REGIONAL DEPARTMENT OF DEFENSE RESOURCES MANAGEMENT STUDIES

THE 6th EXPLORATORY WORKSHOP

"CONTEMPORARY CHALLENGES IN PROJECT AND PROGRAM MANAGEMENT"

ISSN: 2286 - 2773

ISSN-L: 2286 – 2773

Volume coordinator: Lecturer PhD. Aura CODREANU

"CAROL I" National Defense University Publishing House

Bucharest 2013

THE 6th EXPLORATORY WORKSHOP

"CONTEMPORARY CHALLENGES IN PROJECT AND PROGRAM MANAGEMENT"

WORKSHOP COMMITTEE

COL PhD. eng. Cezar VASILESCU

COL PhD. Daniel SORA

The content of the papers is in the entire responsibility of the author(s), and does not necessary reflecting the opinion of the Workshop Committee.

THE 6th EXPLORATORY WORKSHOP

"CONTEMPORARY CHALLENGES IN PROJECT AND PROGRAM MANAGEMENT"

20 December 2013

The proceedings of the workshop unfolded during the

Program and Project Management

Postgraduate Course

Conducted by the

Regional Department

of Defense Resources Management Studies

23 November - 20 December 2013

Braşov
ROMANIA

This page is intentionally left blank

WORKSHOP CONTENTS

ELECTROMAGNETIC EMISSIONS SECURITY SYSTEM FOR MOBILE PHONES (EMS MP)

PhD. eng ADINA OTILIA BOTEANU

CONTENTS

PROJECT NAME

ELECTROMAGNETIC EMISSIONS SECURITY SYSTEM FOR MOBILE PHONE-EMS MP

Project sponsor

National Scientific Research Authority / Ministry of Education

Project summary

As a natural consequence of their functionality, electronic and electrically devices are emitting electromagnetic fields. This related fact is representing one of the biggest concerns for the electronic devices owners and mobile phones in particularly regarding data security risks and health safety. Electromagnetic interferences (i.e. EMI) are another "security" issue of the sensitive equipments owners in terms of reliability. Equipments could be also more susceptible in hostile electromagnetic environments with unpredictable interferences occurrence as a natural or man-made phenomena consequence.

In our approach the prototype resulted will be an optimized, enhanced and improved version of the classical shielding solution with a high grade of novelty, originality and innovation.

The aim of "**Electromagnetic emissions security system for mobile phone-EMS MP**" is to find a group of technologically „*best solutions*" for mobile phone electromagnetic protection, keeping the original configurations and performances of the products.

I. BUSINESS CASE

Scope

The main purpose of the project is to prevent electromagnetic radiation emitted by the mobile phone and to achieve a high performance shielding where sensitive equipment must be protected.

Current situation

The existence of a real interest for electromagnetic shielding, interest being expressed by very important customer organizations in the field of civil and military community, public order and national safety and also from other entities and institutions, telecommunication companies, medical institutes, customers with special needs for electromagnetic protection was a crucial factor for as in conceiving and elaborating this project proposal.

Using electromagnetic shielding protection for mobile phones is a need for users in telecommunications domain which utilize high frequency signals, due to it provides the best efficient solution method, taking into account economical issues.

A different development approach is to apply “extreme” EMC design principles in early developing stages of the electronic components. In order to fulfill all conditions necessary to assure an acceptable level of electromagnetic protection this solution will involve a complex design approach that could also cause original components performances degradation. This option is also not very economical efficient because of major invests needs in current production facilities of the electronic devices developers, already designed for a large target market.

There are other solution to shield the mobile phone like: skin-blok, a thin shielding film, blocShok, a pillow case and Faraday bag (figure 1). All this not assure the permissible level of shielding and not be used during talk to the mobile phone.

Figure 1. Shielding solutions for mobile phone

Solutions

The proposal is to develop an alternative way to the classical solution by achieving an optimized version of a shielding structure using alternative economic materials with a higher degree of interoperability and compatibility. In other words, the emissions protection system will present major advantages like: lightweight structure, friendlier and versatile interfaces, and no restrictions regarding hardware and physical configurations, adaptive to existing equipments, reuse for other applications, easy maintenance, ergonomics, data security improvements, environmental friendly solution.

Integration of unconventional materials such as flexible material, inserted metallic components in dielectric standard fabrics, optical transparent or opaque substratum material for electromagnetic shielding into modular and adaptable structures for electromagnetic protection will also reduce the implementation costs, encouraging friendly environmental technologies, allowing, reusing, in safe conditions existing equipments, efficiency and versatility.

This project is devoted to develop a system to ensure emission security protection, which refers to apply technical measures to isolate and protect from an electromagnetic point of view internal components of equipments from the signals emitted by other external equipments placed in their surroundings. At the same time these measures will perform the conditions in order to protect the external devices functionality and in addition the healthy human body.

Project goals are directly related to electromagnetic filed which explores alternative new classes of materials to perform electromagnetic shield screens for mobile phones.

The project novelty

An innovation brought by this project in terms to *decrease* the level of electromagnetic field produce by the devices and to *increase* the protection of human body is the use of alternative materials, unconventional, for achieving electromagnetic shield screens for mobile phones.

A project major challenge is to optimize unconventional shielding materials for economic improvements in the equipment emissions security field. This approach could stimulate new EMI (i.e. electromagnetic interferences) technologies development, thanks to economic benefits specific to resources "rational" exploitation.

The proposed solution is more expensive than non shielding mobile phone but much cheaper than classical solution.

The integration of individual elements for shielding in a compact system, compatible with the classes of common mobile phones equipments which can be interfaced with other communications systems it is a high-novelty degree solution in the field of communication devices, offering an alternative to equipments protected by classical solutions for the components shielding.

The shielding system will be designed and developed to reach a minimum level[1] for emitted electromagnetic radiation attenuation to protect the mobile phone. Now the radiated power of the mobile phone is 0,125-1W, shielding system will reduce to 0,125W.

Approximately 20-80% of the cell phone radiation from your mobile device's antenna penetrates up to 2 inches into the adult brain (figure 2).

[1] Lönn S et al. *Output power levels from mobile phones in different geographical areas; implications for exposure assessment. Occupational and Environmental Medicine.* 2004;61:769-72

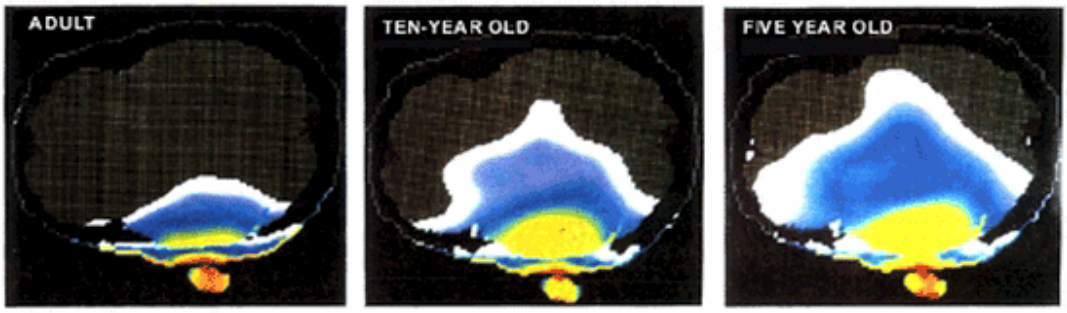


Figure 2. Penetration of radiation on brain of an adult, a 10 year old and a 5 year old

The shielding system providing 40+ dB of attenuation.

The field being yet in the phase of scientific accumulations which will bring the technological maturation, characterized by economical, reproducible and stable solutions, the proposed research is part of a relatively new direction.

Project feasibility

The project is considered, as being a feasible one and with all qualities and premises necessary for development because:

- it proposes new solutions of materials applicable in very interesting fields, international novelty, the proposed technologies having, in our opinion, an important economical and medium impact;

- it responds to the concrete needs of EMI and EMC protection in systems already implemented also in process of implementing in a period with large interest for the resolving of protecting aspects;

- proposes an innovative and original solution regarding an alternative approach of the concept of assuring the emissions protection;

- it represents a new scientific and technological approach, the potential of scientific contribution being a remarkable one.

The project feasibility is determined by having a controlled management process of activities, risk management plan, change management process, quality standards and all the equipments and facilities necessary to complete these activities.

The project will be mostly realized inside our institution a research and development centre, specialized departments with ample experience and acknowledged performances in scientific research and developing area.

Using the experience of each of member team useful product will be made, with novelty character.

The outcomes' project is validated using the testing principles. For example, schema of experimental configuration setup, technical hardware and software tools used for

measuring the vulnerability degree of the equipments emissions are presented in the figure below:

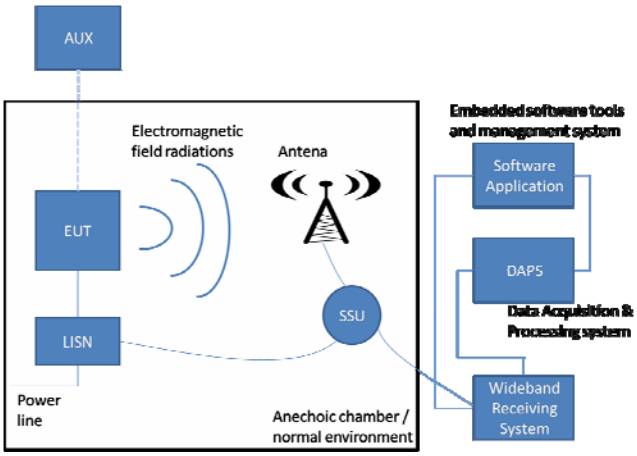


Figure 3. Experimental configuration for compromising radiation evaluation

The estimated implementation period of this project is: 4/1/2013 – 9/23/2015.

Total cost of the project is: 1,740,828 lei.

Type of project is an individual one having in this concept only one subcontracting activities based on fixed payment.

II. SCOPE MANAGEMENT PLAN

II.1 Goal

The project visas to increase safety use of electronic devices by developing a prototype protect against electromagnetic radiation.

II.2 Objectives

We identified the following objectives:

O1. Documentation regarding different types of electromagnetic shielding materials through existing materials features analyses and technical studies.

This first objective will be accomplished between 4/1/2013 – 10/8/2013, by scientific team lead by team manager. The deliverable is a technical study.

O2. Requirements establishment and electromagnetic shielding materials software modelling.

Results: one technical study contains the simulation-modelling activities results and one Technical Specification. To perform this objective will be involved 2 personnel team specialized in IT and software modelling and 2 persons having electronic skills. They work

between 8/28/2013 – 12/6/2014 for software simulation and specification elaboration. The project team will publish technical papers and articles.

O3. Electromagnetic shielding materials-ESM realization for using in prototype system. ESM test and evaluation.

Results: electromagnetic shielding materials and testing and evaluation Report. Scientific teams: 4 persons and 2 persons: electronic engineers and scientific researchers and subcontractors lead by project manager, technical team manager and scientific team manager. To complete this objective they will work between 11/3/2013 – 12/12/2014.

O4. **Prototype design and execution using ESM adaptable/fitted in device configuration. Prototype test and evaluation.**

Results: prototype documentation (prototype project) and test and evaluation report. Technical and scientific teams: 4 persons and 4 persons: electronic engineers and scientific researchers lead by scientific team manager and technical team manager. In addition the design and execution of prototype will be subcontracted to specialized organization or institute. To complete this objective they will work between 12/23/2013 – 9/23/2015.

II.3 Work Breakdown Structure (WBS)

The table presented below show the WBS with the description and the name of each activity undertaken by the project's team, starting from the five objectives.

No.	Objective	Activities	Sub-activities
1.	Documentation regarding different types of electromagnetic shielding materials through existing materials features analyses and technical studies	Researches regarding emissions protection and electromagnetic interferences (EMI) vulnerabilities	Equipments acquisition
			Consumables acquisition
			Analysis regarding EMI vulnerabilities of common mobile phones configurations
			Technical study elaboration
			Technical study approval
		Studies regarding electromagnetic shielding materials	Different technologies of electromagnetic shielding materials technical analysis and performances comparison
			Shielding materials technical

			parameters analysis and identification
			Technical study elaboration
			Technical study approval
			Software technical specification elaboration
			Electromagnetism specialized software acquisition
		Web Project design	
		Financial audit	
2.	Requirements establishment and electromagnetic shielding materials software modelling	Modelling, analysis and optimization for electromagnetic shielding materials	Electromagnetic shielding materials modeling and simulation
			Technical study elaboration
			Technical study approval
		Electromagnetic shielding materials technical and quality requirements elaboration	Technical specifications elaboration for electromagnetic shielding materials
		Project Disseminations of simulation results	Article publication in ISI rated magazines
			Papers presenting at prestigious international conferences
		Program Management Review-PMR1	
		Financial audit	
3.	Electromagnetic shielding materials-ESM realization for using in prototype system. ESM test and evaluation	Electromagnetic shielding materials realization (achievement)	Test and evaluation equipments acquisition
			Subcontracting
			ESM samples execution
			ESM samples test and evaluation
			ESM samples testing report elaboration
			Prototype technical specification

			ESM design and realization for optical opaque shielding fitted in prototype system
			ESM design and realization for optical transparent shielding fitted in prototype system
		Critical Design Review	
		Electromagnetic shielding materials testing & evaluation	ESM testing plan elaboration
			ESM testing plan approval
			ESM test and evaluation
			ESM testing report elaboration
			ESM testing report approval
		Project disseminations of simulation results	Article publication in ISI rated magazines
		Program Management Review-PMR2	
		Web Project update	
		Financial audit	
4.	Prototype design and execution using ESM adaptable/fitted in device configuration. Prototype test and evaluation	Prototype design	Analysis of the specific devices configurations
			Prototype project elaboration
			Prototype project approval
		Critical Design Review	
		Prototype execution	Materials achievement
			Execution of prototype
		Experimenting and measurements test running for prototype	Prototype testing plan elaboration
			Prototype testing plan approval
			Prototype test and evaluation
			Prototype testing report elaboration
			Prototype testing report approval
		Project Disseminations	Article publication in ISI rated magazines
			Papers presenting at prestigious

			international conferences
		Obtaining the patent for Prototype	Patent request
		Program Management Review-PMR3	
		Web Project update	
		Financial audit	

Table 1 - WBS Table

III. TIME MANAGEMENT PLAN (Gantt Chart)

Work plan is split in four major phases wherein are stated the objectives for each of them and are considered the details regarding the activities synchronization in every one of them, so that one activity which uses the results of another activity will not be started until the other one is finalized. In order to develop a realistic and achievable project schedule, in sequencing schedule activities, certain leads and lags have been included.

The project is begun just after the sign-off of the chart by the project sponsor.
The duration of the project is estimated to be 648 days.

The time management plan was elaborated using Microsoft Project software, the **Gantt Chart** are presented in **Appendix 1**, including the relations between different task and the milestones relevant to the project. The milestones relevant for this project are directly related to approval activities.

IV. HUMAN RESOURCE MANAGEMENT

All project activities, carried out inside institution, will be realized in conformity with local available procedures, instructions and other valid regulation documents.

The project team will be lead by the Project Manager (PM) witch will cover the following main aspects: management of scientific and technical activities, resources (financial, human, infrastructure, information) and communication.

The main structure of the project management, regarding the skills and competencies is illustrated in the figure bellow:

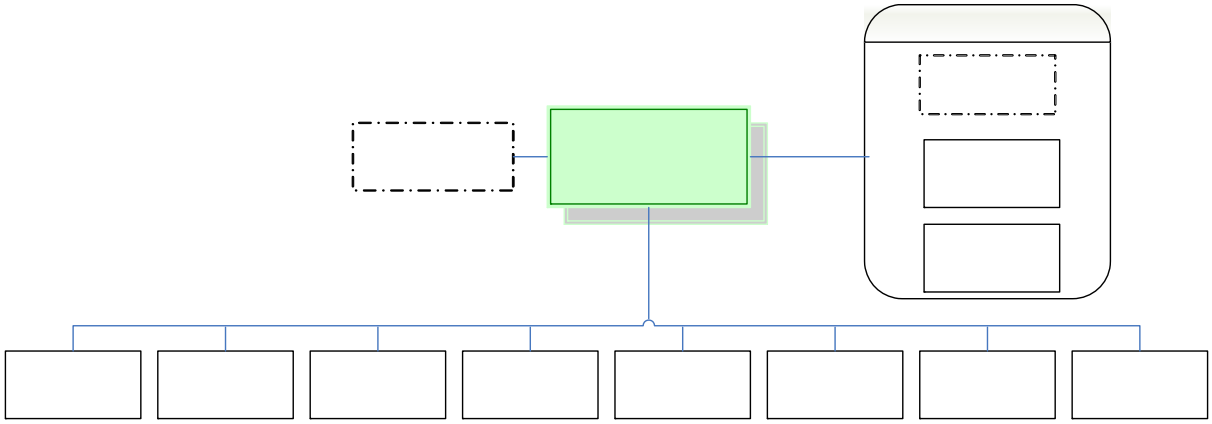


Figure 4. Organizational structure of the project

Assistant Manager

The table below presents the allocation of humans resource to the project's activities with role and responsibility – RAM:

Activity	PM	CS III	CS II	Mechanical engineer	IT specialist	Tele Comunications engineer	Ansys specialist	Test engineer	Assistant Manager	Acquisition specialist	Tehnician	HR specialist	Financial specialist
1.1.1.1	r	c						c		c			
1.1.1.2	r								a	c			
1.1.1.3			c										
1.1.1.4			c										
1.1.1.5	r												
1.1.2.1		c											
1.1.2.2		c											
1.1.2.3		c											
1.1.2.4	r		r						a				
1.1.2.5		c					c			c			
1.1.2.6	r				r		c			c			
1.1.3	u				c								
1.1.4	c											r	c
1.2.1.1		c	c				c						
1.2.1.2		c	c				c						
1.2.1.3	r		r						a				
1.2.2.1		c	c	c				c					
1.2.3.1	c	c	c										
1.2.3.2	c	c	c										
1.2.4	r	r	r	r	r				a				
1.2.5	c											r	c
1.3.1.1	r	r		r				r		c			
1.3.1.2	c								a				
1.3.1.3	r								a				
1.3.1.4			c	c				c					

Electronic engineer CS III

Electronic engineer CS II

Mechanical engineer

IT specialist

1.3.1.5			c	c				c					
1.3.1.6	r	c	c	c									
1.3.1.7	r												
1.3.1.8	r												
1.3.2	r	r	r	r	r				a				
1.3.3.1	r	c		c				c					
1.3.3.2	r	r							a				
1.3.3.3		c		c				c					
1.3.3.4		c		c				c					
1.3.3.5	r	r							a				
1.3.4.1	c	c	c										
1.3.5	r	r	r	r	r				a				
1.3.6	r				c								
1.3.7	r											r	r
1.4.1.1		c	c			c							
1.4.1.2		c	c	c		c							
1.4.1.3	r	r							a				
1.4.2	r	r	r	r	r				a				
1.4.3.1	r	c		c				c		c			
1.4.3.2	r	c	c	c		c					c		
1.4.4.1		c	c	c		c		c					
1.4.4.2	r	r	r	r				r					
1.4.4.3		c	c	c		c		c					
1.4.4.4		c	c	c		c		c					
1.4.4.5	r	r							a				
1.4.5.1	c	c	c										
1.4.5.2	c	c	c										
1.4.6.1	c												
1.4.7	r	r	r	r	r				a				
1.4.8	r				c								
1.4.9	r											r	r

Table 2 – Roles and Responsibility matrix

Legend: a-accountable; c-creator; u-updater; r-reviewer;

V. COMMUNICATIONS MANAGEMENT

Communication management plan contain the stakeholders and the process required to ensure timely distribution of project information.

Stakeholders	Person(s) to convey the message	When the message is conveyed	Format of a message/ activity	Message content
Project sponsor	Project manager	After each objective related major activity	Project status report or E-mail or presentation/ (1.1.1.5, 1.1.2.4, 1.2.1.3, 1.4.1.3, 1.4.4.2, 1.4.4.5)	Business context and benefits Project overview Stage overview High level operational implications Review/approve some project elements Deliverables
Electromagnetic shielding material providers	Project manager	During the requirements definition	Request of information/ (1.2.2.1, 1.3.1.2, 1.3.1.3 1.3.1.7, 1.3.1.8, 1.4.3.1, 1.4.4.3)	Business context
Software application supplier	Project manager Acquisitions specialist	First electromagnetic shielding materials modeling and simulation	Acquisition Contract (1.1.2.6)	Business context Buy software application
Antenna supplier	Project manager Acquisitions specialist	First ESM samples test and evaluation	Acquisition Contract (1.3.1.1)	Business context Buy antenna set
IT equipment	Project	Then project	Acquisition	Business

supplier	manager	activity start	Contract (1.1.1.1, 1.1.1.2)	context Buy IT equipments
Subcontractor	Project manager	Before objective 2	As it is related in contract clauses/ (1.3.1.2)	Business context Buy electromagnetic shielding materials
Telecommunication companies	Project manager	Start date Start of testing phase	Mail Meeting (1.4.1.1)	Research
Potential developers	Project manager Team representatives	Start date	Lend expertise and guidance as needed	Main features developed
Financial auditor	Project manager	After each objective related major activity	Contract (1.1.4, 1.2.5, 1.3.7, 1.4.10)	Reports regarding audit certificate
Research institutes, medical institutes	Project manager Team representatives	Start date	Mail Meeting (1.1.1.3, 1.1.1.4)	Most important features
Science community	Project manager Teams representatives	According to the dissemination process	Presentation / Symposia (1.2.3.1,1.2.3.2, 1.3.4.1 1.4.5.1, 1.4.5.2)	Projects results Project development Major findings
All project team members	Program manager	Monthly	Meeting	Project introduction The following

				steps in project plan and milestones Sponsors and steering committees Teams and members Project phases and deliverables Current status

Table 3 – Communication matrix

VI. PROJECT COST MANAGEMENT

We analyzed the all activities of the project and constituted at a first glance the necessary of materials to evaluate the budget in realistic terms.

The budget cover personnel costs, materials, equipments, subcontracting costs used to shielding material achievement, extern audits activities and transport cost for participation at dissemination.

The equipments and materials necessary are the following: software license for electromagnetic modelling and simulation, personal computers for testing purpose and support for simulation software, printer), materials (raw shielding materials, connectivity elements and mounting accessories of the system), consumables (specific to documents redaction and conservation, office equipments, and auxiliary).

Total cost of the project is: 1,740,828 lei.

VI.1 RESOURCE POOL DESCRIPTION

The project team is composed of 23 people.

Skilled human resources used in this project, equipments, materials, services are related in the resource pool description:

Resource type	Name	Number

Skilled resources/human resource	Project manager	1
	Electronic engineer	8
	Mechanical engineer	2
	IT specialist	1
	Telecommunications engineer	2
	ANSYS specialist	2
	Test engineer	2
	Technician	1
	Assistant Manager	1
	Acquisition specialist	2
	Human resources specialist	1
	Financial specialist	1
	Financial auditor	1
Equipments	Desktop computer	1
	Printer	1
	Laptop	1
	Antenna electromagnetic field set	1
	Measuring and test instruments	1
Software	ANSYS software application	1
Materials	Paper	15
	Pens	20
	Toner	6
	Raw materials	1
Services	Transportation	5
	Accommodation	2
	Patent	1

Table 4 . Resource pool description

VI.2 COST BREAKDOWN STRUCTURE

Resource type	Name	Cost per hour/ product	Total cost (lei)	Total (lei)
Skilled resources/human resource	Project manager	100lei/h	138,50	1,507,203
	Electronic engineer CS II	80lei/h	421,120	
	Electronic engineer CSIII	80lei/h	350,954	
	Mechanical engineer	60lei/h	199,467	
	IT specialist	70lei/h	29,960	
	Telecommunications engineer	60lei/h	96,000	
	ANSYS specialist	70lei/h	61,656	
	Test engineer	60lei/h	128,427	
	Technician	40lei/h	32,000	
	Assistant Manager	30lei/h	17,040	
	Acquisition specialist	30lei/h	25,680	
	Human resources specialist	30lei/h	1,920	
	Financial specialist	40lei/h	2,560	
	Financial auditor	30lei/h	1,920	
Equipments	Desktop computer	2,500lei	2,500	68,500
	Printer	3,500lei	3,500	
	Laptop	2,500lei	2,500	
	Antenna electromagnetic field set	10,000lei	10,000	
	Measuring and test instruments	40,000lei	40,000	
	Electrical / electronic tools and devices	10,000lei	10,000	
Software	ANSYS software application	70,000l	70,000	70,000

		ei		
Materials	Paper	15lei	225	74,725
	Pens	5lei	100	
	Toner	2,000lei	12,000	
	Raw materials	70lei/h	22,400	
	Subcontracting	40,000 lei	40,000	
Services	Transportation	10lei/h	1,200	20,400
	Accommodation	40lei/h	16,000	
	Patent	20lei/h	3,200	
	TOTAL		**1,740,828**	

Table 5 – Cost breakdown structure

VII.2 PROJECT QUALITY MANAGEMENT

VII.1 Project quality definition

We will approach alternative and new types of electromagnetic shielding materials with support of quality, economical and environmental friendly technologies and assuring best performances for mobile phone protection.

The project management will provide the human and material resources need it for objectives achievement and will have an organization structure using vertically subordination and horizontal collaboration principles according with institution quality system of management.

Our institution has implemented a Quality Management System according to ISO standards since 10 years ago. Also our laboratory has implemented SR EN ISO 9001:2001.

The laboratory activities are made using the SMQ developed taking into account the procedures and methods concerning the measurements, which are established in accordance with the articles of the list of standards suggested by the national authority in the field of the project .

The experimenting activities and tests will be performed at the time the basic shield of prototype is complete. We mention, below, Quality Management System and technical standards used in our project.

Our entity uses the following Compatibility EM standards:

- MIL STD 461F – Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment- Department of Defence Interface Standard – December 2007;
- IEEE 299/1997 "Standard Method for Measuring the Effectiveness of Electro- magnetic Shielding Enclosures";
- MIL - STD 220, – „Test Method Standard Method of Insertion Loss Measurement – Department of Defence – USA";
- "Architectural Electromagnetic Shielding Handbook – A Design and Specification Guide" – The Institute of Electrical and Electronics Engineers, Inc., New York, Leland H. Hemming, 1992.

VII.2 Key quality concepts measurement

Solutions for securing the emissions of the mobile phone are augmented in *complexity* as a normal consequence of increasing potential sources of radiations.

Development of a *dedicated* protection system, personalized prototype, implemented in a hardware module.

The proposed solution will have to be *adaptive* to phone types and *interoperable* with most of the mobile phone existing on market and will have to allow other interfacing elements system inclusion, according to technological evolutions and new conditions regarding equipments testing, mentioned in standards and their revisions.

The results obtained by such a system can significantly contribute at *changing the customers vision*, which have sensitive equipment, regarding choosing the best solution for their protection under existing economic constrains, in line with environmental issues and with current concerns for equipment increased interoperability.

Another important argument is represented by the advantage of *obtaining the maximum trust* on behalf of end users concerning the protection offered by the project solution. In addition *avoiding the risk situations* regarding the radiation emission is another major advantage of the project solution.

The solution considered in the project is a *versatile one*, offering to potential users the possibility to access alternative solutions, viable and economic, used to secure the mobile phone.

VII.3 List of deliverables and acceptance criteria

The deliverables and acceptance criteria are presented in connection to each activity:

Deliverables	Activity no	Units/ quantity	Categories	Type	Acceptance criteria
IT equipments	1.1.1.1	1	A	Equipments	Performances
Technical Study vulnerabilities of common mobile phones	1.1.1.4	1	T	Documentation	The results contained are useful in following phase, as input data for software simulation and modelling activities
Technical Study shielding materials technical parameters	1.1.2.3	1	T	Documentation	That contain technical requirements for electromagnetic shielding materials
Software technical specification	1.1.2.5	1	T	Documentation	Useful to acquire the ANSYS software
CAD software application license	1.1.2.6	2	A	Software	Useful to modelling and simulate
Financial audit certificate no. 1	1.1.4	1	QA	Documentation	Compliance with time, costs and goal
Analysis Report for electromagnetism simulations	1.2.1.1	1	R	Documentation	To analyzed different types of materials in accordance with the investigated technologies
Technical Study electromagnetic shielding materials	1.2.1.2	1	T	Documentation	Contains the simulation-modeling activities results of electromagnetic shielding rigid structure of mobile phone
Electromagnetic shielding	1.2.2.1	1	T	Documentation	Analyzing the

materials Technical Specification					behavior of the experimental model realized for baying electromagnetic shielding materials
Article	1.2.3.1	1	R	Documentation	Contain research results Results disseminations
Paper	1.2.3.2	1	R	Documentation	Contain research results Results disseminations
Program Management Review status report no. 1	1.2.4	1	QA	Documentation	Memorandum
Financial audit certificate no. 2	1.2.5	1	QA	Documentation	Compliance with time, costs and goal
ESM samples	1.3.1.3	1	A	Materials	For testing
Electrical/electronic tools and devices	1.3.1.4	1	A	Tools/devices	For measuring
Testing Report	1.3.1.5	1	T	Documentation	Contains experimenting and measurements activities results for shielding materials
Technical specification of prototype	1.3.1.6	1	T	Documentation	Contains revisions of technical requirements for prototype and its elements
ESM for optical opaque shielding fitted in prototype system	1.3.1.7	1	A	Materials	Materials fitted in prototype system
ESM for optical transparent shielding fitted in prototype system	1.3.1.8	1	A	Materials	Materials fitted in prototype system

Critical design minute of meeting no. 1	1.3.2	1	QA	Documentation	Memorandum
Testing and Evaluation Plan	1.3.3.1	1	T	Documentation	Contains experimenting and measurements activities
Testing Report	1.3.3.4	1	T	Documentation	Contains experimenting and measurements activities results for shielding materials
Article	1.3.4.1	1	R	Documentation	Contain research results Results disseminations
Program Management Review status report no. 2	1.3.5	1	QA	Documentation	Memorandum
Financial audit certificate no. 3	1.3.7	1	QA	Documentation	Compliance with time, costs and goal
Technical Execution Project for electromagnetic shielding experimental model	1.4.1.2	1	T	Documentation	Technological solutions validation for the mobile phone
Critical design minute of meeting no. 2	1.4.2	1	QA	Documentation	Memorandum
Materials achievement	1.4.3.1	1	A	Materials	Samples material
Prototype execution	1.4.3.2	1	T	Product	Technical execution project for electromagnetic shielding prototype
Testing and Evaluation Plan of prototype	1.4.4.1	1	T	Documentation	Testing case
Measuring and test instruments	1.4.4.3	1	A	Apparatus	Test instruments for measuring
Testing Report of prototype	1.4.4.4	1	T	Documentation	Results of testing and evaluation

					prototype
Article	1.4.5.1	1	R	Documentation	Contain research results Results disseminations
Paper	1.4.5.2	1	R	Documentation	Contain research results Results disseminations
Patent Request	1.4.6.1	1	R	Documentation	Activities regarding intellectual rights property
Program Management Review status report no. 3	1.3.5	1	QA	Documentation	Memorandum
Financial audit certificate no. 4	1.4.9	1	QA	Documentation	Compliance with time, costs and goal

Table 6 – List of deliverables

Legend: A-Acquisition; QA-Quality Assurance; T-Technical; R- Research

VII.4 Quality planning and control (activities and responsible persons)

The following table provides the indicators of the activities which are divided as quality planning activities and quality control activities, and the responsible person for each activity:

Activity	Responsible persons	Description
Quality planning activities		
Staffing	Project Manager	Identification and assignment, or recruitment, of qualified staff (mentors and supervisors) for sustaining the
Set quality criteria		Set acceptance criteria for the deliverables
Environment	Vocational training	Create a supportive

	specialists	environment, context and structure by elaborating a mentoring model that fits every mentee's needs and expectations and system's requirements
Quality control activities		
Monitoring	Project Manager	Continuous monitoring of all activities planned; recommend action for improvement; monitor the corrective actions
Communication	All stakeholders, according to the Communication Plan	Continuous communication to all team members of any needed information
In-Process Audits	External auditor	Audits of deliverables to ensure completeness and consistency of deliverables, according to the acceptance criteria
Status Reporting	All stakeholders according to the Communication Plan	Periodical activity reports and project status reports

Table 7 – Quality planning and control activities

VIII. PROJECT RISK MANAGEMENT

The main risks to the project were identified by the project manager with support of team using brainstorming, checklist analysis based on historical information and knowledge that has been accumulated from previous similar projects and from other sources of information and assumptions analysis.

VIII.1 List of risks and strategies for tackling major risks

Type of Risk	Risk Conditions	Risk Description	Impact	Probabilit	Importanc	Risk mitigation

				y	e (impact X probability	strategy
Cost	Estimating cost errors or absence of contingency control Project budget decrease/cuts	Contingency control system lacking or non existent Decreasing the budget during the project process	3	2	6	Well budget estimations based on existing prices, the previous projects and feasibility studies
Market risk	Absence of market conditions and opportunities	The new product will not be useful to the other organizations or marketable to others	2	2	4	Feasibility studies and market analysis
Suppliers	principal and certified providers can't be identified or non existent	There are no electromagnetic shielding materials providers	2	2	4	Develop of materials in cooperation with research institutes Components available and directly usable
Procurement	Inadequate process of acquisition	The internal acquisition procedures are not suitable for subcontracting activities regarding the	1	3	3	Create or update the internal procedures in accordance with national regulations in order to be used to perform the project

		conditions of project				
Time	Prices oscillation for antenna electromagnetic field set coming from abroad and errors in estimating the funds for software acquisition Errors in estimating time or resource availability	Poor estimation for overall project Early release of competitive products	1	2	2	A good documentation for antenna electromagnetic field set and software prices
Integration	Difficulties of implementation and integration of all parts of project	Prototype is reasonable for this team to implement	1	2	2	Manage the skills and competencies regarding human resources
User acceptance	Users do not accept any concepts and test requirements of the new product	Issues in prototype requirements test	1	2	2	Refresh the testing plan and procedures in more details to present clearly requirements completion
Design difficulty	Design complexity	Unclear how to design or aspects of design hardly to be decided	1	2	2	Easily maintained the design process Well defined interfaces
Quality	Lack of reviews and technical	Implementing the quality	1	1	1	Create and maintain a well defined

	audits	process based on the quality standards doesn't exist				Program Management Review
Project manager experience	Little experience of project manager	Project manager has a little experience with similar projects and is new to project management medium	1	1	1	Encourage communication and delegation inside the project team to secure collective support

Table 8 – List of risks and mitigation strategy

Legend:

Impact	Probability
1 – Insignificant (no impact)	1- Very unlikely (hasn't occurred before)
2 - Minor (little effect)	2 - Slight (rarely occurs)
3 – Significant (may pose a problem)	3 - Feasible (possible, but not common)
4 - Major (Will pose a problem)	4 - Likely (has before, will again)
5 – Critical (Immediate action required)	5 - Very Likely (occurs frequently)

In Figure 5. Risk assessment presented the relevance of the risks analyzed according to the importance of risk.

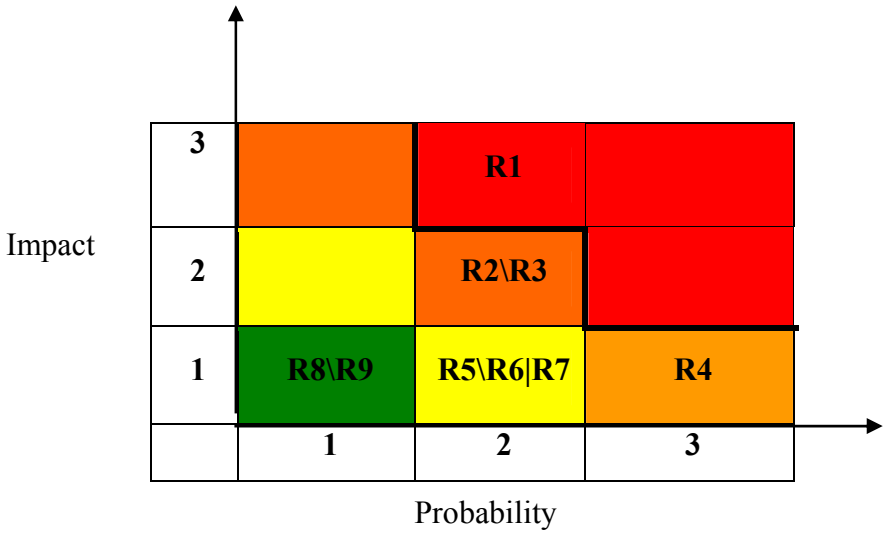


Figure 5. Risk assessment

IX. PROJECT CLOSEOUT

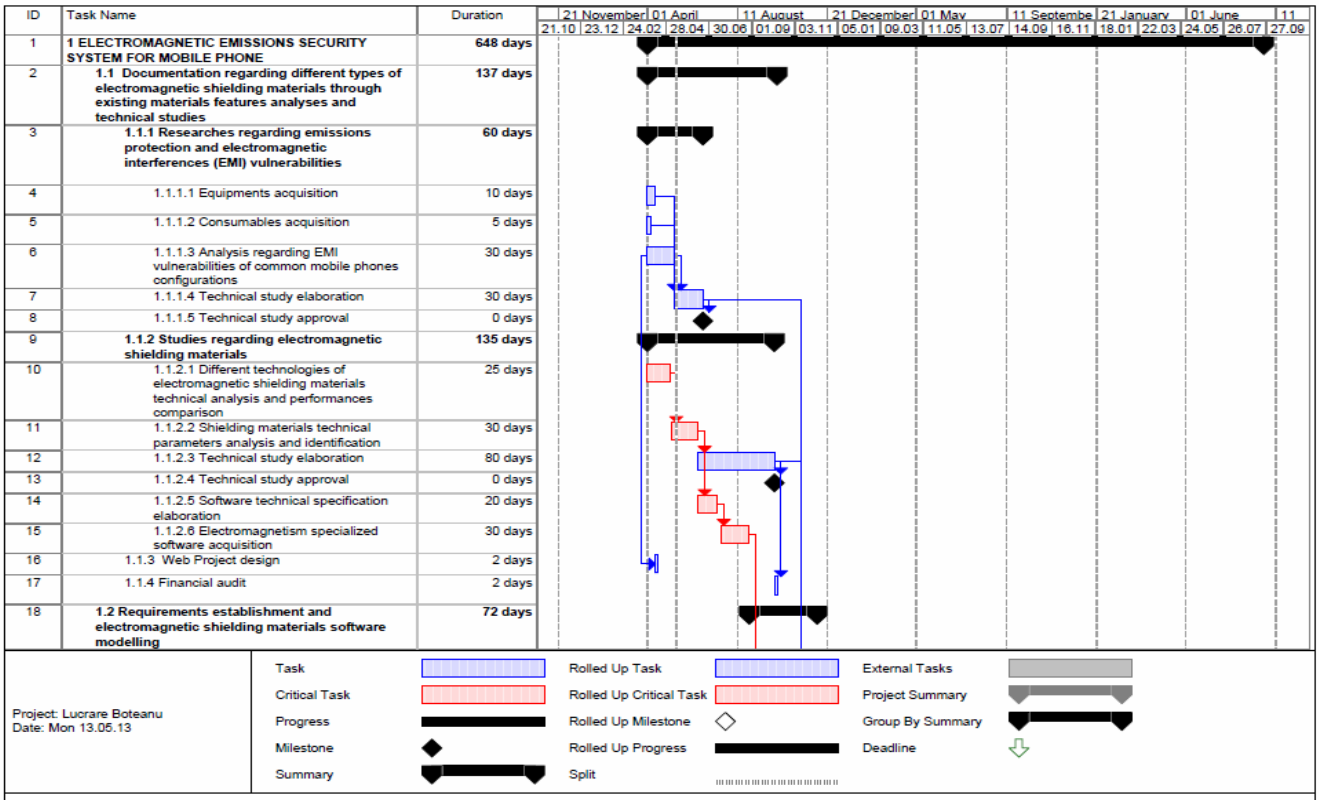
At the end of the project, a meeting will be held with the Project Manager and Project Sponsor to discuss the results of the project, obtains formal sign-off, and identifies any next steps.

The importance of dissemination derive from the necessity to offer to potential developers and information security systems beneficiaries improved, optimized and cheaper versions comparing with classical versions. The results materialized in this project will represent the efficient technical economic proof of new technologies for electromagnetic protection same as fundamental materials. The impact will be stronger if possible applications, but also the final system solutions will extend the mentioned areas, considering very appropriate to participate at scientific sessions activities, same as realizing articles, books and scientific papers.

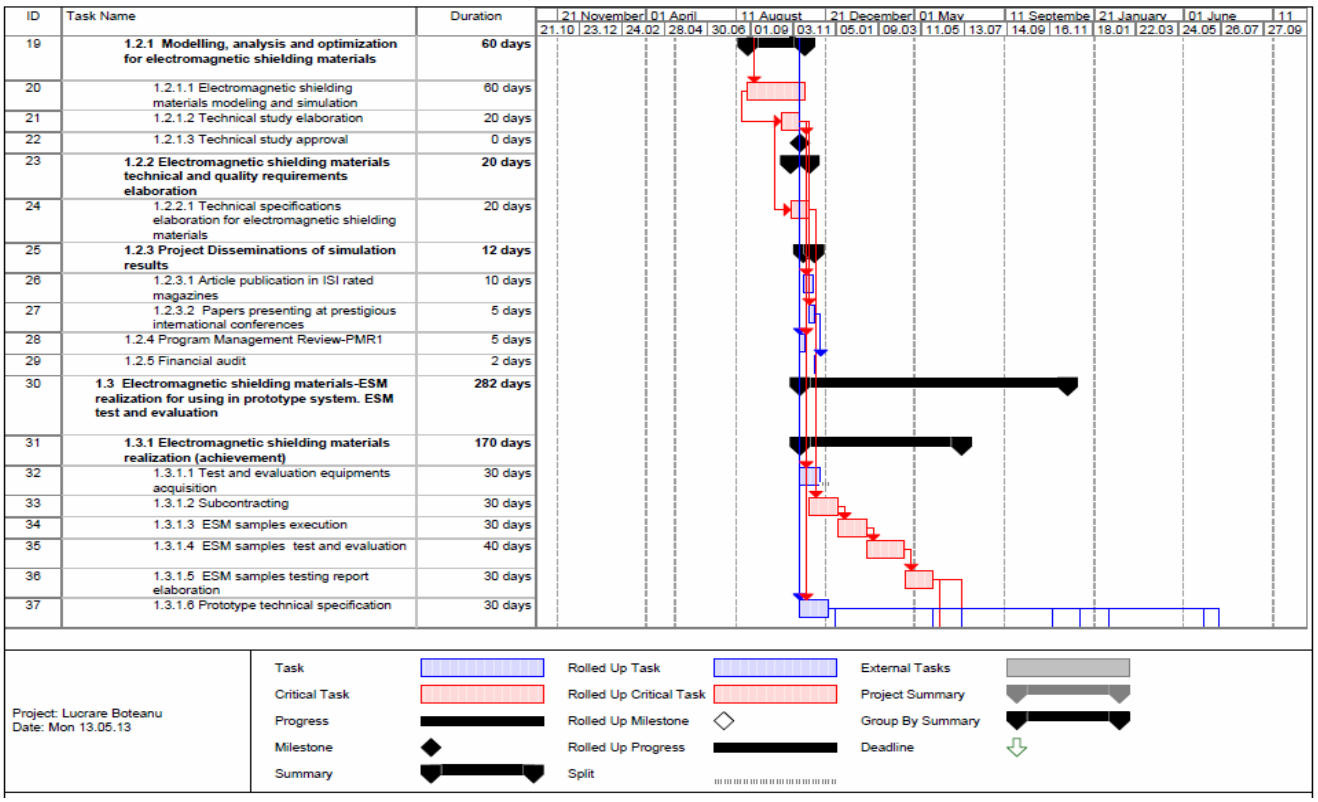
The main activities regarding intellectual rights property is patent request.

X. List of tables

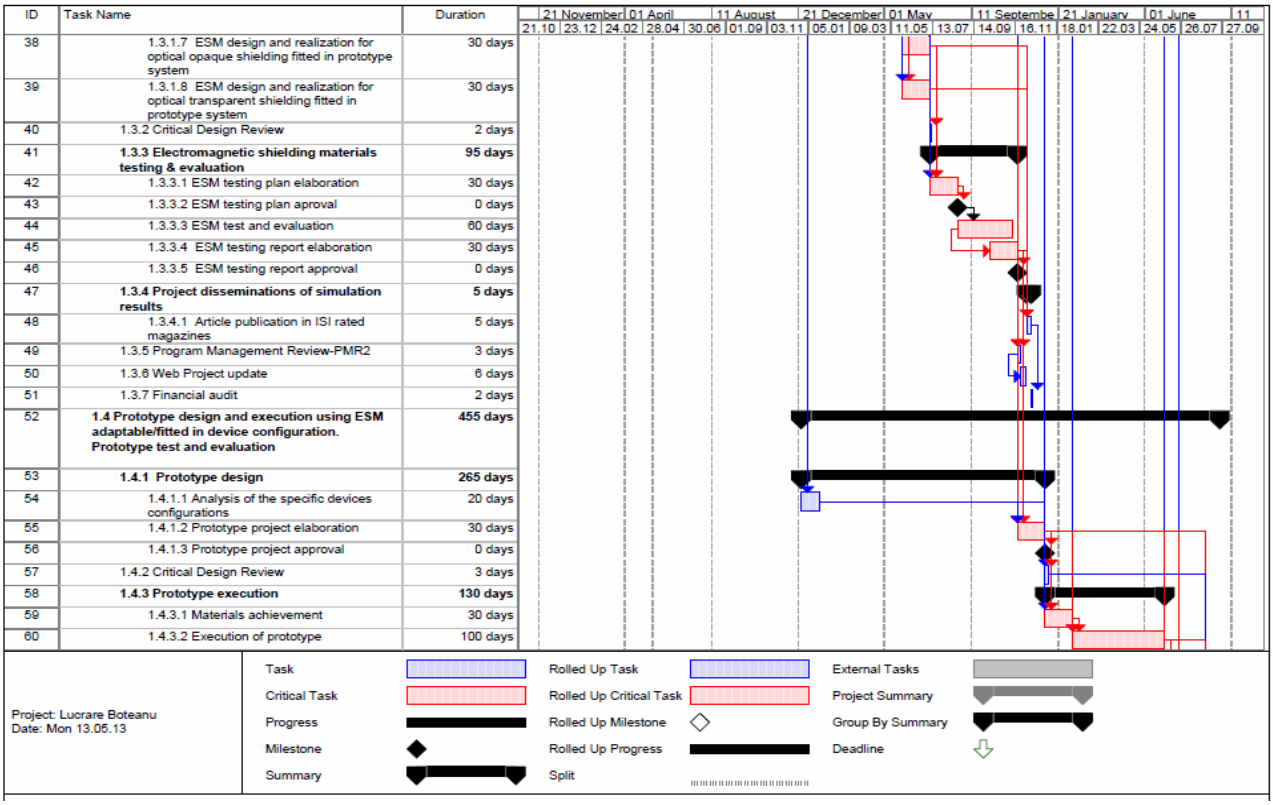
XI. List of figures



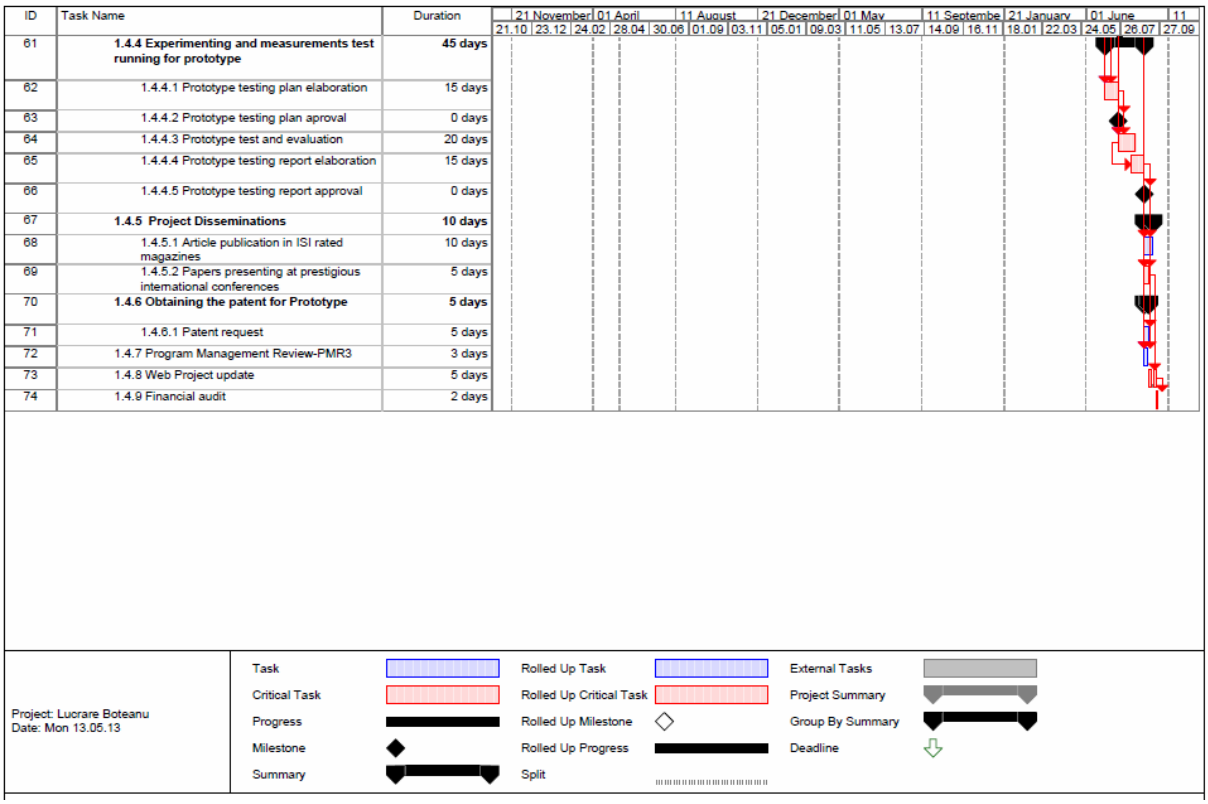
ID	Task Name	Duration
1	**1 ELECTROMAGNETIC EMISSIONS SECURITY SYSTEM FOR MOBILE PHONE**	**648 days**
2	**1.1 Documentation regarding different types of electromagnetic shielding materials through existing materials features analyses and technical studies**	**137 days**
3	**1.1.1 Researches regarding emissions protection and electromagnetic interferences (EMI) vulnerabilities**	**60 days**
4	1.1.1.1 Equipments acquisition	10 days
5	1.1.1.2 Consumables acquisition	5 days
6	1.1.1.3 Analysis regarding EMI vulnerabilities of common mobile phones configurations	30 days
7	1.1.1.4 Technical study elaboration	30 days
8	1.1.1.5 Technical study approval	0 days
9	**1.1.2 Studies regarding electromagnetic shielding materials**	**135 days**
10	1.1.2.1 Different technologies of electromagnetic shielding materials technical analysis and performances comparison	25 days
11	1.1.2.2 Shielding materials technical parameters analysis and identification	30 days
12	1.1.2.3 Technical study elaboration	80 days
13	1.1.2.4 Technical study approval	0 days
14	1.1.2.5 Software technical specification elaboration	20 days
15	1.1.2.6 Electromagnetism specialized software acquisition	30 days
16	1.1.3 Web Project design	2 days
17	1.1.4 Financial audit	2 days
18	**1.2 Requirements establishment and electromagnetic shielding materials software modelling**	**72 days**



ID	Task Name	Duration
19	**1.2.1 Modelling, analysis and optimization for electromagnetic shielding materials**	**60 days**
20	1.2.1.1 Electromagnetic shielding materials modeling and simulation	60 days
21	1.2.1.2 Technical study elaboration	20 days
22	1.2.1.3 Technical study approval	0 days
23	**1.2.2 Electromagnetic shielding materials technical and quality requirements elaboration**	**20 days**
24	1.2.2.1 Technical specifications elaboration for electromagnetic shielding materials	20 days
25	**1.2.3 Project Disseminations of simulation results**	**12 days**
26	1.2.3.1 Article publication in ISI rated magazines	10 days
27	1.2.3.2 Papers presenting at prestigious international conferences	5 days
28	1.2.4 Program Management Review-PMR1	5 days
29	1.2.5 Financial audit	2 days
30	**1.3 Electromagnetic shielding materials-ESM realization for using in prototype system. ESM test and evaluation**	**282 days**
31	**1.3.1 Electromagnetic shielding materials realization (achievement)**	**170 days**
32	1.3.1.1 Test and evaluation equipments acquisition	30 days
33	1.3.1.2 Subcontracting	30 days
34	1.3.1.3 ESM samples execution	30 days
35	1.3.1.4 ESM samples test and evaluation	40 days
36	1.3.1.5 ESM samples testing report elaboration	30 days
37	1.3.1.6 Prototype technical specification	30 days



ID	Task Name	Duration
38	1.3.1.7 ESM design and realization for optical opaque shielding fitted in prototype system	30 days
39	1.3.1.8 ESM design and realization for optical transparent shielding fitted in prototype system	30 days
40	1.3.2 Critical Design Review	2 days
41	**1.3.3 Electromagnetic shielding materials testing & evaluation**	**95 days**
42	1.3.3.1 ESM testing plan elaboration	30 days
43	1.3.3.2 ESM testing plan aproval	0 days
44	1.3.3.3 ESM test and evaluation	60 days
45	1.3.3.4 ESM testing report elaboration	30 days
46	1.3.3.5 ESM testing report approval	0 days
47	**1.3.4 Project disseminations of simulation results**	**5 days**
48	1.3.4.1 Article publication in ISI rated magazines	5 days
49	1.3.5 Program Management Review-PMR2	3 days
50	1.3.6 Web Project update	6 days
51	1.3.7 Financial audit	2 days
52	**1.4 Prototype design and execution using ESM adaptable/fitted in device configuration. Prototype test and evaluation**	**455 days**
53	**1.4.1 Prototype design**	**265 days**
54	1.4.1.1 Analysis of the specific devices configurations	20 days
55	1.4.1.2 Prototype project elaboration	30 days
56	1.4.1.3 Prototype project approval	0 days
57	1.4.2 Critical Design Review	3 days
58	**1.4.3 Prototype execution**	**130 days**
59	1.4.3.1 Materials achievement	30 days
60	1.4.3.2 Execution of prototype	100 days



ID	Task Name	Duration
61	**1.4.4 Experimenting and measurements test running for prototype**	**45 days**
62	1.4.4.1 Prototype testing plan elaboration	15 days
63	1.4.4.2 Prototype testing plan aproval	0 days
64	1.4.4.3 Prototype test and evaluation	20 days
65	1.4.4.4 Prototype testing report elaboration	15 days
66	1.4.4.5 Prototype testing report approval	0 days
67	**1.4.5 Project Disseminations**	**10 days**
68	1.4.5.1 Article publication in ISI rated magazines	10 days
69	1.4.5.2 Papers presenting at prestigious international conferences	5 days
70	**1.4.6 Obtaining the patent for Prototype**	**5 days**
71	1.4.6.1 Patent request	5 days
72	1.4.7 Program Management Review-PMR3	3 days
73	1.4.8 Web Project update	5 days
74	1.4.9 Financial audit	2 days

INTEGRATED SOFTWARE FOR HUMAN RESOURCE AND FINANCIAL DEPARTMENTS

LTC Mihai CHIRCĂ

CONTENTS

I. BUSSINES CASE

The purpose of the project is to integrate the existing softwares used in the MoD by Human Resources and financial department specialists, into unique software in order to avoid data duplication, wasted resources and assure the accuracy of the reports delivered at unit's level. Since estimated costs are almost insignificant, because will be used mainly resources already in the inventory of MoD, the expected outcome is a faster, easier to use, more secure and efficient system to be used by the deciders.

Introduction

After more than 15 years of experience in the information management field I noticed the one of the main problems to be overcome in many areas of the military environment, but not only, is a clear differentiation between efficiency and effectiveness. While effectiveness means doing the right things at the right time the efficiency means doing the things right and describe which time, effort or cost is well used for the intended task or purpose.

While considering operational areas effectiveness is much more important and to reach the main goal is essential no matter how the resources used, considering administrative areas, the lack of efficiency means an inappropriate resource using and finally waste of money.

The problem

In order to accomplish their objectives many departments of the army use different softwares based mainly on the same information (e.g. personal and professional data etc...). Each department creates and updates daily its own database.

The best example is the softwares used by Human Resources and Financial departments. There are a lot of data to be updated and corrected by the financial department even tough the data have been already updated by the HR department and vice versa

Human resource department already use software based on client-server technology since the financial department use an independent software solution so the reports are not available on-line for the higher echelons.

As a result of using different databases and different specialists to manage them I identified the following problems:

a. Very high probability to appear differences between information used so the reports delivered are not always accurate.

b. The time using for update the database is at least double considering also the time to correct the errors

c. Inefficient use of human and equipment resources since any update of the database is done twice.

The solution

The goal of the project is to integrate the software solutions used in the MoD by Human Resources and Financial departments into one single system in order to avoid data duplication and assure the accuracy of the reports delivered at units level and to higher echelons.

The main idea is to modify the database structure use by the HR in order to fit the Financial department needs and to create a new software, based on client-server technology, with 2 components, using the same database, and to be used by each department.

The project will be completed under an authoritative command (Deputy chief of General Staff for Resources) in 15 months using only own resources by the IT specialists that created previous software, in collaboration with HR and Financial representatives. Based on the solution we chose the budget will not be more than 5.000 RON

The benefits

The first benefit of the solution is an increasing efficiency and much more accurate reports but this benefit is harder to see at unit level.

If assume that an average salary for a financial specialist is 2000 lei than his hourly salary is around 11 lei. Further, if assume that this specialist work 1 hour to update or correct the database (already updated by the HR specialist) and in a given month the average number of this activities is only 10, than he waste 110 lei/month. Multiplying this value with the number of military units will result more than 2500 lei wasted /month,

Taking into account that the project total cost is no more than 5000 lei than after the first 2 months we use this solution we are on “profit”.

The third benefit is that this solution and documentation resulted is a platform for future projects to integrate another MoD’s software that use the same information.

The fourth benefits is a more secured database

Assumptions

a. The material and equipment resources required for the project are in the inventory of MoD.

b. The project team members will be paid with their monthly salary.

c. For training courses are necessary founding only for transportation, perdiem and accommodation.

d. Commitment for the project of the HR and Fin department commanders

e. Project team members have big experience in their field.

Constraints

The following constraints apply to the Project. As project planning begins and more constraints are identified, they will be added accordingly.

a. Staff fluctuation due to lack of availability of the entire project team for the entire period of the project

b. Due the data "sensibility" the final product must respect highly security requirements

Key milestones

The total estimated duration of the project is 331 working days between 6 January 2014 and 14 April 2015.

The milestones are:

- 31 January 2014 – Deliver authoritative paper in order to create the project team
- 15 March 2014 – Provide requirements documentation
- 30 September 2014– Deliver provisionally installation program
- 15 December 2014 – Test the software and provide installation program
- 01 April 2015 – Training end-users
- 01 May 2015 – Close the project

II. SCOPE MANAGEMENT PLAN

II.1. Goal

The goal of the project is to integrate the existing softwares used in the MoD by Human Resources and Financial departments into one single software in order to avoid data duplication and assure the accuracy of the reports delivered at unit's level.

II.2. Objectives

The project follows five major objectives:

1. Determine, by human resources and financial department representatives, the requirements during meetings organized in the first 2 month of the project under an authoritative command until all the specification of the software will be decided and generate the framework for the IT team.
2. Develop the software under project manager supervision in 12 months from the beginning of the project using user's requirements so that all the specifications are met.
3. Implementation and testing the software using representative's observation within 2 months under project manager supervision
4. Distribute the product and trains the users for 1 month making final adjustments in order to meet all the user requirements and security regulations.
5. Presents the project results and benefits to potentially clients outside MoD during a series of conferences organized under an authoritative command.

II.3. Work Breakdown Structure

1. Determine the requirements
1.1. Plan project teams that will be involved in software development
1.1.1. Ask departments involved to appoint representatives
1.1.2. Make initial agreements with department representatives
1.1.3. Create the teams
1.2. Organize the details of the meetings
1.2.1. Create the meetings schedule
1.2.2. Deliver authoritative papers
1.3. Identify requirements
1.3.1. Identify individual requirements
1.3.2. Identify conflicting requirements
1.3.3. Propose alternative requirements
1.3.4. Provide draft requirements documentation
1.4. Validate requirements
1.4.1. Verify that stated requirements fulfill the user-s request
1.4.2. Verify existed technology for stated requirement
1.4.3. Verify the requirements from security point of view
1.5. Provide final requirements documentation
2. Software development

2.1. Determine the software configuration

2.1.1. Decide among different solutions (SQL SERVER or MSDE)

2.1.2. Define the migration strategy between existing databases

2.1.2.1. Identify database to be imported or changed

2.1.3. Define the database update strategy

2.1.4. Define the security

2.1.4.1. Determine the security constraints

2.1.4.2. Determine the user groups

2.1.4.3. Determine the authentication method

2.2. Asses technical possibilities

2.2.1. Determine software and hardware *needs*

2.2.2. Determine software or hardware upgrades *needs*

2.2.3. Procure the software or hardware

2.3. Develop the software

2.3.1. Create the databases

2.3.2. Develop the software modules

2.3.3. Integrate the software modules

2.3.4. Test the software in order to fulfill the requirements

2.3.5. Create the provisionally installation program

3. Implementation.

3.1. Determine the testing plan

3.1.1. Determine the testing goals

3.1.2. Determine testing system and testing users

3.2. Install the software on the testing systems at users locations

3.2.1. Make necessary software or systems upgrades

3.2.2. Install the software

3.3. Test the software

3.3.1. Test using various virtual scenarios

3.3.2. Test on real situations and compare with expectations

3.3.3. Identify the errors and make the errors list

3.3.4. Correct the errors

3.3.5. Validate the modifications

3.4. Update the provisionally installation program

4. The IT team delivers the product and trains the users for 1 month making final adjustments in order to meet all the user requirements and security regulations.

4.1. Create software documentation for the technical teams and end-users

4.1.1. Create installation manual

4.1.2. Create user manual

4.2. Obtain the approval from the security department

4.2.1. Deliver the specification and all documentation to the SD

4.2.2. Security department makes an assessment

4.2.3. Security department provide the security approval

4.3. Deliver the software

4.3.1. Create the software distribution plan

4.3.2. Deliver the product to end-user locations

4.3.3. Install the software on the end-users locations

4.3.4. Introduce the new software in exploitation

4.3.5. Identify issues on installation location

4.3.6. Update software documentation

4.4. Train the users

4.4.1. Create the course plan approved by an authoritative command

4.4.2. Organize the course

4.4.3. Users attend to introduction course

4.4.4. Get feed-back

5. The project manager presents the project results and benefits to potentially clients outside Mod during a series of conferences organized under an authoritative command.

5.1. Plan the conference

5.1.1. Identify the target audience.

5.1.2. Obtain necessary approvals from security departments and authoritative command

5.1.3. Send the invitations

5.1.4. Create presentation and promotion materials

III. TIME MANAGEMENT PLAN

The purpose of this plan is to show how the project will be executed and to provide to all stakeholders a tool to monitor project status at any given time. All the project team must agree with work assigned, durations and schedule.

The project schedule will be reviewed and updated by the project manager weekly based on the reports provided by the team leaders.

The total estimated duration of the project is 331 working days between 6 January 2014 and 14 April 2015.

The milestones are:

- 31 January 2014 – Deliver authoritative paper in order to create the project team
- 15 March 2014 – Provide requirements documentation
- 30 September 2014– Deliver provisionally installation program
- 15 December 2014 – Test the software and provide installation program
- 01 April 2015 – Training end-users
- 01 May 2015 – Close the project

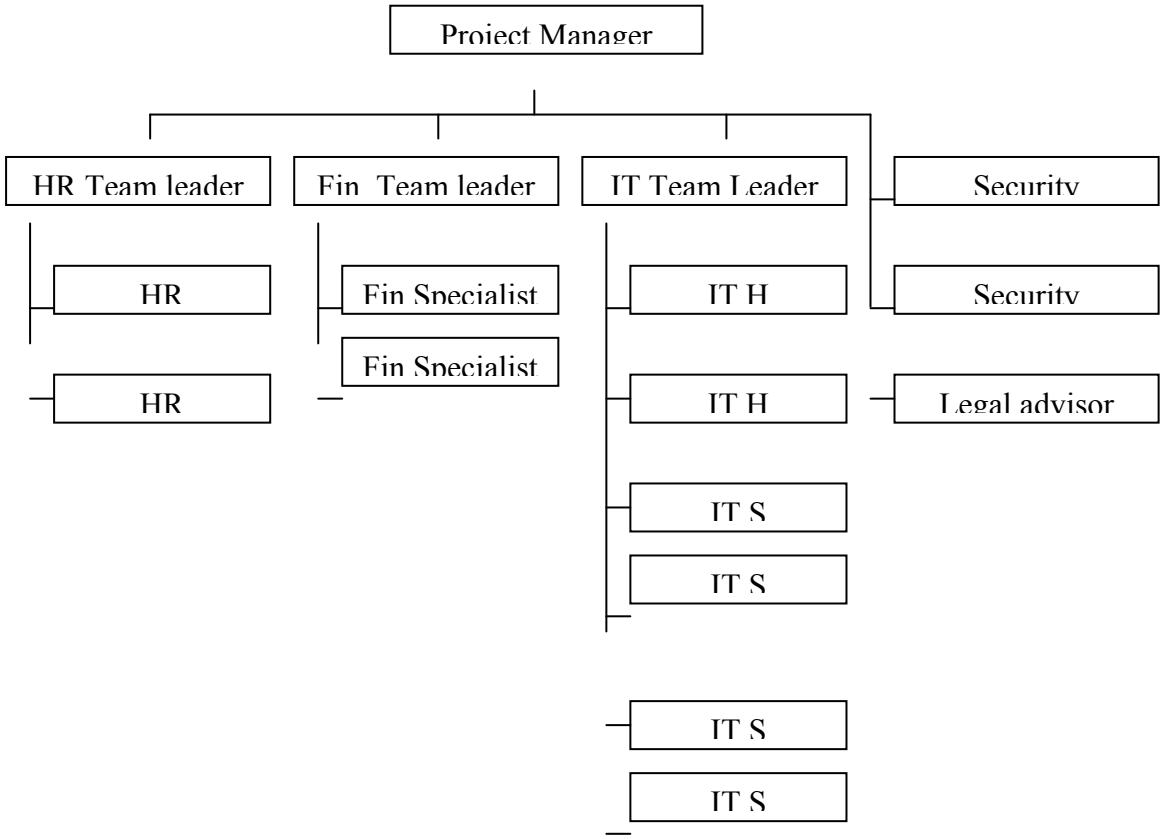
The detailed time management plan of the project is represented by the Gantt chart in the **Appendix 1**.

IV. HUMAN RESOURCE MANAGEMENT

The purpose of this plan is to assure that the project will be successful by ensuring the appropriate specialists and all the roles and responsibilities are clearly defined and understood by every component of the team.

Considering project characteristic, project team members represent different departments and are subordinated by different commanders. Furthermore, some team members may have different ranks and degree of responsibilities on their current work so the entire team activity must be very well managed.

Organizational chart is defined as follows:



The main roles and responsibilities are defined as follows:

Project manager – is responsible for the entire project success. He has to monitor and check all the project phases and periodically report to authoritative command. Also he is responsible to evaluate each project team member ant take or propose measures to correct if necessary.

Team leaders (Human resources, Financial, IT) – are responsible for their team activities and assure that all the tasks assigned to team members are well understood and the results are delivered on time. Also they are responsible for training end-users.

Team members (Human resources - 2, Financial – 2, IT - 8) – are responsible to respect the project schedule and to deliver their work results on time and with defined quality standard. As necessary they will participate to meetings and all the activities on behalf of team leaders.

Advisors (Security – 2, Legal - 1) – are responsible to deliver advices and to participate to key meetings in order to assure all the project requirements. They make assessments on their field and, as necessary they approve plans

The following chart shows the relations between main tasks and the projects roles.

	Project Manager	Team leaders	Team members	Legal advisor	Security advisor	Department Commanders
Determine the teams	R, E	E		C	C	I
Requirements Definition	V	R,V	E	C	C	I
Software development	V	R,V	E			I
Implementation preparation	V	R,V	E		C	I
Software implementation	V	R,V	E	C	C	I
Software Testing	V	V	R,E			I
User Training	V	R	E		C	I

Key: R – Responsible E – Execute V – Verify/Monitor C – Consulted I – Informed

V. COMMUNICATIONS MANAGEMENT

This Plan sets the communications framework for the project and will serve as a guide for communications throughout the life of the project and will be updated as communication needs change. This plan also includes a guide how the meetings will be conducted, ensuring successful meetings.

Project manager will create a database with contact information for all stakeholders directly involved in the project.

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable
Kickoff Meeting	Introduce the project team and the project. Review project	• Face to Face	Once	• Authoritative command • Project	Project Manager	• Agenda • Meeting Minutes

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable
	goal objectives			Team		
Project Team Meetings	Review status of the project with the team.	• Face to Face	Weekly	• Project Team Leaders	Project Manager	• Agenda • Meeting Minutes • Project schedule
Technical Meetings	Discuss and develop technical design solutions for the project.	• Face to Face	As Needed	• Project Technical Staff	Technical Teams leaders	• Agenda • Meeting Minutes
Monthly Status Meetings	Report on the status of the project to management.	• Face to Face	Monthly	• PMO	Project Manager	• Slide updates • Project schedule
Project Status Reports	Report the status of the project including activities, progress, costs and issues.	• Email	Monthly	• Project Sponsor • Project Team • Stakeholders • PMO	Project Manager	• Project Status Report • Project schedule

Meeting Agenda

Meeting Agenda will be distributed 5 working days in advance of the meeting. The Agenda should identify the presenter for each topic along with a time limit for that topic. The first item in the agenda should be a review of action items from the previous meeting.

Meeting Minutes

Meeting minutes will be distributed within 2 business days following the meeting. Meeting minutes will include the status of all items from the agenda.

VI. PROJECT COST MANAGEMENT

The assumptions are:

a.The material and equipment resources required for the project are in the inventory of MoD.

b. The project team members will be paid with their monthly salary.

c. For training courses are necessary founding only for transportation, perdiem and accommodation.

6.1 The list of resources needed for this project:

Resource type	Name	Number
Human resource	Project manager	1
	HR team leader	1
	HR specialists	2
	Finance team leader	1
	Finance specialists	2
	IT Team leader	1
	IT Hardware specialists	2
	IT Software specialists	4
	Security specialists	1
	Legal advisors	1
Equipment	Personal computers	12
	Servers	1
	Printers	2
	Projector	1
Materials	Paper	24
	Printer consumables	12

6.2. Cost breakdown structure

The total cost of the project is estimated at approximate 5**000 RON,** on which 1500 to be used in 2014 fiscal year and 3500 in the 2015 fiscal year.

The detailed descriptions for each activity cost are presented in **Appendix 2.**

VII. PROJECT QUALITY MANAGEMENT

7.1 Project quality definition

The software quality standards and requirements will be determined by the project teams during the second meeting and will be based on Romanian legislation applying MoD particularity for HR, Financial and Security departments. During the development and testing the project team will also document any newly identified quality standards.

The software system delivered to the end-users must assure the following key quality requirements:

a. Provide friendly and intuitive interface
b. Provide facility to be updated and modified from central server without user intervention.
c. Provide tools for archiving data and easy acces to historical information
d. Provide security tools assuring access to database on „need to know" bases, tracing all the users activity, saving and restore working session

7.2. Quality assurance

In order to ensure quality, project manager and team leaders will perform assessments at planned intervals throughout the project to ensure all processes are being correctly implemented and executed. If discrepancies are found, the project manager will meet with the team leaders and review the identified discrepancies.

The Project Manager will schedule regularly management, and document reviews that will result to process improvement. All process improvement efforts must be documented, implemented, and communicated to all stakeholders as changes are made

7.3. List of deliverables and acceptance criteria

A. Project team organizational chart approved by the deputy for resources of General Staff commander.

- to be completed NLT 25 January 2014
- must contain clearly statements about the team members and their personal data. Also will contain the names and positions for the reserve team.
- responsible Project Manager

B. Statement of requirements signed by the key stakeholders. (Departments commanders, security and legal specialists)

- to be completed NLT 15 March 2014
- must contain all the specification needed for the software planning and developing phases.
- responsible Project Manager

C. Software installation program

- to be completed NLT 15 December 2014
- the software must accomplish all the requirement
- the result of the survey regarding software ease of use, over 10% of the users, must have at least 80 points out of 100.
- must assure an easy and correct installation of the software on the end-user computers.
- responsible IT team leader

D. Users training plan approved by the deputy for resources of General Staff commander

- to be completed NLT 15 March 2013
- must contain complete schedule and materials in order to assure end-user training and an easy implementation of the software.
- responsible Project Manager

8. PROJECT RISK MANAGEMENT

The purpose of this plan is to enounce risks and to define a strategy to avoid or mitigate those risks.

The approach to manage risks is to identify, scored and ranked risks. The risk manager will be project manager, will monitor each risk and will take all the measures to implement this plan in order to assure project success. The project manager organizes weekly-based meetings with team leaders in order to monitor and evaluate how the risk affected the project, identify new risks and update this plan.

Risk	Risk likelihood	Risk impact	Risk rate	Risk management strategies
1	2	3	4	5

Risk	Risk likelihood	Risk impact	Risk rate	Risk management strategies
1	2	3	4	5
1. Lack of involvement of authoritative command and no help for unresolved issues	3	4	12	Explain the benefits of the software and the implication of take no corrective measures
2. Staff fluctuation due to lack of availability of the entire project team for the entire period of the project	5	2	10	Ask departments to appoint one reserve for each team.
3. Little or no commitment for the project and weak experience in the domain for the teams members	3	3	9	Ask departments for the best specialists in their domain
4. Delays due to approval needed from, authoritative command, legal or security department	3	2	6	Risk accepted. Develop an efficient communication strategy with legal and security departments
5. Not all requirements are well defined	2	5	10	Include at least one very experienced representative in every team.
6. Too many conflicting requirements	2	3	6	Risk accepted. Increase the number of meetings
7. Continually and rapidly changing of the HR and financial legislation during the entire life of the project	5	5	25	Statement of requirements will include the possibility to modify the software by the IT specialists on short time and upgraded automatically

Risk	Risk likelihood	Risk impact	Risk rate	Risk management strategies
1	2	3	4	5
				without users intervention
8. Not all errors are found during testing period	2	5	10	Develop comprehensive testing procedures with all departments representatives and very experienced users considering virtual and real scenarios
9. Not all security issues addressed and the software is already in use by the users	2	5	10	Ask users security department to double check the security measures and create a plan for upgrade the software on short time
10. Resistance from the users faced with a new software	2	3	6	Develop and deliver good documentation and organize an efficient help system

Legend:

Green = Low risk, Amber 9 = Medium risk, Amber 10 –12 = high risk, Red = High Risk

Likelihood of Occurrence (column 2)

1- Very unlikely (hasn't occurred before)

2 - Slight (rarely occurs)

3 - Feasible (possible, but not

4 - Likely (has before, will again)

Severity of Impact (column 3)

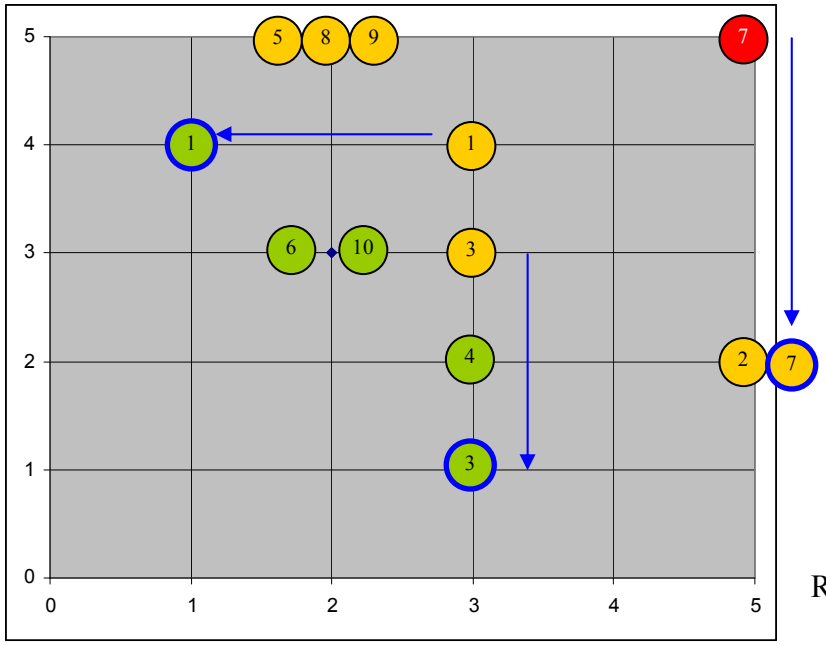
1 - Insignificant (have no effect)

2 - Minor (little effect)

3 - Significant (may pose a problem)

4 - Major (Will pose a problem)

Risk impact



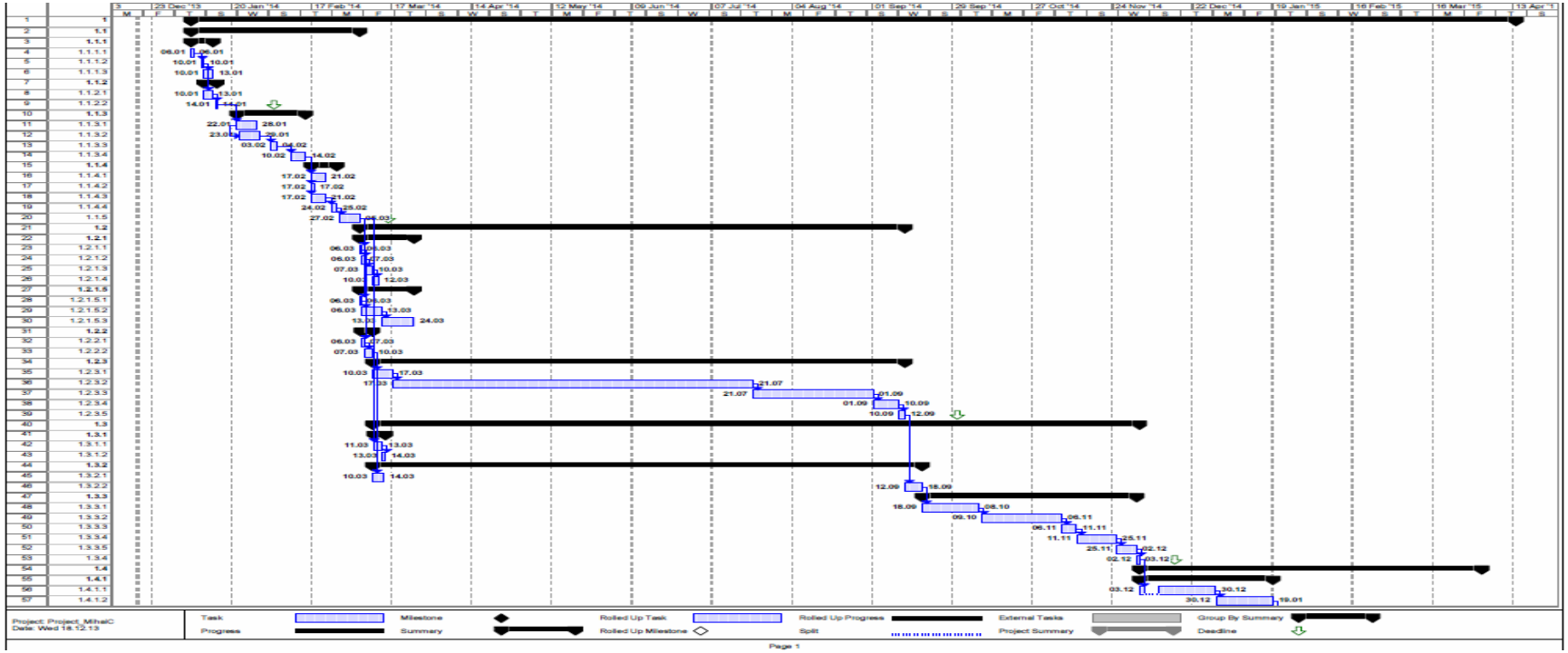
Risk likelihood

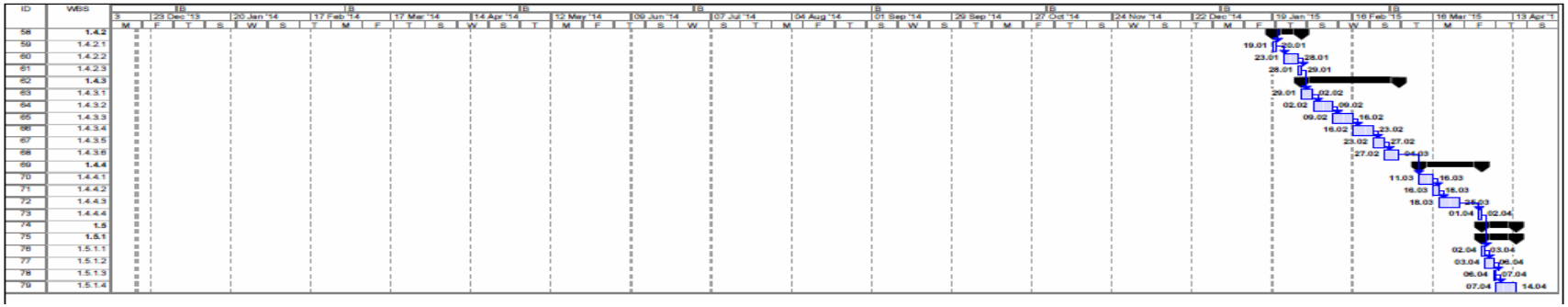
8. PROJECT CLOSEOUT

During all the phases, project manager documents what went well and what went wrong in order to be used by other project managers on similar future projects. Additionally, the project manager will get feed-back from project team members.

All the documents related to the project are to be archived electronically

Based on these documentations, project manager present to key stakeholders the final report and the plan for the conference for presenting the project results. **After the conference a party will be held to celebrate the project success**.





ORGANIZING THE SESSION OF THE ARTILLERY WORKING GROUP

Florian CIOCAN

CONTENTS

I. BUSINESS CASE

The purpose of the project is to organize under the best conditions the Arty Working Group Session during 3 - 6 June 2014, as stated by the Military Committee Directive, the Convening Order and Terms of Reference. The expected outcome is the increase of visibility and prestige of the field and air defense artillery branches amongst the similar structures and military education institutions and in NATO.

1.1. Introduction

According to the MC Directive, Arty Working Group convenes three times a year, in March at NATO HQ and twice, during the summer and fall - together with International Artillery Symposium - by rotation in the NATO member states.

After more than 9 years as NATO member now Romania is the only member country that has never hosted a session of the Arty WG. Following the decision taken at Brussels session on March 2013, Romania will host the session in the summer of 2014 at F&AD Artillery Training Centre HQ, Sibiu.

The estimated costs are almost insignificant, because will be used mainly resources already in the inventory of Field and Air Defense Training Centre, the accommodation and meals will be supported by the nations member and the other expenses by the participant (tax for attending the session is 50 €).

The assigned Project Manager (PM): LTC. Florian CIOCAN, Head of Research, Development and Regulation Section, from F&AD Training Centre.

The decision making authority: Army Staff Commander, International Cooperation Department, F&AD Training Centre Commander and FA Inspector, DD NSA.

Start date of the project: 17 March 2014

End date of the project: 18 July 2014

Budget: 3,000 RON

There is the possibility to increase the budget (up to 10%) depending on the needs that might come up while carrying out the project.

Number of participants in the session: 29 foreign participants (1 Chairman, 1 Secretary, 27 national representative), and 1 Romanian (the representative at the Arty WG).

Main venue: HQ F&AD TC

Resources: F&AD TC has the capability to provide with all the needed resources in - house.

Pre-requisites: The organization of the session falls under the responsibility of a Working Group (WG) that is to start its activity on 10 March 2014.

The WG is chaired by the PM and comprises the Chiefs of the following sections: Logistics, IT&C, and PR as well as the chief of S&LL Office.

The WG meets twice a month to analyze the progress of the project and to establish the next measures to be taken.

The communication with the foreign participant institutions will be done through the Arty WG Forum within the unclassified NSA site, and the site opened for this very particular event.

1.2. Benefits

The organization and support of the session under the best conditions, especially from the administrative, logistic, IT, and PR point of view, will significantly contribute to the enhancing of the F&AD Training Centre and Romanian land forces image among the foreign partners and at the level of the NATO structures.

.

1.3. Assumptions

a) The material and equipment resources required for the project are in the inventory of F&AD TC

b) The project team members will be paid with their monthly salary.

c) Project team members have are subject matter experts in their field.

1.4. Constraints

a) resource are not available at the required date;

b) participants administrative data not received at the required date.

1.5.Key milestones

The total estimated duration of the project is 90 working days between 17 March and 18 July 2014 and the milestones are:

a) 25 April 2014 – Send to participants the final program

b) 29 April 2014 - Confirmation for transportation

c) 5 May 2014 – Verify Presentation kits

d) 8 May 2014 – Confirmation for accommodation

e) 18 July 2014 – Publish LL Collection and close the project

II. SCOPE MANAGEMENT PLAN

1. Goal

To organize under the best conditions the Arty Working Group Session during 4-8 June 2014, as stated by the MC Directive, the Convening Order and TORs.

2. Objectives

The objectives to be aimed for reaching the stated goal are the following:

1. The F&AD Artillery Training Centre WG will support the Chairman to manage the Session on 4-8 June, under best conditions by providing the venue, IT equipment, logistics, and the supporting staff in accordance with the detailed program to be drawn up and agreed by 15 May 2014.

2. The F&AD Artillery Training Centre PR section will promote the success of the session at the end of the event (8 June 2014) by a Press Communicate addressed to local, national and NATO media, thus enhancing its image as reliable partner among the foreign counterparts and at the NATO level.

3. The F&AD Artillery Training Centre LL Office will build upon the experience of the participants to the event in accordance with the LL Guideline by focusing on all lessons identified during the session that are to be published within the Land Forces LI database and collection by the 3rd quarter 2014.

3. Work Breakdown Structure (WBS)

1.1. Draw up the program for the session and receive organizational details

1.1.1. Draw up the final program

1.1.1.1.Draw up a draft program and submit the draft program to participants

1.1.1.1.1. Request of r tentative agenda and convening order

1.1.1.1.2. Pending for answers

1.1.1.1.3. Receive the convening order and tentative agenda

1.1.1.1.4. Prepare and send program draft to the participants

1.1.1.1.5. Pending for answers from participants

1.1.1.1.6. Receive, centralize O&P, draw up the final program

1.1.1.1.7. Send to participants the final program

1.1.1.2.Receive the administrative details from participants

1.1.1.2.1. Ask for administrative details

1.1.1.2.2. Pending answers from participants

1.1.1.2.3. Receive and centralize the data

1.1.1.2.4. Send data to people involved

1.2. Preparing the activities at the HQ of F&AD Training Center

1.1.2. Prepare the conference hall and set up a secretariat for the official

1.2.1.1. Brief the Chief of S&LL Office on the requirements and identify appropriate rooms

1.2.1.2.

1.2.2. Prepare and set up the conference hall and a Secretariat

1.2.2.1. Brief the Chief of S&LL Office on the requirements

1.2.2.2. Identify an appropriate conference hall

1.2.2.3. Identify an appropriate room to host the Secretariat

1.2.2.4. Provide the necessary personnel

1.2.3. Provide the necessary IT&C equipment for the works

1.2.3.1. Brief the IT&C Section Chief on the requirements and decide on and provide the necessary equipment

1.2.3.2. Install the equipment

1.2.4. Prepare Presentation Kits to be offered to the participants

1.2.4.1. Prepare the welcoming letters from the F&AD Training Center

1.2.4.2. Prepare the badges and buy the files

1.2.4.3. Prepare the session written program

1.2.4.4. Prepare the brief presentation of Sibiu and of the F&AD Training Center

1.2.4.5. Prepare the feedback form to be filled in by the participants

1.2.4.6. Verify the Presentation Kits

1.2.5. Arrange transportation (number and types of cars) of the participants from the airport to the hotel and back, from the hotel to the main venue, and back and for the city tour

1.2.5.1. Establish the number and type of cars for the transportation

1.2.5.2. Send request for transportation to motor pool

1.2.6. Preparing accommodation

1.2.6.1. Brief the Chief of Logistics on the requirements

1.2.6.2. Identify a 4* hotel in Sibiu meeting the requirements

1.2.6.3. Book the needed rooms, and the lounge for the welcoming cocktail, official dinner and closing reception

1.2.6.4. Decide on the menu for welcoming cocktail, official dinner and closing reception

1.2.6.5. Book a city tour including Bruckentall Museum, Astra Museum of Traditional Popular Civilization, and salted lakes in Ocna Sibiului

1.3. Administrative activities during the session

1.3.1. Brief the Chief of Logistics on the requirements

1.3.2. Arrival of the delegates

1.3.3. Accommodation of the delegates

1.3.4. Provide transportation from hotel to the main venue and back

1.3.5. Support the Chairman and Secretary during the Plenary session

1.3.6. Take pictures during the works to be offered to the participants at the departure

1.3.7. Organize the coffee break, lunch, official dinner, and closing reception

1.3.8. Guided tour of Sibiu, including the Bruckental Palace, Astra Museum of Traditional Popular Civilization, and salted lakes in Ocna Sibiului

1.3.9. Organize the departure of the delegates

2.1.Cover the event on the F&AD Training Centre, Land Forces Staff and NATO's official websites

2.1.1. Prepare a Press Release at the end of the session

2.1.1.1.Gather and analyze the information for the Press Release

2.1.1.2.Draw up a draft of the Press Release and send for approval

2.1.1.3.Share to the NATO website Admin the English version of the Press Release and photos to be uploaded on the site

2.1.1.4.Checking information published

3.1. Preparing documentation and sensors for information collection

3.1.1. Brief the Chief of S&LL Office

3.1.2. Prepare and approve the questionnaire

3.1.4. Questionnaires collection

3.2. Analyze observations and approve LI

3.2.1. Develop FIR

3.2.2. Analyze data collected

3.2.3. Presenting and approve LI by Scientific Board

3.3. LI dissemination

3.3.1. Including LI in the F&AD Training Centre database

3.3.2. Sending LI to LL Office/Army Staff and to JALLC database

3.3.3. Approve and include LI within LL database and collection

3.3.4. Publish the LL collection

III. TIME MANAGEMENT PLAN

The purpose of this plan is to show how the project will be executed and to provide to all stakeholders a tool to monitor project status at any given time. All the project team must agree with work assigned, durations and schedule.

The project schedule will be reviewed and updated by the project manager weekly based on the reports provided by the team leaders.

The total estimated duration of the project is 90 working days between 17 March and 18 July 2014.

The milestones are:

- 25 April 2014 – Send to participants the final program
- 29 April 2014 - Confirmation for transportation
- 5 May 2014 – Verify Presentation kits
- 8 May 2014 – Confirmation for accommodation
- 18 July 2014 – Publish LL Collection and close the project

The detailed time management plan of the project is represented by the Gantt chart in the **Annex A**.

IV. HUMAN RESOURCE MANAGEMENT

The purpose of this plan is to assure that the project will be successful by ensuring the appropriate

Subject matter experts and all the roles and responsibilities are clearly defined and understood by every component of the team.

Considering project characteristic, project team members represent different departments/ offices from the F&AD Training Centre and LF Staff. Furthermore, some team members may have different ranks and degree of responsibilities on their current work so the entire team activity must be very well managed.

The main roles and responsibilities are defined as follows:

Project manager – is responsible for the entire project success. He has to monitor and check all the project phases and periodically report to authoritative command. Also he is responsible to evaluate each project team member ant take any corrective measure, if necessary.

Team leaders (S&LL, Logistic and IT&C) – are responsible for their team activities and assure that all the tasks assigned to team members are well understood and the results are delivered on time.

Team members (S&LL - 2, Logistic – 3, IT&C - 3) – are responsible for the project schedule and for delivering their work results on time and with defined quality standard. As necessary they will participate to meetings and all the activities on behalf of team leaders.
The following chart shows the relations between main tasks and the projects roles.

Table 1

Activity	Chief LF Staff	ICC	Chairman ARTYWG	F&ADTC Commander	Chief logistics	Chief IT&C	Chief S&LL	Chief PR & P
1.1.	6	3	4	2	5	5	1	5
1.2.	6	3	4	2	5	5	1	5
1.3.	6	3	4	2	1	5	5	5
2.1.	6	3	4	5	5	5	5	1
3.1.	6	3	5	2			1	4
3.2.	6	3	2	4	5	5	1	5
3.3.	6	3	2	1	5	5	4	5

Legend	
LF Staff Commander IC Dir International Cooperation Director ArtyWG Chairman F&AD TC Commander Chief Logistics Chief IT&C Chief PR & Protocol	1 actual responsibility 2 general supervision 3 must be consulted 4 may be consulted 5 must be notified 6 approval authority R S C A N

V. COMMUNICATIONS MANAGEMENT

This Communication Plan sets up the communications framework for the project and will serve as a guide for communications throughout the project cycle and will be updated as communication needs to be changed. This plan also includes a guide how the meetings will be conducted, ensuring successful and fruitful meetings and is presented below.

Table 2

Stakeholders	Project stage interest	Expectations/ Concerns	Who conveys the message	When the message is conveyed	Message format	Message content
LF Staff Commander	Closing	Quality	ICC	Mid July	Written report	Project deliverables
International Cooperation Chief	Equally in all phases	Cost Quality* Schedule	Project Manager	Twice a week	Intranet briefing	Project current status
NATO Arty WG members	Planning	Quality* Schedule	Project Manager	17 March	Written message	Organizational details
				10 July	Feedback form	Quality and Questionnaire

						assessment
F&AD Training Center Commander	Planning	Quality* Schedule	Project Manager	Early March and late May	Written reports	Project overview Stage overview
	Closing	Quality*	Project Manager	18 July	Written report	Feedback from the participants Benefits Media exposure
Project Working Group	Equally in all phases	Cost Quality* Schedule	Project Manager	Twice a month (starting with 17 March	Informal meetings	Project introduction Project phases Deliverables Requirements Current status To do activities
				At any moment required by the Project development	Intranet Phone	High level decisions Changes occurred

Meeting Agenda

Meeting Agenda will be distributed 3 working days in advance of the meeting. The Agenda should identify the responsible for each issue along with a time limit for that particular issue. The first item in the agenda should be a review of action plan establish at the previous meeting.

Meeting Minutes

Meeting minutes will be distributed within 3 business days after the meeting. Meeting minutes will include the discussions, decision taken and follow-up action for the issues included in the agenda.

VI. PROJECT COST MANAGEMENT

6.1. The assumptions for the cost of the project are as follows:

b. The material and equipment resources required for the project are in the inventory of F&AD Training Centre and from LF Staff.

b. The project team members will be paid with their monthly salary.

6.2. The list of resources needed for this project is presented on the table below:

Table 3

Resource type	Name	Number
Human resource	IC specialists	1
	Logistics specialists	3
	S&LL specialists	3
	IT&C specialists	3
	Secretariat specialists	2
	PR specialists	1
	Protocol specialists	1
	Translators	1
	Photographers	1
	Chefs	1
	Waiters	2
	Drivers	2
Equipment	Van	1
	Bus	1
	PCs	2
	Color printers	1
	Scanners	1
	Copy machines	1
	Photo cameras	1
	Photo printers	1
	Fax machines	1
	Phone	1
	Audio-conference microphones	30
	Headsets	30
	Diffusers	2
	Amplifiers	1
	Full-set projection equipments	1
Materials	Special papers	500 sheets
	Files	30 pcs.
	Tonners	2 pcs.
	Gift bags	30 pcs.
	Albums of Romania and Sibiu	30 pcs.
	Plastic covers for badges	30 pcs.
	Fuel	110 lt.
Services	Accommodation	30 rooms * 7 nights
	Hotel lounge and catering (welcoming, official dinner and closing reception)	3 packages
	City tour	1 package
	Catering	4 days*30 menus

6.2. Cost breakdown structure

A meeting similar to that subjected to this Project was organized by LF Staff in 2012, and it cost 5,000 RON.

Based on the order of magnitude estimate, the budget for the Project is 3,000 RON, including a contingency sum of 10% (300 RON). As stated in the Business Case, the budget is not fix, but it can be increased depending on the needs.

The cost breakdown structure of the Project is described in the table below:

Table 4

Direct labor	3,000 RON*
Direct materials	1,000 RON
Direct expenses	1,000 RON
Direct cost	*5,000 RON*
Overhead costs -	10% (500 RON)
Contingency sum	500 RON
TOTAL	5,500 RON

VII. PROJECT QUALITY MANAGEMENT

As mentioned in the Section II.2., the three objectives targeted by the Project are supporting the Chairman to manage the Plenary Session, program observance and F&AD Training Centre image enhancement i.e. Quality Factors.

Against this background, all the activities involved by the Project (see the WBS) are planned to provide the achievement of the Quality Factors. Thus, there is no need for other dedicated Quality Activities for the Project.

In the table below there are to be found a list of the Quality Factors, their description, the deliverables and the acceptance criteria for each of them, as well as the activities generating the deliverables:

Table 5

Quality	Description	Deliverables / Acceptance Criteria	Activities Generating Deliverables
Resource Effectiveness	The extent to which the optimal resources are assigned and used to ensure a quality and on-schedule Plenary Session	No more than 30 min. of waiting in the airport at the arrival and no more than 75 min. at the departure No poor services incidents No delay of the official works No communication shortages during the official works Complete and without mistakes Presentation Kits	1.3.1 – 1.3.4
Future Professional Image	The extent to which the development of the Plenary Session is likely to enhance the image of the F&AD TC as reliable partner among foreign partners and at the NATO level	Positive feedback from the participants	1.3.2, 1.6.2
Perception	The extent to which the	No delay in issuing the Press	1.4.1.1 – 1.4.1.5

	organization of the Plenary Session is likely to improve the perception of the public opinion about the F&AD TC	Release Positive press covering of the event on 6 June More than 1,000 accessions of the information provided on the F&AD TC, LF Staff and NATO websites in the first week after the event	

VIII. PROJECT RISK MANAGEMENT

There are 3 major risks identified for the Project:

a) delays in the activities included in the program;
b) poor cover of the event in the media and on the websites;
c) budget overrun.

Out of these, the first three require a countering strategy.

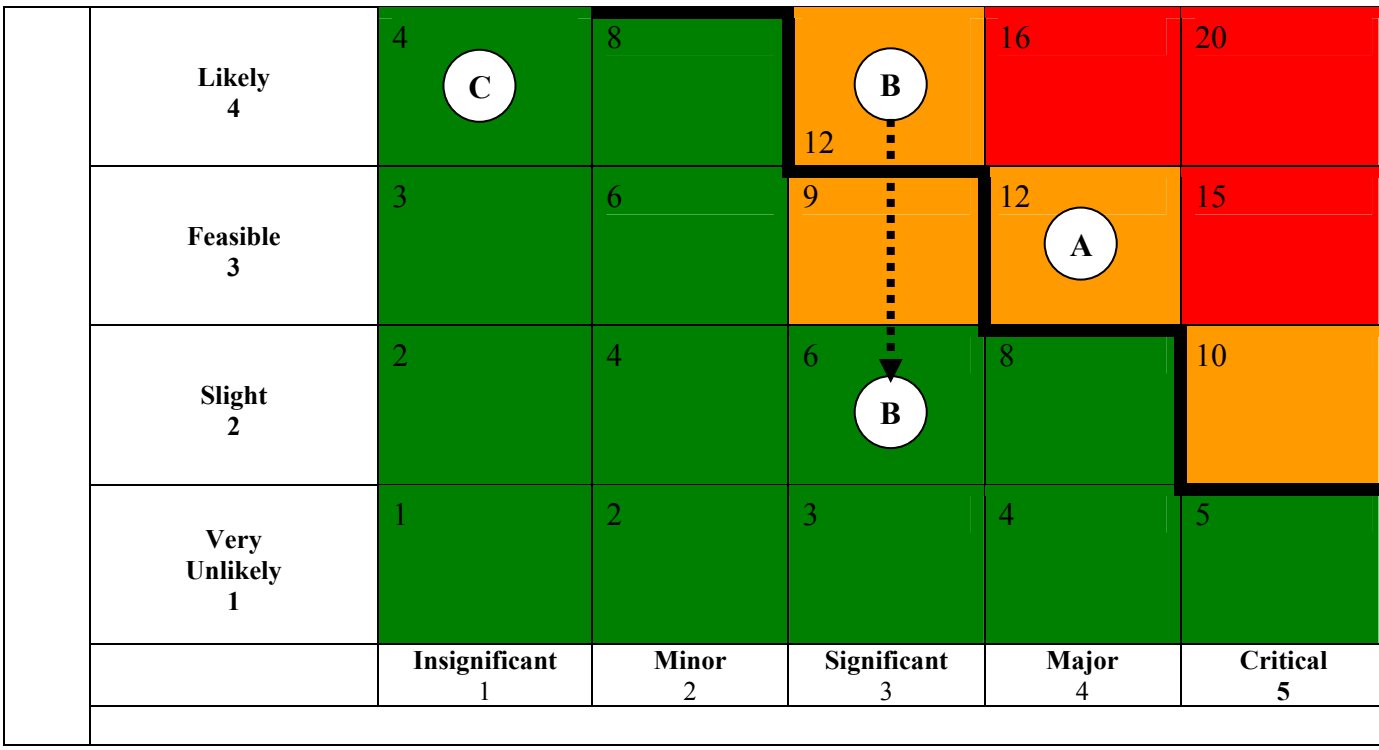
The rating of the risks, their description, and the strategy for tackling them are presented in the table and diagram below:

Table 6

Risk	Rating*	Description	Strategy to counter
A. Delays of the activities included in the program	12 (3A*4B)	- Early arrivals or delays / cancelations of the flights - Unexpected changes in the program of the delegates - Lack of a certain resource at a required moment	Risk avoidance: - drawing up a clear and agreed program - clear briefing of the section/ offices involved about the requirements - reallocation of the resources at disposal
B. Poor covering of the event in the media and on the websites	12 (4A*3B)	- Mass media not broadcasting the Press Release issued to the News Agencies - Long- lasting technical problems with the websites - Not positive perception on the F&ADTC role in the success of the event	Risk mitigation: - good synthesis of the information to be included in the Press Release - good translation into English of the Press Release - send the Press Release directly to some nation wide covering media * taking this measures residual risk will diminish to 6 (2A*3B)
C. Over budget	4 (4A*1B)	**Note:** The budget for the project is not a fix one; it can be increased depending on the needs that might come up while carrying it out	Risk acceptance

Diagram 1

LIKELIHOOD (A)	**Very Likely 5**	5	10	15	20	25



Green = Low risk, Amber 9 = Medium risk, Amber 10 – 12 = High risk, Red = High risk

Likelihood of Occurrence (A)	Severity of Impact (B)
1- Very unlikely (hasn't occurred before)	1 - Insignificant (have no effect)
2 - Slight (rarely occurs)	2 - Minor (little effect)
3 - Feasible (possible, but not	3 - Significant (may pose a problem)
4 - Likely (has before, will again)	4 - Major (will pose a problem)
5 - Very Likely (occurs frequently)	5 - Critical (immediate action required)

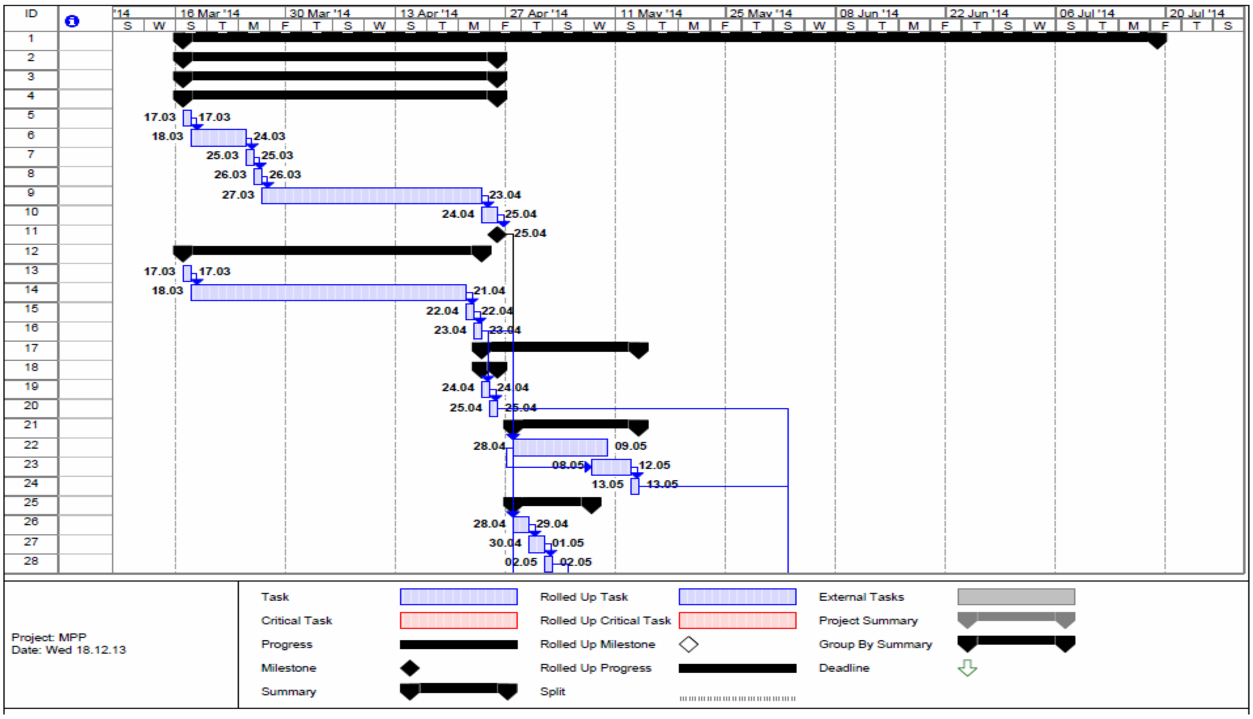
IX. PROJECT CLOSEOUT

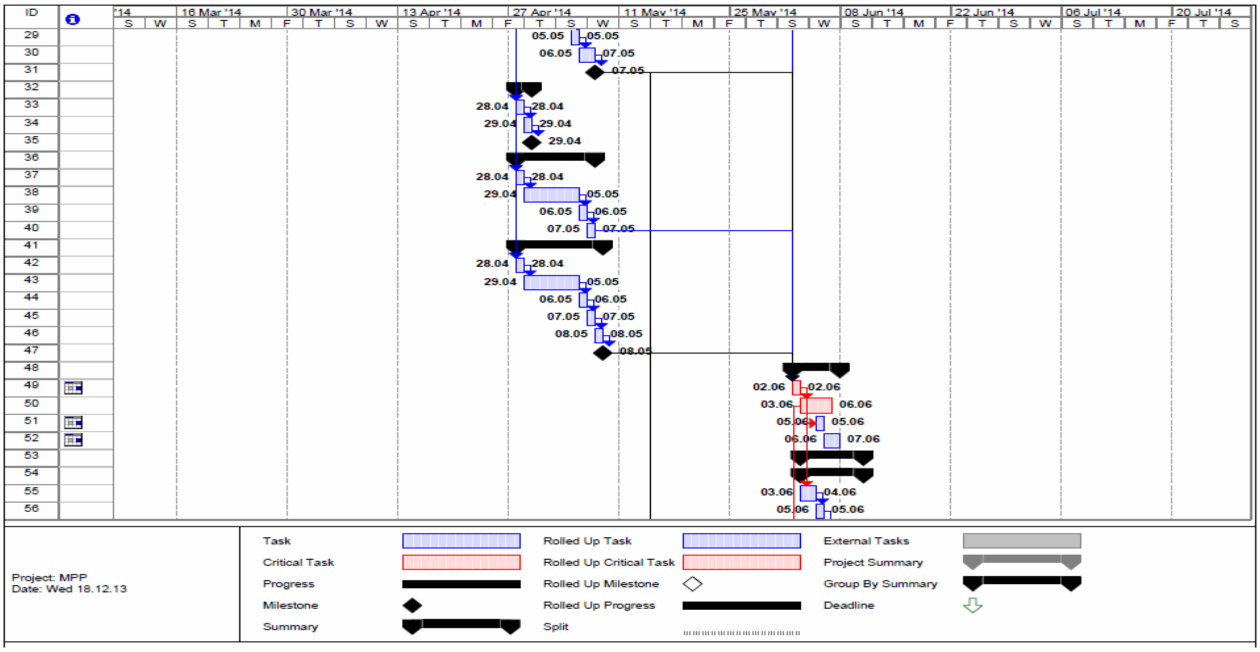
During all the phases, project manager documents the best things happened and the setbacks encountered in order to be used by other project managers on similar future projects. Additionally, the project manager will gather feed-back from all project team members.

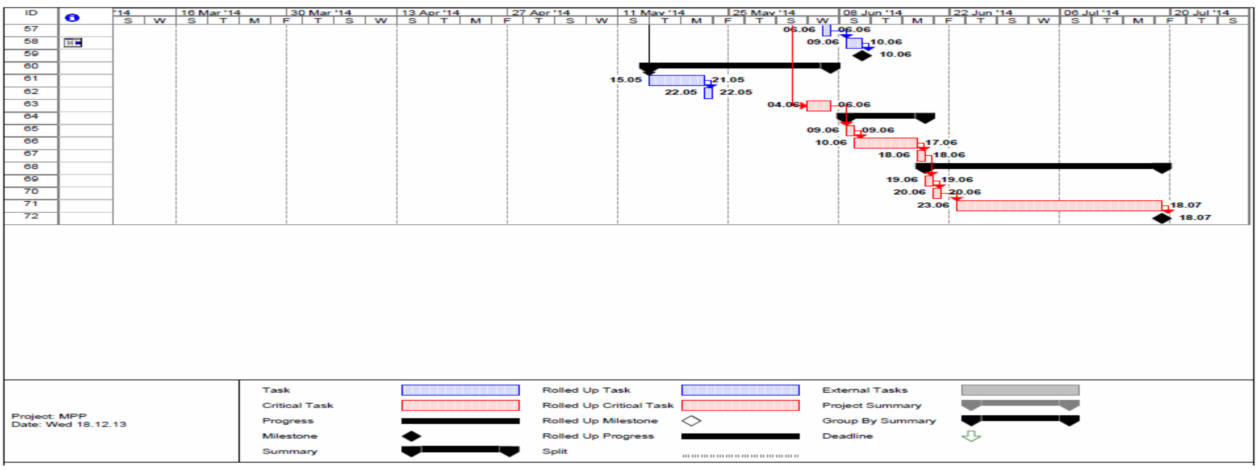
All the IT&C equipments and materials used during the project will be gathered from the rooms allocated as conference and secretariat starting with 10 June 2014.

The project team members will came back to their day to day job starting with the same date.

Based on these activities, project manager will present to key stakeholders the final report and the plan for the conference for presenting the project results NLT 18 July 2014.


ID
'14
16 Mar '14
30 Mar '14
13 Apr '14
27 Apr '14
11 May '14
25 May '14
08 Jun '14
22 Jun '14
06 Jul '14
20 Jul '14
Project: MPP
Date: Wed 18.12.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline


ID
'14
16 Mar '14
30 Mar '14
13 Apr '14
27 Apr '14
11 May '14
25 May '14
08 Jun '14
22 Jun '14
06 Jul '14
20 Jul '14
Project: MPP
Date: Wed 18.12.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline


ID
'14
16 Mar '14
30 Mar '14
13 Apr '14
27 Apr '14
11 May '14
25 May '14
08 Jun '14
22 Jun '14
06 Jul '14
20 Jul '14
Project: MPP
Date: Wed 18.12.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

LIBRARY AUTOMATION BY CREATING AND IMPLEMENTING A LIBRARY COMPUTER SYSTEM (LCS) IN ORDER TO PROVIDE BETTER SERVICES FOR LIBRARY END USERS

Anamaria DUICULETE

CONTENTS

LIBRARY AUTOMATION BY CREATING AND IMPLEMENTING A LIBRARY COMPUTER SYSTEM (LCS) IN ORDER TO PROVIDE BETTER SERVICES FOR LIBRARY END USERS

Project Sponsor: AIR FORCE ACADEMY

Project manager: The Vice Rector for Scientific Research

INTRODUCTION

Library automation refers to the use of computers to automate the typical procedures of libraries. Automating an academic library is the process which restructures its functions and reinvents its services. By keeping a database as the basis, automation converge new technologies of information storage and retrieval with traditional housekeeping operations. An automated academic library can serve the teaching and learning community more effectively. A reduction in the time needed for routine operations can be utilized to give customized services to the users. So Library automation may be defined as the application of computers to perform traditional library housekeeping activities such as acquisition, circulation, cataloguing, reference and serials control.

I.BUSINESS CASE

I.1 The AS IS situation

Library automation can be defined simply as the use of computer and networking technologies in the library. Areas of **Library automation are:** automation of library functions, use of electronic resources within the library (e.g. CD-ROMs), accessing remote electronic resources (e.g. the Internet), office automation (e.g. bibliographic lists), user services (e.g. computer laboratory, multimedia centre), management (accurate reports about dimension of collections, acquisition and users)

To create an automation – library product called **library computer system (LCS),** using all the resources that the institution already have in order to provide more and accurate information for library management, more time for the library personnel to develop/create other type of services for users, more faster and reliable information for users and more safety of the collections.

An LCS is a software used to catalogue, to track circulation (where appropriate) and inventory the library's assets. It is intended for small to medium sized collections. *Larger libraries will typically use an* ***integrated library system*** *(**ILS**) to manage the more complex activities such as acquisitions, interlibrary loan, and the licensing of online resources. An LCS usually comprises relational database software to interact with a database and two graphical user interfaces (one for users, one for librarians).*[2] Usually an LCS separate software functions into discrete programs called modules, each of them integrated with an unified interface. *Examples of modules might include:*

- *Acquisitions (ordering, receiving, and invoicing materials)*
- *Cataloguing (classifying and indexing materials)*
- *Circulation (lending materials to patrons and receiving them back)*
- *Serials (tracking magazine and newspaper holdings)*
- *The OPAC (public interface for users)*
- *Statistics and reports*[3]

The library automation is a requirement for every university as a prove that it can offer a reliable and organized information for all the users doesn't matter the field they act: education, research or others and high quality management.

Library automation is a requirement from The Romanian Agency for Quality Insurance in Academic Education (ARACIS).

An automated library is an educational tool that provides time for inquiry and instruction, provides an environment for students to acquire 21st Century information seeking skills, provides intellectual access to the library's collection, provides a system to manage materials, users and reports and a tools for librarians to identify and develop new services. The Academic Library from Air Force Academy is the only non automated library from all academic military libraries from Romania.

The most important services in the Air Force Academy Library are:

- Collection preservation;
- The book circulation system;
- Acquisition;
- Cataloguing, classification and indexing section
- Statistic and reports (library management)
- Inventory stock.

All these services and others are done by two librarians who are overloaded.

[2] http://www.ifla.org/node/7667
[3] BANCIU, Doina - Informatizarea structurilor infodocumentare, Bucuresti, Ars Docenti, 2007, p.111

The collections structure is:

- specialized collection (military);
- scientific collections;
- serials and academic handbook;
- world and Romanian literature, history, geography and art;

Over of 60 % of library collections are on a free access in three different rooms without any security measures.

The users of Academic Library from Air Force Academy are:

- students,
- master program attendees,
- professors,
- officers,
- instructors,
- NCOs,
- civilian personnel,
- English course attendees.

There are different types of users with different types of needs and they want information from various fields, new and reliable information from the field they act. (the existing means do not allow for a swift response to their information needs)

The Academic Library in numbers, year 2012

The table below offers a quick view on library activity and indicates the amount of work that must be done in order to manage over 70000 items and almost 9000 loans. There is a lot of time consuming repetitive work which make impossible development of new services for users

Numbers of items (books, serials, CDs, DVDs, Maps, e-books)	71345
Numbers of titles	22456
Number of users	586
Numbers of transactions (items borrowed)	8925
Numbers of visits	3146

Table no. 1 – Library in numbers

CDS/ISIS *(Computerised Documentation Service / Integrated Set of Information Systems) - an advanced non-numerical information storage and retrieval software developed*

by UNESCO since 1985 is already implemented in the library and cataloguing module is functional.[4]

In the academic library AFA Over 4000 records were converted from traditional format in MARC (Machine Automate Readable Catalogue) format. But doesn't exist neither an interface for the users nor a local network connection so this module is not available for the users.

I.2 TO BE situation

The simplest way to automate a library is to purchase a library automation product an LCS or an ILS but they are very expensive. The cheapest LCS is over 5615 euro without VAT with a maintenance cost after a year by 858 euro. The costs for an ILS are between 15899 and 58000 euro with a maintenance cost over 1000 euro.

Using the resources that institution already has, such a product can be created. The resources that institution already has in order of human resources, technology and materials are:

- IT specialist (technical and programming) – to provide hardware support, software developing and training for librarians
- Acquisition specialists – to purchase the materials needed
- Trained librarians – to run an automated system
- **CDS/ISIS** software – to develop library modules like: circulation, acquisition, serials, statistics and reports.
- Four computers – to configure the library system.

  Typical Library System Configuration[5]

  - One File Server to hold the library system and database for access by workstations via the Intranet or the Internet
  - One to Two Public Workstations for students/teachers to access the
  - Online Public Access Catalogue (OPAC), CD-ROM network, and/or the Internet
  - One Circulation Workstation for library staff to check-in and check-out items, etc.
  - One Staff Workstation for cataloguing, acquisitions, reporting, etc.

[4] http://portal.unesco.org/ci/en/ev.php-URL_ID=2071&URL_DO=DO_TOPIC&URL_SECTION=201.html
[5] http://ihome.ust.hk/~lblkt/diploma/libauto/libauto.html

- All the accessorise and consumable items needed for the project (barcode reader, barcode labels) are already requested from Air Force HQ by Annual Acquisitions Plan.

Library automation by creating an LCS is a collaborative project which implies using the resources that institution already has. The maximum life cycle of the project could be six months and the minimum three.

The costs will not exceed the estimated amount of 6,800 lei (1574 €).

II.3 Risks and Constraints in the Air Force Academy Library Automation.

Creating an LCS (Library computer System) doesn't imply library automation it is just the beginning. Library automation is a long term goal which could be achieved in three to five years. Project sponsor must know the risks and constrains that can occur in automation of library services.

- It is long term and time consuming process
- Financial expenses
- Continuous staff training are required for it
- Security problems
- It is totally depended on the electricity
- Costly maintenance
- Untrained users speedily disposal of library work

II. SCOPE MANAGEMENT PLAN

II.1 Goal(s)

To obtain an automation library product to free the librarians and to allow them to contribute more meaningfully to spread of knowledge and Information.

To o improve the level of service and quality of output and to fulfil needs that cannot be achieved by manual system. (e.g. sharing of resources, information that appear only in electronic format).

II.2 Work Breakdown Structure

1. The project manager will ensure a common understanding of the goal of the project by establishing the team (an IT technical, IT programming analyst, acquisition officer, and librarians), contacts with repositories of knowledge and with the HQs in charge of libraries in the military.

1.1. Project manager establish time allocated to the project for each person, the project will unfold during the working hours.

1.1.1 Project manager obtain all the approvals for personnel involved in project in order to participate to planed activities.

1.2 Meetings of the team at least three times by week, before project starting.

1.2.1 Establish the days and time needed for meetings.

1.2.2 Providing a report to the project manager after discussions are over.

1.3 Discussion with specialists from other libraries which have been already automated and with military representative from headquarter of Romanian Air Force

1.3.1 Organizing visits to the Transylvania University Library and to the National Defence University Library.

1.3.2 Establish visit details with the university library representatives

1.3.3 Getting necessary approvals and funds for the visit

1.3.4 Prepare discussion agenda

1.3.5 Providing a report to the project manager after discussions are over.

1.3.6 Meetings (discussions) with representative from headquarter of Romanian Air Force in order to obtain formal support. If the project is successful in The Air Force Academy it can be implemented in other units of Air Defence. Is not mandatory that all module to be implemented.

1.3.7 Establish a list of requirements for the automated system to run in accordance with the conclusion drawn by the specialists.

2. Purchasing the equipment necessary for the establishment of the automated system.

2.1. The IT technical specialist will provide several projects about how to use the equipment that library already has in order to implement the automation programs in two month.

2.1.1. Analysing projects

2.1.2 Chose the most suitable solution.

2.2. The officer in charge with acquisitions will buy all the consumable items (barcode labels) and accessories (barcode readers) in six months.

2.2.1. Doing market research

2.2.2. Obtaining approvals for purchasing.

2.2.3 Doing the purchasing

2.2.4 Analyse the system functionality.

2.2.5 Doing the necessary and possible adjustments.

3. Accomplishing the soft necessary for the automated system

3.1 The IT specialist will provide an OPAC module (Online Public Access Catalogue) using the CDS Isis program in order to ensure users' access to the existing data base.

3.1.1 Installing the program

3.1.2 Training key users to use it in order to obtain a feedback

3.1.3 Analysing the feedback

3.1.4 Doing the necessary and possible adjustments.

3.2 The IT specialist will provide all the others module needed to make connections between data bases. Using CDS/ISIS

3.2.1 Installing the programs

3.2.2 Training the library personnel.

3.2.3 The librarians run the programs at the experimental level for at least two week for a real feedback.

3.2.4 Analysing the feedback

3.2.5 Doing the necessary adjustment.

4. Completing two data base: cataloguing and inventory stock and users data.

4.1 Project manager establish time and human resource in order to fill in the library data bases

4.1.1 Project manager will find the voluntaries for this job.

4.1.2 Project manager will organize voluntaries work in terms of time and quality.

4.1.3 Evaluating the voluntaries work

4.1.4 Doing necessary adjustment.

4.1.5 Bar coding items and fill in library data base

4.2 Project manager establish for each librarian number of records which must be fill in data base per day.

4.2.1. Get the approvals to change library schedule.

4.2.2. Reorganize librarians work in order to be able to fill in the number of records establish.

4.2.3 Bar coding items fill in library data base

5. Verifying and implementing the automated system in the library.

5.1 Integrate the technical support, software support, human resource and library data bases (cataloguing and inventory stock and users data)

5.1.1 Testing the technical support and software

5.1.2 Training the library personnel and users.

5.1.3 Analysing the feed-back

5.1.4 Doing necessary and possible adjustments.

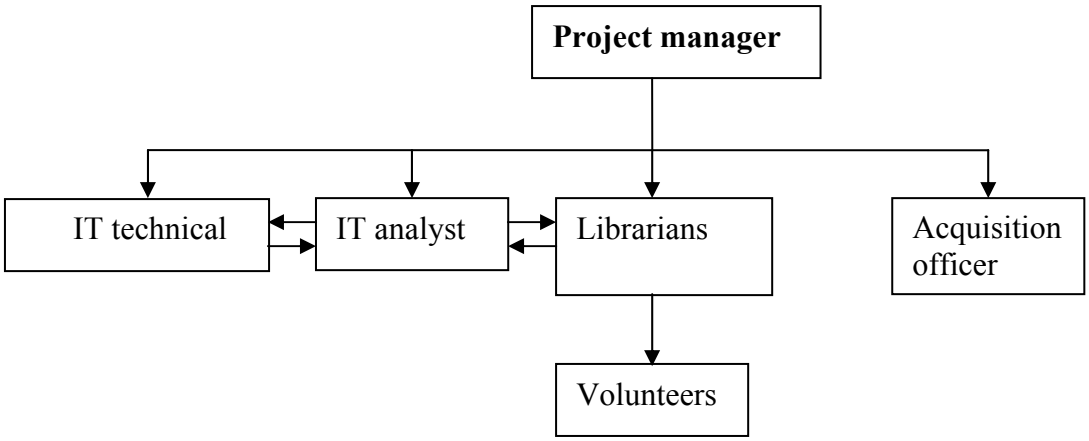
III. TIME MANAGEMENT PLAN

The maximum life cycle of the project could be six months and the minimum three. Duration is not very important for the project as long as the approval for buying necessary materials and equipment (bare code labels, cards, bar code reader) is received. All the activities and connection between them are presented in Appendix 1. Gantt Chart

IV. HUMAN RESOURCE MANAGEMENT

To implement the project in order of human resource, Project Manager needed a team consisting of 1 IT technical specialist, an IT programming analyst, an officer in charge with acquisitions, 2 librarians, volunteers (number to be determined).

IV.1 Chart of Project Management Relationship



IV.2 Linear responsibility Chart of Project Management Relationships

Project manager – Coordinate the project

- obtain approvals,
- ensure the understanding of the project for all the team members,
- organize working hours,
- assign responsibilities,
- monitor and control the quality of work and product.

IT technical – provide technical support for the project

- network design
- provide a list of materials needed
- connections between PC and accessories
- verifying connections

IT programming analyst – provide software module using the integrated soft that exist in the library CDS-ISIS for Windows

- design OPAC module
- design circulation, inventory stock, reporting module
- train library staff

The acquisitions officer – purchase all the materials needed

- market research
- acquisition

Librarians – convert traditional data bases

- fill in library data bases
- bar coding items

Volunteers – help librarians to convert traditional data bases

- fill in library data bases
- bar coding items

Activity code	AFA Commandant	Academic Senate	Project manager	IT technical	IT analyst	Acquisition officer	Librarians	Volunteers
1.1	6	4	1	4	4	4	4	3
1.2	3	4	1	5	5		5	3
1.3	6	4	1	5	5		5	3
2.1	6	4	2	1	3	3	5	3
2.2	6	4	2	3	4	1	4	3
3.1	5	5	2	4	1		3	3
3.2	5	5	2	4	1		3	3
4.1	5	4	2	3	3		1	1
4.2	5	4	2	3	3		1	3
5.1	5	4	1	2	2		3	3

Table no. 2 Linear responsibility Chart of Project Management Relationships

Legend: 1-actual responsibility; 2-general supervisor; 3-must be informed; 4-may be consulted; 5-must be notified; 6-approval authority

V. COMMUNICATIONS MANAGEMENT

V.1 Stakeholders

1. Users – nonessential in project but interested in it **(N)**
   - academic staff
   - students
   - officers
   - NCOs
   - civilian personnel,
   - English course attendees
2. Library Staff – performer **(P)**
3. Academic Senate – influencer **(I)**
4. The Head of Academy – decision maker **(D)**
5. HQ Air Force representative in charge with libraries **(I)**

All users will be informed about the implementation of the project and about constrains on library activity because the librarians will be involved in activities like record conversion and bar coding. For some users such as military or civilian personnel automation of library services is not as necessary as for academic staff and students.

V.2 Communication Matrix

Target audience	**Person(s) to convey the message**	**When the message is conveyed**	**Format of a message**	**Message content**
All project members	Project manager	weekly	Meetings	- Assignments of responsibilities - Activities accomplished - Current status
Users academic staff students officers NCOs civilian personnel,	Project manager	At the beginning of the project	Informal Meetings	- Project objectives - Impact on users - Project final product

Target audience	Person(s) to convey the message	When the message is conveyed	Format of a message	Message content
English course attendees				
Head of Library staff	Project manager	weekly	Reports	- Assignment of responsibilities
Academic Senate	Project manager	Monthly	Reports	- Project overview - Stage overview
The Head of Academy	Project manager	weekly	Reports	- Project overview - Stage overview - High level operational implication
Air Force HQ representative in charge with libraries	Project manager	Monthly	Reports	- Project overview - Stage overview

Table no.3 Communication Matrix

VI. PROJECT COST MANAGEMENT

The project team members will be paid with their monthly salary, according to the number of hours actually worked. The equipment resources required for the project are in the inventory of Academic Library.

A breakdown of the project financial costs and resource pool is listed in the table below.

VI.1 Resource Pool Description

The type and quantity of resources needed in the Project are presented in the table below:

Resource type	Name	Quantity
Human Resource	Project manager	1
	IT technical	1
	IT programming analyst	1
	Acquisition officer	1
	Librarians	2
	Volunteers	4
Equipment	Computers	4
	Bar-code readers	2
Materials	Bar-code labels	7 (sets of 10 000 pieces)
	Cable	5
	cards	1 (set of 1000 pieces
Others (Transportation)	Combustible	30 l

Table no.4 Resources used in Project

VI. 2 Cost breakdown structure

Resource Type	Name	Quantity	Unit cost (lei)	Total cost (lei)	Total (lei)
Human resource	Project manager	1	paid with their monthly salary		0,00
	IT technical	1			
	IT programming analyst	1			
	Acquisition officer	1			
	Librarians	2			
	Volunteers	4			
Equipment	Computers	4	Are in the inventory of		600,00

Resource Type	Name	Quantity	Unit cost (lei)	Total cost (lei)	Total (lei)
			Academic Library		
	Bar-code readers	2	300,00	600,00	
Materials	Bar-code labels	7 (set / 10 000 pieces)	800,00	5600,00	6110,00
	Cable	5	2,00	10,00	
	cards	1 (set/ 1000 pieces)	500,00	500,00	
Others (Transportation)	combustible	30 l	4,60	138,00	138,00
					6 848,00

Table no.5 Project Cost Estimate

VII PROJECT QUALITY MANAGEMENT

In case of library automation by creating an LCS (library Computer system), quality is a multi-dimensional measure that describes how the hardware and software systems satisfy the requirements. For implementing the LCS minimal technical requirements is to create at least a small Local Area Network (LAN) that should meet the following quality criteria.

Minimal quality objective are:

- Establishment of a well storage and retrieval system
- Time and human power saving with qualitative services
- Suitability for library cooperation and coordination development
- Simplicity in library management to meet the objectives
- Proper use of human resources
- Development of the new library services
- Preparation of reports and correspondence
- Suitability for resource sharing and networking

VII. 1 List of deliverables and acceptance criteria:

Deliverable	**Acceptance Criteria**
Job description	PM establishes the job description for each member of the team and his role in the project.
Meeting agenda	PM establishes an objective for each meeting and demands a report**.**
Training for the team	PM establishes an objective for each activity of exchanging experience and asks for a feed-back from each member.
Library system configuration	Technical requirements document for LCS (Library computer system). Implement the LAN (Local Area Network)
Acquisition of materials and equipment	Completeness of purchasing.
OPAC module	Possibility for the users to search collection**s** of books, magazines, e-books, Web sites, maps, CD's, full text articles.
Circulation module	Facilitate front-desk operations, should allow librarians to view users, items, transactions and information about: the loan, returning terms, renewal, reserve, or status activities.
Acquisition module	Allow librarians to establish preliminary Bibliographic records at the time an item is ordered. This could be integrated in the cataloguing module.
Inventory module	Allows Librarians to conduct a full or partial inventory of the library's holdings. Once the inventory procedure is complete, the inventory module produces multiple detailed statistical reports.
Reports modules	Generate reports and bibliographic lists.

Deliverable	Acceptance Criteria
Bar coding and convert traditional data in MARC format.	80 bar coding items/day/person 40 records conversion/day
Planning library activities	PM must obtain approvals for changing library schedule in order to allocate four work hours/day to the project for each librarian.
Product delivery sign off	Establish maintenance operations. Insure continuous training for library staff.

Table no. 6 Deliverables and acceptance criteria

VIII. PROJECT RISK MANAGEMENT

Below is presented the list and ranking of the risks identified as well as the avoidance/mitigating strategies for these risks.

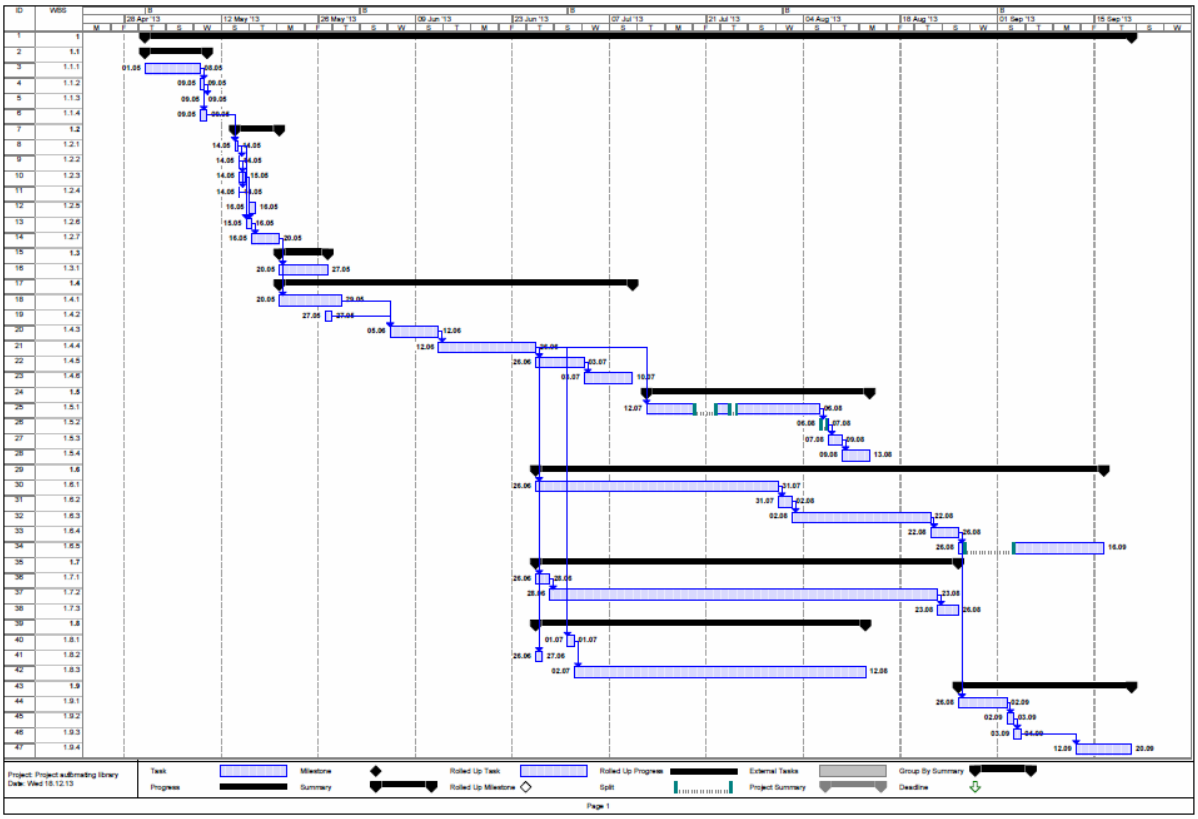
Activity	Type	Risk condition	Risk description	Impact	Probability	Importance (impact X probability)	Risk mitigation strategy
1.1/1.3	Scope	The absence of good planning from PM and understanding from the team members	Incomplete definition of quality requirements	5	3	15	-efficient understanding of library automation by the team. - allocate more time to activities such as change of experience
1.1/1.3	HR	Lack of motivation	People (specialists) assigned to work in project could be discontent because of this extra-work and	5	4	20	-efficient planning of time and responsibilities by PM by collaborative approach

			they should have some opposition to the project.				
2.1 /2. 2	Budget	AF HQ budget decreases/ approval for purchasing is not obtained	The funds for the acquisition of the equipment for Project will be reduced/cut	5	1	5	- preparing request for founds from Academy Senate
3.1 /3. 2	Quality	Inadequate quality	A low level quality for soft provided (difficult to use it, don't respond to the requirements)	5	2	10	- contact a specialist from BCU Bucharest for assistance or training
4.1 /4. 2	Quality	Inadequate quality	A low level of quality for data base (incomplete records, erroneous records)	4	3	12	- changing strategy in order to have correct records not many records

Table no. 7 Major risks and risk mitigation strategies

IX. PROJECT CLOSEOUT

The project will be complete when the last major objective will be accomplished, next maintenance operations will be established and continuous training for library staff insured. At the end of the project, a meeting will be held with the Project Manager, Project Sponsor and the Air Force HQ representative to discuss the results of the project and the next steps that must to be done to automated The Air Force Academy Library and to implement the product in others libraries.



IMPROVING THE QUALITY OF AUTOMATED ACCOUNTING SYSTEM BY UPGRADING ITS SOFTWARE AND HARDWARE COMPONENTS

Major Elena BUȚCU

CONTENTS

Project name:

Improving the quality of automated accounting system by upgrading its software and hardware components

Project sponsor:

Ministry of Defense of Republic of Moldova.

INTRODUCTION

In this paper I am going to present the project of improvement of the functionality of existing automated accounting system by upgrading for the financial structures in the military units of Ministry of Defense Republic of Moldova. The integrated corporate data system named Universal Accounting was implemented in military units since 2006. This project was developed by the software company. Since beginning of using this system flow of data needed has been increased, financial reports became complicated. Additionally changing of the card of accounts is needed. At the present time the current system is not sufficient and flexible enough. The speed of information processing is one of the most problems needed to be solved. That's why the Financial Directorate needs to eliminate shortages and to refine the system.

This opportunity aligns with Financial Department's objective to increase efficiency.

2. Business Case

The business case I am going to describe is about the upgrading of automated accounting system. This upgrading will be implied using the new version of the software with consequently improving of productivity and addressing current implementation issues. The results of upgrading will serve as a justification the reason for upgrading.

Saying this I will try to justify my business case in a few words:

- Functional improvements in the new version will improve productivity and address issues in the current implementation. Slow speed of processing of information is the main issue that users are experiencing with the current version.

- For the effectiveness of proposed process upgrade of current hardware is essential.

- The new interface of software will help users be more effective in their jobs or that will simplify complex tasks and reduce training costs.

- The upgrading of database will allow users to operate the new system better and faster.

- The database of current version still supported, but recently we have experienced increasing of multifunctional issues related to software, therefore this is a requirement for software upgrading.

- The personnel salaries in military structures are fixed; therefore project developer doesn't have to consider additional expenditures for human resources.

- The preparation of users for the upgrade including training and involvement in user acceptance testing is done by the software company.

- Summer is vacational period of year thus intensiveness of workload decreased. Therefore this is the best time for the business to undertake an upgrade. And after summer vacations when upgrading will be installed, personnel staff can begin the training.

- The system mainly used by financial structures of National Army of Republic of Moldova. This factor underlies the importance of this system for the Ministry of Defense and explains its involvement in sponsoring role.

- The project cost will amount to 61 500 MDL ~ 4 000 €. In connection with this project was not included in budget spending of current year, we can ask to use financial resource from extra budget.

Considering what was sayed above, we may conclude that the upgrade is in the best interest of the organization. With this simple decision MoD will receive much functionality needed and ensured continued support.

3. Scope Management Plan

2.1 Goal

Improvement of functionality of the current automated accounting system available in the financial structures of military units of Ministry of Defense of Republic of Moldova by upgrading its software and hardware components.

The project will start on June 3rd and end on December 25th 2013.

2.2 Objectives

2.2.1 The Project Manager will establish the list of requirements for the upgrades necessary, as well as for the contemporary equipment needed to purchase by July 17th 2013.

2.2.2 Financial Department, supported by Ministry of Finance, will purchase all necessary upgrades for the software and the equipment in accordance with existing lows and regulations by August 2nd 2013.

2.2.3 The Project Manager will oversee that the database is upgraded by installing the new equipment and updating of the software by October 22nd 2013.

2.2.4 The Project Manager will oversee the staff training by December 9th 2013.

2.2.5 Maintenance will be held by Software Company by December 24th 2013.

2.3 Work Breakdown Structure (WBS)

Upgrading of automated accounting system includes next stages of activities:

2.3.1. The Project Manager will establish the list of requirements for the upgrades necessary, as well as for the contemporary equipment needed to purchase. This process will be followed by the stages listed below:

- Identification of the qualification working group.
- Elaboration and approval of the work schedule.
- Analysing of existing software (database).
- Development of functional and technical requirements.

2.3.2. Financial Department, supported by Ministry of Finance, will purchase all necessary upgrades for the software and the equipment in six month from the beginning of the project in accordance with existing lows and regulations. The workload will be preceded in steps listed below:

- Definition of the financial resources.
- Signing the contract for software upgrading.
  - Submission of claims.
  - Agreement on price.
  - Setting the timeframe.
- Purchasing of contemporary technical equipment.
  - Determine the specific requirements of hardware.
  - Tender announcement.
  - Signing contract for purchasing technical equipment.
  - Delivering equipment by the contracting company.

2.3.3. The Project Manager will oversee that the database is upgraded by installing the new equipment and application of the software updates

- The new equipment has been installed.

- The supplier will optimize the database by upgrading it.
- New software testing and control.
- Development the system documentation.

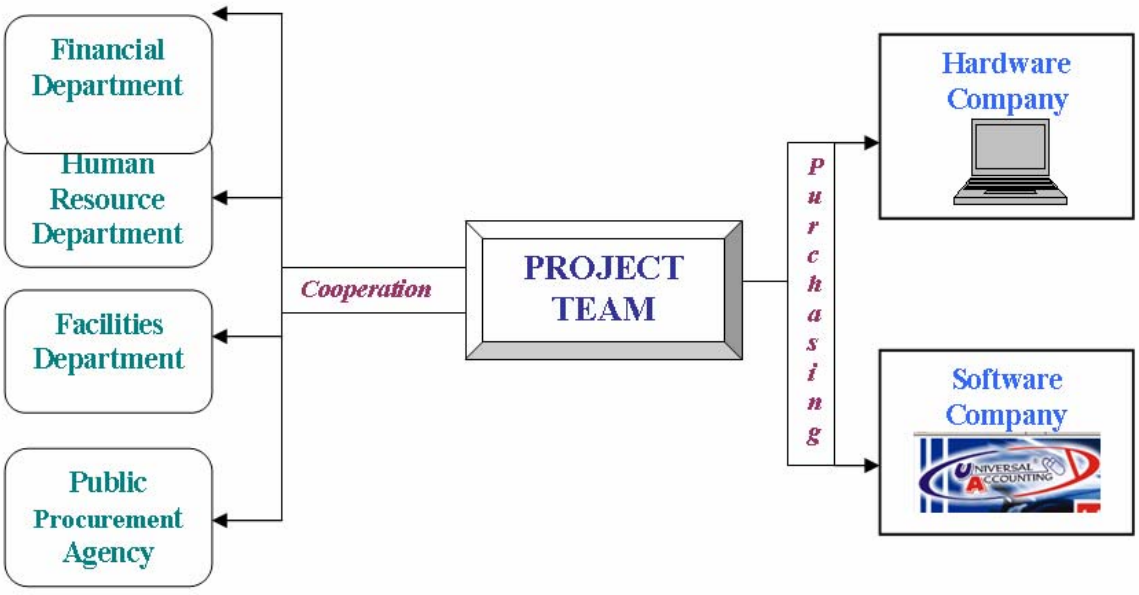
2.3.4. The Project Manager will oversee the training of the staff

- The Project Manager together with the database manager identifies the key personnel who need training.
- The supplier will train the selected staff in accordance with the signed contract.
- The trained key staff ensures the dissemination of knowledge to subordinates.

2.3.5. Maintenance by software company

- Elimination of malfunctions of the system identified during the warranty period insures by the software company.
- Post-warranty service.
  - Analysis of the functioning of the system.
  - The identification of deviations of actual performance from the desired values.
  - Determination of the causes of these deviations.
  - Addressing the identified gaps and ensuring the stability of the performance of the system.
  - The necessary changes of the software documentation.

Interaction Pattern



3. Time Management Plan

The implementation of the project always takes time and needs money and resources. The Time Management Plan, developed in Microsoft Project Application format, is presented in Appendices 1. The beginning of the project is planned on June 3rd. Project team is planning to finish implementation in six month from the beginning of the project.

4. Human Resource Management

In purpose to acquire successful results, the leadership assigns qualified project working group. Human resources must be properly selected, trained and correctly paid. If the staff is not professional, any valuable idea will not be satisfied. One of the most important milestones of the project is defining the sufficient resources for completion of the project by the project manager. One of the manager's functions is to develop characteristics as dominance, control, decision making and organization capacity as well as of influence the behavior of subordinates. Professionalism of the staff and teamwork is the key to the success of the project. The project team consists of:

- General Manager (GM): Signs all important documents.
- Project manager (PM): Responsible for the whole project and the staff.
- Database manager (DM): Responsible for the development of technical upgrading requirements of the database, operational testing and refinement of system resources.
- System engineer (SI): Responsible for the network and communication support.
- Hardware engineer (HI): Responsible for development of the hardware requirements for the server.
- Legal advisor (LA): Responsible for organization tender for purchasing of equipment.
- Employees (E): Responsible for with professional knowledge of accounting system using database and test upgrading.

Activity	Responsible person(s)
Identification of the qualified working group and definition of the budget resources	GM, PM
Project direction, strategy and planning	PM
Quality control	PM, DM, HI, SI
Development of technical requirements for upgrading of the database, operational testing and refinement of system resources	DM

Network and communication support	SI
Development of hardware requirements for the server and maintenance of equipment	HI
Purchasing of equipment	DM
Signing of contracts	PM,LA
Testing of upgraded system	E, DM, SI
Development of technical system documentation	DM

5. Communications Management

Communication is the central factor of any successful enterprise.

Ongoing communication is the responsibility of each person in the project. Due to the dynamics in project communications and the varying stakeholder needs, requirements, and styles, it is critical that everyone involved in the project understands the importance of communication and its overall affect on the entire project.

Work team will communicate with Project Manager on administrative issues, task progress, problems, and schedules. They will communicate with system and hardware engineers on technical or network problems.

The Project Manager will coordinate involvement with Facilities Department in matters of contracts for the supply of equipment and upgrading software.

The Project Manager is responsible for providing status reports to the company management.

The Communications Management Matrix is a document that captures and communicates the results of the project process listed below.

Target audience	Person to convey the message	When the message is conveyed	Format of a message	Message content
All project members	Daniel (PM)	weekly	e-mail	• Project introduction • Teams and members • Project phases • Current status
PM	Ana (DM)	June	written status report	• Analysis of existing soft • Technical requirements
PM	Dorin(SI), Andriu(HI)	June	written status report	• necessary specifications of

				hardware
Company management, Legal advisor	Daniel (PM)	June	e-mail	• organization of tender • Contract for purchase of equipment
Supplier company	Daniel(PM), Ana(DM)	July	e-mail	• discussion of the contract for software upgrades
PM	Supplier company	August	e-mail	• implementation status updates • results of staff training
Company management	Daniel (PM)	September	Presentation	• project overview
PM	Employees	August - October	e-mail	• concerns • define the gaps of the project • results of the testing of upgraded system

6. Project Cost Management

The project cost depends on the use of resources such as human resource, materials and equipment. Usually the personnel salaries in military structures are fixed; therefore project developer doesn't have to consider additional expenditures for human resources. Nevertheless incentive bonuses will be provided at the final stage of the contract. The main costs consist of the purchase of equipment, upgrading existing automated accounting system and personnel training.

Resource pool description

Resource type	Name	Number
Human resources	General manager	1
	Project manager	1
	Database manager	1
	System engineer (network, communication)	1

	Hardware engineer (specification)	1
	Legal advisor (tender, contracts)	1
	Employees (database users)	15
Equipment	Hardware for the Oracle SQL Server	1
Product	Software upgrading	1
Materials	Stationery (toner, paper, pens, pencils)	

The project cost will amount to 61 500 MDL ~ 4 000 €:

- awards of project team = 8 000 MDL
- equipment (server computer) = 22 500 MDL (-5% / +5%) (21 375/23 625 MDL)
- software upgrading = 25 000 MDL (-10% / +10%) (22 500/27 500 MDL)
- staff training = 5 000 MDL
- Consumable stationery = 1 000 MDL

TOTAL: = 61 500 MDL (min - 57 875 MDL max - 65 125 MDL)

7. Project quality management

One of the key features of the project management, along with the cost and time management is the project quality management.

The result of the project largely depends on the quality planning.

Systematically monitoring of the quality of the project carried out in the form of various activities, such as auditing, monitoring and examination.

High level of quality during the project will be gained by obtaining of the results listed below:

1. Optimization of processing of information.
2. Error protection and safety.
3. Effectiveness, reliability.
4. Enhancement of the level of informational security.
5. Saving of time of generation all necessary reporting for supervisor body.
6. Simplifying and improvement of the users interface.
7. Improving of the financial discipline.
8. Ensuring of reliability of system.
9. Increasing of processing information speed.
10. Expanding of functionality.

11. Improving of management quality.
12. Compatibility with other systems.
13. Administration flexibility.
14. High level of maintenance ability.
15. Providing of high quality management decisions.

8. Project risk management

During the planning phase risks associated with the different components of the project should be included. To be capable of doing so, we should be able to identify and prioritize risks at different stages of the project.

The project working team has received information about possible risks in the initiation phase of the project and had to prepare a checklist of those Types of Risks:

Personnel risk

- Changing of Head of Financial Department may lead to the cancellation of the project.

  Solution: Proving of the expediency of the project to new leadership is needed.

- The probability of non-participation of key personnel in the implementation of the project or the lack of qualified personnel.

  Solution: The HR department must insure clear cut succession plans, swift response to any personnel needs and conflict management.

- Conflicts in the work team can decrease productivity of the performers of workflow.

  Solution: The Project Manager has to influence the behavior of subordinates, create a good atmosphere in the team.

Planning Risk

- Gaps in the planning activities.
- Change the system requirements in connection with the objective circumstances.

  Solution: The Project Manager has to prepare requests for change planned tasks of project as sooner as possible.

Quality Risk

- Increased price of hardware (software) can lead to the inability to execute the requirements (design specifications) with available tools.

  Solution: Envisage a possible price increasing in planning and prepare requests for Financial Department with cost justification.

- Failure of equipment or other technical damage can lead to the possibility of loss or damage information or equipment.

Solution: Prepare documentation of the technical capabilities designed to support contingency operations.

Security Risk

- Exceeded access of outside organization to the confidential information.

  Solution: Control over observance of security procedures.

Time Risk

- Planning unrealistic terms.

  Solution: Project Manager develops schedule for the float time.

- Equipment or upgrading will not be delivered in expected time frames.

  Solution: Providing of sanctions in case of violation of the contract.

Unfortunately the project team cannot forecast all risks but has to envisage the most of them.

9. Project closeout

The project is entering to its final stage after carrying out of the main work of the project. The act of implied work will be signed. It is necessary to maintain the high efficiency of the project team in the final phase of the project in order to close the project and deploy the final product under best quality conditions.

Firstly, ensuring of the issues listed below at the end of the project is necessary:

• All contracts are fulfilled.

• Whole planned work on the project is completed and accepted; checking of the quality of the performance is essential.

• All members of the project team officially relieved of their duties.

Secondly, the project has to be performed in high quality, on time and under the budget limitations.

Thirdly and probably the mostly, conducting of a joint analysis of the project needs to be done by working team. Lessons learned and identified during the analysis of the achievements and mistakes and identification of new management techniques will be important tasks for the final phase of the project life cycle.

10. Appendices

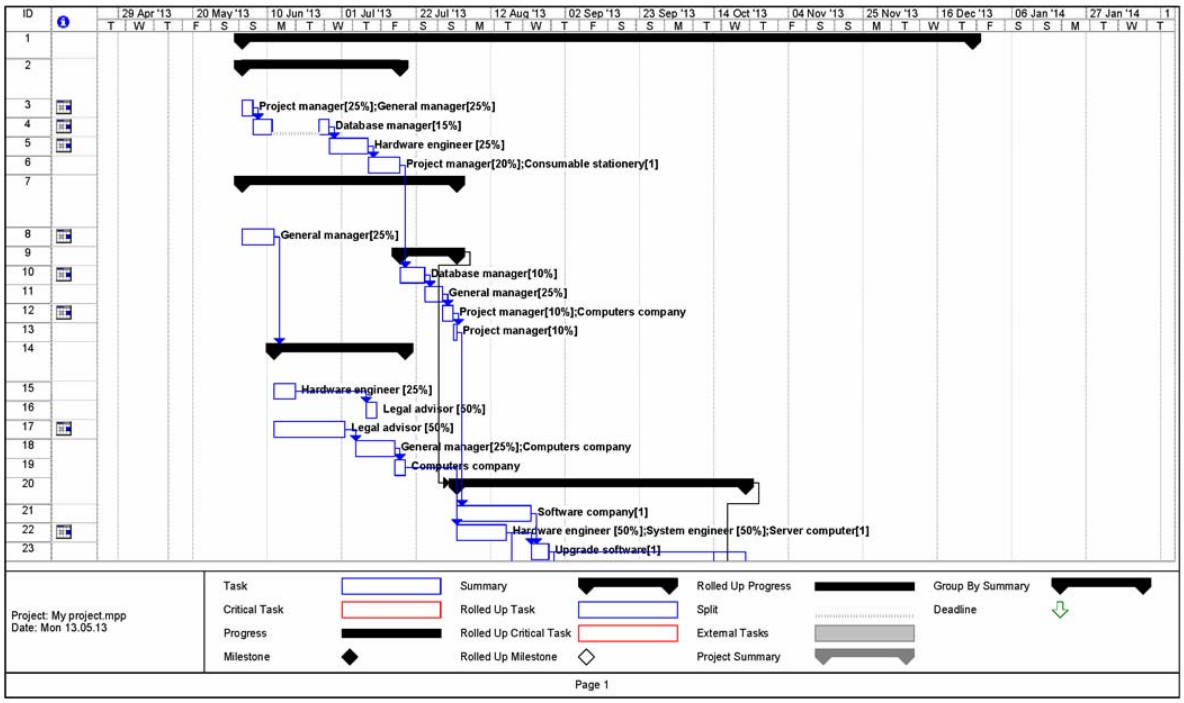
WBS

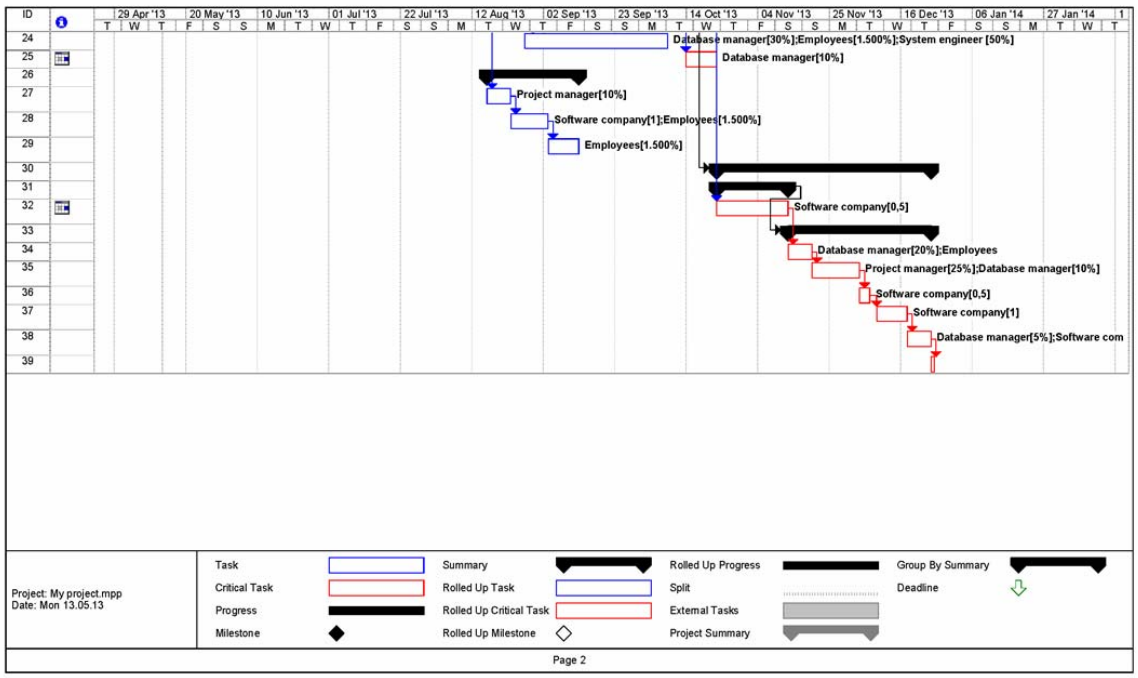
ID	Task Name	Duration	Start	Finish	Pred	Resource Names
1	**1 Improve tne level of database by upgrading of system**	**148 days**	**Mon 03.06.13**	**Wed 25.12.13**		
2	**1.1 The PM will establish the list of requirements for the upgrades necessary, as well as for the modern equipment needed to purchase**	**32,5 days**	**Mon 03.06.13**	**Wed 17.07.13**		
3	1.1.1 Identify a qualification working group.	3 days	Mon 03.06.13	Wed 05.06.13		Project manager[25%];General manager[25%]
4	1.1.2 Analyze existing soft (base of date).	6 days	Thu 06.06.13	Thu 27.06.13	3	Database manager[15%]
5	1.1.3 Development of functional and technical requirements.	7 days	Thu 27.06.13	Mon 08.07.13	4	Hardware engineer [25%]
6	1.1.4 Elaboration and approval of the schedule of works	7 days	Mon 08.07.13	Wed 17.07.13	5	Project manager[20%];Consumable stationery[1]
7	**1.2 Financial Department, supported by Ministry of Finance, will purchase all necessary upgrades for the software and the equipment in six month from the beginning of the project in accordance existing lows and regulations.**	**44,5 days**	**Mon 03.06.13**	**Fri 02.08.13**		
8	1.2.1 Definition the budget resource.	7 days	Mon 03.06.13	Tue 11.06.13		General manager[25%]
9	**1.2.2 Sign a contract for upgrades of software**	**12 days**	**Wed 17.07.13**	**Fri 02.08.13**		
10	1.2.2.1 Submission of claims	5 days	Wed 17.07.13	Wed 24.07.13	6	Database manager[10%]
11	1.2.2.2 Agreement on price	3 days	Wed 24.07.13	Mon 29.07.13	10	General manager[25%]
12	1.2.2.3 Identification the period	3 days	Mon 29.07.13	Thu 01.08.13	11	Project manager[10%];Computers company
13	1.2.2.4 Sign a contract for upgrading system	1 day	Thu 01.08.13	Fri 02.08.13	12	Project manager[10%]
14	**1.2.3 Organize a tender to purchase modern technical equipment**	**27 days**	**Wed 12.06.13**	**Thu 18.07.13**	**8**	
15	1.2.3.1 Determine the necessary specifications of hardware	4 days	Wed 12.06.13	Mon 17.06.13		Hardware engineer [25%]
16	1.2.3.2 Market survey	3 days	Mon 08.07.13	Wed 10.07.13	15	Legal advisor [50%]
17	1.2.3.3 Announcement and organization of the tender.	14 days	Wed 12.06.13	Mon 01.07.13		Legal advisor [50%]
18	1.2.3.4 Sign a contract for technical equipment and payment	7 days	Fri 05.07.13	Mon 15.07.13	17F	General manager[25%];Computers company
19	1.2.3.5 The contracting company delivers the equipment	3 days	Tue 16.07.13	Thu 18.07.13	18	Computers company
20	**1.3 The PM will oversee that the database is upgraded by installing the new equipment and doing the software update**	**57,5 days**	**Fri 02.08.13**	**Tue 22.10.13**	**9**	
21	1.3.1 The development of software	15 days	Fri 02.08.13	Fri 23.08.13	13	Software company[1]
22	1.3.2 The new equipment is installed and tested	10 days	Fri 02.08.13	Fri 16.08.13	19	Hardware engineer [50%];System engineer [50%];Server computer[1]
23	1.3.3 The supplier will optimize the database by upgrading it	3 days	Fri 23.08.13	Wed 28.08.13	22;2	Upgrade software[1]
24	1.3.4 Testing the new version of software and control.	30 days	Tue 27.08.13	Tue 08.10.13	23F	Database manager[30%];Employees[1.500%];System engineer [50%]
25	1.3.5 Develop documentation for the system and its parts.	7 days	Mon 14.10.13	Tue 22.10.13	23	Database manager[10%]
26	**1.4 The PM will oversee the training of the staff**	**19 days**	**Fri 16.08.13**	**Thu 12.09.13**		
27	1.4.1 The PM together with the structures using the database identifies the key personnel who needs training	5 days	Fri 16.08.13	Fri 23.08.13	22	Project manager[10%]
28	1.4.2 The supplier will train the selected staff in accordance with the signed contract	7 days	Fri 23.08.13	Tue 03.09.13	27	Software company[1];Employees[1.500%]

Page 1

ID	Task Name	Duration	Start	Finish	Pred	Resource Names
29	1.4.3 The key staff who undertook the training ensures they disseminate knowledge to their subordinates	7 days	Tue 03.09.13	Thu 12.09.13	28	Employees[1.500%]
30	**1.5 Maintenance by software company**	**45 days**	**Wed 23.10.13**	**Tue 24.12.13**	20	
31	**1.5.1 Performance of work under the warranty.**	**15 days**	**Wed 23.10.13**	**Tue 12.11.13**		
32	1.5.1.1 Elimination of deficiencies identified in the operation of the system	15 days	Wed 23.10.13	Tue 12.11.13	23	Software company[0,5]
33	**1.5.2 Post-warranty service.**	**30 days**	**Tue 12.11.13**	**Tue 24.12.13**	31	
34	1.5.2.1 Analysis of the functioning of the system.	5 days	Tue 12.11.13	Tue 19.11.13	32	Database manager[20%] Employees
35	1.5.2.2 The identification of deviations of actual performance from the design values.	10 days	Wed 20.11.13	Tue 03.12.13	34	Project manager[25%];Database manager[10%]
36	1.5.2.3 Determining the causes of these deviations	3 days	Wed 04.12.13	Fri 06.12.13	35	Software company[0,5]
37	1.5.2.4 Address the identified gaps and ensure the stability of the performance of the plant:	7 days	Mon 09.12.13	Tue 17.12.13	36	Software company[1]
38	1.5.2.5 The necessary changes to the documentation of software .	3 days	Wed 18.12.13	Tue 24.12.13	37	Database manager[5%];Software company[1]
39	**1.6 Closing the project**	1 day	Wed 25.12.13	Wed 25.12.13	38	

Gantt Chart





Resources

My project

ID	Resource Name	Cost	Baseline Cost	Variance	Actual Cost
1	General manager	2,000.00 lei	0.00 lei	2,000.00 lei	0.00 lei
2	Project manager	2,000.00 lei	0.00 lei	2,000.00 lei	0.00 lei
3	System engineer	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei
4	Hardware engineer	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei
5	Legal advisor	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei
6	Database manager	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei
7	Employees	0.00 lei	0.00 lei	0.00 lei	0.00 lei
8	Software company	5,000.00 lei	0.00 lei	5,000.00 lei	0.00 lei
9	Computers company	0.00 lei	0.00 lei	0.00 lei	0.00 lei
10	Server computer	22,500.00 lei	0.00 lei	22,500.00 lei	0.00 lei
11	Upgrade software	25,000.00 lei	0.00 lei	25,000.00 lei	0.00 lei
12	Consumable stationery	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei

Budget Report

Budget Report as of Mon 13.05.13
My project.mpp

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
23	The supplier will optimize the databas	0.00 lei	Prorated	25,000.00 lei	0.00 lei	25,000.00 lei	0.00 lei	25,000.00 lei
22	The new equipment is installed and te	0.00 lei	Prorated	23,500.00 lei	0.00 lei	23,500.00 lei	0.00 lei	23,500.00 lei
6	Elaboration and approval of the sche	0.00 lei	Prorated	1,400.00 lei	0.00 lei	1,400.00 lei	0.00 lei	1,400.00 lei
38	The necessary changes to the docum	0.00 lei	Prorated	1,050.00 lei	0.00 lei	1,050.00 lei	0.00 lei	1,050.00 lei
3	Identify a qualification working group.	0.00 lei	Prorated	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei	1,000.00 lei
21	The development of software	0.00 lei	Prorated	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei	1,000.00 lei
28	The supplier will train the selected sta	0.00 lei	Prorated	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei	1,000.00 lei
37	Address the identified gaps and ensur	0.00 lei	Prorated	1,000.00 lei	0.00 lei	1,000.00 lei	0.00 lei	1,000.00 lei
24	Testing the new version of software a	0.00 lei	Prorated	800.00 lei	0.00 lei	800.00 lei	0.00 lei	800.00 lei
35	The identification of deviations of actu	0.00 lei	Prorated	600.00 lei	0.00 lei	600.00 lei	0.00 lei	600.00 lei
8	Definition the budget resource.	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
11	Agreement on price	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
16	Market survey	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
17	Announcement and organization of th	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
18	Sign a contract for technical equipmer	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
32	Elimination of deficiencies identified r	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
36	Determining the causes of these devia	0.00 lei	Prorated	500.00 lei	0.00 lei	500.00 lei	0.00 lei	500.00 lei
5	Development of functional and technic	0.00 lei	Prorated	250.00 lei	0.00 lei	250.00 lei	0.00 lei	250.00 lei
15	Determine the necessary specificatior	0.00 lei	Prorated	250.00 lei	0.00 lei	250.00 lei	0.00 lei	250.00 lei
12	Identification the period	0.00 lei	Prorated	200.00 lei	0.00 lei	200.00 lei	0.00 lei	200.00 lei
13	Sign a contract for upgrading system	0.00 lei	Prorated	200.00 lei	0.00 lei	200.00 lei	0.00 lei	200.00 lei
27	The PM together with the structures u	0.00 lei	Prorated	200.00 lei	0.00 lei	200.00 lei	0.00 lei	200.00 lei
34	Analysis of the functioning of the syst	0.00 lei	Prorated	200.00 lei	0.00 lei	200.00 lei	0.00 lei	200.00 lei
4	Analyze existing soft (base of date).	0.00 lei	Prorated	150.00 lei	0.00 lei	150.00 lei	0.00 lei	150.00 lei
10	Submission of claims	0.00 lei	Prorated	100.00 lei	0.00 lei	100.00 lei	0.00 lei	100.00 lei
25	Develop documentation for the systen	0.00 lei	Prorated	100.00 lei	0.00 lei	100.00 lei	0.00 lei	100.00 lei
19	The contracting company delivers the	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
29	The key staff who undertook the traini	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
39	Closing the project	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
		0.00 lei		61,500.00 lei	0.00 lei	61,500.00 lei	0.00 lei	61,500.00 lei

Cash Flow

	2nd Quarter	3rd Quarter
Improve tne level of database by upgrading of system		
The PM will establish the list of requirements for the upgrades necessary, as well as for the modern equipment needed to purchase		
Identify a qualification working group.	1.000,00 lei	
Analyze existing soft (base of date).	150,00 lei	
Development of functional and technical requirements.		250,00 lei
Elaboration and approval of the schedule of works		1.400,00 lei
Financial Department, supported by Ministry of Finance, will purchase all necessary upgrades for the software and the equipment in six month from the beginning of the project in accordance existing lows and regulations.		
Definition the budget resource.	500,00 lei	
Sign a contract for upgrades of software		
Submission of claims		100,00 lei
Agreement on price		500,00 lei
Identification the period		200,00 lei
Sign a contract for upgrading system		200,00 lei
Organize a tender to purchase modern technical equipment		
Determine the necessary specifications of hardware	250,00 lei	
Market survey		500,00 lei
Announcement and organization of the tender.		500,00 lei
Sign a contract for technical equipment and payment		500,00 lei
The contracting company delivers the equipment		
The PM will oversee that the database is upgraded by installing the new equipment and doing the software update		
The development of software		1.000,00 lei
The new equipment is installed and tested		23.500,00 lei
The supplier will optimize the database by upgrading it		25.000,00 lei
Testing the new version of software and control.		300,00 lei
Develop documentation for the system and its parts.		
The PM will oversee the training of the staff		
The PM together with the structures using the database identifies the key personnel who needs training		200,00 lei
The supplier will train the selected staff in accordance with the signed contract		1.000,00 lei
The key staff who undertook the training ensures they disseminate knowledge to their subordinates		
Maintenance by software company		
Performance of work under the warranty.		
Elimination of deficiencies identified in the operation of the system		
Post-warranty service.		
Analysis of the functioning of the system.		
The identification of deviations of actual performance from the design values.		
Determining the causes of these deviations		
Address the identified gaps and ensure the stability of the performance of the plant;		
The necessary changes to the documentation of software .		
Closing the project		
Total	1.900,00 lei	55.150,00 lei

	4th Quarter	**Total**
Improve tne level of database by upgrading of system		
The PM will establish the list of requirements for the upgrades necessary, as well as for the modern equipment needed to purchase		
Identify a qualification working group.		1.000,00 lei
Analyze existing soft (base of date).		150,00 lei
Development of functional and technical requirements.		250,00 lei
Elaboration and approval of the schedule of works		1.400,00 lei
Financial Department, supported by Ministry of Finance, will purchase all necessary upgrades for the software and the equipment in six month from the beginning of the project in accordance existing lows and regulations.		
Definition the budget resource.		500,00 lei
Sign a contract for upgrades of software		
Submission of claims		100,00 lei
Agreement on price		500,00 lei
Identification the period		200,00 lei
Sign a contract for upgrading system		200,00 lei
Organize a tender to purchase modern technical equipment		
Determine the necessary specifications of hardware		250,00 lei
Market survey		500,00 lei
Announcement and organization of the tender.		500,00 lei
Sign a contract for technical equipment and payment		500,00 lei
The contracting company delivers the equipment		
The PM will oversee that the database is upgraded by installing the new equipment and doing the software update		
The development of software		1.000,00 lei
The new equipment is installed and tested		23.500,00 lei
The supplier will optimize the database by upgrading it		25.000,00 lei
Testing the new version of software and control.	500,00 lei	800,00 lei
Develop documentation for the system and its parts.	100,00 lei	100,00 lei
The PM will oversee the training of the staff		
The PM together with the structures using the database identifies the key personnel who needs training		200,00 lei
The supplier will train the selected staff in accordance with the signed contract		1.000,00 lei
The key staff who undertook the training ensures they disseminate knowledge to their subordinates		
Maintenance by software company		
Performance of work under the warranty.		
Elimination of deficiencies identified in the operation of the system	500,00 lei	500,00 lei
Post-warranty service.		
Analysis of the functioning of the system.	200,00 lei	200,00 lei
The identification of deviations of actual performance from the design values.	600,00 lei	600,00 lei
Determining the causes of these deviations	500,00 lei	500,00 lei
Address the identified gaps and ensure the stability of the performance of the plant;	1.000,00 lei	1.000,00 lei
The necessary changes to the documentation of software .	1.050,00 lei	1.050,00 lei
Closing the project		
Total	4.450,00 lei	61.500,00 lei

OPTIMIZING THE TEST&EVALUATION PROCESS OF INTEGRATED SECURITY SYSTEMS – ISS

LTC. Eng. Mihai ENACHE

CONTENTS

Project name

Optimizing the test-evaluation process of integrated security systems – ISS

Project sponsor

National Authority for Scientific Research (NASR)

Project summary

This project is a complex, multidisciplinary one and from this perspective, it can be related to the following research direction and theme: priority domain **"Space and security",** research direction **"Security infrastructure and systems" / "The protection of physical and informatics infrastructures"** thematic.

To prove the specific scientific and technical study of the project, including the novelty degree and the possibility of applying the research results we will take into consideration the following aspects described hereinafter.

The type of this project belongs to individual projects class.

The project will be performed by METRA – Military Equipments Technologies Research Agency.

I. BUSINESS CASE

I.1. The concept and current situation

The Integrated Security Systems-ISSs protect people's properties and are applying even for industrial, research, defense activities areas and so on.

The ISS projects are unique and depend on the site configuration and could have one or more of main function:

- Deny-Detection-Delay-Deter
- Access control
- Events evaluation
- Force intervention,

and could be realized using one or more of system'subsystems.

ISSs is composed by several subsystems and many devices/equipments taking into account the level of systems, the site importance and dimensions and not after all security mechanisms established by users and providers.

For ISS are essential the monitoring, management and real time control of its components and, as well as their functions, from specialized monitoring centre (figure 1).

Figure 1 Monitoring centre
http://www.futureengineering.ro/sisteme-integrate-de-securitate-dispecerat

Nowadays the presence of those devices in the majority technical security solutions used by people and organizations have conducted to an unprecedently situation of using different types and models of electronically devices.

The use of modern technology in almost all the technical equipment and process give to designers the opportunity to integrate their (equipment) features into a system features.

In addition was initiated the idea if it is possible that software specialists to create an applications in order to manage the system functionality having a friendly graphical user interface-GUI.

There are many ISS installed without strictly control about their process design and without user's management of their features in order to be easy operable. Some of these classical approaches are based on:

- ISS implementing, based on requirements;
- physical and functional integration of individual sensors (efraction, fire, access control equipments, perimetral sensor, CCTV);
- using in unique software controlled system;
- internal manufacturers controlling mechanism and processes;
- test and evaluation-TE activities;
- user's acceptance.

All of the above are the steps regarding TE activities. They represent a formal activity regarding product homologation, after ISS implementation, and we don't know if the proposed solutions are good from the initiation phases of projects consists of research, developing and designing.

I.2. The need

There is a fierce competition among ISS providers, each of these owning and deploying their own solutions and techniques. Consequently, an entity owning a given number of sites may

benefit from more than one ISS solution. However, this is a disadvantage because multiple solutions may be in conflict in case a centralized, integrated system is needed. Therefore, the solution is that from the design phase the integration of the systems does not depend on the methods and standardization protocols used by various suppliers/vendors. Moreover, if this solution is worked out, then it becomes possible to use it even further in the homologation process and in the system exploitation phase (upon warranty expiry date).

In these situations the main interest for end-users is regarding the results quality of the process because of the large variety spectrum of the equipments and measurements tools utilized by producers and the possible unwanted consequences with economical impact for imprecise results.

For instance, all the producers and providers work hardly and have in mind one of the major market indicators: the reduction of time regarding design and internal test and evaluation process and in the same time improving performances and features of the sensors system

For user's, need is to assure that the starting point of buying process is whether it is possible to develop alternative solutions for security systems.

Most interest/concerns are referring to enhance evaluation process from the starting point of ISS project, due to the large number of the client's requests and their normal attitude for optimize their resource usage.

I.3. *Solutions*

The project aim is to create an experimental model in order to be used in test and evaluation activities of ISS projects.

The ISS design can be optimized by enhancing data acquisition and process and by developing better solutions for sensors system.

Project's contribution at knowledge development refers to include the elaboration of completely new conceptual ISS-projects models meeting the need for a diversified set of the proposed solutions.

The earliest testing and evaluation stage will represent the technical proof that an equipment or system is able to work in conformity with his design criteria.

The solutions' project will be validated using the testing principles. For example, using the experimental configuration setup, technical hardware and software tools (example, in figure below) for measuring the vulnerability degree of the project solutions the designers could optimize the ISS parameters and features and in the same time the number of equipments and cost.

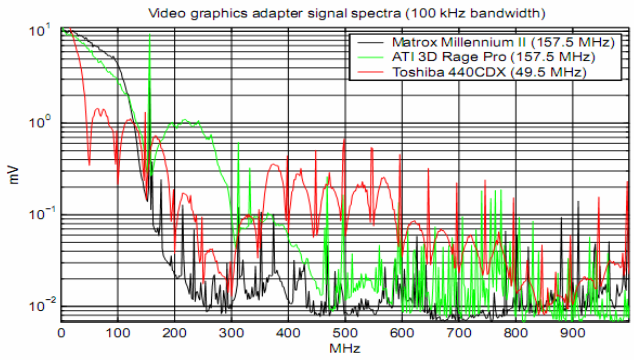


Figure 2 Design process evaluations

I.4. The project novelty

The project proposes the development of an automatic system for analysis and evaluation the design process in order to reduce risk about results uncertainty and abnormal delays in ISS realization.

The novelty aspects and advantages are followings:

- performs a specific and new tool need for TE process design even if ISS is made specific using different standardizations in this domain<
- create a concept for security mechanism and solutions evaluation;
- it proposes new international novelty solutions of security mechanism acceptance applicable in security fields;
- the specific results:
    - used for fixed or mobile system;
    - data processing and equipments real-time control system development;
    - the identification of viable, efficient and low-cost sensors solutions for security field data capturing;
- acquisition of ISS based on certified projects;
- the customers could know even by the initiate period of projects if these are properly designed and can complete all requirements;
- it responds to the concrete needs of all customers regarding site's protection in systems already implemented also in process of certifying the design and security systems for the resolving of protecting aspects and to reduce the risk of insecurity;
- the proposed optimizing the design solutions and certifying approaches have, in our opinion, an important economical and social impact;
- it starts the process of gratefully standardization in security domain based on the viable requirements and information of site's vulnerabilities studies;

- using the licensed software, with access to the source program create to everybody the way to add their experience and develop their own platform from design testing purpose;
- eliminate the dependence of design simulation by the site properties.

I.5. Project feasibility

Considered criteria for experimental model (or prototype) design and realization will be some of the following:

- performances, adaptability, costs and availability of the sensors;
- technologies costs for the implementation of the entire systems;
- scalability, real-time response and human-machine interfaces of the software.

The project suggests accomplishing and implies some theoretical and practical activities, such as:

- Theoretical studies elaboration activities for technical solutions fundament;
- Physical site configuration and security mechanism modelling, analysis and optimization using specialized software;
- Experimental model design and realization through elementary security sensors integration;
- Process automation software development;
- Analysis and evaluation software development;
- Practical development activities for system integration;
- Measurements for system design and Hardware-Software integration into a single platform;
- Product Testing and evaluation.

All these activities and their links give us the reliability that the project is considered as being a feasible one, and with all qualities and premises necessary for development a final usefully product.

There are, for instance, a lot of arguments to be sure about the success of project:

- The intended market for project results exploitation is in continuously growing and diversification, affirmation based by proven interest of large target customers with special needs for sensitive information and physical protection. In this respect, the number of the companies participating in bidding actions, as well as the difficulty of most of these to meet the bidders' requirements is the proof. For example, for the past four years, out of a total of 12 contracts granted to ISS providers, about half of these

were completed, while the rest where postponed or cancelled on reasons of too high standards to be met ;

- The team's skills and competencies that covers all the quality criteria and user acceptance for activities, as illustrated in the HR table;
- The project team uses a controlled management process of activities and all the equipments and facilities necessary to complete these activities;
- The outcomes' project is validated using the certified ISO 9001:2008 internal Quality Management Systems;
- The experimental configuration setup, technical hardware and software tools used for measuring the parameters of the EM are the newest certified generation;
- It represents a new scientific and technological approach in security concepts, the potential of scientific contribution being a remarkable one.

Beneficiary and possible customers are: governments, companies, banks, defence organisations, all ISS owners, research institutes, educational institutes, common people, parking sites, resorts, children's playing locations, administrative centres, museums

The stakeholders in this field are from all over the world and are continuously growing, like followings:

- national security structures and departments;
- military units;
- civil community, public order and national administrative organisations;
- customers with special needs for information and physical protection;
- other entities and research institutions;
- security equipments vendors/providers and manufacturers;
- standardization departments.

The basic assumptions of this project are:

The estimated implementation period of this project is: 4/29/2013 – 4/29/2016.

Total project' budget is 2.997.197 LEI.

After the Project Chart is signed-off we will start the project Statement of Work / SOW

Contracting Authority: Scientific Research National Authority (SRNA).

Contractor: METRA – Military Equipments Technologies Research Agency.

II. SCOPE MANAGEMENT PLAN

II.1. Goal

The project will optimize Integrated Security Systems-ISS testing and evaluation design and execution processes by building an experimental model.

II.2. Objectives

The concept of this project regarding the objectives follows the answers to following questions: what are, how, when/period, who, outcomes/results, how much/how many.

We have shared the project in five phases to reach the objectives identified as followings:

1. **Requirements establishment for experimental model and a site reference model 3D simulation**

In the first phase (table 1 description), it will be elaborated the requirements for experimental model and we will perform a site reference model 3D simulation. The results of these activities will be used, in following phases. Network installation and Web page of the project will be made. The results of project's phase will be concreted in: technical specifications that contain technical requirements for experimental model, simulation and modeling technical study using specialized software and, also, technical study for sites reference model.

a	What	• EM requirements established • create a reference model for a site • arbitrary site 3D simulation (using CAD application)
b	How	• documentation, preliminary market studies and customer needs and technical specification elaboration • site configurations analysis
c	When/period	• 133 days
d	Who (Time Management Plan - TMP)	• team's managers • members of Technical Team – TT and Scientific Team: personnel specialized in electronic and IT • persons specialized in CAD software
e	Outcome/ results	• EM Technical Specification • Sites/objectives reference model (RM) Technical Study • Analysis Report for 3D simulations (Project Quality Management - PQM)
f	How much/how many	(PQM)

Table 9 Phase 1 description

2. **Standardization interfaces identification for a vaste variety of sensors and security systems equipments EM hardware platform realization**

In the second phase of the project (table 2 description), based on the studies and analyses performed in first phase, will be realized EM HW platform that will be tested in own specialized laboratory. For this, it will be designed a specialized testing platform for the characterization and the evaluation of the security equipments integrated into HW platform.
The main activities are:

- Standard interfaces Technical Study elaboration;
- HW platform equipments acquisition;
- Electrical/electronic tools and devices acquisition;
- Measuring and test instruments acquisition;
- It will be elaborated the technical and quality requirements for EM HW platform and we will up-date experimental mode technical specification;
- Experimenting and measurements test running for experimental model HW platform, verification and evaluation for validation of the technological solutions;
- Test runs for functionality demonstration in laboratory conditions.

a	What	• EM HW platform • Documentation concerning common interfaces (communication protocols and physical/electrical interfaces) that exists/are used by security equipments • EM technical Specification up-date
b	How	• acquisition procedures • design and completion • documentation and studies • functional verification
c	When/period	• 147 days
d	Who (TMP)	• team's managers • members of Technical Team - TT: personnel specialized in electronic and IT, system engineers, test engineers • members of Scientific Team – ST: scientific researchers specialized in electronic and IT • Support Team: Financial, Acquisitions Department
e	Outcome/ results (PQM)	• standard interfaces Technical Study • EM HW platform Technical Specification, including equipments technical specifications

		• EM HW platform • EM Technical Specification – up-date
f	How much/how many	(PQM)

Table 10 Phase 2 description

3. EM software platform realization

In the third phase of the project (table 3 description), we will make an analysis of SW's configurations used in ISS subsystems. Based on the studies and analyses performed in first phase and in this phase, will be realized EM SW platform that will be tested in own specialized laboratory by SW programmers and electronic engineers specialized in SW interfaces and communications protocols.

The main activities are:

- IT Software Technical Study elaboration;
- Programming software (C++, SQL, Dot NET and so on) licenses acquisition;
- SW platform modules acquisition (if it is necessary);
- Designing and realization of SW platform;
- It will be elaborated the technical and quality requirements for EM HW platform and we will up-date experimental mode technical specification;
- Experimenting and measurements test running for experimental model SW platform, verification and evaluation for solutions validation;
- Test runs for functionality demonstration.

a	What	• EM SW platform based on information contained in technical studies and specialized literature in order to demonstrate SW requirements
b	How	• documentation concerning majority/common SW's configurations used in ISS subsystems • acquisition procedures for SW module (if it is necessary, depends on the previous decisions) • SW module construction, SW module integration for building the application
c	When/period	• 372 days
d	Who	• team's managers

	(TMP)	• members of TT: personnel specialized in electronic, IT, software programmers (C++, SQL, Dot NET and so on), system engineers, test engineers • members of ST: scientific researchers specialized in electronic and IT • Support team: Financial, Acquisitions Department
e	Outcome/ Results (PMQ)	• IT Software Technical Study • EM SW platform Technical Specification, including SW modules technical specifications • EM SW platform • EM Technical Specification – up-date
f	How much/how many	(PQM)

Table 11 Phase 3 description

4. EM realization and functional verification through HW-SW integration

In project's fourth phase (table 4 description), the experimental model of the system will be designed and realized starting from the performed HW and SW platform and the technical requirements for the system elaborated, based on updated System Performance Specification from previous phases, and depending on it we will be established the possibilities of improving the solution. Then we will proceed to the design of the EM with modular structure, flexible and open to different physical and electrical configurations of the HW equipments. The designing solutions will be analyzed for the establishment of the activities necessary for practical realization of the experimental model of security system.

An important component of experimental model realization process is given by the physical and functional integration of this, with ISSs already installed in Ministry of Defense-MoD sites and the demonstration of functioning for the centralized assembly.

a	What	• EM
b	How	• EM HW-SW platform physical and functional integration in order to demonstrate EM requirements • Using HW platform and SW module integrated into a SW application • Construction a friendly graphical user interface to control and operate the system • EM Functional verification

c	When/period	• 221 days
d	Who (TMP)	• Team's manager • members of TT, specialized in electronic, IT, software programmers (C++, SQL, Dot NET and so on), system engineers, test engineers • members of ST, scientific researchers specialized in electronic and IT
e	Outcome/ Results (PQM)	• EM • EM project • Functional Test Plan • Functional Test Report
f	How much/how many	(PQM)

Table 12 Phase 4 description

5. EM test and evaluation

In project's final phase will be experimented and tested system experimental model, based on the designing process, technical requirements and performances, and system's technical parameters. Testing activities will be realized in accordance with the testing-evaluation plan, the testing procedures and the verification matrix for the system's requirements to validate the technological solution used at the realization of EM.

Report testing-evaluation will be elaborated containing the results of the tests for acceptance criteria and the conclusions regarding the assurance of the designed system's performances.

The results of project's phases will be concreted in: Acceptance Test and Evaluation Plan and Experimental Model Acceptance Test and Evaluation Report.

At the final of these activities Web Project will be update.

a	What	• EM testing and evaluation
b	How	• using Test and Evaluation documentation • using Case Study, Operational ISS, and Design Scenarios
c	When/period	• 83 days
d	Who (TMP)	• Team's manager • members of TT, specialized in electronic, IT, software programmers (C++, SQL, Dot NET), system engineers, test engineers • members of ST, scientific researchers specialized in electronic and IT

e	Outcome/ Results (PQM)	• Acceptance Test and Evaluation Plan - TEP, including Test and Evaluation Procedures • Acceptance Test and Evaluation Report – TER • EM: - accepted and certified in developmental phase - prepared for homologation in developmental phase
f	How much/how many	(PQM)

Table 13 **Phase 5 description**

Also in three phases will be elaborated papers and scientific articles with the results of the research to disseminate the results obtained in the research activities deployed in project's period.

II.3. Work Breakdown Structure (WBS)

The table presented below show the WBS with the description and the name of each activity undertaken by the project's team, starting from the five objectives.

OPTIMIZING THE TEST&EVALUATION PROCESS OF INTEGRATED SECURITY SYSTEMS – ISS

PROJECT CHART SIGN-OFF

O1	**Requirements establishment for experimental model and a site reference model 3D simulation**		
	A1	**EM requirements establishment**	
		S11	Site's general vulnerabilities analysis regarding physical protection
		S12	Documentation concerning ISS configurations stated in standards and internal (in-country) regulations
		S13	Documentation concerning ISS functions, performances and failures
		S14	EM initial requirements establishment
		S15	Network IT Equipments acquisition
	A2	**Sites/objectives reference model performing**	
		S21	Consumables acquisition
		S22	Documentation regarding specific configurations and architectural features of important or well-known/common sites
		S23	Sites/objectives reference model (RM) Technical Study elaboration
		S24	Sites/objectives reference model (RM) Technical Study analysis and approval
	A3	**Modeling and 3D simulation of site reference model and any specific**	

		configuration	
		S31	CAD software license acquisition
		S32	Network installation and functional verification
		S33	Create the site general plans and architectural plans of buildings floors for RM, using CAD application
		S34	3D simulations of site configuration elements
		S35	3D simulations Analysis Report elaboration
		S36	3D simulations Report analysis and approval
	A4	**EM Technical Specification elaboration**	
		S41	EM Technical Specification elaboration
		S42	EM Technical Specification approval
	A5	**Web project design**	
	A6	**Phase I Analyses and Technical Audits (Quality Audits)**	
		S61	Program Management Review 1-PMR1
	A7	**Phase I deliverables reception**	
	A8	**Phase I Financial Audit**	
O2	**Standardization interfaces identification for a vaste variety of sensors and security systems equipments EM hardware platform realization**		
	A1	**Studies and analysis of standard interfaces used in ISS equipment**	
		S11	Documentation concerning majority/common ISS equipments electrical/physical interfaces configurations (communication protocols, etc) stated in standards and internal (in-country) regulations and that exists/are used by security equipments
		S12	Standard interfaces Technical Study elaboration
		S13	Standard interfaces Technical Study approval
	A2	**EM HW platform execution and functional testing**	
		S21	EM HW platform Technical Specification elaboration
		S22	HW platform equipments acquisition
		S23	Electrical/electronic tools and devices acquisition
		S24	Measuring and test instruments acquisition
		S25	HW platform design
		S26	EM HW platform completion
		S27	EM HW platform functional verification
		S28	EM HW platform functional Report elaboration
		S29	EM HW platform functional Report analysis and approval
	A3	**Refinement of requirements for SW based on the previous analysis and technical data contained in technical studies**	
		S31	EM Technical Specification actualization/up-grade (up-date)
		S32	EM Technical Specification review and approval (up-date)
	A4	**Phase II Analyses and Technical Audits (Quality Audits)**	
		S41	Program Management Review 2 - PMR2
		S42	Critical Design Review 1 - CDR1
	A5	**Project results dissemination**	
		S51	Articles, technical papers in ISI magazines
		S52	Participating at symposiums and conferences
	A6	**Phase II deliverables reception**	
	A7	**Phase II Financial Audit**	

O3	**EM software platform realization**		
	A1	**Analysis of SW's configurations used in ISS**	
		S11	Documentation concerning majority/common SW's configurations used in ISS subsystems
		S12	IT Software Technical Study elaboration
		S13	IT Software Technical Study analysis and approval
	A2	**EM SW platform achievement and functional testing**	
		S21	EM SW platform Technical Specification elaboration
		S22	Programming software (C++, SQL, Dot NET and so on) licenses acquisition
		S23	SW platform modules acquisition (if it is necessary)
		S24	EM SW platform design
		S25	EM SW platform realization
		S26	EM SW platform functional testing
		S27	EM SW platform functional Report elaboration
		S28	EM SW platform functional Report analysis and approval
	A3	**Refinement of requirements for SW based on the previous analysis and technical data contained in technical studies**	
		S31	EM Technical Specification actualization/up-grade (up-date)
		S32	EM Technical Specification review and approval (up-date)
	A4	**Phase III Analyses and Technical Audits (Quality Audits)**	
		S41	Program Management Review 3 - PMR3
		S42	Critical Design Review 2 - CDR2
	A5	**Web project update**	
	A6	**Phase III deliverables reception**	
	A7	**Phase III Financial Audit**	
O4	**EM realization and functional verification through HW-SW integration**		
	A1	**EM execution by integration of HW and SW platforms**	
		S11	EM design
		S12	HW and SW platforms physical integration
		S13	HW and SW platforms functional integration
		S14	EM realization
	A2	**EM functional verification**	
		S21	EM Functional Test Plan elaboration
		S22	Functional verification
		S23	EM Functional Test Report elaboration
		S24	EM Functional Test Report review and approval
	A3	**Phase IV Analyses and Technical Audits (Quality Audits)**	
		S31	Program Management Review 4 - PMR4
		S32	Critical Design Review 3 - CDR3
	A4	**Project results dissemination**	
		S41	Articles, technical papers in ISI magazines
		S42	Participating at symposiums and conferences
	A5	**Web project update**	
	A6	**Phase IV deliverables reception**	
	A7	**Phase IV Financial Audit**	

O5	**EM acceptance test and evaluation**		
	A1	**EM Acceptance Test and Evaluation Plan elaboration**	
		S11	EM Acceptance Test and Evaluation Plan elaboration
		S12	EM Acceptance Test and Evaluation
		S13	EM Acceptance Test and Evaluation Report elaboration
		S14	EM Acceptance Test and Evaluation Report review and approval
	A2	**Phase V Analyses and Technical Audits (Quality Audits)**	
		S31	Program Management Review 5 - PMR5
	A3	**EM results dissemination**	
		S31	Articles, technical papers
		S32	Participating at symposiums and conferences
		S33	Final Workshop
	A4	**Proprietary rights protection-Patent obtaining**	
		S41	Patent request elaboration
	A5	**Web project update**	
	A6	**Phase V deliverables reception**	
	A7	**Phase V Financial Audit**	

Table 14 **Work Breakdown Structure - WBS**

Legend:

	Objectives - O
	Main Activities - A
	Sub-activities - S

III. TIME MANAGEMENT PLAN (Gantt Chart)

The time management plan – TMP was elaborated using Microsoft Project software.

The activities described in Table 1 - WBS Tableare presented in **Appendix 1.** It includes the relations between different task and the milestones relevant to the project.

The project will begin after the project chart sign-off by the Contracting Authority (sponsored representatives) and Contractor - the high level management of the institution (METRA manager) that undertakes the project.

The duration of the project is estimated to be 785 working days during 3 years.

The milestones relevant for this project are directly related to the main deliverables for each phase and importance derives by the fact to accomplish all the project's requirements in order to maintain a timing of these phases' activities.

Milestone	WBS	Date
Sites/objectives reference model (RM) Technical Study analysis and approval	1.2.2.4	23.07.13
3D simulations Report analysis and approval	1.2.3.6	17.09.13
EM Technical Specification analysis and approval	1.2.4.2	31.10.13

Phase I deliverables reception	1.2.7	08.11.13 to 11.11.13
Standard interfaces Technical Study analysis and approval	1.3.1.3	12.12.13
EM HW platform functional Report analysis and approval	1.3.2.9	05.05.14 to 06.05.14
EM Technical Specification review and approval (up-date)	1.3.3.2	12.05.14 to 13.05.14
Phase II deliverables reception	1.3.6	22.05.14
IT Software Technical Study analysis and approval	1.4.1.3	09.01.14
EM SW platform functional Report analysis and approval	1.4.2.8	19.02.15
EM Technical Specification review and approval (up-date)	1.4.3.2	19.03.15 to 20.03.15
Phase III deliverables reception	1.4.6	30.03.15 to 31.03.15
EM Functional Test Report review and approval	1.5.2.4	07.01.16
Phase IV deliverables reception	1.5.6	15.01.16 to 18.01.16
EM Acceptance Test and Evaluation Report review and approval	1.6.1.4	07.04.16
Phase V deliverables reception	1.6.7	27.04.16 to 28.04.16

Table 15 – Milestones

IV. HUMAN RESOURCE MANAGEMENT

To ensure that the resources assigned to the project are rationally used and organized, I identified and set out the Project Management Team-PMT and the roles team components: Project Manager, Scientific Team - ST, Technical Team - TT and Support Team -SpT.

The project team will be lead by the Project Manager (PM) which will perform the management of the project and will cover the following main aspects: management of scientific and technical activities, resources (financial, human, infrastructure, information) and communication. The main structure of the project management is illustrated in the figure bellow, and consists in basic involved structures definition and the relationships between METRA's departments. PMT is responsible for the implementation of scientific decision into the Project Plan, to optimize the resources consumption and to achieve the objectives of the project, take decisions regarding the resources allocation, manage the time IAW the project plan realization, coordinate the project team leaders, presents the stage reports to the Contracting Authority.

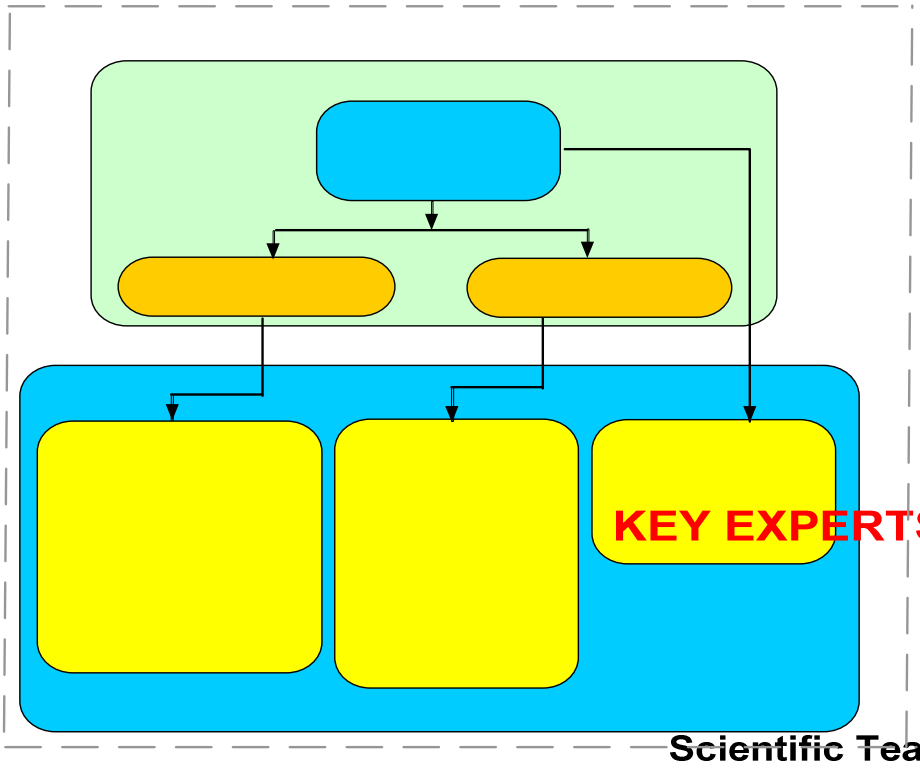


Figure 3 Organizational structure

Project Manager is assisted by:

- Support Team: includes executives for finance, acquisition, procurement, logistics and human resources;
- Scientific Team: includes executives for design, modelling software specialist decisions;
- Technical Team for testing & evaluation, mechanical and electronic integration.

The Gantt Chart presents the allocation of humans resource to the project's activities and table 8 ilustrates role and responsibility. The responsible (team leader) for each major activity and / or objective is marked with an „a". The team leaders, besides coordinating the activity of the team are responsible for the briefings and the reports concerning team's activities.

No		HUMAN RESOURCES									
1		PM									
2	Responsibility	a									
3		TECHNICAL TEAM									
4		M-TT	EE-TT	DE-TT	IT-TT	SW-TT	ME-TT	Tch-TT	CAD SW-TT	W-TT	PW
5	Responsibility	a, r	c	c	c, u	c	c	c	c	c	c, u

6		SCIENTIFIC TEAM									
7		M-ST	SRI-ST	SRIII-ST	SR-ST	AR-ST	SWP-ST	TE-ST	SE-ST		
8	Responsibility	a, r	c	c	c	c	c	c	c		
9		SUPPORT TEAM									
10		QA	F	A	HR	Legal	ACR				
11	Responsibility	c, r	c, r	c	c, r	c, r	r				

Table 16 – Responsibility and HR allocation matrix
Legend: a-accountable; c-creator; u-updater; r-reviewer.

The description of each team members and their skills is related in table 10 – Pool description table

V. COMMUNICATIONS MANAGEMENT

Communication management plan contain the stakeholders and the process required to ensure timely distribution of project information. The communications management plan has to perform the following roles:

- to report to high importance stakeholders the status of the project and the influence on their institutions;
- to inform other stakeholders of the status of the project and how the findings will help their activity;
- to brief and debrief all project members on their activity and how their work influences the project.

Project data information flow will be provided by the availability of standard communications tools: electronic mail, exchange of documents, project website, meetings and reports.

Stakeholders	**Person(s) to convey the message**	**When the message is conveyed**	**Format of a message/ activity**	**Message content**
Project sponsor/Contracting Authority	Project manager	After each objective related major activity	Project status report or E-mail or presentation/PMR (1.2.6.1, 1.2.7, 1.3.4.1, 1.3.6, 1.4.4.1, 1.4.6, 1.5.3.1, 1.5.6, 1.62.1, 1.6.6)	• Business context and benefits • Project overview • Stage overview • High level operational implications • Review/approve some project elements • Deliverables reception
ISS and security equipments Customers	Project manager	Start date Start of acceptance testing phase and final dissemination	Mail Meeting (1.6.1.4, 1.6.3.3)	• Market • Business • Economic
Hardware equipments	Project manager	During the	Acquisition Contract,	• Business context

and Software application suppliers	Acquisitions specialist	requirements definition Acquisition process	technical specifications (1.2.1.5, 1.2.3.1, 1.3.2.1, 1.3.2.2, 1.3.2.3, 1.3.2.4, 1.4.2.1, 1.4.2.2, 1.4.2.3)	• Buy hardware equipments • Buy software application
Security equipments manufacturers and vendors	Project manager	Start date Start of acceptance testing phase and final dissemination	Mail Meeting (1.6.1.4, 1.6.3.3)	• Research • Business context • Sell reasons
Potential developers	Project manager Team representatives	Start date	Lend expertise and guidance as needed	• Main features developed
Financial auditor	Project manager	After each objective and major phase related major activity	Contract (1.2.8,1.3.7, 1.4.7, 1.5.7, 1.6.7)	• Reports regarding audit certificate
Research institutes	Project manager Team representatives	Start date Start of acceptance testing phase and final dissemination	Mail Meeting (1.6.1.4, 1.6.3.3)	• Most important features • Research reasons
Science community	Project manager Teams representatives	According to the dissemination process	Presentation / Symposium (1.3.5.1, 1.3.5.2, 1.5.4.1, 1.5.4.2, 1.6.3.1, 1.6.3.2, 1.6.3.3)	• Projects results • Project development • Major findings
All project team members	Program manager	Monthly	Meeting	• Project introduction • The following steps in project plan and milestones • Sponsors and steering committees • Project phases and deliverables • Current status
Teams leaders	Program manager	Weekly	Meeting / Discussions	• Common points of interest; • Cross-reference on activities status
Program manager	Team leaders	Twice a weak	E-mail	• Status report
Project members	Team leaders / Program manager	When necessary	E-mail	• Correcting tasks; • Detailed actions;
High level management of institution	Program manager	Once per each phase Once a year	E-mail Presentation	• Project status; • Benefits for the institution;

Table 17 – Communication matrix

VI. PROJECT COST MANAGEMENT

ISS is a project with the main deliverable an EM with a test and evaluation function and method and a software program. To fulfill all task the budget covers personnel costs, logistic costs (materials, equipments, consumables), extern audits activities and transport/travel cost for participation at dissemination. The equipments and materials necessary are presented in table 10.

Considering that we use our own facilities and only buy the necessary equipments, the costs are mainly work-oriented (ex. salaries, indirect costs). In the next part of this chapter we describe the resources used.

Total cost of the project is detailed in appendix no 1 and is: 2,997,197 LEI

VI.1. Resource pool description

The next table describes the resources used in the project and their costs. The No column mentions the number of human resources for a specific skill.

The measurements equipments and the materials (raw materials, connectivity elements and mounting accessories of the system) will be buying at each phases when it is necessary before the starting activities. The network equipments and consumables (specific to documents redaction and conservation-paper, cartridge, office equipments and auxiliary) are aquired at the start of project.

Table 18 – Pool description table

Resource type	Name	Description	No.	Cost	Total cost
Skilled human resources	PM	Project Manager	1	150 LEI/hr	39,455 LEI
	Technical Team				
	M-TT	Manager Technical Team - Technical Team	1	100 LEI/hr	33,025 LEI
	EE-TT	Electronic Engineer - Technical Team	2	75 LEI/hr	379,695 LEI
	DE-TT	Design Engineer - Technical Team	2	80 LEI/hr	156,484 LEI
	IT-TT	IT specialist - Technical Team	1	75 LEI/hr	23,100 LEI
	SW-TT	SW specialist - Technical Team	1	90 LEI/hr	318,731 LEI
	ME-TT	Mechanical Engineer - Technical Team	1	75 LEI/hr	75,259 LEI
	Tch-TT	Technician - Technical Team	1	60 LEI/hr	37,680 LEI
	CAD SW-TT	CAD SW specialist - Technical Team	2	75 LEI/hr	131,400 LEI
	W-TT	Worker - Technical Team	1	30 LEI/hr	2,400 LEI
	PW	Project Writer - Technical Team	1	50 LEI/hr	9,200 LEI
	Scientific Team				
	M-ST	Manager Scientific Team - Scientific Team	1	100 LEI/hr	33,044 LEI
	SRI-ST	Scientific researcher I rank - Scientific Team	1	120 LEI/hr	76,320 LEI
	SRIII-ST	Scientific researcher III rank - Scientific Team	2	90 LEI/hr	382,194 LEI
	SR-ST	Scientific researcher - Scientific Team	2	75 LEI/hr	86,400 LEI
	AR-ST	Assistant researcher - Scientific Team	1	60 LEI/hr	6,960 LEI
	SWP-ST	SW programmer - Scientific Team	2	100 LEI/hr	354,774 LEI
	TE-ST	Test Engineer - Scientific	1	90 LEI/hr	241,691 LEI

		Team			
	SE-ST	System engineer - Scientific Team	1	100 LEI/hr	203,346 LEI
	Support Team				
	QA	Quality Assurance - Support Team	1	50 LEI/hr	3,800 LEI
	F	Financial - Support Team	1	60 LEI/hr	1,200 LEI
	A	Acquisition - Support Team	1	50 LEI/hr	25,000 LEI
	HR	Human Resources - Support Team	1	50 LEI/hr	1,000 LEI
	L	Legal - Support Team	1	60 LEI/hr	8,040 LEI
	Contracting Authority				
	ACR	Contracting Authority Representative	1	0 LEI/hr	0 LEI
Material	C	Consumables	23	500 LEI	11,500 LEI
Project support equipments	Server	Network	1	10,000 LEI	10,000 LEI
	Laptop	Network (2xCAD, 2xSW platform)	4	4,500 LEI	18,000 LEI
	PC desktop	Network (2xSW platform)	2	5,000 LEI	10,000 LEI
	Printer	Network	1	6,000 LEI	6,000 LEI
	Switch	Network	1	3,000 LEI	3,000 LEI
	Rack	Network	1	3,000 LEI	3,000 LEI
	SW-P	SW Programming (C++, SQL, Dot NET) license	2	40,000 LEI	80,000 LEI
	SW-app	CAD SW application license	5	6,000 LEI	30,000 LEI
Project EM equipments	Laptop R&T	EM - HW platform (Ruggedized and TEMPEST)	1	8,000 LEI	8,000 LEI
	SW-modules	SW modules	2	22,000 LEI	44,000 LEI
	SDP	SDP equipments - Hardware platform (sensors and centralized equip.)	1	6,000 LEI	6,000 LEI
	CA	CA equipments - HW platform equipments (sensors and centralized equip.)	1	10,000 LEI	10,000 LEI
	STVCI	STVCI equipments - HW platform equipments (sensors and centralized equip.)	1	8,000 LEI	8,000 LEI
	SDAE	SDAE equipments - HW platform equipments (sensors and centralized equip.)	1	5,000 LEI	5,000 LEI
	SDAI	SDAI equipments - HW platform equipments (sensors and centralized equip.)	1	5,000 LEI	5,000 LEI
	E/E-TD	Electrical/electronic tools and devices	1	20,000 LEI	20,000 LEI
	MTI	Measuring and test instruments	1	60,000 LEI	60,000 LEI
Fees				500 LEI /	
	Fees-sc	Taxes, travel,	7		1,500 LEI

		accommodations, house allowances		use	
	Fees-ap	Taxes, travel, accommodations, house allowances	3	4000LEI / use	28,000 LEI
Total					**2,997,197 LEI**

VI.2. Cost breakdown structure

According to the resource allocations we have determined the costs for each activity in WBS. Those costs are presented in **Table 29 – Cost breakdown structure**. The payment dates (finish date) are after financial audits are completed. The contractors can request the payment in advance for buying reasons. The payments for this project related to the fiscal year and each phase are the followings:

Table 19 – Cost breakdown structure

WBS	Cost (LEI)	Date	WBS	Cost (LEI)	Date	WBS	Cost (LEI)	Date
1	**2997197**	4/27/2016	*1.3.2.4*	6060	2/11/2014	**1.4.6**	920	3/31/2015
1.1	**16800**	5/10/2013	*1.3.2.5*	74800	2/25/2014	**1.4.7**	1680	4/2/2015
1.2	**441929**	11/13/2013	*1.3.2.6*	113400	3/25/2014	**1.5**	**869880**	1/20/2016
1.2.1	86560	6/28/2013	*1.3.2.7*	99110	4/15/2014	**1.5.1**	562075	9/15/2015
1.2.1.1	12600	5/31/2013	*1.3.2.8*	32400	4/29/2014	*1.5.1.1*	228000	5/12/2015
1.2.1.2	26400	6/7/2013	*1.3.2.9*	2080	5/2/2014	*1.5.1.2*	117420	6/23/2015
1.2.1.3	9600	5/24/2013	**1.3.3**	6757	5/9/2014	*1.5.1.3*	153600	8/4/2015
1.2.1.4	27000	6/28/2013	*1.3.3.1*	5100	5/6/2014	*1.5.1.4*	63055	9/15/2015
1.2.1.5	10960	6/7/2013	*1.3.3.2*	1657	5/9/2014	**1.5.2**	277660	1/7/2016
1.2.2	50130	7/23/2013	**1.3.4**	12480	5/15/2014	*1.5.2.1*	79000	10/27/2015
1.2.2.1	1880	5/31/2013	*1.3.4.1*	3600	5/15/2014	*1.5.2.2*	97200	12/8/2015
1.2.2.2	24000	6/21/2013	*1.3.4.2*	8880	4/17/2014	*1.5.2.3*	99700	1/5/2016
1.2.2.3	21850	7/19/2013	**1.3.5**	9880	5/6/2014	*1.5.2.4*	1760	1/7/2016
1.2.2.4	2400	7/23/2013	*1.3.5.1*	1160	5/6/2014	**1.5.3**	9866	1/13/2016
1.2.3	208330	9/17/2013	*1.3.5.2*	8720	5/6/2014	*1.5.3.1*	3600	1/13/2016
1.2.3.1	3680	6/14/2013	**1.3.6**	1720	5/20/2014	*1.5.3.2*	6266	12/10/2015
1.2.3.2	90200	6/28/2013	**1.3.7**	1680	5/22/2014	**1.5.4**	13880	1/12/2016
1.2.3.3	36800	7/26/2013	**1.4**	**912180**	4/2/2015	*1.5.4.1*	1220	1/12/2016
1.2.3.4	55200	8/30/2013	**1.4.1**	70900	1/9/2014	*1.5.4.2*	12660	1/12/2016
1.2.3.5	20050	9/13/2013	*1.4.1.1*	34400	11/26/2013	**1.5.5**	3000	1/20/2016
1.2.3.6	2400	9/17/2013	*1.4.1.2*	34900	1/7/2014	**1.5.6**	1720	1/18/2016
1.2.4	85409	10/31/2013	*1.4.1.3*	1600	1/9/2014	**1.5.7**	1680	1/20/2016
1.2.4.1	83200	10/29/2013	**1.4.2**	797280	2/19/2015	**1.6**	**278740**	4/27/2016
1.2.4.2	2209	10/31/2013	*1.4.2.1*	15200	5/20/2014	**1.6.1**	245780	4/7/2016
1.2.5	4500	6/21/2013	*1.4.2.2*	13840	6/3/2014	*1.6.1.1*	57800	2/2/2016
1.2.6	3600	11/6/2013	*1.4.2.3*	8360	3/4/2014	*1.6.1.2*	100800	3/15/2016
1.2.6.1	3600	11/6/2013	*1.4.2.4*	96680	8/26/2014	*1.6.1.3*	85300	4/5/2016
1.2.7	1720	11/11/2013	*1.4.2.5*	442000	12/16/2014	*1.6.1.4*	1880	4/7/2016
1.2.8	1680	11/13/2013	*1.4.2.6*	148800	1/27/2015	**1.6.2**	3600	4/13/2016
1.3	**479347**	5/22/2014	*1.4.2.7*	70000	2/17/2015	*1.6.2.1*	3600	4/13/2016
1.3.1	73900	12/12/2013	*1.4.2.8*	2400	2/19/2015	**1.6.3**	15080	4/25/2016
1.3.1.1	49600	11/26/2013	**1.4.3**	27120	3/20/2015	*1.6.3.1*	1160	4/12/2016

1.3.1.2	22900	12/10/2013	*1.4.3.1*	25040	3/17/2015	*1.6.3.2*	8960	4/12/2016
1.3.1.3	1400	12/12/2013	*1.4.3.2*	2080	3/20/2015	*1.6.3.3*	4960	4/25/2016
1.3.2	372930	5/2/2014	**1.4.4**	11280	3/26/2015	**1.6.4**	3200	4/27/2016
1.3.2.1	39200	12/31/2013	*1.4.4.1*	3600	3/26/2015	*1.6.4.1*	3200	4/27/2016
1.3.2.2	3920	1/28/2014	*1.4.4.2*	7680	1/29/2015	**1.6.5**	6000	4/27/2016
1.3.2.3	1960	1/14/2014	**1.4.5**	3000	4/2/2015	**1.6.6**	1720	4/28/2016
						1.6.7	1680	4/29/2016

VII. PROJECT QUALITY MANAGEMENT

VII.1. Project quality definition and Key quality concepts measurement

The quality approach consists in controlling the deliverables according to applying standard.

All project activities, carried out inside institution, will be realized in conformity with local available procedures, instructions and other valid regulation documents. Technical aspects of experimental model development can be identified.

The scientific results of this project will be submitted to science community in order to have a feed-back for the writings. In the same time this feed-back will serve as a quality measurement. The quality control applied to the project's activity and deliverables will govern its evolution in order to improve the project's scientific value. A quality control is the key to prove the reliability of the project.

The main METRA's laboratory activities are made using the SMQ developed taking into account the procedures and methods concerning the measurements, which are established in accordance with the articles of a list of standards suggested by the national authority.

The experimenting activities and tests will be performed at the time the basic Hw and SW platform are completed and again upon completion of the integration into an EM. We mention, below, Quality Management System – QMS and technical standards used by our entity.

METRA has implemented a quality management system in conformity with the NATO publication requirements, AQAP 2110 – NATO quality assurance requirements for design, development and production" for "L-7522-National Defense Activities" domain, for the following activities:

- scientific research and technological development for informatics and communication systems, information security systems (physical and informational);
- test and evaluation for informatics and communication systems and equipments, integrated security systems (physical and informational) and of electromagnetic compatibility and of compromising radiations;
- software development;
- micro production;

- maintenance and service for cryptography devices.

We mention herein the main technical standards and regulations applied by our entity in research activities:

- security standards:
  - UFC 4-022-01 Security Engineering
  - UFC 4-021-02NF Security Engineering Electronic Security Systems
  - UFC 4-020-01 DoD Security Engineering Facilities Planning Manual
  - Perimeter Security Sensor Technology Handbook HB Word
- TEMPEST standards and regulations:
  - SDIP 29, - „Facility Design Criteria and Installation of Equipment for the Processing of Classified Information", January 2006;
  - SDIP 28 "NATO zoning procedures";
  - SDIP 27, - „NATO TEMPEST Requirements and Evaluation Procedures", November 2005;
- CEM standards:
  - MIL STD 461F – Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment- Department of Defense Interface Standard – December 2007;
  - IEEE 299/1997 "Standard Method for Measuring the Effectiveness of Electro-magnetic Shielding Enclosures".

VII.2. List of deliverables and categories and acceptance criteria

The complete list of deliverables, the estimated dates is presented in appendix no. 1 and acceptance criteria (acquisition criteria, performance criteria specified in technical standards, test and evaluation criteria used by national researches institutes and MoD regulations, internal procedures criteria for quality specified in implemented QMS) are presented in the next table. These criteria are verified during the each phase and activity and at the milestones stages PMR-Project Management Review and Reception activities the project will be checked concerning quality aspects.

The finished of almost each major activity is marked by a deliverable.

No. Phase	Deliverables * milestone	Units/ quantity	Categories/ Gantt Chart	Type / PMR no. or reception ID/Gantt Chart (R....)
0.	**Project chart**			
1.	1. Network IT equipments	1	A/1215	Equipments/127

	2. Reference model Technical Study*	1	T/1224	Documentation/PMR1
	3. CAD software application license	2	A/1231	Software/127
	4. Analysis Report for 3D simulations*	1	R/1236	Documentation/PMR1
	5. EM Technical Specification*	1	T/1242	Documentation/PMR1
	6. Project status report no. 1	1	QA/1261	Documentation
	7. Reception record*	1	QA/127	Documentation
	8. Financial audit certificate no. 1	1	QA/128	Documentation
2.	1. Standard Interfaces Technical Study*	1	T/1313	Documentation/PMR2
	2. EM HW platform Technical Specification, including equipments technical specifications	1	T/1321	Documentation/PMR2
	3. Electrical/electronic tools and devices	1	A/1323	Tools/devices/136
	4. Measuring and test instruments	1	A/1324	Apparatus/136
	5. EW HW platform project/design	1	R/1325	Documentation/PMR2
	6. EM HW platform	1	T/1326	Subsystem/136
	7. EM HW platform functional Report*	1	R/1329	Documentation/PMR2
	8. EM Technical Specification (up-date)*	1	T/1332	Documentation/PMR2
	9. Project status report no. 2	1	QA/1341	Documentation
	10. Critical design minute of meeting no. 1	1	QA/1342	Documentation
	11. Paper, article	1	R/1351	Documentation/136
	12. Reception record*	1	QA/136	Documentation

	13. Financial audit certificate no. 2	1	QA/137	Documentation
3.	1. IT Software Technical Study*	1	T/1413	Documentation/PMR3
	2. EM SW platform Technical Specification, including software modules technical specifications	1	T/1421	Documentation/PMR3
	3. Programming software licenses	3	A/1422,1423	Software/146
	4. EM SW platform project/design	1	R/1424	Documentation/PMR3
	5. EM SW platform	1	T/1425	Subsystem/146
	6. EM SW platform functional Report*	1	R/1428	Documentation/PMR3
	7. EM Technical Specification (up-date)*	1	T/1432	Documentation/PMR3
	8. Project status report no. 3	1	QA/1441	Documentation
	9. Critical design minute of meeting no. 2	1	QA/1442	Documentation
	10. Reception record*	1	QA/146	Documentation
	11. Financial audit certificate no. 3	1	QA/147	Documentation
4.	1. EM project/design	1	R/1511	Documentation/PMR4
	2. EM	1	T/1514	System/156
	3. EM Functional Test Plan	1	R/1521	Documentation/PMR4
	4. EM Functional Test Report*	1	R/1524	Documentation/PM4
	5. Project status report no. 4	1	QA/1531	Documentation
	6. Critical design minute of meeting no. 3	1	QA/1532	Documentation
	7. Paper, article	1	R/1541	Documentation/156
	8. Reception record*	1	QA/156	Documentation
	9. Financial audit certificate	1	QA/157	Documentation

	no. 4			
5.	1. EM Test and Evaluation Plan - TEP, including EM Test and Evaluation Procedures	1	R/1611	Documentation/PMR5
	2. EM Test and Evaluation Report – TER*	1	R/1614	Documentation/PMR5
	3. Project status report no. 5	1	QA/1621	Documentation
	4. Paper, article	1	R/1631	Documentation/166
	5. Patent Request	1	R/1641	Documentation/166
	6. EM: - accepted and certified in developmental phase; - prepared for homologation in developmental phase.	1	T/1514,1633	System/166
	7. Reception record*	1	QA/166	Documentation
	8. Financial audit certificate no. 4	1	QA/167	Documentation

A-Acquisition; QA-Quality Assurance; T-Technical; R- Research

Table 20 – List of deliverables

VII.3. Quality planning and control (activities and responsible persons)

The following table provides the indicators of the activities which are divided as quality planning activities and quality control activities, and the responsible person for each activity according to their interest and their authority in the project.

Activity	Responsible persons	Description
Quality planning activities		
Set quality criteria	Contracting Authority, Acquisition and standardization departments	Set acceptance criteria for the deliverables
Staffing	Project Manager	Identification and assignment, or recruitment, of qualified staff (mentors and supervisors) for sustaining the activity
Environment	Team's managers	Create a supportive

		environment, context and structure in order to met the expectations and system's requirements
Quality control activities		
Monitoring	Project Manager, Teams' managers	Continuous monitoring of all activities planned; recommend action for improvement; monitor the corrective actions
Communication	All stakeholders, according to the Communication Plan	Continuous communication to all project members of any needed information
In-Process Audits, program , reception and major activities close-up	Project Manager, Contracting Authority Representative, institute's control entities	Audits of deliverables to ensure completeness and consistency of deliverables, according to the acceptance criteria
Status Reporting	All stakeholders according to the Communication Plan	Periodical activity reports and project status reports
Published results	Project manager	Science value and novelty for science community
Objectives accomplished	Project manager, Sponsors control entities	Cost, time, results
Team's activity result	Project manager	Verify the results according with requirements. Request revising
Team's activity result	Team's Managers	Verify the results according with requirements
Member's work	Team members	-
Acquisitions	Member of Support Team and Acquisition specialized Departments	Quality standards for acquisitions entity
Salaries	Member of Support Team and Financial specialized Departments	Quality standards for financial entity

Table 21 Quality planning and control

VIII. PROJECT RISK MANAGEMENT

The main risks to the project were identified by the project manager with support of team using brainstorming, checklist analysis based on historical information and knowledge that has been accumulated from previous similar projects and from other sources of information and assumptions analysis.

VIII.1. List of risks

No	Type of Risk	Risk Conditions	Risk Description	Impact	Probability	Importance (impact X probability	Risk mitigation strategy
1	Market	The users don't accept and use the product in their research activities	The product will be not useful for customers or ISS/equipments providers or marketable to other companies or organizations	5	2	10	Feasibility studies and users participation at reception and dissemination activities
2	Integration	Compatibility issues	The EM not working after the integration phase. Different parts not working into an integrated system	5	3	15	Establishing the reliable control process during the development for each platforms
3	Legal	Changes at High Level Management Changes in the contract with sponsors	The institutions will not support the project Acquisition laws to be changed	4	1	5	Periodical briefing to decision makers Flexibility in technical requirements imposed by sponsor regarding the deliverables
4	Time	Prices oscillation for IT products coming from abroad	Poor estimation for overall project; errors in estimating time or resource availability; poor allocation and 5management of float; early release of competitive products	3	2	6	Start the equipments acquisition process earliest in the contract and in dedicated phases

5	Scope	The absence of good platform architecture view of EM	Incomplete definition of quality requirements; inadequate scope control; poor definition of scope or work packages	4	1	4	A good documentation for whole team about EM architecture
6	Cost fluctuations	Estimating errors; The organization can't undertake the project. Prices increases.	Estimating errors regarding acquisition price or the prices are not fixed	2	1	2	Project budget adequate planning; financial resource reallocation; integration management Different types of equipments with similar performances and different suppliers.
7	Quality	Inadequate quality assurance program	A low level quality for IT component provided and developed; poor attitude toward quality; substandard design/materials/workmanship	4	2	8	The Quality Assurance Program and documents will be issued before acquisition and checked up thorough
8	Technology	The project isn't technically feasible	The technology could be obsolete before a useful product can be produced	3	2	6	Researches of innovative technologies. Requirement refinement.
9	Human resources	Reallocation a human resources to other activities.	The number of team member is permanently in fluctuation process	1	2	2	Time management plan well controlled. Human resources regarding the skills is maintaining in

							the planned manner
10	Procurement	Unenforceable conditions or contract clauses; adversarial relations	Issues regarding acquisition process and contract clauses	2	2	4	The best way to use the organization's financial resources and project budget

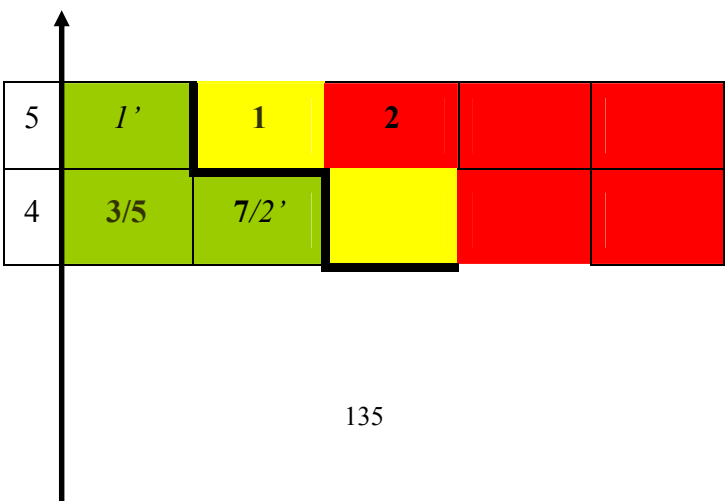
Table 22 List of risks

Legend:

Impact	**Probability**
1 – Insignificant (no impact)	1- Very unlikely (hasn't occurred before)
2 - Minor (little effect)	2 - Slight (rarely occurs)
3 – Significant (may pose a problem)	3 - Feasible (possible, but not common)
4 - Major (Will pose a problem)	4 - Likely (has before, will again)
5 – Critical (Immediate action required)	5 - Very Likely (occurs frequently)

VIII.2. Risks assessment matrix

In the figure below we represented the risk detailed in the table before using their "No". The " N' ", where N is the No of the risk represents the risk after applying the mitigation strategy. The risks with low importance are not represented after mitigation because they are considered irrelevant for the project.



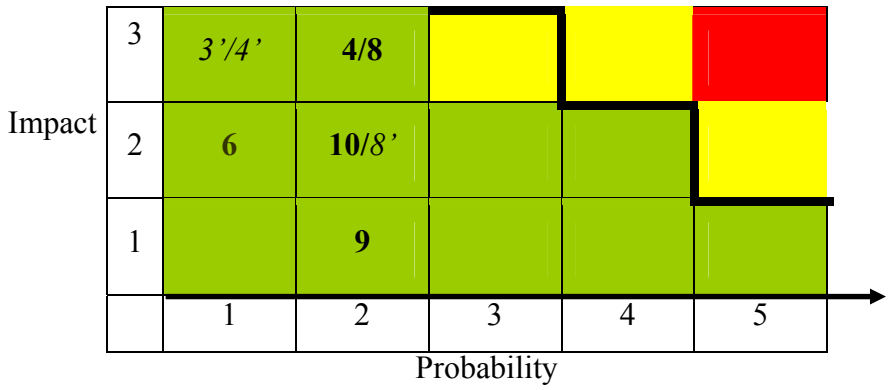


Figure 4 Risk assessment

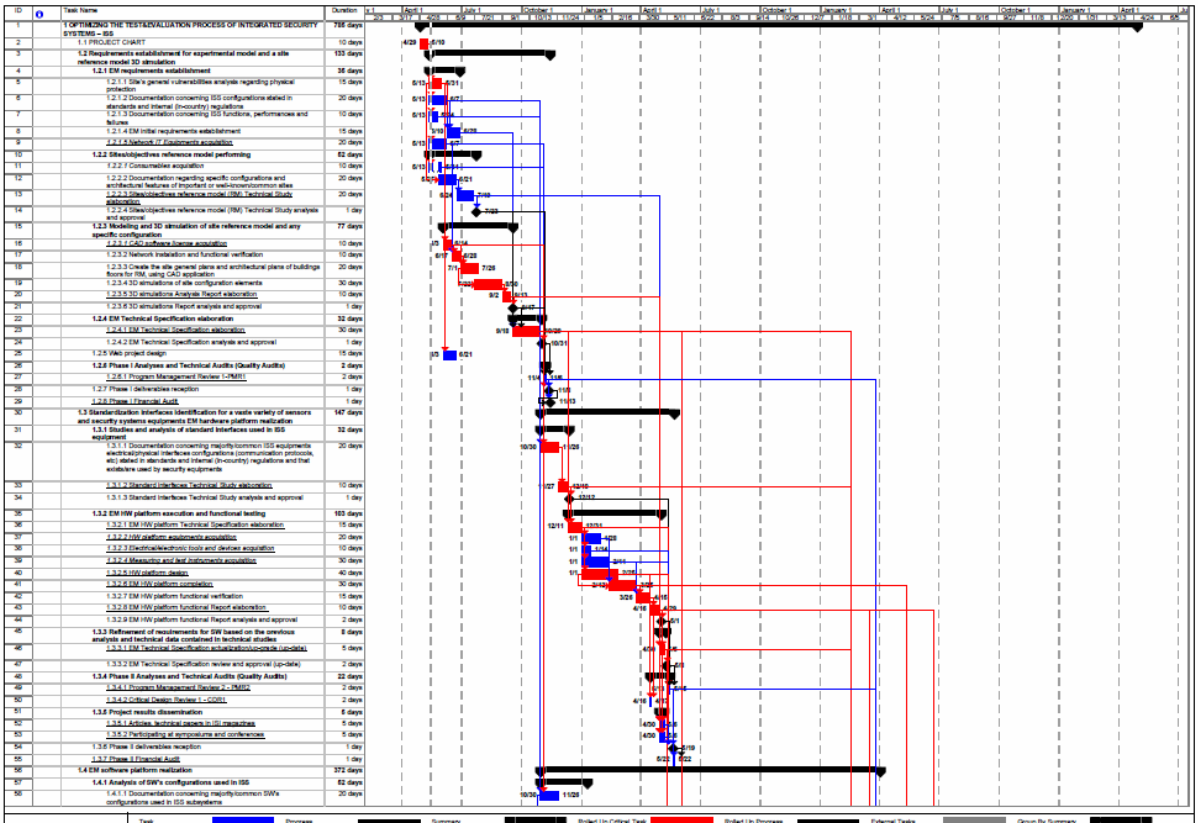
IX. PROJECT CLOSEOUT

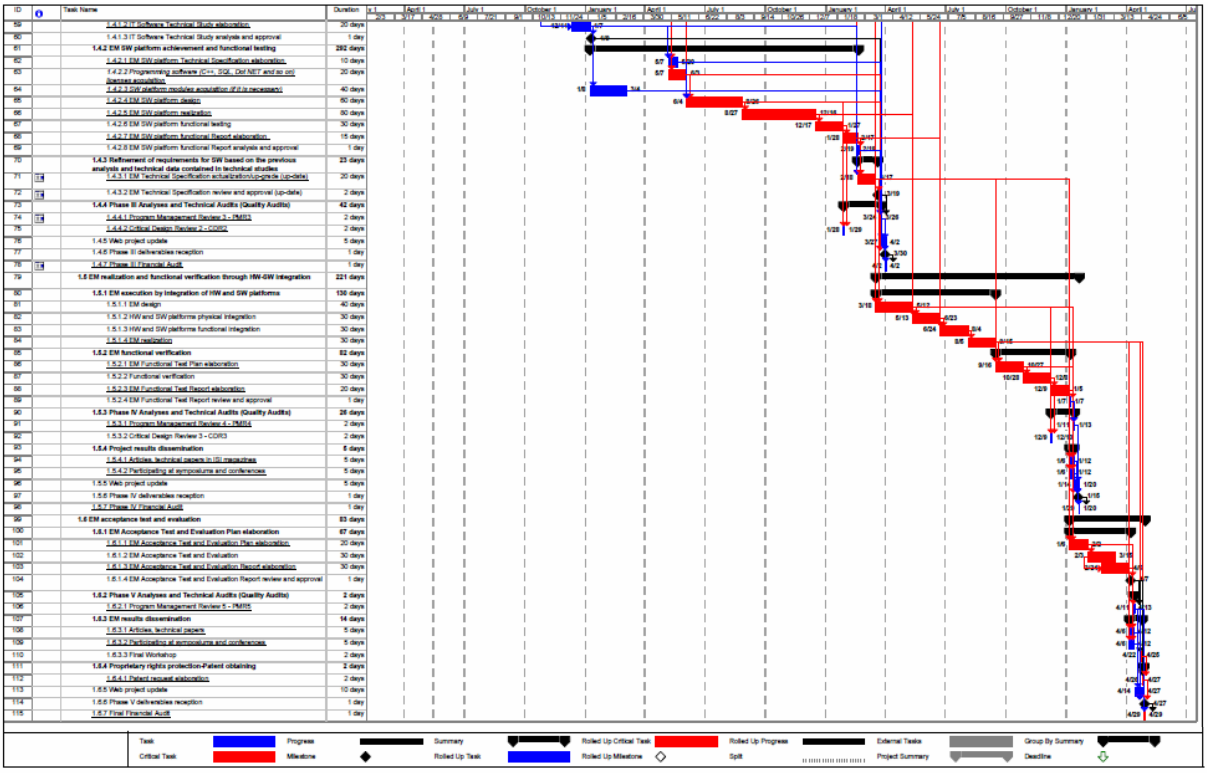
1. The Final Acceptance Test and Evaluation activity will provide all necessary information regarding the performances and capabilities of EM, and will confirm the feasibility of chosen concept.
2. The final report documents all the performances obtained and create the guidance for promoting the new concept and methodology in designing process of ISS.
3. At the end of the project, a final PMR meeting will be held with the Project Manager and Contracting Authority Manager in order to close-out all the requirements, sign-off all documents and identifies any next steps concerning remarkable results.
4. The Final Workshop will prove the importance of dissemination.
5. The EM will be accounted by METRA and will be used in the process of researching-developing on laboratory conditions. The research results and the solutions to accomplish the product will be used by potential developers and protection security systems beneficiaries to improve, optimize and controls the own ISS design.
6. The EM will be presented by the METRA at expositions and presentation events for products in similar activity area.
7. We will make a national patent request for the achieved EM in developmental stage.

X. List of figures and tables

XI. Appendices

Appendix 1 – OPTIMIZING THE TEST&EVALUATION PROCESS OF INTEGRATED SECURITY SYSTEMS – ISS MS-Project Time Management Plan




ID
Task Name
Duration
1.4.1.2 IT Software Technical Study elaboration 20 days
1.4.1.3 IT Software Technical Study analysis and approval 1 day
1.4.2 EM SW platform achievement and functional testing 292 days
1.4.2.1 EM SW platform Technical Specification elaboration 10 days
1.4.2.2 Programming software (C++, SQL, Dot NET and so on) 20 days
1.4.2.3 SW platform modules acquisition (if it is necessary) 40 days
1.4.2.4 EM SW platform design 60 days
1.4.2.5 EM SW platform realization 60 days
1.4.2.6 EM SW platform functional testing 30 days
1.4.2.7 EM SW platform functional Report elaboration 15 days
1.4.2.8 EM SW platform functional Report analysis and approval 1 day
1.4.3 Refinement of requirements for SW based on the previous analysis and technical data contained in technical studies 23 days
1.4.3.1 EM Technical Specification actualization(up-grade (up-date) 20 days
1.4.3.2 EM Technical Specification review and approval (up-date) 2 days
1.4.4 Phase III Analyses and Technical Audits (Quality Audits) 42 days
1.4.4.1 Program Management Review 3 - PMR3 2 days
1.4.4.2 Critical Design Review 2 - CDR2 2 days
1.4.5 Web project update 5 days
1.4.6 Phase III deliverables reception 1 day
1.4.7 Phase III Financial Audit 1 day
1.5 EM realization and functional verification through HW-SW integration 221 days
1.5.1 EM execution by integration of HW and SW platforms 130 days
1.5.1.1 EM design 40 days
1.5.1.2 HW and SW platforms physical integration 30 days
1.5.1.3 HW and SW platforms functional integration 30 days
1.5.1.4 EM realization 30 days
1.5.2 EM functional verification 82 days
1.5.2.1 EM Functional Test Plan elaboration 30 days
1.5.2.2 Functional verification 30 days
1.5.2.3 EM Functional Test Report elaboration 20 days
1.5.2.4 EM Functional Test Report review and approval 1 day
1.5.3 Phase IV Analyses and Technical Audits (Quality Audits) 26 days
1.5.3.1 Program Management Review 4 - PMR4 2 days
1.5.3.2 Critical Design Review 3 - CDR3 2 days
1.5.4 Project results dissemination 6 days
1.5.4.1 Articles, technical papers in ISI magazines 5 days
1.5.4.2 Participating at symposiums and conferences 5 days
1.5.5 Web project update 5 days
1.5.6 Phase IV deliverables reception 1 day
1.5.7 Phase IV Financial Audit 1 day
1.6 EM acceptance test and evaluation 83 days
1.6.1 EM Acceptance Test and Evaluation Plan elaboration 67 days
1.6.1.1 EM Acceptance Test and Evaluation Plan elaboration 20 days
1.6.1.2 EM Acceptance Test and Evaluation 30 days
1.6.1.3 EM Acceptance Test and Evaluation Report elaboration 30 days
1.6.1.4 EM Acceptance Test and Evaluation Report review and approval 1 day
1.6.2 Phase V Analyses and Technical Audits (Quality Audits) 2 days
1.6.2.1 Program Management Review 5 - PMR5 2 days
1.6.3 EM results dissemination 14 days
1.6.3.1 Articles, technical papers 5 days
1.6.3.2 Participating at symposiums and conferences 5 days
1.6.3.3 Final Workshop 2 days
1.6.4 Proprietary rights protection-Patent obtaining 2 days
1.6.4.1 Patent request elaboration 2 days
1.6.5 Web project update 10 days
1.6.6 Phase V deliverables reception 1 day
1.6.7 Final Financial Audit 1 day
April 1
July 1
October 1
January 1
April 1
July 1
October 1
January 1
April 1
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

ADVANCED TECHNIQUES FOR COMPLEX COMMUNICATIONS SYSTEMS TESTING -TEACOM-

Dan FOSTEA

CONTENTS

Project name

ADVANCED TECHNIQUES FOR COMPLEX COMMUNICATIONS SYSTEMS TESTING -TEACOM-

Sponsor

National Scientific Research Authority / Ministry of Education

XII. Business case

This project undertakes the issue of a rapid, automated as possible and problem solving testing system for complex communications systems.

The technical literature studying the field of testing has a lot of reference on how to improve testing, especially on how to find new methodologies.

"*Today, test methods for communication protocols assume, among other things, that the protocol design is specified as a single, monolithic finite state machine (FSM). From this specification, test suites that are capable of detecting output and/or transfer faults in the protocol implementation are derived. Limited applicability of these methods is mainly because of their specific assumptions, and due to the size of the derived test suite and the resulting test effort for realistic protocols. In this work, the compositional test method (C-method), which exploits the available structure of a communication protocol, is proposed. The C-method first tests each protocol component separately for output and/or transfer faults, using one of the traditional test methods, then checks for composability, and finally tests the composite system for composition faults. To check for composability and to derive the test suite for the detection of composition faults, it is not required to construct the global state machine. Instead, all information is derived from the component state machines, which avoids a potential state explosion and lengthy test cases. Furthermore, the test suite checks for composition faults only. This substantially reduces the size of the test suite and thus the overall test effort.*"[6]

XII.1. Justification

- Testing in general and especially in the case of complex technical environments is a very important issues that must be address in such a manner that can permit the

[6] Compositional Testing of Communications Systems, R. Gotzhein, F. Khendek, Report 329/2004, Department of Computer Sciences, University of Kaiserslautern, Germany, 2004, Zusammenfassung

beneficiary to solve any problem before the product may enter the process of utilization.

- Testing a complex communications system involves a lot of complex tasks that need to be coordinated in such a manner that we can find the response to a series of questions:
    - Is the system working?
    - Does the system comply with requirements?
    - Is the system compatible with other systems that it is supposed to work with?
    - Is the system, in any way, harmful for the user?
- The software develops in such a way that now we are able to use high level software programs to help us accomplish almost any task, so why not improve testing at such level that we can do it faster and more accurate.

These are only a few of the problems we have to answer to and one the objective of the project is to identify and organize these kinds of problems.

XII.2. Current situation

Communications systems being so widely spread in many fields and having so many and diversified components the preferred testing approach is to design personalised tests and procedures. This approach can bring the desired results but implies hard work in the planning phase and long and non-standard tests.

There are a lot of software tools, developed for specific systems:

- Elektrobit Testing Ltd. used MathWorks tools to develop the Propsound™ CS, a high-resolution multidimensional radio channel measurement system[7];

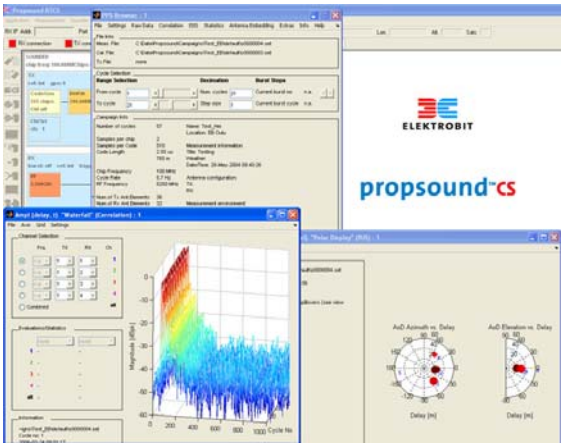


Figure 5 – Testing software developed using MathWorks

[7] http://www.mathworks.com/company/user_stories/Elektrobit-Testing-Ltd.-Develops-High-Resolution-Radio-Channel-Measuring-System.html, 2013-05-11

- The new product technology group at Timken Research sought greater efficiency in their testing process by developing analyses and a methodology to ensure high quality of their tapered roller bearing line[7];

- Testing early on and throughout the development cycle reduces the risks that affect time to market, cost and software quality. By exercising components (application components, devices and services) at the beginning of the development cycle in a runtime environment, and by continuing to test, as components are refined, developers can be assured of continuous Software Communications Architecture (SCA) compliance up to development cycle completion[8]

It is important to have a clear-cut methodology suitable for software implementation. System Test Approach documented by PeopleSoft Upgrade Project [9] offers the "M 5000A1 - System Test Approach Document" that tries to direct the testers to the right path.

XII.3. Solutions

This project proposes a step by step solution to identify a rapid, no errors and trusted testing procedure.

The advantage of taking the testing analysis step by step is the flexibility of the project. According to the findings, the final objective can suffer adjustments, being adapted to the best solutions.

The main objectives, as they are identified in chapter XIII.2 *Objectives*, are correlated to the stages, steps proposed in order to accomplish the goal of the project:

- The first stage is the documentation. Defense and commercial testing are the two methodologies that we will analyze in order to underline to strong points of these procedures. This stage is closed with two studies including a database of testing procedures and in this way offers the data needed for stage 2;
- The second stage will select the proper tests and procedures in order to create a "software friendly" methodology;
- The third stage involves the development of a software aid for testing communications systems.

To prove the viability of the results, the project team will organize a final testing using the methodology and the software developed for this project, and a traditional testing method.

---

[8] http://www.slideshare.net/PrismTech1/sca-test-03mar2011final, 2013-05-11

[9] Information and Technology Services, http://www.mais.umich.edu/methodology/upgrade/system-test/M5000A1-system-testing-approach.docx, 2013-05-11

The software version developed for this project will be a beta version. The goal is to prove the functionality of the concept. After the project is finished we propose to release a limited software version in order to be tested freely and offer us the change to improve to TEACOM System and correct any malfunction that escaped the project's team.

XII.4. The novelty

This project offers the possibility to elaborate a procedure, to chose the test, to execute the tests and, of course to elaborate the test report. We don't offer the final solution to all testing but we want to create a clear way to undertake testing in such a manner that not only verify the meeting of requirements but also to reveal the potential of the system being tested.

The evolution approach we offer wants to develop an opened system. The software will have two major components:

- Procedure elaborating – will chose the procedure based on the requirements and a database of tests and procedures and also will offer an environment to input the tests results manually or gather the results from the "test sensors". After testing is complete TEACOM SW software will create the test report;
- Software sensors – the TEACOM Sensor soft will be installed on the system being tested monitoring its functionality and reporting to TEACOM SW the results.

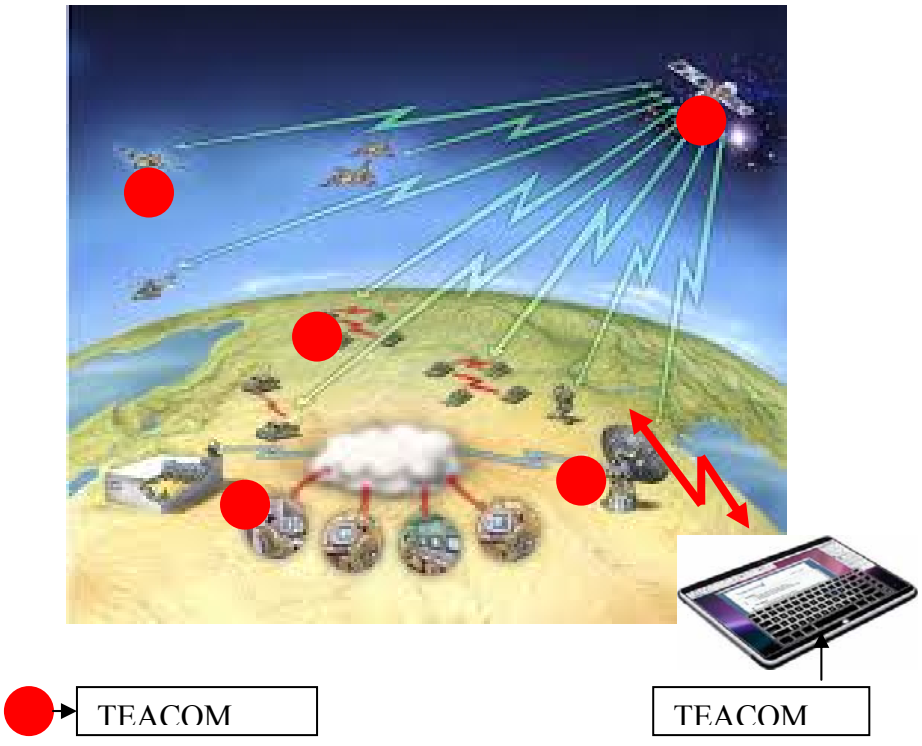


Figure 6 – TEACOM Software

XII.5. Project feasibility

Testing is a much documented field of activity so is communications. To gather the information and to put it together in a methodology and developing software it takes dedication and experience.

The team undertaking this project is composed of engineers specialized in both fields. Their experience and their dedication will help reveal the desire purpose.

To develop the software we elected several young, skilled IT engineers.

The quality of the project is assured by two experienced test engineers, one of them being the Project Manager.

The institution that employs the projects' member is a research agency with both the experience and the facilities needed. Our institute is currently involved indifferent communications procedures and has also a rich portfolio in this domain.

The project will also benefit of well organized acquisitions and financial departments that collaborated with research teams in this kind of projects.

XII.6. Impact

The project we proposed is targeting technical community, proposing a way to do things faster and better.

It is well integrated in team's institution serving our field of activity. The project is also responding to the national research needs formulated by the Ministry of National Education.

Improving the testing also helps acquisition authorities act better in relation to the contract they manage.

XIII. Scope Management Plan

XIII.1. Goal

The project will improve testing of complex communications systems by developing an automated system based on a clear-cut methodology, making the tests faster and more reliable.

XIII.2. Objectives

In order to achieve the goal described before we set five major objectives each one ending in a deliverable that is also a mean to control the quality of the work.

- From the beginning of the project, two teams of telecommunications engineers, each led by testing experts, will analyze the ups and downs in the testing of civilian and defense communications systems based on their and others experience resulting in two studies presenting the best testing methods.
- A group of specialists coordinated by a senior testing expert will elaborate a new methodology for testing, integrating the results of the first objective, along with present methodology and procedures.
- A team of IT programmers and communications engineers, led by a senior testing expert, will be developing a software aid for testing, including the creation of automatic processes, through out the entire project, correlating the results with up-to-date software.
- A team of testers will elaborate a comparative study, at the end of the project, presenting the results of testing a communications system, in real environment conditions, using the software, the methodology and a traditional method.
- The dissemination of the results will be coordinated by the project manager in such a manner that every stage presented before will conclude in a paper, workshop or seminary that will involve, at least, all team leaders.

XIII.3. Work Breakdown Structure (WBS)

The Table 1 - WBS Table presents the WBS with the description and the name of each activity undertaken by the project's team, starting from the five objectives.

Legend:

· Objective
o Main Activity
§ Activity

Table 23 - WBS Table

	Name	Description
1	Analyze testing methods	· Two teams of telecommunications engineers, each led by testing experts, will analyze the ups and downs in the testing of civilian and defense communications systems based on their and others experience resulting in two studies presenting the best testing methods.
1.1	Defense testing	o The first team will study the testing of military communications systems preparing a draft study;

1.1.1	Analyze own testing	§ The team will analyze lists of at least two testing procedures each, including official testing plan and testing report which each team member was directly;
1.1.2	Analyze others testing	§ The team will choose several procedures from lists of at least two testing procedures each, including official testing plan and testing report which each team member will proposed;
1.1.3	Get direct data	§ Groups of specialists from the team will get information directly from others testers;
1.1.4	Participate at a testing	§ The team will participate at a real testing, as observers, analysis the data relevant to their task;
1.1.5	Draft study	§ The team leader will coordinate the gathering of data including it in a draft study;
1.2	Civilian testing	o The second team will study the testing of civilian communications systems preparing a draft study;
1.2.1	Analyze own testing	§ The team will analyze lists of at least two testing procedures each, including official testing plan and testing report which each team member was directly;
1.2.2	Analyze others testing	§ The team will choose several procedures from lists of at least two testing procedures each, including official testing plan and testing report which each team member will proposed;
1.2.3	Get direct data	§ Groups of specialists from the team will get information directly from others testers;
1.2.4	Participate at a testing	§ The team will participate at a real testing, as observers, analysis the data relevant to their task;
1.2.5	Draft study	§ The team leader will coordinate the gathering of data including it in a draft study;
1.3	Workshop on military vs. civilian testing	§ The teams will have common workshop exchanging opinions;
1.4	elaborating a comprehensive study	o The first team will elaborate a comprehensive study underlining the advantages and disadvantages of using a certain testing method in concordance with a specific system focusing on defense systems;
1.4.1	elaborate study	§ The team will elaborate the studies;
1.4.2	publishing study	§ The studies will be published in a technical magazine and/or be presented at a conference;
1.5	elaborating a comprehensive study	o The second team will elaborate a comprehensive study underlining the advantages and disadvantages of using a certain testing method in concordance with a specific system focusing on commercial systems;
1.5.1	elaborate study	§ The team will elaborate the studies;

1.5.2	publishing study	§ The studies will be published in a technical magazine and/or be presented at a conference;
2	elaborating methodology	· A group of specialists coordinated by a senior testing expert will elaborate a new methodology for testing, integrating the results of the first objective, along with present methodology and procedures;
2.1	analyzing methods	o The team will analyze 5 different methods of testing by comparing their results;
2.1.1	selecting methods	§ The team will select 5 methods of testing orienting their selection on the detailed of tests and the possibility of obtaining an automatic process;
2.1.2	establishing criteria	§ The team will establish a list of critical criteria to be compared;
2.1.3	grading the methods	§ Every method will be graded according to the criteria;
2.2	integrating studies results	o The studies elaborated by the first two teams will be analyzed from the method used point of view;
2.2.1	associate methods used with methods analyzed	§ The team will associate the methods used in testing presented in the studies to the methods previously analyzed;
2.2.2	revising the grades	§ The grading of the methods will be revised according to the new data;
2.3	elaborating a paper	o By comparing all the tests, used in the methods analyzed, the team will elaborate a technical paper containing the most comprehensive ones ant their arguments of selection;
2.4	elaborating methodology	o The team leader will coordinate the elaboration of the methodology;
2.4.1	testing procedure template	§ For one weeks a part of the team will elaborate a testing procedure template;
2.4.2	writing down the tests	§ Another part of the team will write down the content of different specific communications test based on the functionality that needs to be verified;
2.4.3	completing the methodology	§ After the completion of the two previous activities the team will complete the methodology, including reports templates;
3	Software development	· A team of IT programmers and communications engineers, led by a senior testing expert, will be developing a software aid for testing, including the creation of automatic processes, through out the firsts two years.
3.1	Software design	o For a half a year the team will elaborate software design;
3.2	Software core	o The software core will be constructed to work on different mobile platforms such as Windows 7 and Android;

3.3	Communications modules	o Different software services will be developed to be installed on the potential tested object getting data from specific communications equipment;
3.4	User graphic interface	o The integration of the module developed previously and graphic user interface will finalize the software;
4	Testing the deliverables	· A team of testers will elaborate a comparative study, at the end of the project, presenting the results of testing a communications system, in real environment conditions, using the software, the methodology and a traditional method.
4.1	Analyzing tests	o After a 3 days of analyzing the potential systems to be tested the team will choose a system suitable for beginning testing;
4.2	Traditional method testing	o The team will apply a traditional testing method;
4.2.1	Elaborating testing procedure	§ Elaborate the testing procedure;
4.2.2	Executing tests	§ Executing the tests;
4.2.3	Elaborating the testing report	§ Elaborating the testing report;
4.3	New method testing	o The methodology elaborated as part of this project will be used to test the same system;
4.3.1	Elaborating testing procedure	§ Elaborate the testing procedure;
4.3.2	Executing tests	§ Executing the tests;
4.3.3	Elaborating the testing report	§ Elaborating the testing report;
4.4	Software testing	o The third testing will be conducted using the software;
4.4.1	Elaborating testing procedure	§ Elaborate the testing procedure;
4.4.2	Executing tests	§ Executing the tests;
4.4.3	Elaborating the testing report	§ Elaborating the testing report;
4.5	comparison study	o The team will elaborate a study by comparing the results of all three methods underlining the criteria mentioned while developing the methodology;
5	Dissemination	· The dissemination of the results will be coordinated by the project manager in such a manner that every stage presented before will conclude in a paper, workshop or seminary that will involve, at least, all team leaders.
5.1	Final workshop	o The highlights indentified through out the project will be included in a final workshop opened to all national and international specialists in the testing field.

XIV. Time Management Plan (Gantt Chart)

The project is supposed to begin just after the sign-off of the chart by the sponsored representatives and the high level management of the institution that undertakes the project.

The duration of the project is estimated to be 579 working days during 2 years and 2 months.

The time management plan was elaborated using Microsoft Project software. The activities described in Table 1 - WBS Table are presented in **Appendix 1**, including the relations between different tasks.

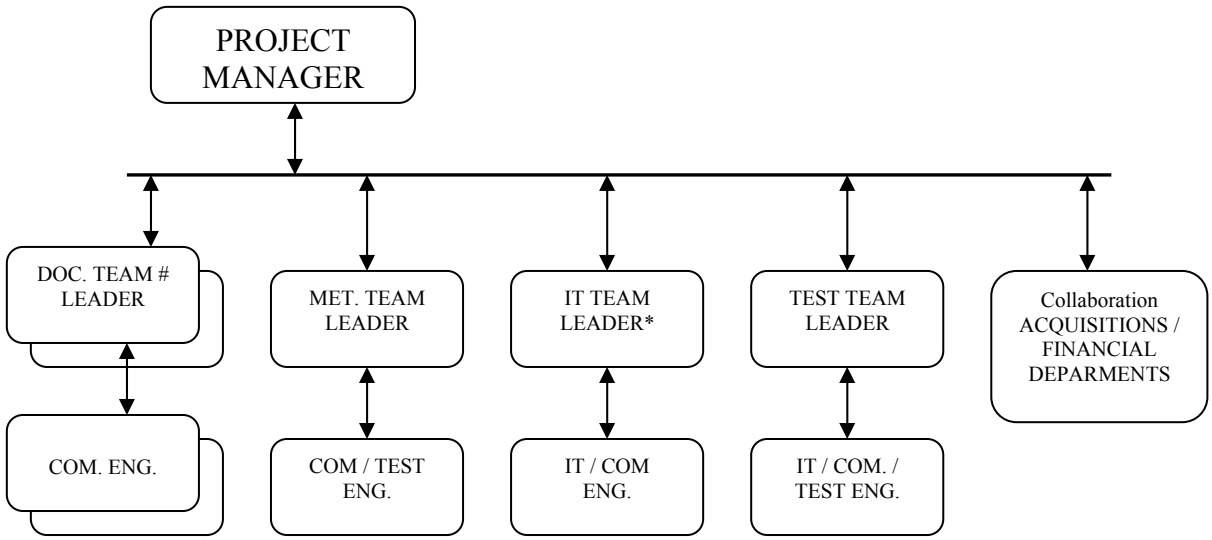
The milestones relevant for this project are directly related to the deliverables published to be analyzed by the science community.

Milestones	WBS	Date	Importance
Military testing case study	1.4.1	5/6/2014	The publishing of those two studies marks the accomplishing of the first objective and guaranties that all data necessary for objectives two and three is in place
Civilian testing case study	1.5.1	5/6/2014	
Case study	2.3	8/12/2014	Publishing a case study about the possibility of tests being done automatically and selecting those tests helps the software developers
Communications systems testing methodology	2.4.3	10/14/2014	The methodology will be published in order to get various opinions on the subject and to gather data for improvements. This marks the final of the objective 2 activities.
Study on how testing was improved	4.5	3/13/2015	The final milestone reveals the improvements made in the field.

Table 24 – Milestones

XV. Human Resource Management

The organization of the projects' team follows the diagram in the Figure 7 – Project **structure**.



* The IT TEAM LEADER will be the Project Manger

Legend: DOC. TEAM # - Documentation teams 1 & 2 (Objective 1); MET. TEAM – Methodology team (Objective 2); IT TEAM – Software development team (Objective 3); TEST TEAM – Testing team (Objective 4)

Figure 7 – Project structure

Table 25 – Responsibility and HR allocation matrix presents the humans resource allocation for the project's activities.

Only activities have allocated a number of human resources of each kind, according to the table. The responsible (team leader) for each major activity and / or objective is marked with an „A". The team leader, besides coordinating the activity of the team is responsible for the briefings and the reports concerning team's activity.

		Senior test	**Com. Eng.**	**Test. Eng**	**IT Eng.**
1	Analyze testing methods			**A**	
1.1	Defense testing			A	
1.1.1	Analyze own testing		2	1	
1.1.2	Analyze others testing		2	1	
1.1.3	Get direct data		2	1	
1.1.4	Participate at a testing		2	1	
1.1.5	Draft study		2	1	

1.2	Civilian testing			A	
1.2.1	Analyze own testing		2	1	
1.2.2	Analyze others testing		2	1	
1.2.3	Get direct data		2	1	
1.2.4	Participate at a testing		2	1	
1.2.5	Draft study		2	1	
1.3	Workshop on military vs. civilian testing		4	2	
1.4	elaborating a comprehensive study			A	
1.4.1	elaborate study		2	1	
1.4.2	publishing study		2	1	
1.5	elaborating a comprehensive study			A	
1.5.1	elaborate study		2	1	
1.5.2	publishing study			A	
2	elaborating methodology	A			
2.1	analyzing methods	A			
2.1.1	selecting methods	1	3	1	
2.1.2	establishing criteria	1	3	1	
2.1.3	grading the methods	1	3	1	
2.2	integrating studies results	A			
2.2.1	associate methods used with methods analyzed	1	3	1	
2.2.2	revising the grades	1	3	1	
2.3	elaborating a paper	1	3	1	
2.4	elaborating methodology	A			
2.4.1	testing procedure template	1	3	1	
2.4.2	writing down the tests	1	3	1	
2.4.3	completing the methodology	1	3	1	
3	Software development				A
3.1	Software design	1	2	1	3
3.2	Software core	1			3
3.3	Communications modules	1	2		2
3.4	User graphic interface	1	1	1	2
4	Testing the deliverables		A		
4.1	Analyzing tests	1	2		1
4.2	Traditional method testing		A		
4.2.1	Elaborating testing procedure	1	2		1

4.2.2	Executing tests	1	2		1
4.2.3	Elaborating the testing report	1	2		1
4.3	New method testing		A		
4.3.1	Elaborating testing procedure	1	2		1
4.3.2	Executing tests	1	2		1
4.3.3	Elaborating the testing report	1	2		1
4.4	Software testing		A		
4.4.1	Elaborating testing procedure	1	2		1
4.4.2	Executing tests	1	2		1
4.4.3	Elaborating the testing report	1	2		1
4.5	comparison study	A	2	2	1
5	Dissemination	A			
5.1	Final workshop	1	2	2	1

Table 25 – Responsibility and HR allocation matrix

Legend

	Communications
Com. Eng.	engineers
IT Eng.	IT engineers
Test Eng.	Testing engineers
	Senior testing
Senior Test*	engineer

* One of the two senior testing engineers will be the program manager

XVI. Communications Management

The communications management plan has to fulfill, mainly, the following roles:

- to report to high importance stakeholders the status of the project and the influence on their institutions;
- to inform other stakeholders of the status of the project and how the findings will hell their activity;
- to brief and debrief all project members on their activity and how their work influences the project;

Target audience	Person(s) to convey the message	When the message is conveyed	Format of a message	Message content
All project members	Program manager	Once at two Months	Meeting	• Project introduction • Sponsors and steering committees • Teams and members • Project phases and deliverables • Current status
Teams leaders	Program manager	Weekly	Meeting / Discussions	• Common points of interest; • Cross-reference on activities status
Program manager	Team leaders	Twice a weak	E-mail	• Status report
Project members	Team leaders / Program manager	When necessary	E-mail	• Correcting tasks; • Detailed actions;
Sponsor	Program manager	After each objective related major activity	Presentation	• Business context and benefits • Project overview • Stage overview • High level operational implications
High level management of institution	Program manager	Once a year	Presentation	• Project status; • Benefits for the institution;
Testing entities selected for collaborations	Team leader coordinating the activity	Before and after each testing activity	Meeting	• Teams intations • Intended / obtained outcome
Science community	Teams representatives	According to the dissemination process	Presentation / Symposia	• Projects results • Project development • Major findings

Table 26 – Communication matrix

XVII. Project Cost Management

TEACOM is a fundamentally a documentary project with the main deliverables a methodology and a software program.

Considering that we mainly use our own facilities and only rent the necessary equipments, the cost is mainly work-oriented (ex. Salaries, rent…).

In the next part of this chapter we describe the resources used.

XVII.1. Resource pool description

Table 18 – Pool description table describes the resources used in this project categorized by type and the cost for each resource.

Skilled human resources used in this project, described in Table 25 – Responsibility and HR allocation matrix, are employees of the research institute, whom, for the duration of the project are paid by the sponsor.

The material consumed trough the entire project is composed by all kinds of paper, ink, cartridge and other things needed.

To assure the development of the software and to print the necessary materials we will acquire two Tablets and two printers. The tables will be used to test the software and they will each have a different operating system (Android and MS Windows 7).

The resources of the project will be also used for renting a Conference room, when necessary, for renting test equipments and to pay the maintenance for the Personal Computers (PC) used.

Resource type	Name	Number	Cost / hour	Unit use cost	Total cost
Skilled human resources	Com. Eng.	6	60.00 Lei/h		730,320.00 Lei
	IT Eng.	4	90.00 Lei/h		990,720.00 Lei
	Test Eng.	2	60.00 Lei/h		374,208.00 Lei
	Senior Test	2	120.00 Lei/h		721,440.00 Lei
Material	Printing materials sets	78		50.00 Lei	3,900.00 Lei
Project equipment	Tablet	2		3,500.00 Lei	2,000.00 Lei
	Printer	2		1,000.00 Lei	7,000.00 Lei
Rentals	Conference room	1		3,200 Lei	6,400.00 Lei
	Test Equipment	2	20.00		450.00 Lei

Own equip.	PC	8	Lei/h 2.00 Lei/h	210.00 Lei
Total				**2,836,648.00 Lei**

Table 27 – Pool description table

XVII.2. Cost breakdown structure

According to the resource allocations we determined the costs for each activity in WBS. Those cost and the finish date is presented in Table 29 – Cost breakdown structure.

The costs for this project related to the fiscal year are presented in the next table.

Year	Cost	Period
2013	512,538.00 Lei	06/03/2013 – 12/31/2013
2014	1,277,566.00 Lei	01/01/2014 – 12/31/2014
2015	1,046,544.00 Lei	01/01/2015 – 08/20/2015
Total	2,836,648.00 Lei	06/03/2013 – 08/20/2015

Table 28 – Cost / year

WBS	Cost	Finish Date	WBS	Cost	Finish Date
Total	**2,836,648.00 Lei**	8/20/2015	2.2.2	48,008.00 Lei	10/7/2014
1	504,302.00 Lei	5/20/2014	2.3	72,508.00 Lei	1/8/2015
1.1	103,800.00 Lei	10/24/2013	2.4	144,224.00 Lei	5/14/2015
1.1.1	9,176.00 Lei	6/13/2013	2.4.1	36,008.00 Lei	2/19/2015
1.1.2	7,456.00 Lei	6/20/2013	2.4.2	36,108.00 Lei	2/19/2015
1.1.3	43,456.00 Lei	8/22/2013	2.4.3	72,108.00 Lei	5/14/2015
1.1.4	14,656.00 Lei	9/12/2013	3	1,317,456.00 Lei	1/9/2015
1.1.5	29,056.00 Lei	10/24/2013	3.1	190,714.00 Lei	8/23/2013
1.2	304,680.00 Lei	3/21/2014	3.2	377,914.00 Lei	2/7/2014
1.2.1	22,856.00 Lei	6/21/2013	3.3	374,414.00 Lei	7/25/2014
1.2.2	21,856.00 Lei	7/12/2013	3.4	374,414.00 Lei	1/9/2015
1.2.3	129,856.00 Lei	11/15/2013	4	417,638.00 Lei	8/4/2015
1.2.4	43,456.00 Lei	12/27/2013	4.1	2,928.00 Lei	2/20/2015

1.2.5	86,656.00 Lei	3/21/2014	4.2	126,150.00 Lei	4/14/2015
1.3	8,960.00 Lei	3/25/2014	4.2.1	36,050.00 Lei	3/6/2015
1.4	43,431.00 Lei	5/20/2014	4.2.2	72,050.00 Lei	4/7/2015
1.4.1	43,431.00 Lei	5/6/2014	4.2.3	18,050.00 Lei	4/14/2015
1.4.2	0.00 Lei	5/20/2014	4.3	126,150.00 Lei	6/2/2015
1.5	43,431.00 Lei	5/20/2014	4.3.1	36,050.00 Lei	4/28/2015
1.5.1	43,431.00 Lei	5/6/2014	4.3.2	72,050.00 Lei	5/26/2015
1.5.2	0.00 Lei	5/20/2014	4.3.3	18,050.00 Lei	6/2/2015
2	559,492.00 Lei	5/14/2015	4.4	126,150.00 Lei	7/21/2015
2.1	246,744.00 Lei	11/27/2014	4.4.1	36,050.00 Lei	6/16/2015
2.1.1	67,208.00 Lei	7/1/2014	4.4.2	72,050.00 Lei	7/14/2015
2.1.2	134,408.00 Lei	10/21/2014	4.4.3	18,050.00 Lei	7/21/2015
2.1.3	45,128.00 Lei	11/27/2014	4.5	36,260.00 Lei	8/4/2015
2.2	96,016.00 Lei	10/7/2014	5	37,760.00 Lei	8/20/2015
2.2.1	48,008.00 Lei	8/12/2014	5.1	37,760.00 Lei	8/20/2015

Table 29 – Cost breakdown structure

XVIII. Project quality management

XVIII.1. Project quality definition

The quality approach consists in controlling the deliverables according to applying standard.

The project team is part of a research institute and its activity is submissive to the standards applied to entire institution.

The project management will provide the human and material resources need it for objectives achievement and will have an organization structure using vertically subordination and horizontal collaboration principles according with institution quality system of management.

XVIII.2. Key quality concepts measurement

The scientific results of this project will be submitted to science community in order to have a feed-back for the writings. In the same time this feed-back will serve as a quality measurement.

The second important characteristic of this project is its flexibility and, implicitly, its adaptability. The quality control applied to the project's activity and deliverables will govern its evolution in order to improve the project's scientific value.

A clear-cut quality control is the key to prove the reliability of the project.

XVIII.3. List of deliverables and acceptance criteria

The finished of almost each major activity is marked by a deliverable.

The two major deliverables, which are also the purpose of the project, are the software aid for testing, delivered at the end of activity 3 - Software development and the Communications systems testing methodology delivered at the end of activity 2.

The complete list of deliverables, the estimated dates and acceptance criteria are presented in the next table.

Deliverable description	Activity	Estimated date	Acceptance criteria
Software design	3.1	8/23/13	The design will be published
Workshop proceedings	1.3	3/25/2014	Team leaders concluded the joint experience
Military testing case study	1.4.1	5/6/2014	Publishing the study in a military journal / review
Article/Presentation outlining the most important results	1.4.2	5/20/2014	Publishing an article in a IEEE quoted magazine
Civilian testing case study	1.5.1	5/6/2014	Publishing the study in a commercial journal / review
Article/Presentation outlining the most important results	1.5.2	5/20/2014	Publishing an article in a IEEE quoted magazine
Case study	2.3	8/12/2014	Publishing the study
Testing template	2.4.1	9/2/2014	The template is adequate to communications systems
Article - Communications relevant tests	2.4.2	9/2/2014	Publishing the study in a commercial journal / review
Communications systems testing methodology	2.4.3	10/14/2014	Publishing the methodology
Communications systems testing software	3.4	1/9/2015	The software respects the requirements
Study on how testing was improved	4.5	3/13/2015	The presents the improvements obtained using the software and the methodology
Workshop proceedings and papers/presentations collection	5.1	3/27/2015	More than 50 participants

Table 30 – List Deliverables

XVIII.4. Quality planning and control (activities and responsible persons)

In

Figure 8 – Quality **planning and control** we can follow the responsible for each kind of activity according to their interest and their authority in the project.

The controlling / responsible entities for acquisitions and the salaries aren't represented in

Figure 8; they are subject to the quality standards specific for that domain.

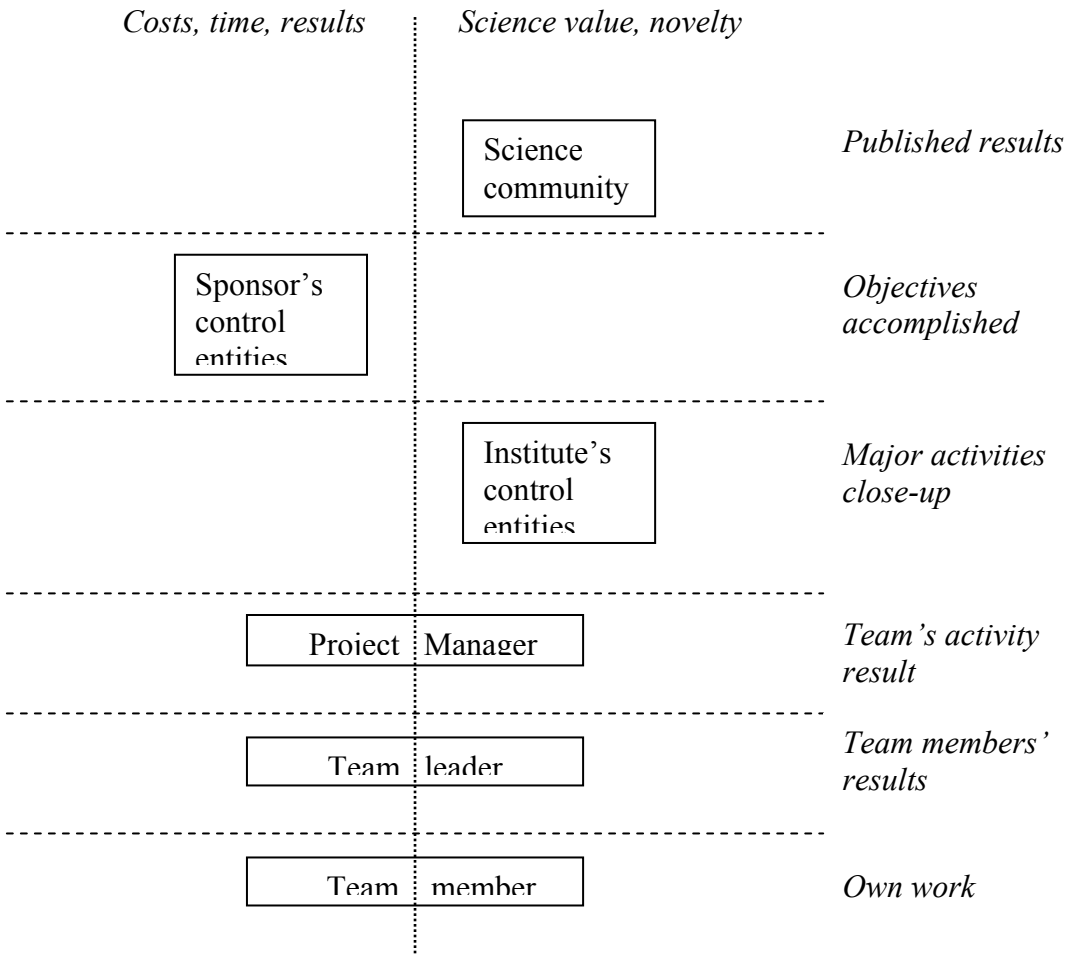


Figure 8 – Quality planning and control

XIX. Risk management plan

The following table presents the risks identified in this project. The "risk mitigation strategy" column describes a strategy to diminish the importance of the risk.

ID	Type of Risk	Risk Conditions	Risk Description	Im.	Pr.	Ip.	Risk mitigation strategy
R1	Legal	Not obtaining information for testing studies	The civil and military entities not providing the necessary data for the teams	4	2	8	- Signing protocols with testing entities; - Ensuring back-up testing data;
R2	Integration	The system to be tested will not support the software	The software not working for the intended platforms	5	3	15	- The IT team will conduct tests on different communications systems;
R3	Time 1	No relevant testing occurring at the proposed time	The teams are not able to participate at a live testing	2	3	6	- From the beginning of the project the teams will have as a priority finding a testing site;
R4	Time 2	No communications system available for final testing	The project teams need to find a suitable system and site available for the time of verifying the findings	3	2	6	- The project manager will secure a site for testing; - The project management will follow the program for testing in order to find a communications systems to be tested;
R5	Scope	The absence of good software design	Incomplete definition of quality requirements	4	3	12	- A good documentation for whole team about software requirements; - The senior testing engineer will supervise the outcome;
R6	Quality	Inadequate quality assurance program	A low level quality for IT component developed	4	2	8	- The software will follow closely the methodology developed for this

							project;

Table 31 - Risks

Legend:
Ip. - Importance (impact X probability)

Impact - Im	Probability – Pr
1 – Insignificant (no impact)	1- Very unlikely (hasn't occurred before)
2 - Minor (little effect)	2 - Slight (rarely occurs)
3 – Significant (may pose a problem)	3 - Feasible (possible, but not common)
4 - Major (Will pose a problem)	4 - Likely (has before, will again)
5 – Critical (Immediate action required)	5 - Very Likely (occurs frequently)

In Figure 5. Risk assessment we presented the relevance of the risks analyzed according to the importance revealed in Table 31 - Risks. The risks after applying the counter measures are represented as "Rn^1" where n is the risk's ID.

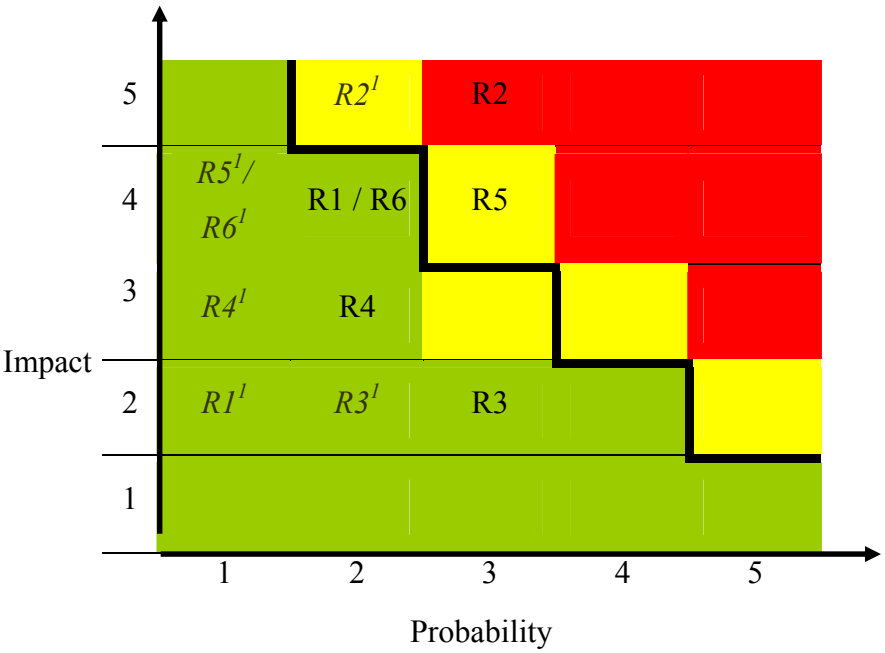


Figure 9 – Risk assessment

The most important risk is R2 - the compatibility of the software. In order to mitigate this risk, the team, composed of highly skilled programmers will test the software on different platforms. The platform used for testing will be recommended by the communications engineers based on the need for testing in such a way that will cover most of the equipments used in testing. Even if the team will not cover all possible equipments they will develop a

software module ready to be adapted to any new equipment. Developing this module helps reduce the probability of the risks and the importance is figures as R2[1].

The second most important risk is also software related. The software design is also very important in creating a good aid for testing. In this case the team of testing engineering will have the final saying. They will appeal to the science community, using disseminating techniques, in order get their opinion for the product. Integrating the observations from different specialists, the risk impact will be considering lower, R5[1].

XX. Project closeout

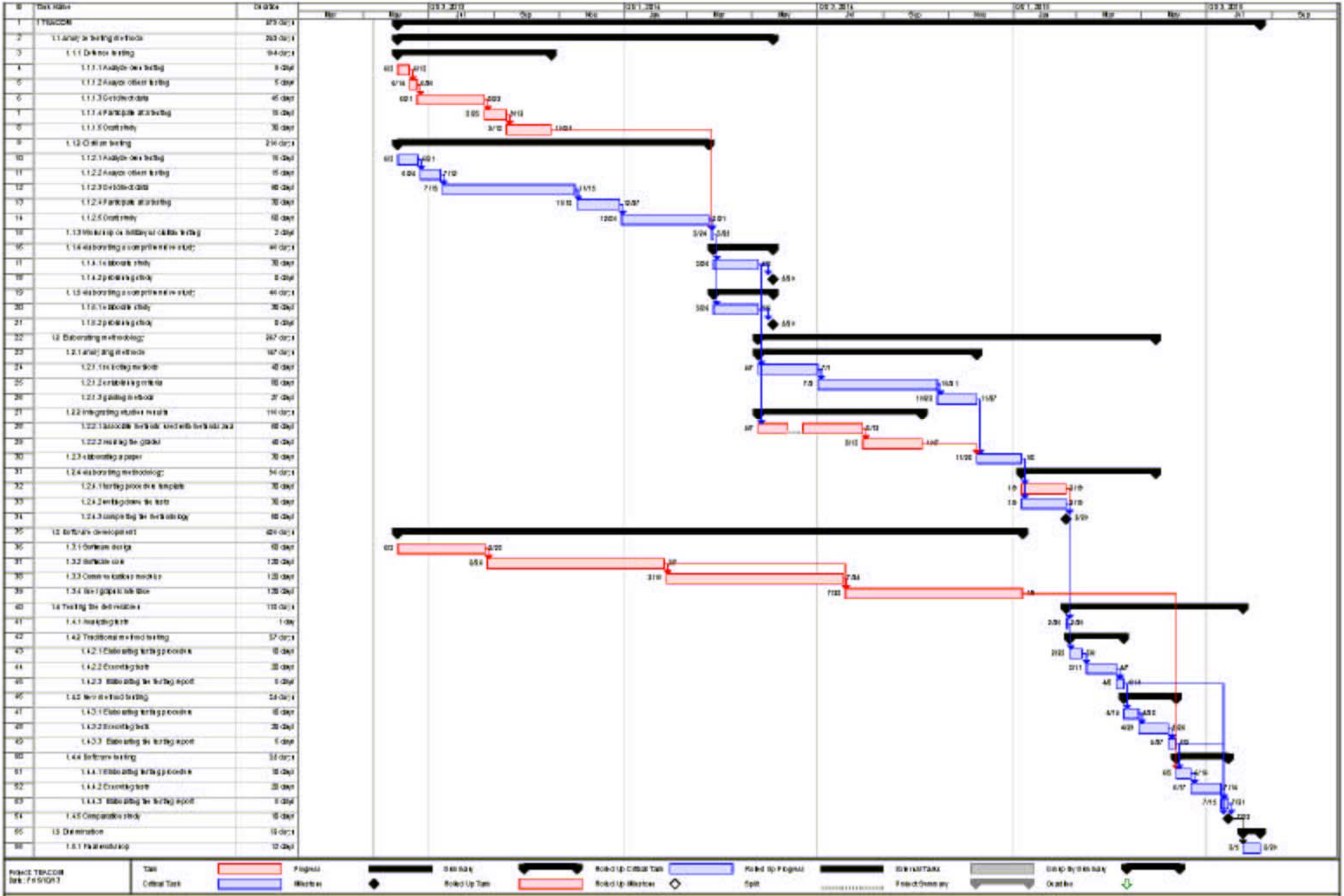
The final testing, comparing the three methods, has the role of proving the viability of the concept. Once the data is revealed, the improving of testing will be evident.

Next step is promoting the new methodology and further on test the software in different conditions.

The upside of offering TEACOM software free, with access to the Advance Programming Interfaces is that everybody can add their experience and develop their own modules and eventually, personalization profiles.

XXI. List of tables and figures

XXII. Appendices



"HENRI COANDĂ" AIR FORCE ACADEMY'S PHYSICAL TRAINING DATABASE (AFAPTD)

Cosmin IVANCIUC

CONTENTS

I. Business case

Military personnel and cadets must meet age- and gender-specific body fat standards, as defined by Army Regulation S.M.G.-13/2012, to remain in the military. Age- and gender-specific weight-for-height allowances are used as the primary screening tool to identify potentially overfat soldiers (individuals who may exceed the body fat standard).

Since, in October 2012, over 40 % of A.F.A. military personnel and cadets didn't meet Army Physical Fitness Test (APFT) standards, an A.F.A. meeting, in February 2013 recommended several initiatives including a key recommendation to develop a flexible, centralized database system to track height, weight, percent body fat (%BF), and fitness data for each A.F.A. military personnel and cadets.

The **GOAL** is to develop a databse for „Henri Coandă" Air Force Academy (A.F.A.) to provide an integrated outlook on controlling the physical condition of the Air Force Academy military personnel and cadets.

Currently, there is no centralized computer system to efficiently monitor soldier compliance with the APFT. Often, military personnel use several stand-alone computer programs, which may or may not be accurate tools, to monitor current status with the weight and fitness regulations, with limited ability to track compliance over time.

„Henri Coandă" Air Force Academy **is the sponsor** of a computerized database for:

- storage and tracking of data related to height, weight, %BF for each A.F.A. military personnel and cadets and Army Physical Fitness Test (APFT) scores;
- provide a nutrition and fitness program for those who didn't meet the APFT standard;
- generation of reports using these data.

Implementing this database platform will help A.F.A. military personnel and cadets to track their results at Army Physical Fitness Test (APFT). Also, the medical department could sugest nutrition programs and the physical training responsable could issue some personalized fitness programs in order for A.F.A. personnel to improve their physical condition.

Not implementing this database could boost the military personnel percentage of „NO GO"s at Army Physical Fitness Test (APFT) with increased stress on the personnel health, primarly that, in the end, will affect, also, the organisation itself.

Start date: 06 may 2013

End date: 24 june 2013

Duration: 36 days.

Assessed constraints:

- Procedural issues regarding the Internet connections:
  - allow of broadcasting within specific areas using wireless transmitters.
- Human resources issues:
  - reluctance of the personnel is to be involved due to tasks overload;
  - resistance of the admin staff, due to the effort to implement the platform.
- Budgetary issues:
  - the pressure on the budget is greater at the beginning of the project, due to the needs to improve the IT infrastructure;
- Information classified issues: the tutors and admin personnel of the database would have to pay greater attention to the personal data not to be broadcasted over the INTRAMAN-network.
- Time issue:
  - changing in the time management plan (time reduction).

This is a colabortive project and the main involved structures are IT department, HR department, Medical department and the PT responsable from within A.F.A. Academy.

The project manager is capt. IVANCIUC Cosmin.

II. Scope Management Plan

2.1. Goal

To develop a databse for „Henri Coandă" Air Force Academy (A.F.A.) to provide an integrated outlook on controlling the physical condition of the Air Force Academy military personnel and cadets.

2.2 Objectives

Objective 1: IT department will develop the database platform, using Microsoft Acces, by 05/06/2013, in order to be completed with military personnel and cadets personal physical training data.

Objective 2: IT department will fill in the personal accounts for all A.F.A. military personnel and cadets, with the data, provided by Medical and HR departments, not later then 31/05/2013.

Objective 3: IT department will evaluate/improve the platform, using Microsoft Acces, through database critiques given by its users, in order to increase its efficiency, by 18/06/2013.

Objective 4: IT department will finalize the project, entitling the medical department and physical training responsable with database administrators rights, no later then 24/06/2013.

2.3 Work Breakdown Structure (WBS)

O1. IT department will develop the database platform, in order to be completed with military personnel and cadets personal physical training data, using Microsoft Acces, by 05/06/2013.

1.1 Develop the product specifications

1.1.1 The project manager, IT manager, the medical department manager and the physical training responsable will establish the database features.

1.1.2 The medical department manager will provide to IT department age- and gender-specific weight-for-height allowances.

1.1.3 The physical training responsable will provide to IT department the Army Physical Fitness Test (APFT) standards.

1.2 IT department manager will identify key personnel that will develop the database software.

1.2.1 Assign the individuals.

1.2.2 Briefing the IT personnel, that will develop the database, on its specifications.

1.3 Developing the database

1.3.1 Writting the programming code.

1.3.2 The medical department manager and the physical training responsable will issue a set of questions for the database critiques section.

1.3.3 Initial test the database functionality.

1.3.4 Evaluate and improve the platform, based on the initial testing results.

1.3.5 Create users account for all A.F.A. military personnel and cadets.

1.3.6 Intermediate test the functionality of the database.

1.3.7 Meeting with the A.F.A. commander in order to report the testing results.

1.4 Identifing possible locations where cadets can use the database

1.4.1 IT department manager will issue a list of possible locations.

1.4.2 A.F.A. commander will chose a location(s).

1.4.3 Make available the identified locations.

1.4.4 Overhaul the existing HW items to be re-assigned for the database within the previously specified location(s).

1.4.5 Move the HW into the specified location.

1.5 Install the database platform on all A.F.A. military personnel terminals and on those designed to be used by the cadets.

1.6 Develop a tutorial for operating the database.

1.6.1 Issue a document, in Microsoft Word format and, also short videos, that will describe the database and how to use it.

1.6.2 Disseminate the tutorial.

O2. IT department will fill in the personal accounts for all A.F.A. military personnel and cadets, with the data, provided by Medical and HR departments, not later then 31/05/2013.

1.7 Medical department will perform, using specific means, the mesurements of height, weight and percent body fat for all A.F.A. military personnel and cadets, no later then 30/07/2013, in order to be filled up in the database personal accounts.

1.8 HR department will summarize, by consulting every A.F.A. military personnel and cadets personal files, data regarding the individuals full name, gender and date of birth, in order to be filled up in the database personal accounts, not later then 30/06/2013.

1.9 IT department will fill in the personal accounts for all A.F.A. military personnel and cadets

O3. IT department will evaluate/improve the platform, using Microsoft Acces, through database critiques given by its users, in order to increase its efficiency, by 18/06/2013.

1.10 The A.F.A. military personnel and cadets feed back.

1.10.1 The A.F.A. military personnel and cadets will access their database personal accounts in order to check personal data validity.

1.10.2 The A.F.A. military personnel and cadets will flag, to IT department, any personal data errors using the database critiques section.

1.10.3 The A.F.A. military personnel and cadets will fill in the database critiques with any suggestions they might have.

1.11 IT department will evaluate/improve the platform, through database critiques given by its users.

1.11.1 The medical department manager and the physical training responsable will analyse the critiques.

1.11.2 The medical department manager and the physical training responsable will meet the I.T. manager in order to improve the database platform, based on database critiques given by its users.

1.12. Database functionality check

1.12.1 Final test the functionality of the database.

1.12.2 Meeting with the A.F.A. commander in order to report the testing results.

O4. IT department will finalize the project, entitling the medical department and physical training responsable with database administrators rights and training the critical personnel in database usage, no later then 24/06/2013.

1.13 Identify the personnel for the critical positions (admins).

1.13.1 Assign the individuals for the critical positions.

1.13.2 Train the critical personnel.

1.14 Start the database usage (databse is fully operable and can be used by the A.F.A. military personnel and cadets).

1.15 Meeting with the A.F.A. commander in order to report the project is finished.

III. Time management plan (Gantt chart)

See Appendix no. 1

Start date: 06 may 2013;

End date: 24 june 2013;

Duration: 36 days;

Major milestones: - 21/05/2013 – status report to A.F.A. commander;

- 18.06.2013 – status report to A.F.A. commander .

IV. Human Resource Management

See Appendix no. 2

Involved departments from within A.F.A. Academy: - IT department;

- HR department;
- Medical department;
- PT responsable.

V. Communications Management

Target audience	Person(s) to convey the message	When the message is conveyed	Format of a message	Message content
AFA commander	Project manager	Start of project	Status report	• Project introduction • Project scope

Target audience	Person(s) to convey the message	When the message is conveyed	Format of a message	Message content
				• Project total budget • Project overview • Project tactic context and benefits • Assessed constraints • Assessed risks
Project manager	All project members	Weekly (every friday)	Oral communication	• Project status
AFA commander	Project manager	When achieving milestones	Status report	• Current status
AFA academic members	Project manager	At the end of the project	Status report	• Current status • Deliverables in place • Benefits and restraints

VI. Project cost management

Project total cost: 8.422,67 RON

6.1 Resource pool description: See Appendix no. 3

6.2 Cost breakdown structure: See Appendix no. 4

VII. Project quality management

1. Project quality definition

The developed AIR FORCE ACADEMY PHYSICAL TRAINING DATABASE (AFAPTD) platform will be INTRAMAN-based and it will integrate the platform with quality assurance data bases, virtual personal data, physical testing results and communicational tools. The platform will provide the A.F.A. military personnel, cadets and admin personnel the required facilities to easily and securely access the personal accounts, to monitor in real-time their physical training progress and their biannual results on physical training testing.

2. Key quality concepts measurement

Areas	Project characteristics	Quality criteria
Functionality	- INTRAMAN-based; - supports standards; - accommodates different communicational tools.	- easily customizable - easy to maintain - great flexibility - more users

Areas	Project characteristics	Quality criteria
		- centralized administration - automated administration - easy to import / export
Availability	- INTRAMAN-based	- 24/7
Accessibility	- user- friendly interface	- easy to access
Security	- user authentication - mirrored resources - up-datable	- secure access - assured redundancy - developed patches

3. List of deliverables and acceptance criteria

Activities	Deliverables	Acceptance criteria
1.1.1	Product specifications, with emphasis on critical and desirable requirements.	Compliance with project goal and objectives.
1.1.2	Age- and gender-specific weight-for-height allowances	In accordance with army standards
1.1.3	Army Physical Fitness Test standards	In accordance with Army Physical Fitness Test standards
1.2.1	List with proposal individuals	Individuals are from AFA personnel
1.2.2	Trained personnel	Assigned personnel knows the platform specifications
1.3.1	Air force academy physical training database (AFAPTD)	Compliance with the platform specifications
1.3.2	A set of questions for the critiques	No more than 30 min to complete
1.3.3	Test for acceptance	The platform complies with the specifications
1.3.4	Improved Air Force Academy physical training database (AFAPTD)	Compliance with the platform specifications
1.3.5	User accounts	All critical personnel has the possibility to access the platform in a secure way (password protected)
1.3.6	Test for acceptance	The platform complies with the specifications
1.3.7	Functional platform	Easy to access database
1.4.1	List with available locations	The locations will accommodate all HW items
1.4.2	Order issued in order to choose a location	Location is from those proposed by the IT manager
1.4.3	Locations made available	The locations will be available for the HW items of the e-Learning platform
1.4.4	Overhauled HW items	The IT HW items complies with

Activities	Deliverables	Acceptance criteria
		the platform specifications in terms of operating / maintenance cycle
1.4.5	Move the HW items into the specified location(s)	All HW items are in the same location(s)
1.5	Install platform	AFA military personnel and cadets can access the database
1.6.1	Tutorials in hard-copy and soft-copy formats	Tutorials developed for all the functions of the platform
1.6.2	Tutorials in hard-copy and soft-copy formats	AFA military personnel and cadets can access the tutorials
1.7	List w/ mesurements of height, weight and percent body fat for all A.F.A. military personnel and cadets	Data accuracy
1.8	List with individuals full name, gender and date of birth	Data accuracy
1.9	Filled in database	Data accuracy
1.10.1	All AFA military personnel and cadets can access their accounts	Easy to access personal accounts
1.10.2	Errors signaled to IT department	Real data provided to IT department
1.10.3	Filled-in critiques	Complete filling in
1.11.1	List w/ the proposal from the critiques	Compliance with the platform specifications
1.11.2	Improved Air Force Academy physical training database (AFAPTD)	Compliance with the platform specifications
1.12.1	Test for acceptance	The platform complies with the specifications
1.12.2	Functional platform	Easy to access database
1.13.1	List with proposed personnel for admin positions	The personnel is from the staff of AFA
1.13.2	Trained personnel	All the assigned personnel took a 1day course about operating the platform
1.14	Full functional platform	Functional platform
1.15	Full functional platform	Functional platform

VIII. Project Risk Management

1. List of risks

Area	Risks
Financial	- budget cuts due to financial crisis - budget cuts due to shift in AFA priorities - yearly budget allotment not as planned
Human resources	- reluctance of the personnel is to be involved due to tasks overload; - resistance of the admin staff, due to the effort to implement the platform
Material risks	- high rate of failures - new software not interoperable with existing one due to different software and hardware connectivity issues
Procedural risks	- too restrictive administrative settings for hardware - not developed standard operating procedures - changes in project timeline
Miscellaneous	- transformation of academy

2. Risks assessment matrix

Risk	Likelihood	Impact	Risk
	A	B	C=AxB
Budget cuts due to financial crisis	3	4	12
Budget cuts due to shift in AFA priorities	1	4	4
Yearly budget allotment not as planned	2	3	6
Reluctance of the personnel is to be involved due to tasks overload	3	3	9
Resistance of the admin staff, due to the effort to implement the platform	3	2	6

Risk	Likelihood	Impact	Risk
	A	B	C=AxB
High rate of failures	3	2	6
New software not interoperable with existing one due to different software and hardware connectivity issues	1	4	4
Too restrictive administrative settings for hardware	3	3	9
Not developed standard operating procedures	2	2	4
Changes in project timeline	2	4	8
Transformation of academy	2	5	10

Risks significance (colors legend):

Insignificant	Minor	Significant	Major

Mitigation strategies

Risk	Mitigation strategy
Budget cuts due to financial crisis	- planning the project before the financial year starts - monitor the project
Budget cuts due to shift in AFA priorities	- do nothing
Yearly budget allotment not as planned	- framework contract - monitor the project
Reluctance of the personnel is to be involved due to tasks overload	- leadership - communication plan - emphasize the benefits of project and risks for not doing anything
Resistance of the admin staff, due to the effort to implement the platform	- leadership
High rate of HW failures	- maintenance strategy - equipment insurance
New software not interoperable with existing one due to different software and hardware connectivity issues	- clear-cut requirements - monitor the project
Too restrictive administrative settings for hardware	- shift in security policy - new procedures for administrative areas (not classified)

Risk	Mitigation strategy
Not developed standard operating procedures	- monitor the project
Changes in project timeline	- change plan
Transformation of academy	- state the developing of the A.F.A. physical training database as high priority in its personnel development

IX. Closeout

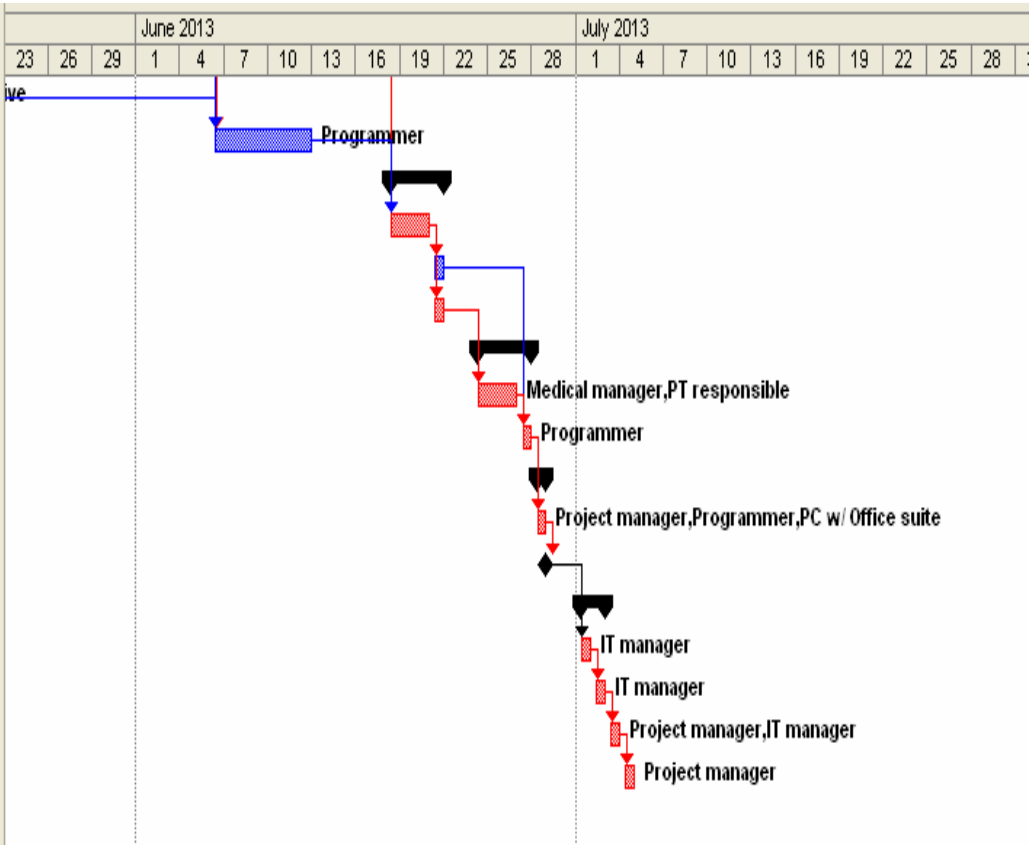
The database is fully operational. Personal data of A.F.A. military personnel and cadets are filled-in and they can easily access their personal accounts. The medical department manager and the PT responasble can sugest nutrition programs and fitness programs for those that doesn't meet the Army Physical Fitness Test (APFT) standards.

Time management plan (Gantt Chart)

Appendix no.1

Task Name
1 „HENRI COANDĂ" AIR FORCE ACADEMY PHYSICAL TRAINING DATABASE (AFAPTD)
1.1 Develop the product specifications
1.1.1 Establish the database features
1.1.2 Provide to IT department age- and gender-specific weight-for-height allowances
1.1.3 Provide to IT department the Army Physical Fitness Test (APFT) standards
1.2 A2. IT department manager will identify key personnel that will develop the d
1.2.1 Assign the individuals
1.2.2 Briefing the selected personnel
1.3 Developing the database
1.3.1 Writting the programming code
1.3.2 Issue the database critiques section
1.3.3 Initial test the database functionality
1.3.4 Evaluate and improve the platform
1.3.5 Create users account for all A.F.A. military personnel and cadets
1.3.6 Intermediate test the functionality of the database
1.3.7 Meeting with the A.F.A. commander in order to report the testing results
1.4 Identifing possible locations where cadets can use the database
1.4.1 IT department manager will issue a list of possible locations
1.4.2 A.F.A. commander will chose a location(s)
1.4.3 Make available the identified locations
1.4.4 Overhaul the existing HW items to be re-assigned for the database
1.4.5 Move the HW into the specified location
1.5 Install the database platform on all A.F.A. military personnel terminals and on
1.6 Develop a tutorial for operating the database
1.6.1 Issue tutorials
1.6.2 Disseminate the tutorials
1.7 Mesurements of height, weight and percent body fat for all A.F.A. military per
1.8 Summarize data regarding the individuals full name, gender and date of birth
1.9 Fill in the personal accounts for all A.F.A. military personnel and cadets

	Task Name
28	**1.8 Summarize data regarding the individuals full name, gender and date**
29	**1.9 Fill in the personal accounts for all A.F.A. military personnel and cadet**
30	**1.10 The A.F.A. military personnel and cadets feed back**
31	1.10.1 The A.F.A. military personnel and cadets will access their database per
32	1.10.2 The A.F.A. military personnel and cadets will flag, to IT department, any
33	1.10.3 The A.F.A. military personnel and cadets will fill in the database critique
34	**1.11 IT department will evaluate/improve the platform, through database**
35	1.11.1 Analyse the critiques
36	1.11.2 Improve the database platform, based on database critiques given by its
37	**1.12 Database functionality check**
38	1.12.1 Final test the functionality of the database
39	1.12.2 Meeting with the A.F.A. commander in order to report the testing results
40	**1.13 Identify the personnel for the critical positions (admins)**
41	1.13.1 Assign the individuals for the critical positions
42	1.13.2 Train the critical personnel
43	**1.14 Start the database usage (databse is fully operable and can be used**
44	**1.15 Meeting with the A.F.A. commander in order to report the project is**



Appendix no.2

Human Resource Management

Linear responsibility chart of project management relationship*

Activities	A.F.A. commander	Project manager	IT manager	Programmer	Medical dept. manager	Medical ass.	HR	PT responsable	Enlisted
1.1.1	6	1	3	-	3	4	4	3	-
1.1.2	4	2	5	-	1	4	4	5	-
1.1.3	4	2	5	-	4	4	4	1	-
1.2.1	4	2	1	5	-	4	4	4	-
1.2.2	4	2	1	5	-	4	4	4	-
1.3.1	4	5	2	1	4	4	4	4	-
1.3.2	4	5	4	4	1	4	4	1	-
1.3.3	4	1	2	3	4	4	4	4	-
1.3.4	4	2	5	1	4	4	4	4	-
1.3.5	4	2	5	1	4	4	4	4	-
1.3.6	4	1	2	3	4	4	4	4	-
1.3.7	6	1	5	5	5	5	5	5	5
1.4.1	6	2	1	3	4	4	4	4	5
1.4.2	6	2	1	3	4	4	4	4	5
1.4.3	5	2	5	4	4	4	4	4	1
1.4.4	5	2	1	3	5	5	5	5	5
1.4.5	5	5	2	4	4	4	4	4	1
1.5	5	2	4	1	4	4	4	4	-
1.6.1	5	2	4	1	4	4	4	4	-
1.6.2	5	2	4	1	4	4	4	4	-
1.7	5	2	5	5	5	1	5	5	5
1.8	5	2	4	4	4	4	1	4	-
1.9	5	2	4	1	4	4	4	4	-
1.10.1	5	1	4	3	4	4	4	4	4
1.10.2	5	1	4	3	4	4	4	4	4
1.10.3	5	1	4	3	4	4	4	4	4

Activities	A.F.A. commander	Project manager	IT manager	Programmer	Medical dept. manager	Medical ass.	HR	PT responsable	Enlisted
1.11.1	5	2	5	5	1	4	4	1	-
1.11.2	5	2	5	1	4	4	4	4	-
1.12.1	5	2	5	1	4	4	4	4	-
1.12.2	6	1	5	5	5	5	5	5	5
1.13.1	5	2	1	5	4	4	4	4	-
1.13.2	5	2	1	5	4	4	4	4	-
1.14	5	1	5	5	5	5	5	5	5
1.15	6	1	5	5	5	5	5	5	5

* Legend: 1 – actual responsability;
2 – general supervision;
3 – must be consulted;
4 – may be consulted;
5 – must be notified;
6 – approval authority.

Appendix no. 3

Resource pool description

	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code
1	Project manager	Work		PM		100%	20.00 RON/hr	40.00 RON/hr	0.00 RON	Prorated	Standard	
2	IT manager	Work		IT		100%	15.00 RON/hr	30.00 RON/hr	0.00 RON	Prorated	Standard	
3	Programmer	Work		P		100%	13.00 RON/hr	26.00 RON/hr	0.00 RON	Prorated	Standard	
4	Medical manager	Work		MM		100%	15.00 RON/hr	30.00 RON/hr	0.00 RON	Prorated	Standard	
5	Medical assistant	Work		MA		100%	13.00 RON/hr	26.00 RON/hr	0.00 RON	Prorated	Standard	
6	HR representative	Work		HR		100%	15.00 RON/hr	30.00 RON/hr	0.00 RON	Prorated	Standard	
7	PT responsible	Work		PT		100%	13.00 RON/hr	26.00 RON/hr	0.00 RON	Prorated	Standard	
8	Enlisted	Work		E		300%	10.00 RON/hr	20.00 RON/hr	0.00 RON	Prorated	Standard	
9	PC w/ Office suite	Work		PC		600%	1.00 RON/hr	1.00 RON/hr	0.00 RON	Prorated	Standard	
10	Printer	Work		P		100%	0.30 RON/hr	0.30 RON/hr	0.00 RON	Prorated	Standard	
11	Phone	Work		P		500%	0.03 RON/hr	0.03 RON/hr	0.00 RON	Prorated	Standard	
12	INTRAMAN service	Work		I		100%	0.05 RON/hr	0.05 RON/hr	0.00 RON	Prorated	Standard	
13	AFA website	Work		A		100%	0.05 RON/hr	0.05 RON/hr	0.00 RON	Prorated	Standard	
14	Videorecorder	Work		V		100%	0.50 RON/hr	0.50 RON/hr	0.00 RON	Prorated	Standard	
15	DVD blancs	Work		D		500%	2.00 RON/hr	2.00 RON/hr	0.00 RON	Prorated	Standard	
16	Paper	Material		P			0.00 RON		0.00 RON	Prorated		

Appendix no. 4 Cost breakdown structure

Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
1 „HENRI COANDĂ" AIR FORCE ACADEMY PHYSICAL TRAINING DATABASE (AFAPTD)	**0.00 RON**	**Prorated**	**8,422.67 RON**	**0.00 RON**	**8,422.67 RON**	**0.00 RON**	**8,422.67 RON**
1.1 Develop the product specifications	**0.00 RON**	**Prorated**	**616.00 RON**	**0.00 RON**	**616.00 RON**	**0.00 RON**	**616.00 RON**
1.1.1 Establish the database features	0.00 RON	Prorated	504.00 RON	0.00 RON	504.00 RON	0.00 RON	504.00 RON
1.1.2 Provide to IT department age- and gender-specific weight-for-height allowances	0.00 RON	Prorated	60.00 RON	0.00 RON	60.00 RON	0.00 RON	60.00 RON
1.1.3 Provide to IT department the Army Physical Fitness Test (APFT) standards	0.00 RON	Prorated	52.00 RON	0.00 RON	52.00 RON	0.00 RON	52.00 RON
1.2 A2. IT department manager will identify key personnel that will develop the database s	**0.00 RON**	**Prorated**	**480.00 RON**	**0.00 RON**	**480.00 RON**	**0.00 RON**	**480.00 RON**
1.2.1 Assign the individuals	0.00 RON	Prorated	60.00 RON	0.00 RON	60.00 RON	0.00 RON	60.00 RON
1.2.2 Briefing the selected personnel	0.00 RON	Prorated	420.00 RON	0.00 RON	420.00 RON	0.00 RON	420.00 RON
1.3 Developing the database	**0.00 RON**	**Prorated**	**1,554.67 RON**	**0.00 RON**	**1,554.67 RON**	**0.00 RON**	**1,554.67 RON**
1.3.1 Writting the programming code	0.00 RON	Prorated	560.00 RON	0.00 RON	560.00 RON	0.00 RON	560.00 RON
1.3.2 Issue the database critiques section	0.00 RON	Prorated	154.67 RON	0.00 RON	154.67 RON	0.00 RON	154.67 RON
1.3.3 Initial test the database functionality	0.00 RON	Prorated	264.00 RON	0.00 RON	264.00 RON	0.00 RON	264.00 RON
1.3.4 Evaluate and improve the platform	0.00 RON	Prorated	104.00 RON	0.00 RON	104.00 RON	0.00 RON	104.00 RON
1.3.5 Create users account for all A.F.A. military personnel and cadets	0.00 RON	Prorated	208.00 RON	0.00 RON	208.00 RON	0.00 RON	208.00 RON
1.3.6 Intermediate test the functionality of the database	0.00 RON	Prorated	264.00 RON	0.00 RON	264.00 RON	0.00 RON	264.00 RON
1.3.7 Meeting with the A.F.A. commander in order to report the testing results	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.4 Identifing possible locations where cadets can use the database	**0.00 RON**	**Prorated**	**1,260.00 RON**	**0.00 RON**	**1,260.00 RON**	**0.00 RON**	**1,260.00 RON**
1.4.1 IT department manager will issue a list of possible locations	0.00 RON	Prorated	60.00 RON	0.00 RON	60.00 RON	0.00 RON	60.00 RON
1.4.2 A.F.A. commander will chose a location(s)	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.4.3 Make available the identified locations	0.00 RON	Prorated	160.00 RON	0.00 RON	160.00 RON	0.00 RON	160.00 RON
1.4.4 Overhaul the existing HW items to be re-assigned for the database	0.00 RON	Prorated	240.00 RON	0.00 RON	240.00 RON	0.00 RON	240.00 RON
1.4.5 Move the HW into the specified location	0.00 RON	Prorated	800.00 RON	0.00 RON	800.00 RON	0.00 RON	800.00 RON
1.5 Install the database platform on all A.F.A. military personnel terminals and on those de	0.00 RON	Prorated	312.00 RON	0.00 RON	312.00 RON	0.00 RON	312.00 RON
1.6 Develop a tutorial for operating the database	**0.00 RON**	**Prorated**	**312.00 RON**	**0.00 RON**	**312.00 RON**	**0.00 RON**	**312.00 RON**
1.6.1 Issue tutorials	0.00 RON	Prorated	208.00 RON	0.00 RON	208.00 RON	0.00 RON	208.00 RON
1.6.2 Disseminate the tutorials	0.00 RON	Prorated	104.00 RON	0.00 RON	104.00 RON	0.00 RON	104.00 RON
1.7 Mesurements of height, weight and percent body fat for all A.F.A. military personnel ar	0.00 RON	Prorated	1,040.00 RON	0.00 RON	1,040.00 RON	0.00 RON	1,040.00 RON
1.8 Summarize data regarding the individuals full name, gender and date of birth	0.00 RON	Prorated	600.00 RON	0.00 RON	600.00 RON	0.00 RON	600.00 RON
1.9 Fill in the personal accounts for all A.F.A. military personnel and cadets	0.00 RON	Prorated	520.00 RON	0.00 RON	520.00 RON	0.00 RON	520.00 RON
1.10 The A.F.A. military personnel and cadets feed back	**0.00 RON**	**Prorated**	**0.00 RON**	**0.00 RON**	**0.00 RON**	**0.00 RON**	**0.00 RON**

Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
1.8 Summarize data regarding the individuals full name, gender and date of birth	0.00 RON	Prorated	600.00 RON	0.00 RON	600.00 RON	0.00 RON	600.00 RON
1.9 Fill in the personal accounts for all A.F.A. military personnel and cadets	0.00 RON	Prorated	520.00 RON	0.00 RON	520.00 RON	0.00 RON	520.00 RON
1.10 The A.F.A. military personnel and cadets feed back	**0.00 RON**	**Prorated**	**0.00 RON**	**0.00 RON**	**0.00 RON**	**0.00 RON**	**0.00 RON**
1.10.1 The A.F.A. military personnel and cadets will access their database personal accounts in c	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.10.2 The A.F.A. military personnel and cadets will flag, to IT department, any personal data erroı	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.10.3 The A.F.A. military personnel and cadets will fill in the database critiques with any suggest	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.11 IT department will evaluate/improve the platform, through database critiques given by	**0.00 RON**	**Prorated**	**776.00 RON**	**0.00 RON**	**776.00 RON**	**0.00 RON**	**776.00 RON**
1.11.1 Analyse the critiques	0.00 RON	Prorated	672.00 RON	0.00 RON	672.00 RON	0.00 RON	672.00 RON
1.11.2 Improve the database platform, based on database critiques given by its users	0.00 RON	Prorated	104.00 RON	0.00 RON	104.00 RON	0.00 RON	104.00 RON
1.12 Database functionality check	**0.00 RON**	**Prorated**	**272.00 RON**	**0.00 RON**	**272.00 RON**	**0.00 RON**	**272.00 RON**
1.12.1 Final test the functionality of the database	0.00 RON	Prorated	272.00 RON	0.00 RON	272.00 RON	0.00 RON	272.00 RON
1.12.2 Meeting with the A.F.A. commander in order to report the testing results	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
1.13 Identify the personnel for the critical positions (admins)	**0.00 RON**	**Prorated**	**240.00 RON**	**0.00 RON**	**240.00 RON**	**0.00 RON**	**240.00 RON**
1.13.1 Assign the individuals for the critical positions	0.00 RON	Prorated	120.00 RON	0.00 RON	120.00 RON	0.00 RON	120.00 RON
1.13.2 Train the critical personnel	0.00 RON	Prorated	120.00 RON	0.00 RON	120.00 RON	0.00 RON	120.00 RON
1.14 Start the database usage (databse is fully operable and can be used by the A.F.A. milit	0.00 RON	Prorated	280.00 RON	0.00 RON	280.00 RON	0.00 RON	280.00 RON
1.15 Meeting with the A.F.A. commander in order to report the project is finished	0.00 RON	Prorated	160.00 RON	0.00 RON	160.00 RON	0.00 RON	160.00 RON

PROMOTING AN ALTERNATE SAFER NON-POLLUTING MEANS FOR DEMOLISHING BUILDINGS IN CROWDED AREAS

George MINEA

CONTENTS

I. Business case

Globe's population just reached 7 billion inhabitants and we will soon be 8 billion people on this planet as the figures exponentially grow, so we need to shelter ourselves and offer to all of our peers enough spaces to work. As in the big metropolitan areas the horizontally development of constructions is not possible anymore, it goes without saying that taller and taller buildings have to be built instead of the ones we inhabit nowadays.

In order to replace these structures with newer, better and safer ones, when demolishing the old ones, we need to remember that they are already built in extremely crowded areas and to take into consideration that people's safety prevails and derived from this the need to preserve the environment by protecting it from additional types of pollution (e.g. gasses emanated from explosions).

Nowadays more and more laws refer to proactive environmental measures that have to be taken in order to ease people's lives, enabling them to obtain significantly high benefits from the ones who break them, most of the times as a result of apparently frivolous lawsuits.

It is imperative that we keep up with the legal changes and to try to facilitate our lives in the society so we offer an additional means for demolishing buildings only working on the ground level and without using any explosives or large and noisy machines (e.g. wrecking balls) which present danger not only for the ones working at the process but also for the people living in the neighborhood.

The method we will provide is not only safer and less polluting than the conventional ways but also cheaper, economically wise, keeping in mind that it enables an up to 99 % steel recovery rate. It consists in demolishing a building starting from the ground floor and going all the way to the top, only working on the ground level. This is done with the help of a hydraulic jacks system which will sustain and lower the building floor by floor as soon as the building is being demolished. This way of demolishing building was used for the first time between 2007 and 2008 by the Kajima Corporation, which is one of world's biggest construction companies worldwide[10]. The method was

[10] http://www.kajima.co.jp/english/tech/kcd/

named after the company that used it for the first time ever and it is called “The Kajima Cut and Take Down Method”.

II. Scope management plan

Through the scope management plan it will be shown and developed the list of activities that are to be followed during the entire project of promoting a new method for demolishing buildings.

The main goal that the current project has, is promoting an alternate safer non-polluting means for demolishing buildings in crowded areas.

The main three objectives that the current project has are the following:

1. Establishing service’s main target according to market research, by the sales department, in order to create a network of beneficiaries, by the end of August 2013.
2. Procurement by the logistics and engineering departments of the technology materials and know how, necessary for demolishing one building for demonstration purposes, by the end of March 2014.
3. Organizing by the P.R. department and a specialized engineer team, according to company’s policy, a demonstrative demolition, in order to present the technology to the target, by the end of May 2014.

From the presented objectives it derives the work breakdown structure which aims at allowing the project manager to effectively have a real-time overview of each and every one activity, letting him to act accordingly.

Each objective is broken down into two main activities as presented in the Work Breakdown Structure in Table no. II.1.

ID	Task Name	Duration	Start	Finish
1	**1 Promoting an alternate safer non-polluting means for demolishing buildings in crowded areas**	**276 days**	**Wed 5/1/13**	**Wed 5/21/14**
2	**1.1 Identify potential beneficiaries that would be interested in acquiring the provided services**	**47 days**	**Wed 5/1/13**	**Thu 7/4/13**
3	1.1.1 Create a presentation summarising the provided product's benefits	2 days	Wed 5/1/13	Thu 5/2/13
4	1.1.2 Acquire a list with all the current stakeholders	2 days	Fri 5/3/13	Mon 5/6/13
5	1.1.3 Look for new possible beneficiaries bound to the current stakeholders	40 days	Fri 5/3/13	Tue 7/2/13
6	1.1.4 Do a market research in order to find other beneficiaries that might be interested in the provided service	43 days	Tue 5/7/13	Thu 7/4/13
7	**1.2 Establish the beneficiaries network**	**29.5 days**	**Fri 7/5/13**	**Thu 8/15/13**
8	1.2.1 Outline the ties between the existing stakeholders and other possible beneficiaries	12 days	Fri 7/5/13	Wed 7/31/13
9	1.2.2 Identify means of comunicating service's outcome to possible beneficiaries	6 days	Wed 7/31/13	Thu 8/8/13
10	1.2.3 Inform the possible beneficiaries of the service you will provide	5 days	Thu 8/8/13	Thu 8/15/13
11	1.2.4 Review the interested beneficiaries list	0 days	Thu 8/15/13	Thu 8/15/13
12	**1.3 Buy/lease the technology, materials and the know how**	**95 days**	**Wed 5/1/13**	**Tue 9/10/13**
13	1.3.1 Contact the technology provider	5 days	Wed 5/1/13	Tue 5/7/13
14	1.3.2 Negociate the terms of a contract	60 days	Wed 5/8/13	Tue 7/30/13
15	1.3.3 Review the terms of the negotiated contract	0 days	Tue 7/30/13	Tue 7/30/13
16	1.3.4 Buy/lease the technology, materials and know how	30 days	Wed 7/31/13	Tue 9/10/13
17	**1.4 Train the personnel into using the acquired technology**	**145 days**	**Wed 9/11/13**	**Tue 4/1/14**
18	1.4.1 Establish the number employees needed to operate the technology	10 days	Wed 9/11/13	Tue 9/24/13
19	1.4.2 Hire/promote the additionally needed personnel	15 days	Wed 9/25/13	Tue 10/15/13
20	1.4.3 Apply the terms of the previously negociated contract to train the personnel	120 days	Wed 10/16/13	Tue 4/1/14
21	**1.5 Hire an advertising and marketing company to promote the provided services to the interested beneficiaries**	**180 days**	**Wed 9/11/13**	**Tue 5/20/14**
22	1.5.1 Set up a price range for the newly provided services	30 days	Wed 4/2/14	Tue 5/13/14
23	1.5.2 Identify the right advertising and marketing company to promote the services	10 days	Wed 9/11/13	Tue 9/24/13
24	1.5.3 Contact the advertising and marketing company	3 days	Wed 9/25/13	Fri 9/27/13
25	1.5.4 Negociate the terms of a contract	30 days	Mon 9/30/13	Fri 11/8/13
26	1.5.5 Review the terms of the negotiated contract	0 days	Fri 11/8/13	Fri 11/8/13
27	1.5.6 Hire the advertising and marketing company to develop an advertising campaign	7 days	Mon 11/11/13	Tue 11/19/13
28	1.5.7 Use the advertising material	70 days	Wed 2/12/14	Tue 5/20/14
29	**1.6 Demonstrate newly acquired techcnology's use**	**36 days**	**Wed 4/2/14**	**Wed 5/21/14**
30	1.6.1 Organise a demonstrative demolition	30 days	Wed 4/2/14	Tue 5/13/14
31	1.6.2 Review the preparations made for the demonstrative demolition	0 days	Tue 5/13/14	Tue 5/13/14
32	1.6.3 Execute a demonstrative demolition	5 days	Wed 5/14/14	Tue 5/20/14
33	1.6.4 Present the price range for the services provided to the beneficiaries	1 day	Wed 5/21/14	Wed 5/21/14

Table no. II.1

III. Time management plan

Time management plan's purpose is to establish a timeline for the activities that are to take place during project's development and to provide a basis for actively intervening at any time in project's evolution so that the objectives would not exceed the time allocated for each of them to be met.

The project is set to develop over 276 working days, from its beginning on the 1st of May 2013 until the dissemination on the 21st of May 2014.

The most important milestones are met after the project manager will have been reviewed the following activities:

- establishing the beneficiaries network, for the service that is to be provided;
- negotiating the contract for acquiring the needed technology and know-how for a demonstrative demolition;
- negotiating the contract for acquiring the services needed successfully promote the newly acquired technology;
- to organize a demonstrative demolition.

For a deeper understanding of the timeline, a Gantt chart is included in Chart no. III. 1. (it is complementary to Table no. II.1)

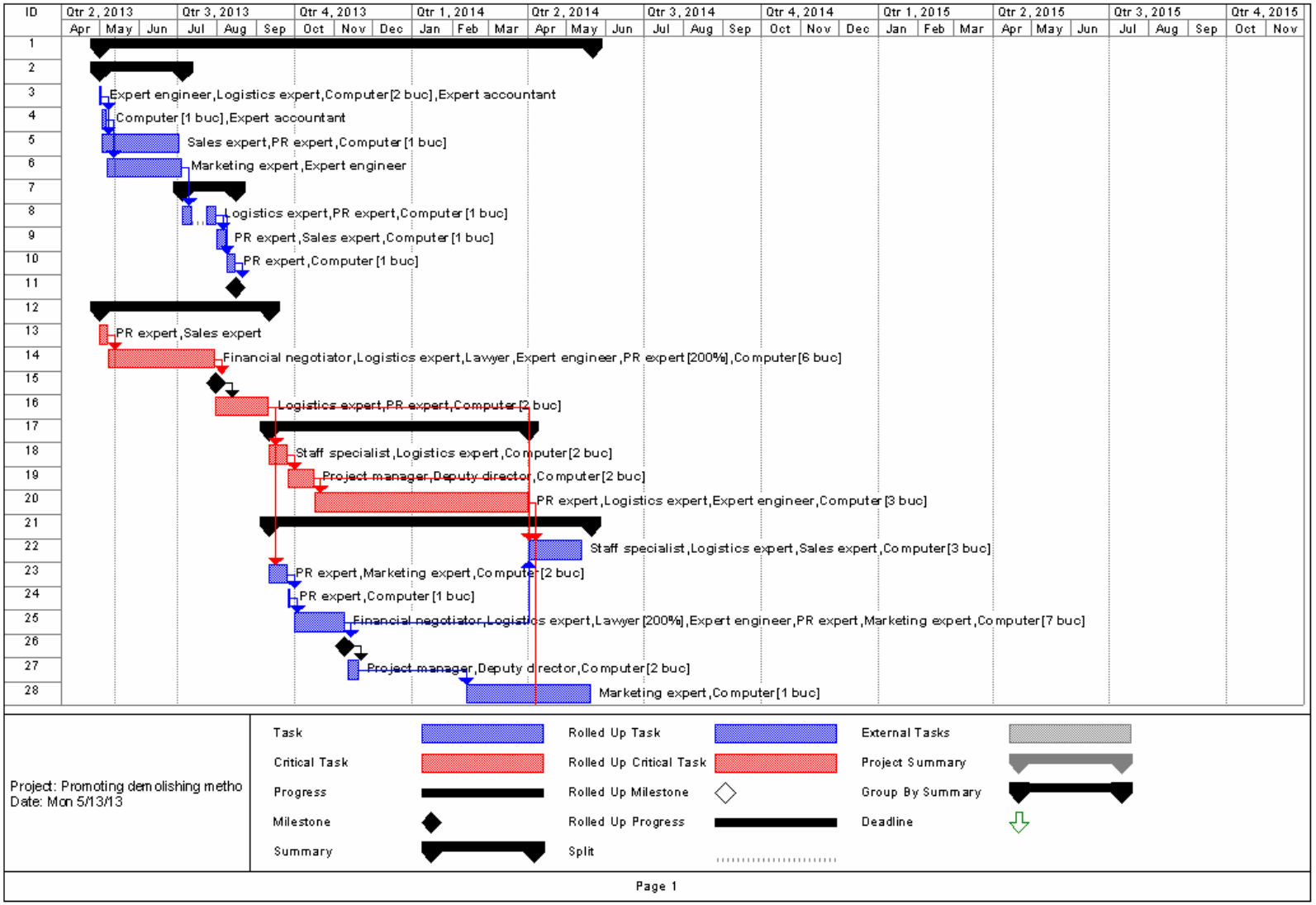
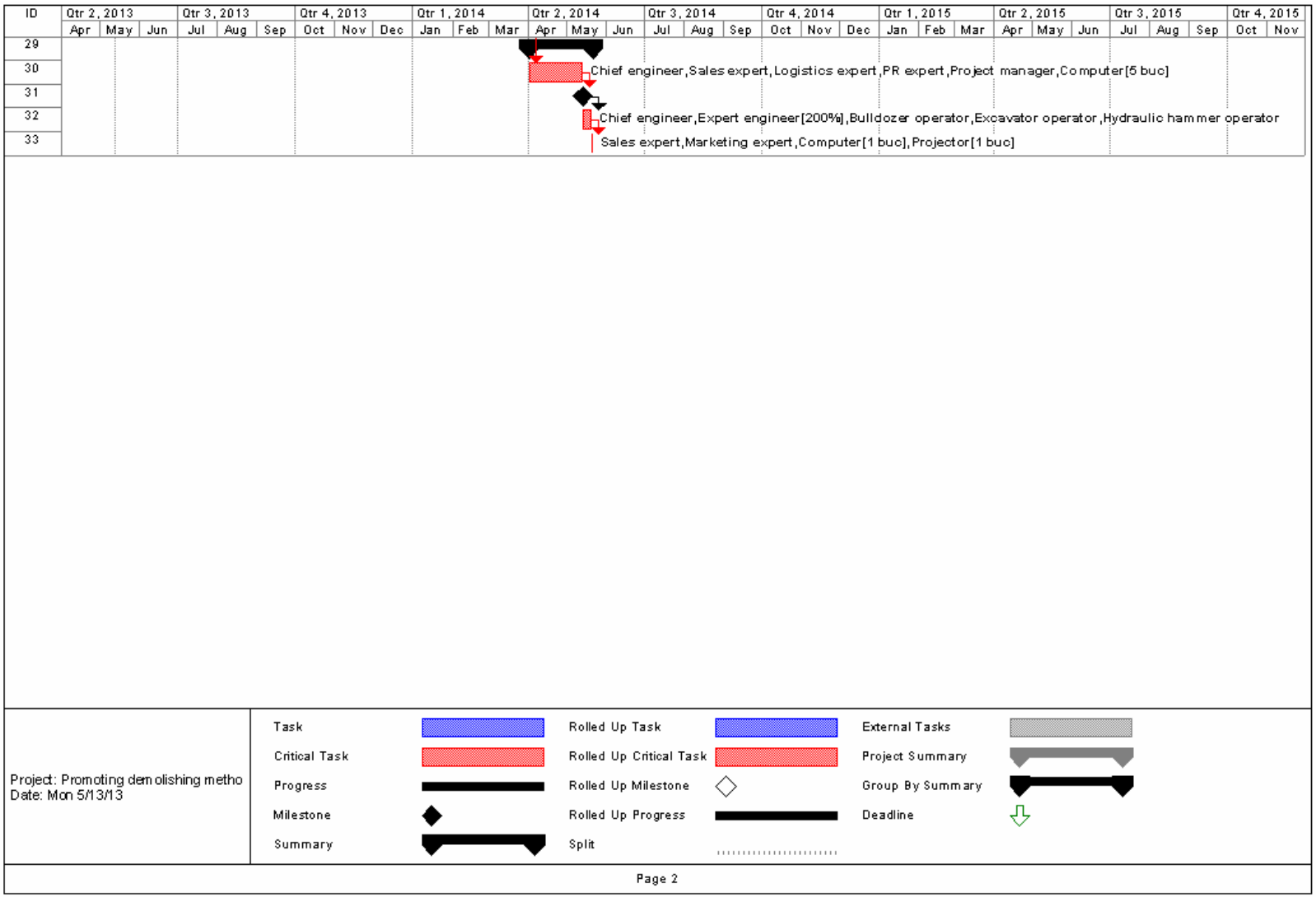


Chart no. III.1


ID
Qtr 2, 2013
Apr May Jun
Qtr 3, 2013
Jul Aug Sep
Qtr 4, 2013
Oct Nov Dec
Qtr 1, 2014
Jan Feb Mar
Qtr 2, 2014
Apr May Jun
Qtr 3, 2014
Jul Aug Sep
Qtr 4, 2014
Oct Nov Dec
Qtr 1, 2015
Jan Feb Mar
Qtr 2, 2015
Apr May Jun
Qtr 3, 2015
Jul Aug Sep
Qtr 4, 2015
Oct Nov
29
30
31
32
33
Chief engineer,Sales expert,Logistics expert,PR expert,Project manager,Computer[5 buc]
Chief engineer,Expert engineer[200%],Bulldozer operator,Excavator operator,Hydraulic hammer operator
Sales expert,Marketing expert,Computer[1 buc],Projector[1 buc]
Project: Promoting demolishing metho
Date: Mon 5/13/13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 2

IV. Human resources management

In order for the project to successfully achieve its goal, the human resources that have to be used are already employed by the company and will work according its current schedule.

The positions that need to be engaged in project's development are the following:

- for organizational purposes:
    - project manager;
    - one expert accountant;
    - two expert engineers;
    - one chief engineer;
    - two logistics experts;
    - two sales experts;
    - two P.R. experts;
    - one marketing expert;
    - one financial negotiator;
    - two lawyers;
    - one staff specialist.

- for demonstrative purposes:
    - one chief engineer (out of the one engaged for organizational purposes);
    - two expert engineers (out of the one engaged for organizational purposes);
    - one bulldozer operator;
    - one excavator operator;
    - four hydraulic hammer operators;
    - three chainsaw operators;
    - one tipper driver;
    - two hydraulic jack operators;
    - one hydraulic jack console operator.

To actively promote the new demolition method to possible beneficiaries, an advertising and marketing company will be used after negotiating a services contract, while having one marketing specialist from our company as liaison to constantly keep in touch with their work development.

To overview the achievement of the know-how from the technology provider, in order to use it properly, one P.R. expert, one logistics expert and one expert engineer will work during the allocated period of time as liaisons to the technology provider company.

In order to clarify and to establish the responsibility for each position through project's development we have established a linear responsibility chart, presented in Table no. IV.1.

Table no. IV.1

Activity's task no. according to the WBS in Table no. 1	Deputy director	Project manager	Expert accountant	Expert engineers	Logistics experts	Sales experts	P.R. experts	Marketing expert	Financial negotiator	Lawyers	Chief engineer	Staff specialist
1.1.	-	-	-	-	-	-	-	-	-	-	-	-
1.1.1.	5	4	1	1	1	-	-	-	-	-	-	-
1.1.2.	-	4	1	-	-	-	-	-	-	-	-	-
1.1.3.	-	4	-	-	-	1	1	-	-	-	-	-
1.1.4.	5	4	-	1	-	-	-	1	-	-	-	-
1.2.	-	-	-	-	-	-	-	-	-	-	-	-
1.2.1	-	4	3	3	1	-	1	-	-	-	-	-
1.2.2.	-	4	3	-	-	1	1	3	4	3	-	-
1.2.3.	-	4	-	-	-	3	1	-	-	-	-	-
1.2.4.	6	1	-	-	-	-	-	-	3	3	-	-
1.3.	-	-	-	-	-	-	-	-	-	-	-	-
1.3.1.	5	4	-	-	-	1	1	-	-	-	-	-
1.3.2.	5	4	-	1	1	3	1	3	1	1	-	-
1.3.3.	6	1	-	3	-	-	-	-	3	3	-	-
1.3.4.	6	2	-	-	1	3	1	-	-	3	-	-
1.4.	-	-	-	-	-	-	-	-	-	-	-	-
1.4.1.	5	2	-	-	1	-	-	-	-	-	3	1
1.4.2.	6	2	-	-	-	-	1	-	-	1	-	1

Activity's task no. according to the WBS in Table no. 1	Deputy director	Project manager	Expert accountant	Expert engineers	Logistics experts	Sales experts	P.R. experts	Marketing expert	Financial negotiator	Lawyers	Chief engineer	Staff specialist
1.4.3.	-	4	-	1	1	-	1	-	-	3	-	-
1.5.	-	-	-	-	-	-	-	-	-	-	-	-
1.5.1.	6	4	-	-	1	1	-	3	3	-	-	1
1.5.2.	6	4	-	-	-	1	1	1	3	3	-	-
1.5.3.	-	4	-	-	-	-	1	-	-	-	-	-
1.5.4.	5	2	3	1	1	3	1	1	1	1	-	-
1.5.5.	6	1	-	-	-	-	-	-	-	3	3	-
1.5.6.	5	4	-	-	-	-	-	1	1	-	-	-
1.5.7.	6	2	-	-	-	-	-	1	-	3	-	-
1.6.	-	-	-	-	-	-	-	-	-	-	-	-
1.6.1.	5	2	-	-	1	1	3	-	-	-	1	-
1.6.2.	6	1	-	-	-	-	-	-	-	3	-	-
1.6.3.	5	2	-	1	3	-	-	-	-	-	1	-
1.6.4.	6	2	-	-	-	1	-	1	-	-	-	-

1- actual responsibility
2- general supervision
3- must be consulted
4- must be notified
5- may be notified
6- approval authority

V. Communications management plan

The communications management plan will allow the working stakeholders to effectively exchange their ideas and to constantly know who works and what during project's evolution. Its purpose is also to remove any possible risk that might appear because of a faulty communication between every stakeholder. The communication flow matrix is presented in Table no. V.1.

Table no. V.1

Target audience	**Who conveys the message**	**When the message is conveyed**	**The message format**	**Message content**
The entire project team	Project manager	At the beginning of the project	Oral communication	The goal of the project
Project manager	Anyone from the project team	At any time	By any means available	Ideas for improving the project
Deputy director	Project manager	Weekly (every Friday)	Written report	Project's status
Project manager	Every field expert from the project team	Weekly (every Thursday)	Written report	Project's status
Project manager	Expert engineer	2nd of May 2013	Written presentation	Product's main benefits
The entire project team	Sales expert	31st of July 2013	Written presentation	The network of possible beneficiaries
The possible services beneficiaries	P.R. expert	15th of August 2013	Written letter and electronic mail	Information about the future provided services
Technology provider	P.R. expert	7th of May 2013	Written letter and oral communication	Set the terms for a negotiation
Technology provider	Financial negotiator and lawyers	By the end of July 30 2013	Oral communication followed by legal	Negotiate the terms of a contract

Target audience	Who conveys the message	When the message is conveyed	The message format	Message content
			documents	
Project manager	Staff specialist	24th of September 2013	Written report	The number of people needed to be trained in order to operate the technology
Project manager	Expert engineer (liaison to the technology provider)	Weekly (until the know-how is acquired)	Written report	Training status
Project manager	Sales expert	13th of May 2014	Written presentation	Price range for the newly provided services
Deputy director	Project manager	24th of September 2013	Written report	Advertising and marketing company's selection process
Advertising company	P.R. expert	27th of September 2013	Written letter and oral communication	Set the terms for a negotiation
Advertising company	Financial negotiator and lawyers	By the end of November 8 2013	Oral communication followed by legal	Negotiate the terms of a contract

Target audience	Who conveys the message	When the message is conveyed	The message format	Message content
			documents	
Project manager	Marketing expert (liaison to the advertising company)	Weekly (until the campaign is over)	Written report	Promotional campaign's status
All the beneficiaries	Hired advertising company	According to campaign's specifications	Ads in national and local media and project's web site	Advertising products
Deputy director	Project manager	13th of May 2014	Written report	Detail the demonstration
All the interested beneficiaries	Sales expert, P.R. expert, and the hired advertising company	21st of May 2014	Written presentation, brochures, ads in national and local media and project's web site	The price range for the provided services.

VI. Cost management plan

The cost management plan enables both the project team and the company board to schedule and control the budged needed to meet the objectives as planned and to have a permanent overview of the expenditures in progress.

The resource pool depicts the hourly rates for every employee and the materials needed for the project to meet the required objectives and it is presented in Table no. VI.1.

Table no. VI.1

ID	Resource Name	Type	Material Label	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Base Calendar	Code
1	Expert accountant	Work		100%	35 lei /hr	70 lei /hr	0 lei	Standard	
2	Expert engineer	Work		200%	35 lei /hr	70 lei /hr	0 lei	Standard	
3	Logistics expert	Work		200%	35 lei /hr	70 lei /hr	0 lei	Standard	
4	Sales expert	Work		200%	35 lei /hr	70 lei /hr	0 lei	Standard	
5	PR expert	Work		200%	35 lei /hr	70 lei /hr	0 lei	Standard	
6	Marketing expert	Work		100%	35 lei /hr	70 lei /hr	0 lei	Standard	
7	Financial negotiator	Work		100%	50 lei /hr	100 lei /hr	0 lei	Standard	
8	Lawyer	Work		200%	50 lei /hr	100 lei /hr	0 lei	Standard	
11	Chief engineer	Work		100%	30 lei /hr	60 lei /hr	0 lei	Standard	
12	Project manager	Work		100%	35 lei /hr	70 lei /hr	0 lei	Standard	
13	Deputy director	Work		100%	60 lei /hr	120 lei /hr	0 lei	Standard	
14	Bulldozer operator	Work		100%	15 lei /hr	30 lei /hr	0 lei	Standard	
15	Excavator operator	Work		100%	11 lei /hr	22 lei /hr	0 lei	Standard	
16	Hydraulic hammer operator	Work		400%	11 lei /hr	22 lei /hr	0 lei	Standard	
17	Chainsaw operator	Work		300%	11 lei /hr	22 lei /hr	0 lei	Standard	
18	Tipper driver	Work		100%	15 lei /hr	30 lei /hr	0 lei	Standard	
19	Hydraulic jack operator	Work		200%	15 lei /hr	30 lei /hr	0 lei	Standard	
20	Hydraulic jack systemoperator	Work		100%	22 lei /hr	44 lei /hr	0 lei	Standard	
30	Staff specialist	Work		100%	30 lei /hr	60 lei /hr	0 lei	Standard	
9	Computer	Material	buc		0 lei		0 lei		
10	Telephone	Material	buc		0 lei		0 lei		
21	Excavator	Material	buc		0 lei		0 lei		
22	Bulldozer	Material	buc		0 lei		0 lei		
23	Manual hydraulic hammer	Material	buc		0 lei		0 lei		
24	Hydraulic chainsaw	Material	buc		0 lei		0 lei		
25	Tipper	Material	buc		0 lei		0 lei		
26	Hydraulic jack	Material	buc		0 lei		0 lei		
27	Hydraulic jack console	Material	buc		0 lei		0 lei		
28	Diesel fuel	Material	l		6 lei		0 lei		
29	Projector	Material	buc		0 lei		0 lei		
31	Building to be demolished	Material	buc		0 lei		0 lei		

All the personnel presented in Table no. VI.1 is employed in the company and the same standard rates would have been paid to them no matter the work undertaken, according to their job description.

The materials are provided by the company so they will not be acquired at a cost per use or be paid at a standard rate, except the diesel fuel which will be bought at the market price.

The building to be demolished is owned by the company and was scheduled to be brought down because of its ineffectiveness, so from its standard price will be deduced the value of the materials presumed to be recovered from its demolishing.

In Table no. VI.3, which depicts the cost breakdown, will be shown the entire funds needed for the project to successfully achieve its goal, specifying that out of the 13.649.120 lei, 7.000.000 lei are needed for the technology and know-how acquirement, 150.000 lei for hiring an advertising company and 26.400 lei for diesel fuel. Also the value of the building to be demolished is 6.000.000 lei out of which will be deduced 5.200.000 lei presumed to result from the recycled materials and 900.000 lei standard cost of a demolition using company's materials, as presented in Table no.VI.2.

Table no. VI.2

Breakdown	Theoretical cost 13.649.120 lei	To be or not to be deduced
Technology	7.000.000 lei	Not to be deduced
Advertising	150.000 lei	Not to be deduced
Building to be demolished	6.000.000 lei	Not to be deduced
Diesel fuel	26.400 lei	Not to be deduced
Materials recycled	5.200.000 lei	To be deduced
Demolition cost	900.000 lei	To be deduced
Wages	472.720 lei	To be deduced
----------	7.076.400 lei	----------
----------	Real cost	----------

Table no. VI.3

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Qtr 2, Apr
1	**1 Promoting an alternate safer non-polluting means for demolishing buildings in crowded areas**	**0 lei**	**Prorated**	**13,649,120 lei**	
2	**1.1 Identify potential beneficiaries that would be interested in acquiring the provided services**	**0 lei**	**Prorated**	**38,360 lei**	
3	1.1.1 Create a presentation summarising the provided product's benefits	0 lei	Prorated	1,680 lei	
4	1.1.2 Acquire a list with all the current stakeholders	0 lei	Prorated	560 lei	
5	1.1.3 Look for new possible beneficiaries bound to the current stakeholders	0 lei	Prorated	12,040 lei	
6	1.1.4 Do a market research in order to find other beneficiaries that might be interested in the provided service	0 lei	Prorated	24,080 lei	
7	**1.2 Establish the beneficiaries network**	**0 lei**	**Prorated**	**8,120 lei**	
8	1.2.1 Outline the ties between the existing stakeholders and other possible beneficiaries	0 lei	Prorated	3,360 lei	
9	1.2.2 Identify means of comunicating service's outcome to possible beneficiaries	0 lei	Prorated	3,360 lei	
10	1.2.3 Inform the possible beneficiaries of the service you will provide	0 lei	Prorated	1,400 lei	
11	1.2.4 Review the interested beneficiaries list	0 lei	Prorated	0 lei	
12	**1.3 Buy/lease the technology, materials and the know how**	**0 lei**	**Prorated**	**7,131,720 lei**	
13	1.3.1 Contact the technology provider	0 lei	Prorated	2,800 lei	
14	1.3.2 Negociate the terms of a contract	0 lei	Prorated	112,120 lei	
15	1.3.3 Review the terms of the negotiated contract	0 lei	Prorated	0 lei	
16	1.3.4 Buy/lease the technology, materials and know how	7,000,000 lei	Prorated	7,016,800 lei	
17	**1.4 Train the personnel into using the acquired technology**	**0 lei**	**Prorated**	**117,400 lei**	
18	1.4.1 Establish the number employees needed to operate the technology	0 lei	Prorated	5,200 lei	
19	1.4.2 Hire/promote the additionally needed personnel	0 lei	Prorated	11,400 lei	
20	1.4.3 Apply the terms of the previously negociated contract to train the personnel	0 lei	Prorated	100,800 lei	
21	**1.5 Hire an advertising and marketing company to promote the provided services to the interested beneficiaries**	**0 lei**	**Prorated**	**274,960 lei**	
22	1.5.1 Set up a price range for the newly provided services	0 lei	Prorated	24,000 lei	
23	1.5.2 Identify the right advertising and marketing company to promote the services	0 lei	Prorated	5,600 lei	
24	1.5.3 Contact the advertising and marketing company	0 lei	Prorated	840 lei	
25	1.5.4 Negociate the terms of a contract	0 lei	Prorated	69,600 lei	
26	1.5.5 Review the terms of the negotiated contract	0 lei	Prorated	0 lei	
27	1.5.6 Hire the advertising and marketing company to develop an advertising campaign	150,000 lei	Prorated	155,320 lei	
28	1.5.7 Use the advertising material	0 lei	Prorated	19,600 lei	
29	**1.6 Demonstrate newly acquired techcnology's use**	**0 lei**	**Prorated**	**6,078,560 lei**	
30	1.6.1 Organise a demonstrative demolition	0 lei	Prorated	40,800 lei	
31	1.6.2 Review the preparations made for the demonstrative demolition	0 lei	Prorated	0 lei	
32	1.6.3 Execute a demonstrative demolition	6,000,000 lei	Prorated	6,037,200 lei	
33	1.6.4 Present the price range for the services provided to the beneficiaries	0 lei	Prorated	560 lei	

VII. Quality management plan

Project's outcome will be quantifiable if the identified beneficiaries acquire the promoted services. In order to enhance that possibility the project has to successfully reach all the milestones and not to exceed the budged allocated as well as not taking any unnecessary risks which might endanger achieving its goal.

The project manager has the entire responsibility for the quality assurance as he has to be immersed into the project development and overview each and every step taken.

Table no. VII.1 will provide the deliverables and their acceptance criteria.

Table no. VII.1

Deliverable	Acceptance criteria
A presentation summarizing product's benefits.	It offers more than three critical advantages than the conventional product.
A network of possible beneficiaries.	It goes at least to a tertiary level of possible beneficiaries and it also includes public administrations and non-governmental organizations.
Acquiring the technology and know-how.	The signed contract provides complete access to technology's blueprints. The trainees have to be trained intensive in order to be able to train others after enough practice in the field.
Hire an advertising and marketing company.	The promotion campaign will take place for 70 days and the ads will be posted in national and local media, as well as on the project's web site.
Demolish one of company's buildings that were scheduled to be brought down.	The value of the materials recycled from demolition and the proper demolition to be at least equal to the current value of the building.
Price range's presentation.	Present all the achievements of using the promoted service.

VIII. Project risk management

The project risk management is depicted in Table no. VIII.1 and can be interpreted with the help of Chart no. VIII.1, both presented below.

Table VIII.1

Risk conditions	Risk description	Impact	Probability	Importance	Risk mitigation strategy
Major changes in company's structure	To overlook any important outcome for key beneficiaries	2	3	6	To review the benefits presentation and the stakeholders, key beneficiaries and secondary beneficiaries lists by the project manager
	To omit any key stakeholder	2	2	4	
	Not to identify all the key beneficiaries	4	3	12	
	Not to identify all the secondary beneficiaries tied to the key ones	4	3	12	
Natural disasters that might affect the company	The funds for technology acquisition to be cut/reduced	5	2	10	Verify if the insurance covers any possible natural disasters
Inadequate contract negotiation with the technology provider	To overlook the need to assign new positions inside the company in order to operate the newly acquired technology	5	4	20	A good documentation regarding company's future structure after technology's acquirement
	Not to train all the needed personnel in order to properly operate the newly acquired technology	5	3	15	
Faulty search for an advertising and marketing company	Choosing an improper advertising and marketing company	5	4	20	Hire a company that was hired before with success
Inadequate contract negotiation with the advertising and marketing company	Misinform the advertising company regarding the services to be promoted	5	3	15	Keep a continuous contact with the advertising company, reviewing every step taken
	Poorly promote the services	5	4	20	
Natural disasters that might affect the company	The funds for advertising to be cut/reduced	5	2	10	Verify if the insurance covers any possible natural disasters
Faulty internal auditing	To poorly communicate the price range to the beneficiaries	5	3	15	Review the ongoing auditing and correct any problem when it appears

Chart no. VIII.1

Risk Assessment Matrix

Using the Risk Assessment Matrix.
When assessing a risk for the first time you should assume there are no controls already in place. The subsequent two assessments are completed with 1) those controls already in place and 2) with any additional controls needed to reduce the risk further. The assessor should assign values for the identified 'likelihood' of occurrence (A) and the severity of the 'Impact' (B). By multiplying 'A' and 'B' together you get the rating score, which gives an indication of how important the risk is. The thick black line is the "line of tolerance". Those risks that are plotted above the line (score 10 – 25) are "out of tolerance" and should be referred to CRMG for further consideration.

LIKELIHOOD (A)	Insignificant 1	Minor 2	Significant 3	Major 4	Critical 5
Very Likely 5	5	10	15	20	25
Likely 4	4	8	12	16	20
Feasible 3	3	6	9	12	15
Slight 2	2	4	6	8	10
Very unlikely 1	1	2	3	4	5
	IMPACT (B)				

Green = Low risk, Amber 9 = Medium risk, Amber 10 –12 high risk, Red = High risk

Likelihood of Occurrence (A)	**Severity of Impact (B)**
1- Very unlikely (hasn't occurred before)	1 - Insignificant (have no effect)
2 - Slight (rarely occurs)	2 - Minor (little effect)
3 - Feasible (possible, but not common)	3 - Significant (may pose a problem)
4 - Likely (has before, will again)	4 - Major (Will pose a problem)
5 - Very Likely (occurs frequently)	5 - Critical (Immediate action required)

IX. Project closeout

Looking into the near future we can positively say that the method used for demolishing buildings, supported by this project is the one that will monopolize the construction market. The question that remains is who will first seize the technology.

CHANGING THE X FAMILY'S HOUSE'S ROOF

Gabriel MOVILEANU

CONTENTS

CHANGING OF X FAMILY'S HOUSE'S ROOF

Project sponsor: X FAMILY

INTRODUCTION

The company ABC, based in A town, is a construction company founded in 1992. Its area of activity is building new houses, blocks of flats and also light industrial buildings.

In the last two years, the company's turnover has slightly decreased and now it looks for new opportunities.

I. BUSINESS CASE

X family has addressed to our company to contract us for changing the roof of their house in A town, the same as our company's location.

Present situation

Last year, an unusually summer storm with hail has seriously damaged many buildings in A town's area. This storm almost destroyed the northern part of the X family's house's roof.

In the next weeks, X family has made couple emergency repairs to the roof by replacing the affected tiles with others. But the replacement tiles were second hand and not from the same type like those that were replaced.

As a consequence, X family has had to face with many rain water leaks beneath the roof and a lot of cracked tiles over the winter which, unrepaired, will conduct to more other problems (more rain water under the roof, ceiling and furniture deterioration and even danger of injury for the inhabitants).

The original roof of the house has been made 60 years ago, with the cheapest materials at that time. Now, the roof is made from two types of different old style tiles that are not only obsolete and at the end of their life cycle (70 years[11]), but also in bad condition.

Perspectives

X family wants a new roof for their house, built from new materials, with better thermal characteristics and new format in order to improve the life conditions in their house. They also want to solve the problem of cracked tiles over the winter because the effort to maintain the old roof and all related issues has increased in the last four years.

[11] Construction materials – V. Gheorghe and others, Technical Publishing house, 1978

Their house is located in an area with many new houses, with modern design and they want to have a house which fits better among the others.

Opportunities

Taking into account X family's desire to have a refurbished house, the roof change is just the first step. Once the roof will be replaced, they will start planning new changes to their house.

The change of their house's roof is a chance for our company to have a future contract with them because, after finishing the replacement, they will have more thrust in our team and our skills to meet their needs.

Also, taking this contract and finishing it on standards (national standards and the standards recommended by the manufacturer of the main materials for the roof), it will constitute a good promotion among all the citizens from A town area who have met the same situation with their houses (roofs deteriorated due to last year hail storm or with old houses).

Although in A town area there are two more other construction companies, they are much smaller then us and they are focused on building new houses rather than repairing old ones. In the same time, they do neither have their own design office nor the supply department (which will raise their cost of production by contracting these services with other companies).

To accomplish the contract, we will use our internal resources (one team of construction and its own general tools and devices) and the expertise from our internal departments (technical, supply, accounting, designing, quality assurance). The project is made in a collective manner.

This project is important for our company because it is a first step in developing a new activity (constructions repairs) and it covers a real need in A town area. If we don't take the project, X family will find other solution to change the roof of their house and we will miss the opportunity to be the first on the market with this type of service in an area that is so close to us.

Assumption

Taking in consideration the goal of the project, to obtain construction approval will be necessary just technical documentation with a small fee (less than 1000 lei). Otherwise, by the contract, the customer will be in charge with obtaining construction approval and paying the fee (our company will draw up just technical documentation to be submitted).

After acceptance of the project by the head of the company, the ABC company manager will assign a project manager from the Sales department personnel and all the board of the company will be informed in a short briefing about the general data regarding this project: the goal, its importance and the opportunities for the future and the name of project manager. In the end of the briefing, the board of the company will assign personnel from their departments

as project team members. The briefing will take place before the evaluation of the X family's house.

The X family's request for roof changing is resolute and the customer will sign the contract.

ABC Company uses 15% rate of overhead from the total cost of work and materials procured for the construction and used to accomplish the project.

ABC Company uses contingency sum as 3% from the total value of materials procured for the construction and used to accomplish the project.

The supplier will deliver all the requested materials at the customer's location, free of charge (usual offer for materials with a value more than 10.000 lei, at a distance less than 30 km).

After signing the reception form by the customer and receiving the last rate of payment, the project results will be analysed by the board of the company in a meeting with the personnel assigned to the main positions of the project team.

Time frame

The project has a total working time of 37 days with 17 days time to receive approvals. It is scheduled to start on 16 May 2013 and to finish on 05 July 2013.

II. SCOPE MANAGEMENT PLAN

II.1 GOAL

The project goal is to change the house's roof of X family.

II.2 OBJECTIVES

The project objectives are:

- Project manager (PM) will sign the contract with X family by 20 May 2013.
- Project manager (PM) will obtain approval for starting construction from local authorities by 19 June 2013.
- The PM will make necessary arrangements in accordance with customers' requirements to have all the materials necessary for the roof supplied to the X family's house by the supply department not later than 21 June 2013.
- The execution department will install the new roof on X family's house, following the standards of the manufacturer of main materials for the chosen solution of the roof by 5 July 2013.

II.3 WORK BREAKDOWN STRUCTURE (WBS)

The activities and sub-activities for the above established objectives are:

O1. Project manager (PM) will sign the contract with X family by 20 May 2013

1. Sign the contract with X family

   1.1 Meet the X family to present different solutions for the roof

1.1.1 Survey the house and the roof

1.1.2 Measure the roof and the related elements

1.1.3 Present the technical solutions and materials to X family

1.1.4 Set a draft of the final offer with X family

1.2 Establish two final offers based on technical requirements and existing materials from the market

1.2.1 Meting with project team

1.2.2 Set the final technical solution for the roof consulting the company's technical expert

1.2.3 Set two suppliers of construction materials by consulting company's commercial department

1.2.4 Set two drafts of the contract (one for each supplier)

1.3 Meet the X family to sign the contract

1.3.1 Present to X family both draft contracts

1.3.2 Sign the final contract

O2. Project manager (PM) will obtain approval for starting construction from local authorities by 19 June 2013

2. Obtain the approval for construction

2.1 Draw up the technical project

2.2 Submit the documentation for roof changing to competent authorities

2.3 Submit the request for scrap materials disposal

2.4 Receive the approval for roof changing

2.5 Receive the approval for scrap materials disposal

2.6 Inform the X family about receiving approvals

O3. The PM will make necessary arrangements in accordance with customers' requirements to have all the materials necessary for the roof supplied to the X family's house by the supply department not later than 21 June 2013

3. Supply the construction materials

3.1 Sign contract with supplier for construction materials

3.2 Inform the X family about the date of materials delivery

3.3 Receive the first rate of payment from the X family

3.4 Receive the materials at X family's house

3.5 Pay the materials to the supplier

O4. The execution department will install the new roof on X family's house, following the standards of the manufacturer of main materials for the chosen solution of the roof by 5 July 2013

4. Install the new roof
    4.1 Set the site organization
        4.1.1 Perform work safety training
        4.1.2 Set the place for storing new materials
        4.1.3 Set the place for storing old tiles
        4.1.4 Set the place for scrap materials
        4.1.5 Set the ways of access
    4.2 Remove the old cover of the roof
        4.2.1 Install the scaffolding
        4.2.2 Remove the old tiles
    4.3 Install the new roof
        4.3.1 Make necessary repairs to the wooden structure of the roof
        4.3.2 Install new roof
    4.4 Clean the place
        4.4.1 Collect all scrap materials and transport them to the place of disposal
        4.4.2 Remove the scaffolding
    4.5 Close the contract with X family
        4.5.1 Sign de reception form
        4.5.2 Receive the last rate of payment
        4.5.3 Project close out

The time line for the project is provided in Appendix 3.

III. TIME MANAGEMENT PLAN (GANTT CHART)

The starting date for the project is 16 May 2013 and the end date is 5 July 2013. The project has couple key points (milestones) that could influence the duration of the project:

- signing the final contract with the customer (20 May 2013);
- receiving approval for scrap materials disposal (23 May 2013);
- receiving approval for roof changing (18 June 2013);
- signing the reception form (05 July 2013).

The time management diagram (Gantt chart) for the project activities is provided in Appendix 4.

IV. HUMAN RESOURCE MANAGEMENT

The project of replacing the roof of X family's house uses a team of constructors and experts from our company's departments. They are assigned to work in this project for certain

period of time (to accomplish specific tasks), as we can see in table 1 (Linear responsibility chart of project management relationships).

The personnel involved in this project and the structure of the relationship among them are illustrated in figure 1 (Team project structure).

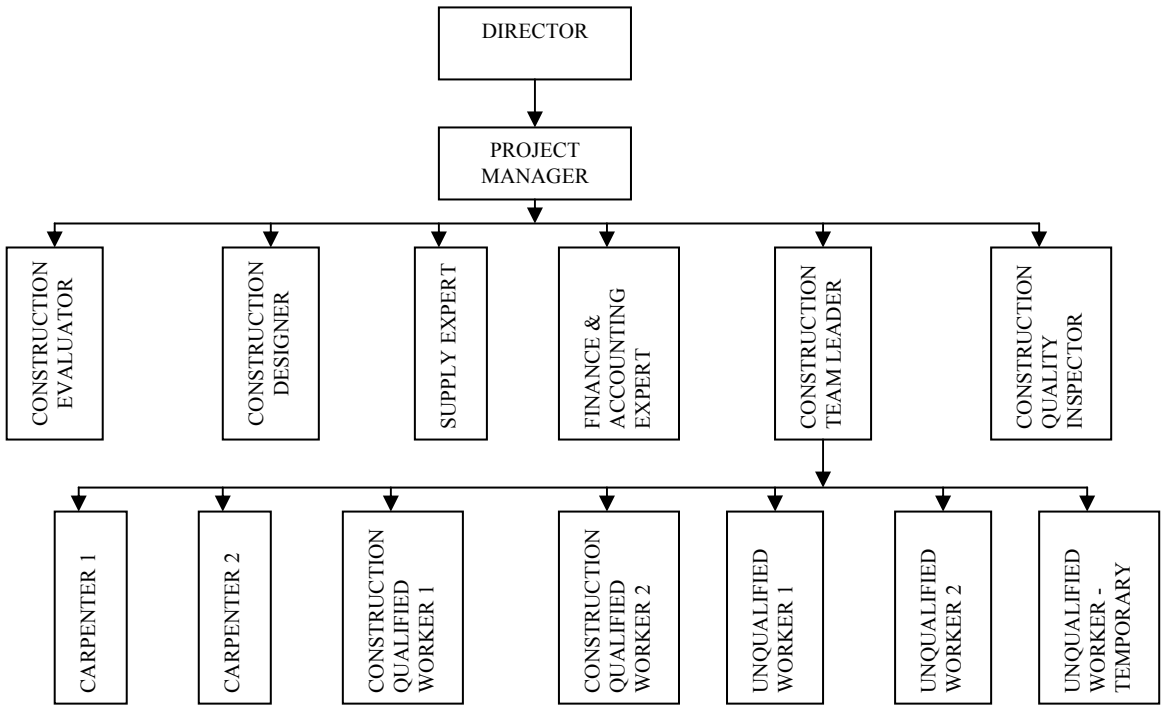


Figure 1 Team project structure

Project team assignment

To obtain a good project team, the board of the company will take into account when defining the team the behavior of the proposed individuals from their departments, if they have ever worked in the same team, if they know each other and the relationships not only among them but also with project manager.

For a successful project it is necessary to have, as much is possible, team members that know each other and that have no conflicts among them, all the more so as this project is a pilot project and its success will open new opportunities for ABC Company.

Motivation policy

In the meetings with the project personnel (activity 1.1.2.1 with project board and in informal meeting with construction team members) project manager and construction team leader will explain the opportunities that this project will open for the ABC company (entrance on house refurbishing market in A town area) and how this will influence the benefits of ABC employees: more contracts with reduced construction time involve more work hours for them resulting in more income for each employee.

The project manager will emphasize that commitment to the schedule and sticking on the technical procedures will assure not only customer needs satisfaction at highest standard but also a good image for the company on the market resulting in more contracts.

Objective **Type of employee**	**Sign the contract with X family**	**Obtain the approval for construction**	**Supply the construction materials**	**Install the new roof**
Director	1	2, 6	6	6
Project manager	2, 3, 6	3, 6	2, 6	2, 6
Construction evaluator	3	5	5	5
Construction designer	3, 6	3		
Supply expert	4, 6	6	3	5
Finance & accounting expert	5	6	3, 6	3, 6
Construction team leader	5	6	6	3
Construction Q.A. inspector	6	6	5	3, 6
Carpenter				3, 6
Construction qualified worker				3, 6
Unqualified worker			3, 6	3, 6

Table 1 Linear responsibility chart of project management relationships

Legend: 1: approval authority; 3: execute; 5: may be consulted;
2: general supervision; 4: must be consulted; 6: must be notified.

V. COMMUNICATIONS MANAGEMENT

To assure a good communication among the project team members and with the customer, with the supplier and with the local authorities will be used the next technical means and channels:

- oral communication via telephone, direct report, presentation, informal discussions/meetings (using telephones, projectors and related equipment);
- written communication via email or written official request to the authorities (using computers and related equipment).

The communication matrix containing the information about communication channels, timeline, communication means and included data is presented in table 2 (Communication matrix).

Target audience	Person(s) to convey the message	When the message is conveyed	Format of the message	Message content
Director	PM	- at the end of 1.2.5, 1.4.3.2 and 1.4.5.2 activities	- direct report	- the status of activity
	FA	- before and after each operation in company's account	- direct report	- the reason of operation and its value
Project manager	CD, SE, FA, CTL, QA	- at the end of each activity the stakeholders are involved in, daily for multiple-days activity and in the moment of unusual situation occurrence	- email and telephone	- the status of activity
Construction evaluator	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
Construction designer	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
		- at the end of 1.1.3.2 activity	- informal discussion and email	- status of activity and request for next working step
Supply expert	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
		- at the end of 1.1.3.2 activity	- telephone and email	- information about project status and request for next working step
Target audience	**Person(s) to convey the message**	**When the message is conveyed**	**Format of the message**	**Message content**
Finance & accounting expert	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
		- at the end of 1.3.2 activity	- telephone and email	- information about signing the supply contract and date of first rate payment
		- at the end of 1.3.4 activity	- telephone and email	- information about materials delivery and

				request for next working step
		- at the end of 1.4.5.1 activity	- telephone and email	- information about signing the reception form
Construction team leader	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
		- at the end of 1.2.5 and 1.3.2 activities	- telephone and email	- information about project status and request for next working step
Construction Q.A. inspector	PM	- during 1.1.2.1 activity	- presentation	- general data about project and schedule and personnel duties
	CTL	- before finishing any stage defined in technical project as check point	- telephone and email	- end date for the stage
Carpenter	CTL	- at the end of 1.1.2.1 activity	- informal meeting	- general data about project and schedule and personnel duties
		- one day before each activity C is involved in	- telephone or informal meeting	- status of activity and request for next working step
Construction qualified worker	CTL	- at the end of 1.1.2.1 activity	- informal meeting	- general data about project and schedule and personnel duties
		- one day before each activity CQW is involved in	- telephone or informal meeting	- status of activity and request for next working step
Unqualified worker	CTL	- at the end of 1.1.2.1 activity	- informal meeting	- general data about project and schedule and personnel duties
		- one day before each activity UW is involved in	- telephone or informal meeting	- status of activity and request for next working step
Target audience	**Person(s) to convey the message**	**When the message is conveyed**	**Format of the message**	**Message content**
Customer	PM	- one day before any meeting at the CO location	- telephone and email	- general information to establish the

				appointment
		- at the moment of obtaining approvals (established in Gantt chart)	- telephone and email	- status of the project and ask for the first rate payment
	CTL	- daily, after the beginning of the activity at CO house	- informal meeting	- status of the project
Supplier	SE	- at the end of 1.1.3.2 activity	- telephone	- the decision to start contract its services for supply
Local authorities	PM	- after elaboration of legal documentation to be submitted	- submit the legal documentation directly to the local authorities	- requested documentation for construction approval and scrap materials disposal according legal regulation

Note: The activities' codes used in the above table are from Gantt chart.

Table 2 Communication matrix

Legend: D – director; PM – project manager; CD – construction designer; SE – supply expert; FA – finance & accounting expert; CTL – construction team leader; QA – construction Q.A. inspector; C – carpenter; CQW – construction qualified worker; UW – unqualified worker; CO – customer; S – supplier.

VI. PROJECT COST MANAGEMENT

VI.1 Resource pool description

To accomplish the goal of this project ABC Company will use its own personnel, tools and devices. Only consumable materials will be procured from the market by a local supply contractor.

The resources are presented in the table 3.

Resource type	Resource name	Resource quantity
Human resource (individuals)	Project manager	**1**
	Construction evaluator	**1**
	Construction designer	**1**

	Supply expert	**1**
	Finance & accounting expert	**1**
	Construction team leader	**1**
	Construction quality inspector	**1**
	Carpenter	**2**
	Construction qualified worker	**2**
	Unqualified worker	**2**
	Unqualified worker - temporary	**1**
Equipment (units)	Tape measure	**2**
	Computer with INTERNET	**2**
	Printer	**2**
	Mobile phone	**3**
	Fixed phone	**2**
	Hammer	**3**
	Electric shears	**1**
	Chainsaw	**1**
	Lever	**1**
	Axe	**1**
	Pliers	**2**
	Ladder	**1**
	Scaffolding	**1**
	Pen	**4**
	Van	**1**
	Car	**1**
	Flashlight	**1**
	Projector	**1**
Materials	Timber (m^3)	**3**
	Slat (piece)	**135**
	Main material (m^2)	**150**
	Paper (leafs)	**117**
	Marking tape (roll)	**1**
	Nails (kg)	**19**
	Fuel (l)	**67**

Table 3 Resource pool description

Consumable materials used inside the company, for its normal functioning, but also related with the project (tonner used to print project documents, electrical power and so on) are not in the above table and they will be counted apart in a general cost of 15% from the total cost of work and all the other materials procured from the market and will be invoiced to the customer. This supplementary cost (overhead) will include also the liquidation of the tools and devices that belong to the company and are used to accomplish the project.

VI.2 Cost breakdown structure

The use of resources for each stage of the project will generate costs for every activity. Also costs will be distributed among resources types. The distribution of costs for each activity (cost breakdown structure) is presented in Appendix 1 and the cost for each resource is presented in Appendix 2.

The total cost of the project is 31.237,17 lei and it contains different categories of costs:

- direct cost (work + equipment + materials) = 26.472,17 lei;
- contingency sum (3% from materials cost) = 794,17 lei;
- overhead cost (15% from direct cost) = 3.970,83 lei.

They are presented also in Appendix 1.

VII. PROJECT QUALITY MANAGEMENT

VII.1 Project quality definition

The goal of this project is to replace the old fashion and deteriorated roof of X family's house with a new one, made with new technology and with a shape and color that will fit better with the general design of all the houses from their area of living.

The desired roof has following quality criteria agreed by the customer:

- made from new materials that are in use now, with proven quality (new model of tiles or metal tiles that have already been used on other constructions in the customer area for at list 5 years with no repairs);
- after removing the old roof, all the wooden structure will be inspected, modified and repaired as requested in order to provide necessary structure for the new roof and to assure that all the decayed material will be replaced;
- all the work will be made according ABC company internal procedures, in respect of national construction standards and following the guideline recommended by the manufacturer of the main material (the manufacturers used to give to the customer, for each main material sale, a guide of good practice for installation);
- at the end of the work, will be no scrap materials remained neither on the roof nor in the garret or in the courtyard of the house.

VII.2 Key quality concepts measurement

Efficiency

The ABC Company provides to the customer a new roof in a timely manner, with no delays produced by the company's fault. The new roof will assure protection for the house for more than 30 years with no additional cost of maintenance, as proven by the chosen solution used in other countries in northern part of Europe.

Professionalism

ABC Company uses internal construction procedures according to national construction standards (the company was accredited by National Inspectorate for Construction last year) and has specialists that attended courses with the experts of new construction materials manufacturers in order to keep up with new materials and new installing procedures that are on market in the present in Romania.

Individual orientation

The solution for the roof, the type and the color of the material were chosen together with the client, taking into account not only to obtain a good roof but also to respect the customer's desire for a modern design that suites better in his area.

Reliability

ABC Company has a well known good reputation on market not only because of the quality of the services we offer but also because of its warranty policy. For this roof we offer a 15 years warranty period for the installing procedure and we work with manufacturers that offer materials with more than 30 years warranty period for their products.

VII.3 List of deliverables and acceptance criteria

In the next table (table 4) are listed the deliverables of the project and their acceptance criteria:

Deliverables	**Acceptance criteria**
Technical design of the roof	In accordance with ABC company's standards
Documentation for construction approval	Documentation approved by the authorities with no delays due to missing or wrong contain
Supply with construction materials	The supply is performed with the requested materials, with no delays and materials are in good condition
Organizing the working space	There are different areas designated for new materials disposal, old tiles disposal, scrap materials disposal and ways of access that do not interfere with the normal access in / out of the house
Old roof removed	All the tiles and retaining elements removed before the week end and house protected against rain
Deliverables	**Acceptance criteria**
Wooden structure of the roof	Replacing all deteriorated wooden structure

repaired	
New roof installed	New roof in place, following manufacturer's guidelines, with no delays
Lessons identified	The identified lessons to be applicable to a next project of the same type

Table 4 Project deliverables and acceptance criteria

VII.4 Quality planning and control (activities and responsible persons)

The activities for planning and control the quality are provided in the next table (table 5):

Quality phases	Activity	Responsible person
Planning	Establish quality concepts for the project	Project manager
	Establish project deliverables and acceptance criteria	Project manager
	Establish key points for control	Construction quality inspector
Control	Check the technical design	Construction quality inspector
	Check the documentation for construction approval	Construction quality inspector
	Check the supply	Supply expert
	Check the old tiles removing	Construction quality inspector
	Check the repairs to wooden structure	Construction quality inspector
	Check the installing of new roof	Construction quality inspector

Table 5 Quality planning and control

VIII. Project risk management

VIII.1 List of risks and strategies for tackling

For this project, risks could be caused by the weather or by resources, legal, scope or financial issues. The main risks identified for the project and the strategies to tackling them are presented in table 6.

Type of risk	Risk description	Impact	Probability	Importance (impact x probability)	Risk mitigation strategy
Weather	Rain and / or strong wind (**R1)**	4	4	16	- Changing the start date of construction after discussing the weather forecast with customer; - Having in contract an amendment to delay the acceptance date with the period of bad weather.
Resource	Temporary lack of construction materials (**R2)**	4	2	8	- Choosing alternate supplier; - Contract amendment for additional costs (up to 15%) and material type change.
	Employees temporary unavailability (**R3)**	3	2	6	- Using other personnel from the same compartment; - Extending the working time within contract limits.
	Delay in first rate payment by the customer (**R4**)	4	2	8	- Delaying the supply process based on contract amendment.
Legal	Delay in construction approval (**R5)**	5	2	10	- A proper technical documentation submitted to local authorities.
	Delay in scrap materials disposal approval (**R6)**	2	1	2	- Dispose the scrap materials in customer's courtyard.
Scope	Changes required by the customer (**R7)**	4	3	12	- Negotiate with the customer new amendment to the contract for additional funds

					and time. - Computer simulation presented to the customer.
Financial	Customer does not pay the last rate (**R8)**	4	2	8	- First rate will cover not only the whole price of construction materials but also 40% of total cost plus profit - For the rest of the payment ABC Company will assume the risk

Table 6 Risks and strategies for tackling

The risks impact has five levels: 1- insignificant (no effect); 2 – minor (little effect); 3 – significant (may pose a problem); 4 – major (will pose a problem); 5 – critical (immediate action required). The probability of occurrence has also five levels: 1 – very unlikely (hasn't happen before); 2 – slight (rarely occurs); 3 – feasible (possible, but not common); 4 – likely (has before, will again); 5 – very likely (occurs frequently).

VIII.2 Risks assessment matrix

In graphic format, the representation of impact and the probability of occurrence are provided in the figure 2. In the field of the matrix there are presented the importance of risks and the risks of this project (R1 – R 8). Green means low risk, yellow means medium risk and red means high risk.

The meanings of probability of occurence and impact values are the same like for the table 6.

VIII.3 Strategies for tackling

The first three major risks are:

- weather change (rain and / or strong wind);
- changes required by the customer;
- delay in construction approval.

Weather change is the most common cause of construction projects delays because strong wind and rain do not allow the work outside the construction (danger of death or serious injuries to the personnel). In our case, this risk could be reduced by establishing a starting date for the construction after consulting the weather forecast and having the acceptance from the customer.

If bad weather conditions occur, by the contract, constructor will reschedule the work starting with the first day with good weather conditions.

In many cases, after work begins, customer asks for changes to the initial design or he wants to add additional tasks to the initial project, tasks that have to be accomplished before finishing the genuine project. To minimize this risk, after we will have the technical solution for the project, we will present a computer simulation to the customer and we can adjust the solution on customer request.

If any change will still be requested by the customer, by the contract the customer will take responsibility for the delays of the project.

Sometimes, because of changes in legislation, the documentation submitted for construction approval is not correct. To solve this problem, we have permanent contact with the local authorities and we are aware about the latest changes in documentation. To assure we submit the correct technical documentation we will double check it at the submitting date with the local authority expert and we have a half of day like spare time to correct discrepancies, if any.

LIKELIHOOD (PROBABILITY)						
	Very Likely 5	**5**	**10 (R5)**	**15**	**20**	**25**
	Likely 4	**4**	**8 (R2,R4, R8)**	**12**	**16 (R1)**	**20**
	Feasible 3	**3**	**6 (R3)**	**9**	**12 (R7)**	**15**
	Slight 2	**2 (R6)**	**4**	**6**	**8**	**10**
	Very Unlikely 1	**1**	**2**	**3**	**4**	**5**
		Insignificant 1	**Minor 2**	**Significant 3**	**Major 4**	**Critical 5**
		IMPACT				

Figure 2 Risk assessment matrix

IX. PROJECT CLOSEOUT

After finishing the roof changing, cleaning the place and having a short overview on the entire roof, the customer and the project manager will sign the reception form and the customer will pay the last rate of the contract.

In the same day, the board of the company will meet the persons who were assigned to the main positions of the project team. The purpose of this meeting is to inform the board of the company about the immediate results of the project in terms of time, money and planning and conducting the work, in order to make a decision of continue this project and to adjust the planning process according the results.

Further analyses will take place in the company in order to check if these projects could develop in a framework.

APPENDIX 1

Resource type	Resource name	Cost per unit	Cost of the resource	Total cost of the resource
Human	Project manager	17.00 lei/hr	380.80 lei	8,251.66 lei
	Construction evaluator	16.00 lei/hr	115.20 lei	
	Construction designer	16.00 lei/hr	224.00 lei	
	Supply expert	14.00 lei/hr	240.80 lei	
	Finance & accounting expert	14.00 lei/hr	128.80 lei	
	Construction team leader	13.00 lei/hr	1,233.60 lei	
	Construction quality inspector	14.00 lei/hr	275.31 lei	
	Carpenter	12.00 lei/hr	2,076.80 lei	
	Construction qualified worker	12.00 lei/hr	1,849.25 lei	
	Unqualified worker	10.00 lei/hr	1,647.10 lei	
	Unqualified worker - temporary	10.00 lei/hr	80.00 lei	
Equipment	Tape measure	0.00 lei/hr	0.00 lei	0.00 lei
	Computer with INTERNET	0.00 lei/hr	0.00 lei	
	Printer	0.00 lei/hr	0.00 lei	
	Mobile phone	0.00 lei/hr	0.00 lei	
	Fixed phone	0.00 lei/hr	0.00 lei	
	Hammer	0.00 lei/hr	0.00 lei	
	Electric shears	0.00 lei/hr	0.00 lei	
	Chainsaw	0.00 lei/hr	0.00 lei	
	Lever	0.00 lei/hr	0.00 lei	
	Axe	0.00 lei/hr	0.00 lei	
	Pliers	0.00 lei/hr	0.00 lei	
	Projector	0.00 lei/hr	0.00 lei	
	Ladder	0.00 lei/hr	0.00 lei	
	Scaffolding	0.00 lei/hr	0.00 lei	
	Pen	0.00 lei/hr	0.00 lei	
	Van	0.00 lei/hr	0.00 lei	
	Car	0.00 lei/hr	0.00 lei	
	Flashlight	0.00 lei	0.00 lei	
Materials	Timber	500.00 lei	1,500.00 lei	18,220.51 lei
	Slat	8.00 lei	1,080.00 lei	
	Main material	100.00 lei	15,000.00 lei	
	Paper	0.03 lei	3.51 lei	
	Marking tape	35.00 lei	35.00 lei	
	Nails	7.00 lei	133.00 lei	
	Fuel	7.00 lei	490.00 lei	
Direct costs (human+equipment+materials)				26,472.17 lei
Contingency sum (3% from total materials cost)				794.17
Overhead cost (15% from direct costs)				3,970.83
Total cost (direct cost+contingency sum+overhead costs)				31,237.17 lei

APPENDIX 2

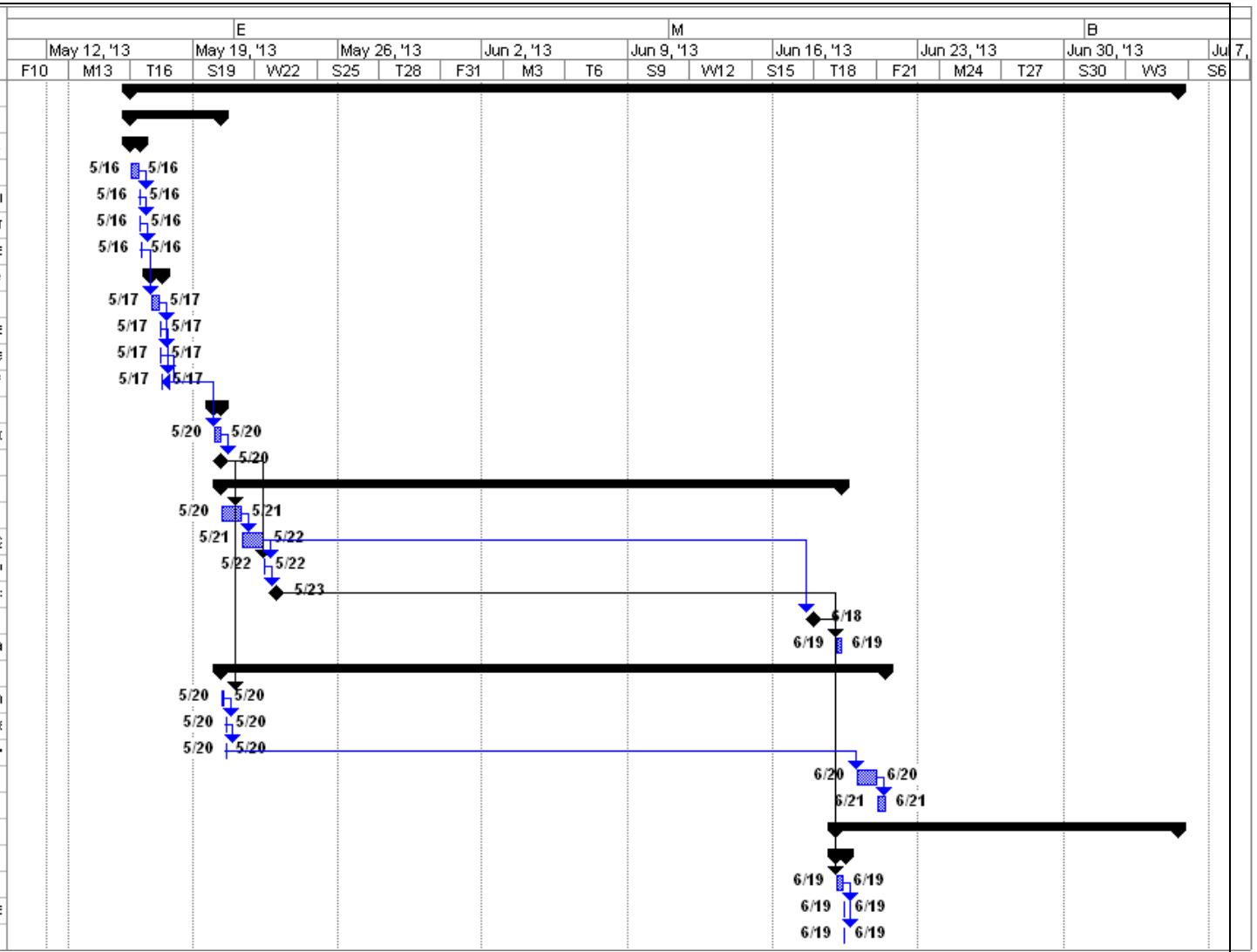
Activity code	Name of activity	Duration	Start	Finish	Cost
1	Changing the roof of X family's house	36.48 days	16-May-13	5-Jul-13	26,472.17 lei
1.1	Sign the contract with X family	2.1 days	16-May-13	20-May-13	406.20 lei
1.1.1	Meet the X family to present different solutions for the roof	0.4 days	16-May-13	16-May-13	120.65 lei
1.1.1.1	Survey the house and the roof	0.15 days	16-May-13	16-May-13	60.90 lei
1.1.1.2	Measure the roof and the related elements	0.1 days	16-May-13	16-May-13	26.46 lei
1.1.1.3	Present the technical solutions and materials to X family	0.1 days	16-May-13	16-May-13	26.46 lei
1.1.1.4	Set a draft of the final offer with X family	0.05 days	16-May-13	16-May-13	6.83 lei
1.1.2	Establish two final offers based on technical requirements	0.55 days	17-May-13	17-May-13	250.65 lei
1.1.2.1	Meting with project team	0.15 days	17-May-13	17-May-13	125.25 lei
1.1.2.2	Set the final technical solution for the roof	0.2 days	17-May-13	17-May-13	52.95 lei
1.1.2.3	Set two suppliers of construction materials	0.2 days	17-May-13	17-May-13	22.55 lei
1.1.2.4	Set two drafts of the contract (one for each supplier)	0.2 days	17-May-13	17-May-13	49.90 lei
1.1.3	Meet the X family to sign the contract	0.1 days	20-May-13	20-May-13	34.90 lei
1.1.3.1	Present to X family both draft contracts	0.1 days	20-May-13	20-May-13	34.90 lei
1.1.3.2	Sign the final contract	0 days	20-May-13	20-May-13	0.00 lei
1.2	Obtain the approval for construction	21.93 days	20-May-13	19-Jun-13	350.95 lei
1.2.1	Draw up the technical project	1 day	20-May-13	21-May-13	128.30 lei
1.2.2	Submit the documentation for roof changing to local authorities	1 day	21-May-13	22-May-13	150.30 lei
1.2.3	Submit the request for scrap materials disposal	0.3 days	22-May-13	22-May-13	47.95 lei
1.2.4	Receive approval for scrap materials disposal	0 days	23-May-13	23-May-13	7.00 lei
1.2.5	Receive the approval for roof changing	0 days	18-Jun-13	18-Jun-13	14.00 lei
1.2.6	Inform the X family about receiving approvals	0.03 days	19-Jun-13	19-Jun-13	3.40 lei
1.3	Supply the construction materials	24.2 days	20-May-13	21-Jun-13	321.61 lei
1.3.1	Sign contract with supplier for construction materials	0.4 days	20-May-13	20-May-13	58.92 lei
1.3.2	Inform the X family about the date of materials delivery	0.03 days	20-May-13	20-May-13	3.40 lei
1.3.3	Receive the first rate of payment from the X family	0.05 days	20-May-13	20-May-13	5.60 lei
1.3.4	Receive the materials at X family’s house	1 day	20-Jun-13	20-Jun-13	213.00 lei
1.3.5	Pay the materials	0.3 days	21-Jun-13	21-Jun-13	40.69 lei
1.4	Install the new roof	12.48 days	19-Jun-13	5-Jul-13	25,393.41 lei
1.4.1	Set the site organization	0.53 days	19-Jun-13	19-Jun-13	305.13 lei
1.4.1.1	Perform work safety training	0.17 days	19-Jun-13	19-Jun-13	155.41 lei
1.4.1.2	Set the place for storing new materials	0.2 days	19-Jun-13	19-Jun-13	40.40 lei
1.4.1.3	Set the place for storing old tiles	0.2 days	19-Jun-13	19-Jun-13	40.40 lei
1.4.1.4	Set the place for scrap materials	0.16 days	19-Jun-13	19-Jun-13	34.46 lei
1.4.1.5	Set the ways of access	0.16 days	19-Jun-13	19-Jun-13	34.46 lei
1.4.2	Remove the old cover of the roof	2.47 days	19-Jun-13	21-Jun-13	1,233.42 lei
1.4.2.1	Install the scaffolding	0.4 days	19-Jun-13	19-Jun-13	169.37 lei
1.4.2.2	Remove the old tiles	1.8 days	20-Jun-13	21-Jun-13	1,064.05 lei
1.4.3	Install the new roof	8.5 days	24-Jun-13	4-Jul-13	23,330.60 lei
1.4.3.1	Make necessary repairs to the wooden structure of the roof	1.5 days	24-Jun-13	25-Jun-13	1,104.80 lei
1.4.3.2	Install new roof	7 days	25-Jun-13	4-Jul-13	22,225.80 lei
1.4.4	Clean the place	0.53 days	4-Jul-13	5-Jul-13	185.86 lei
1.4.4.1	Collect all scrap materials and transport them to the place of disposal	0.23 days	4-Jul-13	4-Jul-13	88.66 lei
1.4.4.2	Remove the scaffolding	0.3 days	4-Jul-13	5-Jul-13	97.20 lei
1.4.5	Close the contract with X family	0.45 days	5-Jul-13	5-Jul-13	338.40 lei
1.4.5.1	Sign de reception form	0 days	5-Jul-13	5-Jul-13	0.00 lei
1.4.5.2	Receive the last rate of payment	0.05 days	5-Jul-13	5-Jul-13	5.60 lei
1.4.5.3	Project close out	0.4 days	5-Jul-13	5-Jul-13	332.80 lei

APPENDIX 3

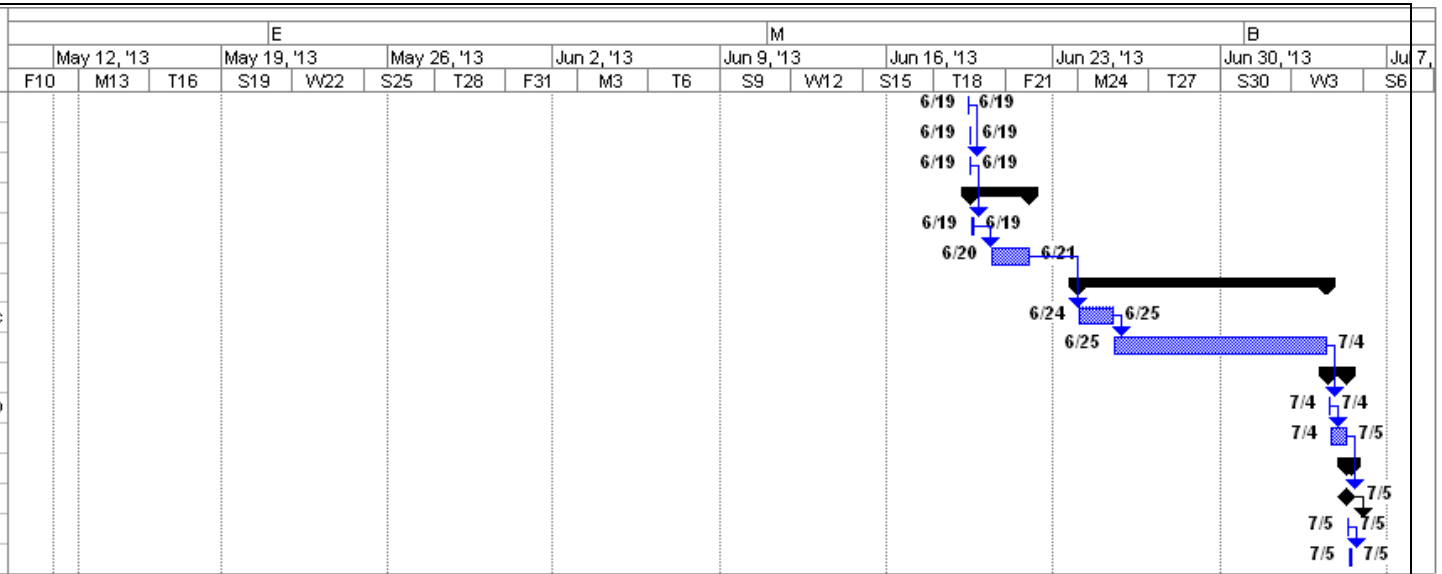
ID	Task Name	Duration	Start	Finish
1	**1 Changing the roof of X family's house**	**36.48 days**	**Thu 5/16/13**	**Fri 7/5/13**
2	**1.1 Sign the contract with X family**	**2.1 days**	**Thu 5/16/13**	**Mon 5/20/13**
3	**1.1.1 Meet the X family to present different solutions for the roof**	**0.4 days**	**Thu 5/16/13**	**Thu 5/16/13**
4	1.1.1.1 Survey the house and the roof	0.15 days	Thu 5/16/13	Thu 5/16/13
5	1.1.1.2 Measure the roof and the related elements	0.1 days	Thu 5/16/13	Thu 5/16/13
6	1.1.1.3 Present the technical solutions and materials to X family	0.1 days	Thu 5/16/13	Thu 5/16/13
7	1.1.1.4 Set a draft of the final offer with X family	0.05 days	Thu 5/16/13	Thu 5/16/13
8	**1.1.2 Establish two final offers based on technical requirements and existi**	**0.55 days**	**Fri 5/17/13**	**Fri 5/17/13**
9	1.1.2.1 Meting with project team	0.15 days	Fri 5/17/13	Fri 5/17/13
10	1.1.2.2 Set the final technical solution for the roof	0.2 days	Fri 5/17/13	Fri 5/17/13
11	1.1.2.3 Set two suppliers of construction materials	0.2 days	Fri 5/17/13	Fri 5/17/13
12	1.1.2.4 Set two drafts of the contract (one for each supplier)	0.2 days	Fri 5/17/13	Fri 5/17/13
13	**1.1.3 Meet the X family to sign the contract**	**0.1 days**	**Mon 5/20/13**	**Mon 5/20/13**
14	1.1.3.1 Present to X family both draft contracts	0.1 days	Mon 5/20/13	Mon 5/20/13
15	1.1.3.2 Sign the final contract	0 days	Mon 5/20/13	Mon 5/20/13
16	**1.2 Obtain the approval for construction**	**21.93 days**	**Mon 5/20/13**	**Wed 6/19/13**
17	1.2.1 Draw up the technical project	1 day	Mon 5/20/13	Tue 5/21/13
18	1.2.2 Submit the documentation for roof changing to local authorities	1 day	Tue 5/21/13	Wed 5/22/13
19	1.2.3 Submit the request for scrap materials disposal	0.3 days	Wed 5/22/13	Wed 5/22/13
20	1.2.4 Receive approval for scrap materials disposal	0 days	Thu 5/23/13	Thu 5/23/13
21	1.2.5 Receive the approval for roof changing	0 days	Tue 6/18/13	Tue 6/18/13
22	1.2.6 Inform the X family about receiving approvals	0.03 days	Wed 6/19/13	Wed 6/19/13
23	**1.3 Supply the construction materials**	**24.2 days**	**Mon 5/20/13**	**Fri 6/21/13**
24	1.3.1 Sign contract with supplier for construction materials	0.4 days	Mon 5/20/13	Mon 5/20/13
25	1.3.2 Inform the X family about the date of materials delivery	0.03 days	Mon 5/20/13	Mon 5/20/13
26	1.3.3 Receive the first rate of payment from the X family	0.05 days	Mon 5/20/13	Mon 5/20/13
27	1.3.4 Receive the materials at X family's house	1 day	Thu 6/20/13	Thu 6/20/13
28	1.3.5 Pay the materials	0.3 days	Fri 6/21/13	Fri 6/21/13
29	**1.4 Install the new roof**	**12.48 days**	**Wed 6/19/13**	**Fri 7/5/13**
30	**1.4.1 Set the site organization**	**0.53 days**	**Wed 6/19/13**	**Wed 6/19/13**
31	1.4.1.1 Perform work safety training	0.17 days	Wed 6/19/13	Wed 6/19/13
32	1.4.1.2 Set the place for storing new materials	0.2 days	Wed 6/19/13	Wed 6/19/13
33	1.4.1.3 Set the place for storing old tiles	0.2 days	Wed 6/19/13	Wed 6/19/13
34	1.4.1.4 Set the place for scrap materials	0.16 days	Wed 6/19/13	Wed 6/19/13
35	1.4.1.5 Set the ways of access	0.16 days	Wed 6/19/13	Wed 6/19/13
36	**1.4.2 Remove the old cover of the roof**	**2.47 days**	**Wed 6/19/13**	**Fri 6/21/13**
37	1.4.2.1 Install the scaffolding	0.4 days	Wed 6/19/13	Wed 6/19/13
38	1.4.2.2 Remove the old tiles	1.8 days	Thu 6/20/13	Fri 6/21/13
39	**1.4.3 Install the new roof**	**8.5 days**	**Mon 6/24/13**	**Thu 7/4/13**
40	1.4.3.1 Make necessary repairs to the wooden structure of the roof	1.5 days	Mon 6/24/13	Tue 6/25/13
41	1.4.3.2 Install new roof	7 days	Tue 6/25/13	Thu 7/4/13
42	**1.4.4 Clean the place**	**0.53 days**	**Thu 7/4/13**	**Fri 7/5/13**
43	1.4.4.1 Collect all scrap materials and transport them to the place of disposal	0.23 days	Thu 7/4/13	Thu 7/4/13
44	1.4.4.2 Remove the scaffolding	0.3 days	Thu 7/4/13	Fri 7/5/13
45	**1.4.5 Close the contract with X family**	**0.45 days**	**Fri 7/5/13**	**Fri 7/5/13**
46	1.4.5.1 Sign de reception form	0 days	Fri 7/5/13	Fri 7/5/13
47	1.4.5.2 Receive the last rate of payment	0.05 days	Fri 7/5/13	Fri 7/5/13
48	1.4.5.3 Project closeout	0.4 days	Fri 7/5/13	Fri 7/5/13

APPENDIX 4

ID	Task Name
1	**1 Changing the roof of X family's house**
2	**1.1 Sign the contract with X family**
3	**1.1.1 Meet the X family to present different**
4	1.1.1.1 Survey the house and the roof
5	1.1.1.2 Measure the roof and the related ele
6	1.1.1.3 Present the technical solutions and r
7	1.1.1.4 Set a draft of the final offer with X fa
8	**1.1.2 Establish two final offers based on te**
9	1.1.2.1 Meting with project team
10	1.1.2.2 Set the final technical solution for the
11	1.1.2.3 Set two suppliers of construction ma
12	1.1.2.4 Set two drafts of the contract (one f
13	**1.1.3 Meet the X family to sign the contract**
14	1.1.3.1 Present to X family both draft contrac
15	1.1.3.2 Sign the final contract
16	**1.2 Obtain the approval for construction**
17	1.2.1 Draw up the technical project
18	1.2.2 Submit the documentation for roof changing
19	1.2.3 Submit the request for scrap materials disp
20	1.2.4 Receive approval for scrap materials dispo:
21	1.2.5 Receive the approval for roof changing
22	1.2.6 Inform the X family about receiving approva
23	**1.3 Supply the construction materials**
24	1.3.1 Sign contract with supplier for construction
25	1.3.2 Inform the X family about the date of materi
26	1.3.3 Receive the first rate of payment from the X
27	1.3.4 Receive the materials at X family's house
28	1.3.5 Pay the materials
29	**1.4 Install the new roof**
30	**1.4.1 Set the site organization**
31	1.4.1.1 Perform work safety training
32	1.4.1.2 Set the place for storing new materi
33	1.4.1.3 Set the place for storing old tiles



ID	Task Name
33	1.4.1.3 Set the place for storing old tiles
34	1.4.1.4 Set the place for scrap materials
35	1.4.1.5 Set the ways of access
36	**1.4.2 Remove the old cover of the roof**
37	1.4.2.1 Install the scaffolding
38	1.4.2.2 Remove the old tiles
39	**1.4.3 Install the new roof**
40	1.4.3.1 Make necessary repairs to the wooc
41	1.4.3.2 Install new roof
42	**1.4.4 Clean the place**
43	1.4.4.1 Collect all scrap materials and transp
44	1.4.4.2 Remove the scaffolding
45	**1.4.5 Close the contract with X family**
46	1.4.5.1 Sign de reception form
47	1.4.5.2 Receive the last rate of payment
48	1.4.5.3 Project closeout



THE 40TH ANNIVERSARY OF THE 1ST SURFACE TO AIR MISSILE BRIGADE – A METHODOLOGICAL GUIDE ON ORGANIZING AND PROMOTING THE EVENT

Margarit PUFLEA

CONTENTS

Project name: The 40th anniversary of the 1st Surface to Air Missile Brigade – a methodological guide on organizing and promoting the event

Project sponsor: Romanian Air Force and other identified sponsors

Project summary

The project will not limit to the anniversary day, it will be a bunch of activities like symposia, exhibitions, demonstrative exercises, broadcasted emission, TV shows, that will last around eight months and it will finalise with celebration day. But these activities are just the tip of the iceberg. Back of them a lot of resources are involved into small activities to make the principal activities to show better.

Being a training activity from the Main Plan Activity most of the resources have already been allocated (human resources, equipments and a part of materials). It is still needed some financial resources to acquire promotional materials and food for festive lunch.

The overall cost, including all resources, is estimated at approximately 108 704 lei. But if we deduct the labour cost, and some resources already allocated the real cost will remain 36584 lei. From the MoD budget, upon actual regulation, we should receive 25% (9000lei) of the estimated financial resources. The rest of financial resources (27500lei) will be the project team task to get them from the sponsors and local authorities.

The estimated implementation period of this project is: 01.12.2012 – 01.08.2013.

I. BUSINESS CASE

I.1 Introduction

Since the military organization comes under people's wish, beginning with the 90s, one of the military tasks is to be open to the civilian interest by allowing them, on military's own initiative, access to public information.

The regulation approved by the ministry of defence, *General Rule number 4* from 2009, specifies that every five years each unit must celebrate its anniversary day. So it was given the possibility to the units and military branches to reveal to the large public some of aspects regarding their training military activities and readiness capacity.

This year the 1st SAM Brigade will reach 40 years since it was set up. The activity was established in the annual Main Plan Activities, two levels up: general Staff and Air Force HQ plans of activities.

The activity, approved by the chief of ROU Air Forces, will take place on the 1st of August.

I.2 Reasons

Until the 90s the Air Defence branch was kept as a secret structure due to his its technological equipment and the importance of its actions during the first hours of any crisis. Unfortunately this behaviour leads to a lack of information about this structure.

Today Air Defence, Surveillance and Aviation form the ROU Air Force, but Air Defence, as a main branch of ROU AF, continues to remain unknown to the large public because, first of all, "it has fallen under the shadow of aviation" and secondly there was no any project to regularly promote the Air Defence activity. Now we found an opportunity to reveal our capacity of training and fighting to the contributors as such they may rely on our determination and willingness to guarantee the country's sovereignty and territorial integrity against any challenges.

Being part of the training activities the anniversary day celebration is a priority for us and it will be situated on our first agenda activity.

The manifestations consecrated to the anniversary day will increase the troops moral and their proud to serves as a soldier in Air Defence.

Most of our former peers, who served in 1st SAM Bde, strongly want to joint us, in our project, to support through human, financial and material resources the activities of the 40th Anniversary Day.

The project importance resides in the following aspects:

1. Increase Air Defence image capital inside the local and national community;
2. It will be a useful tool (a model) for the teams charged with the developing the future celebration activity in a time and resources constraints;
3. It will be a means to get resources from the sponsors.

The **main beneficiaries** of this project, in terms of image promotion, are ranked down:

- Air Defence branch;
- The 1st SAM Bde;
- The sponsored involved into the project;
- ROU Air Force;
- MoD;
- Local authorities.

The 1st SAM Bde assumes full responsibility concerning the quality and timeliness of the project activities.

I.3 Constraints

There are some constraints regarding the human resources and the activity management. A part of the human resources are simultaneously involved in this project and in

their proper or regular job, as a result the project manager during the planing must deal with this challenge. Other constraint is connected to the capacity of system management. There are many activities, very diversified, in different places, involving a large number of people to which there is no dedicated a special command control system, in special equipments. To overcome this shortage a regular flux of information using the actual equipments must be implemented and each stakeholder should be aware.

I.4 Assumptions

The following assumptions are taken into consideration during the process until they will gradually be removed, as soon as the certitudes will appear:

-the requests, regarding the anniversary, sent to the high echelons will be approved;

-the MoD will assure the funds needed to finalize the project;

-all the performers from the unit have the capacity and availability to fulfill their job inside the project.

I.5 Risks

The cornerstone of the process will be the created image of the 1st SAM Bde. But it depends on the resources that revolve around it, even if we are talking about the human resources, materials or equipment. If something is not assured or the resource quality is poor the goal of the activity may be at risk. The most important risks that the management team must take into consideration are related to the time available, the allocated resources, people communication capacity and the team spirit.

II. SCOPE MANAGEMENT PLAN

II.1 Main goal

Promote the image of the Air Defence and the 1st SAM Bde forces by organizing the 40th Anniversary Ceremony in accordance with MoD order.

II.2 Objectives

1. The project officer, in accordance with commander's decision, will establish the organizational structure teams for the project implementation (charged with: organizing activities, promotion activities, admin activities, ceremony activities, symbols and heraldic sign approval, negotiation with sponsors) by choosing the people from brigade headquarter and subordinate units, no longer than 1st of august 2013;

2. The education and training module will get all the necessary approval from the higher echelons, as it was established in MoD regulation, regarding the organization and developing activities, by sending the reports to each decision body, no longer than 1st of April 2013;

3. The PIO will undertake all activities needed to promote the event all along its preparation, unfolding and closeout in accordance with existing endorsements and regulations on such events;

4. The negotiation sponsors team will negotiate upon on general rules with the local company to get the extra necessary funds no later than 1st of May;

5. The project manager will organize the event by establishing all the details necessary for the latter to unfold under the best conditions beginning with three month before the event

6. The operation module will monitor all the activities during the implementation process by using liaison officers and photo-video equipments in order to identify the lessons learned and gather the materials for historical register.

7. The project manager ensures project closeout upon finishing all activities by evaluating results disseminated data and dissolving the team

III. HUMAN RESOURCE MANAGEMENT

III.1 Resource pool description

All the project's activities will be carried out by the **Project Team,** composed of six departments, each of it supported by specialists chosen from Bde HQ or subunits. The organizational charter is displayed in *annex no.1*.

The **Project Manager** on behalf of Bde commander will lead all the established activities.

The chief of each department will be recruited from the Bde HQ and Bde's subunits, having expertise in their position.

All human resources implied must clearly understand their roles and responsibilities in order to successfully perform their job in the project. Table no 3.1 shows the established roles and responsibilities of all stakeholders, for each project main phases.

Table 3.1 Stakeholders of the 40th Anniversary of 1st SAM Bde

no		Stockholder's name	Role	Level of influence[1]	When[2] are stakeholders affected
1.	1st SAM Bde		Performer	H	A
	1.1	Monitoring scenario and evaluating team	Monitoring	L	A
	1.2	Media promoting group	Performer	H	P
	1.3	Sponsors' negotiation group	Performer	H	P
	1.4	Anniversary/Open Gate Day organizing group	Performer	H	E
	1.5	Logistics group	Performer	H	P
	1.6	Acquisition group	Performer	M	P
	1.7	HAWK subunits	Performer	H	E
	1.8	The marching troupes	Performer	H	E

2.	ROUAF representatives	Decision maker	M	P
3.	General Staff representative	Decision maker	M	P
4.	MoD representative	Decision maker	L	P
5.	Sponsors	Influencer	H	E
6.	Local authorities	Influencer	L	E
7.	Military Historical Services	Technical matter expert	L	PE
8.	Military Archive and Documentation Services	Technical matter expert	L	P
9.	Retired and Vet Association	Nonessential	L	E
10.	National Military Museum	Conciliation	M	PE
11.	Military Aviation Museum	Influencer	M	E
12.	Military media	Influencer	H	E
13.	Civilian media	Influencer	H	E
14.	National Press	Nonessential	L	E
15.	Heraldic and denomination Commission of MoD	Decision maker	H	P
16.	Military Plastic art Studio	Conciliation	L	P
17.	The invitees	Influencer	H	E
18.	Bucharest garrison	Influencer	M	E

Legend: 1. L= low influence; H=high influence; M=medium influence;

2. Phases: P=planning; E=execution; C=controlling; CL=closing; O=operating; A=equally in all phases.

The most important stakeholders involved in the project are: MoD representative, General Staff representative, Military National Museum, Military Aviation Museum, sponsors. In the above table is reviled all the stakeholders and their influence.

The HR for each activity will be described in the Microsoft Project responsibility matrix.

3.2 Work Breakdown Structure (WBS)

In order to effectively manage the work required to complete this project, it was subdivided into individual work packages which will not exceed 8 hours of work per week for the busiest man. The project is broken down into 20 activities, according to project's main objectives, listed above. Each of these phases is then subdivided further down to work packages and schedule activities, as shown in Work Breakdown Structure, *annex no.2*.

IV. TIME MANAGEMENT PLAN

According to the Gantt chart the activities project are expanded on two years 2012 and 2013, but in 2012 there are few activities that refer to the budget estimation and the planning activity in the Main Plan Activity. The burden of the activities is in the first eight month of the 2013. In the Gantt chart there are at least four milestones that must be met in the absence of which we cannot go ahead or if we go ahead the quality of goal fulfillment may be affected. It is about getting approval form MoD and AF for the funds, getting the approval from MoD's Heraldic and Denomination Commission, getting the sponsors support and making the

promotional materials on time. There are also three important meetings during the project for tasks and activities adjustments.

Annex no 3 presents an extract of the Gantt chart with detailed time limits of the activities in the project.

V. COST MANAGEMENT PLAN

As I mentioned before the main burden of funds has been assured through the Main Plan Activity, it is about the labors salary, electric power, gasoline, equipments, and a side of financial funds. The other side of financial funds we assume that we will get from the sponsors.

Annex no 4 presents a resource pool description needed to develop the project in good conditions.

For a better understanding of the resources distribution in the table below I present the cost for each project objective with the total and real cost. From the real cost 36584 lei we estimate that we will receive 25% from MoD and 75% from sponsors 27000 lei.

Objective number	Resources			Total cost	Real cost
	Labor	Materials	Equipment		
1.	1488	4.5		1492.50 lei	0
2.	105.6	10		115.6 lei	0
3.	32904.68	15992		48896.71	11148.7
4.	1468	304.3		1772.3	0,3
5.	19457.63	34002.8		53460.42	25435
6.	2172.8	10		2182.8	0
7.	777.6	6.9		784.5	0.9
Total	**58374.3**	**50330.5**		**108 704.83**	**36584,9**

The total cost is the cost with all resources (labors and material) which they are anyway spend, even if we had or not the anniversary, for training and education activity. The real cost is the direct materials cost, special dedicated for anniversary, (buying the promotional materials and food).

A list of the all the resources implied and the costs of those which still need to be purchased and their distribution for the activities scheduled, is provided in annex no 4.

VI. QUALITY MANAGEMENT PLAN

The success of the project will be assessed according to the following criteria:

Criteria	Description	Acceptable criteria	Activities
Punctuality	Finalizing the activities on time	-obeying to the schedule activities established in Gantt chart;	3, 4, 6.6, 7.7.3, 7.7.6, 8.3, 9.3, 10.1.3, 13.4.2,
Activity synchronization	The project must run freely without any impediments that lead to blockage	-activities must be done so that one activity doesn't hamper other activity.	2.3.1, 3, 8.3, 13.4.2,
Consistency of the undertaking action	No to give up in front of difficulties	-the performers must put all the energy to fulfill the objectives	4, 6.7,

			13.4.2,
Complying the procedures and rules regarding the general behavior and aspect of the soldiers and the equipment	Create a good impression regarding the performers' appearance and the equipments that come in contact with civilian	-the performers must be very respectful with the people that come in contact; -uniform freshly pressed; -shined of shoes; -having haircut; -the existence of ribbons, name tag, insignia; -the equipment freshly painted; -the cars and equipments' wheels are cleaned and painted; -the inside of the must be cleaned and the things put in order;	7.7, 10.2, 12.2, 17.
The event news in prime times	In written or audio-video media the events must be highlight	-in military written media the event must appear on the first page; -in at least two TV national channels the event must be popularized.	9, 9.2, 9.3
Financial	Project meets its financial targets	-the amount of financial funds from sponsors assures all the promotional materials and the materials for festive lunch.	13.4.2
Invitees' impression	Receiving positive feed-back from invitees	It will be measured in terms of: -positive appreciation from the participants; -hospitality; -hand over of promotional materials; -maintaining a close communication; -the participation requests.	17

VII. COMUNICATIONS MANAGEMENT

Through his complexity, determined by numerous activities, the duration, the number of people involved, the stakeholders, spaced and time dimension, the project cannot be managed during his phases without an accurate communication program. Vertical or horizontal, formal or informal, verbal or written, using official or nonofficial channels, the communication is one of the most important tools that have a decisive impact in the success of the project.

Target Audience	Person(s) to convey the message	When the message is conveyed	Format of a message	Message content
All project members	Communication team representative	Monthly	News letter	-sponsors and steering comity; -team members; -project

				introduction; -current status;
Steering comity	Project manager	weekly	Formal presentation;	-project phases; -the activities stadium; -changes in system functionality; -way ahead.
Education and training group	Project manager	weekly	-Formal presentation; -informal discussion;	-the training group responsibility; -the reports deadline; -the troop readiness level
Media promotion group	Project manager	weekly	-Formal presentation; -informal discussion;	-the activities stage; -the promotion materials quality
Sponsors' negotiation group	Project manager	weekly	Fax; Letter; Formal presentation	-the negotiation manner; -the negotiation stage;
Anniversary/OGD organizing group	Project manager	weekly	-Formal presentation; -informal discussion;	-the organizing group responsibility; -the activities stage;
Logistics group	Project manager	weekly	-Formal presentation; -informal discussion;	-the organizing group responsibility; -the activities stage;
Acquisition group	Project manager	Monthly	-Formal presentation; -informal discussion;	-the organizing group responsibility; -the activities stage;
Local authority	Local population	Monthly	-News letter; -fax;	-project shape; -project status; -the project impact on the area; -benefits to the customers;
The MoD's Heraldic and Denomination Commission	Chief of media promotion group	Monthly	-INTERNET-email or military net	-heraldic conciliation;
The invitees	Chief of organizational	-one month before the	-News letter; -informal	-invitation to the ceremony;

	group	anniversary and during the ceremony	discussion;	-the anniversary impact; -
The performers	Project manager	-before any important activity	-verbal	-the performers role; -the actions standards;
Sponsors	Team negotiator	weekly	-News letter; -Verbal; -Email; -Fax; -Formal presentation;	-project shape; -project status; -their impact on the project; -business need; -benefits to the business; - benefits to the employs;

VIII. PROJECT RISK MANAGEMENT

In an uncertain environment, in a fluid world, where the things are changed at a high speed we should be ready to adapt at new situation. Having a reserve plan for all the project that are developing in same environment it is a necessity. Only those who are flexible, those who can adapt rapidly to the new situation, those who can foresee the possible changes will prevail. There is a large variety of risks but a project manager has no time to asses all the risks, as a result he must have the capacity, the experience, the knowledge to choose for assessing only the risks that can affect his project.

Through the team project experience and studies done on the subject we have identified a list of eight most likely risks that may result in failing of goal. We assessed the risks based on probability and severity of hazard. Below is presented a matrix of ranking types of risks identified, as well as the avoidance/mitigating strategies for The 40th Anniversary day of the 1st SAM Bde project.

Types of risk	**Risk conditions**	**Risk description**	**Severity**	**Probability**	**Importance**	**Risk mitigation strategy**
Funds allocation	Not get the established funds from high echelon	The amount of promotional materials will decrease or the number of invitees should decrease	5	2	10	-Look for supplementary sponsors -Cut some promotional materials with low image impact
Time	Lack of time for some activities	Missing some activity with negative image impact	5	2	10	-Calculate a buffer time for each important activity
Team spirit and	Some of the	Poor outcomes	5	2	10	-Get the right

attitude of some staff personnel	performers show low implication due to overloading with tasks	with deep image impact				motivation ways (assure time off, using material motivation)
Team communications	Due to the large number of people and stakeholders not all the of them will receive or send on time the information	It might produce some gaps or misunderstanding in the normal planning and developing the project	3	3	9	-have detailed communication plan at hands on each stakeholder
Quality	Quality presentation is low	The participants dissatisfaction will increase	4	2	8	-Increase the monitoring and controlling activities
Testability	Some of the objectives are not tangible (are not measurable)	The difficulty of having the immediate feedback regarding the fulfilling of all the objectives	4	2	8	-have a plan in dealing with the outcomes of each objective
Weather	Bad weather	Decrease the number participates	5	1	5	-have a reserve day; -use the inside space or using more tents
Task conflict	They appointed people for the project tasks have a proper job tasks	They cannot do the both tasks at high standards in the same time allocated	4	2	8	-during the planning activities these situation will be deconflicted

I used the following legend to asses the impact and the possibility of producing for each risk identified.

Likelihood of Occurrence (A)		**Severity of Impact (B)**	
1- Very unlikely	(hasn't occurred before)	1 - Insignificant	(have no effect)
2 - Slight	(rarely occurs)	2 - Minor	(little effect)
3 - Feasible	(possible, but not	3 - Significant	(may pose a problem)
4 - Likely	(has before, will again)	4 - Major	(Will pose a problem)
5 - Very Likely	(occurs frequently)	5 - Critical	(Immediate action required)

There were no risks that overcame the score 10, above which it cannot be tolerable.

Project3.mpp

ID	Resource Name	Type	Material Label	Initials	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At
110	Fruits	Material	kg	F		5,00 lei		0,00 lei	Prorated
111	Cakes	Material	kg	C		30,00 lei		0,00 lei	Prorated
112	Oils	Material	l	O		7,00 lei		0,00 lei	Prorated
113	Vinegar	Material	l	V		5,00 lei		0,00 lei	Prorated
114	Biscuits	Material	kg	B		10,00 lei		0,00 lei	Prorated
115	Tomato sauce	Material	kg	T		10,00 lei		0,00 lei	Prorated
116	Maps	Material	buc	M		3,00 lei		0,00 lei	Prorated
117	Insignia	Material	buc	I		3,00 lei		0,00 lei	Prorated
118	Magazines	Material	buc	M		5,00 lei		0,00 lei	Prorated
119	Coins	Material	buc	C		30,00 lei		0,00 lei	Prorated
120	Plackets	Material	buc	P		70,00 lei		0,00 lei	Prorated
121	Albums	Material	buc	A		300,00 lei		0,00 lei	Prorated
122	Flags	Material	buc	F		100,00 lei		0,00 lei	Prorated
123	Models	Material	buc	M		200,00 lei		0,00 lei	Prorated
124	Banners	Material	buc	B		100,00 lei		0,00 lei	Prorated
125	clothes	Material	kg	c		3,00 lei		0,00 lei	Prorated
126	area map	Material	buc	a		0,00 lei		0,00 lei	Prorated
127	phone network	Material	buc	p		0,00 lei		0,00 lei	Prorated
128	meter	Material	buc	m		0,00 lei		0,00 lei	Prorated
129	carpet	Material	sqm	c		0,00 lei		0,00 lei	Prorated
130	flag	Material	buc	f		0,00 lei		0,00 lei	Prorated
131	banner	Material	buc	b		100,00 lei		0,00 lei	Prorated
132	the parade block	Work		t	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated
133	190 people	Work		1	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated
134	SOP	Material		S		0,00 lei		0,00 lei	Prorated
135	barriers	Material		b		0,00 lei		0,00 lei	Prorated
136	equipment for food prepa	Material		e		0,00 lei		0,00 lei	Prorated
137	high ranking personalit	Work		h	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated
138	retired representative	Work		r	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated
139	medals	Material	buc	m		70,00 lei		0,00 lei	Prorated
140	chair	Material	buc	c		0,00 lei		0,00 lei	Prorated
141	napkins	Material	buc	n		0,01 lei		0,00 lei	Prorated

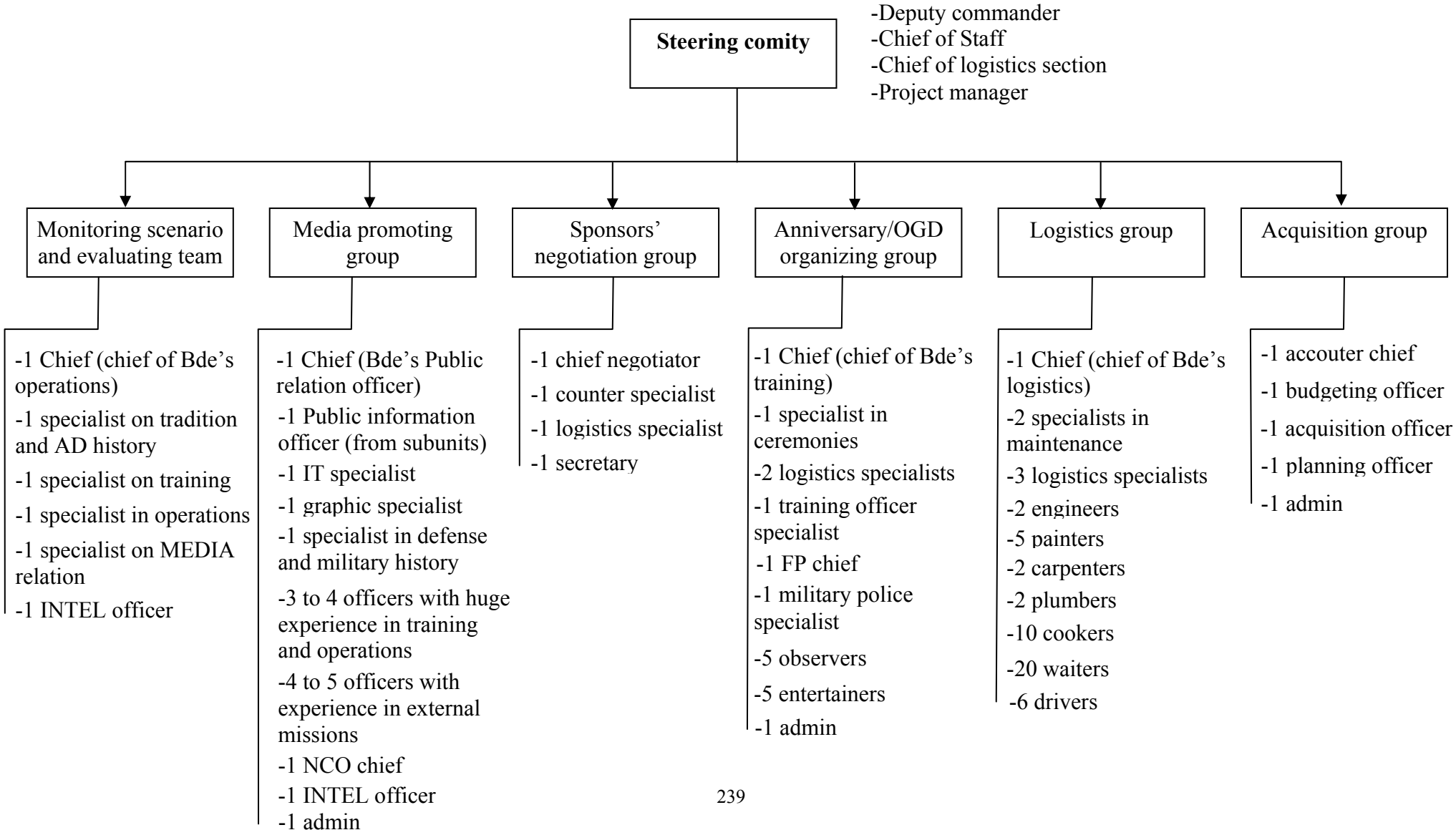
Page 3

IX. CLOSE OUT

A formal meeting will be set up to officially end the project. This will take place one week after the ceremony ends. The participants will be from each department, from subunits, sponsors' representative. With this occasion the project manager will highline the outcomes of the project, the shortages and the lessons identified. The participants may bring in any subject regarding the anniversary day.

ANNEX no.1

ORGANIZATION CHARTER



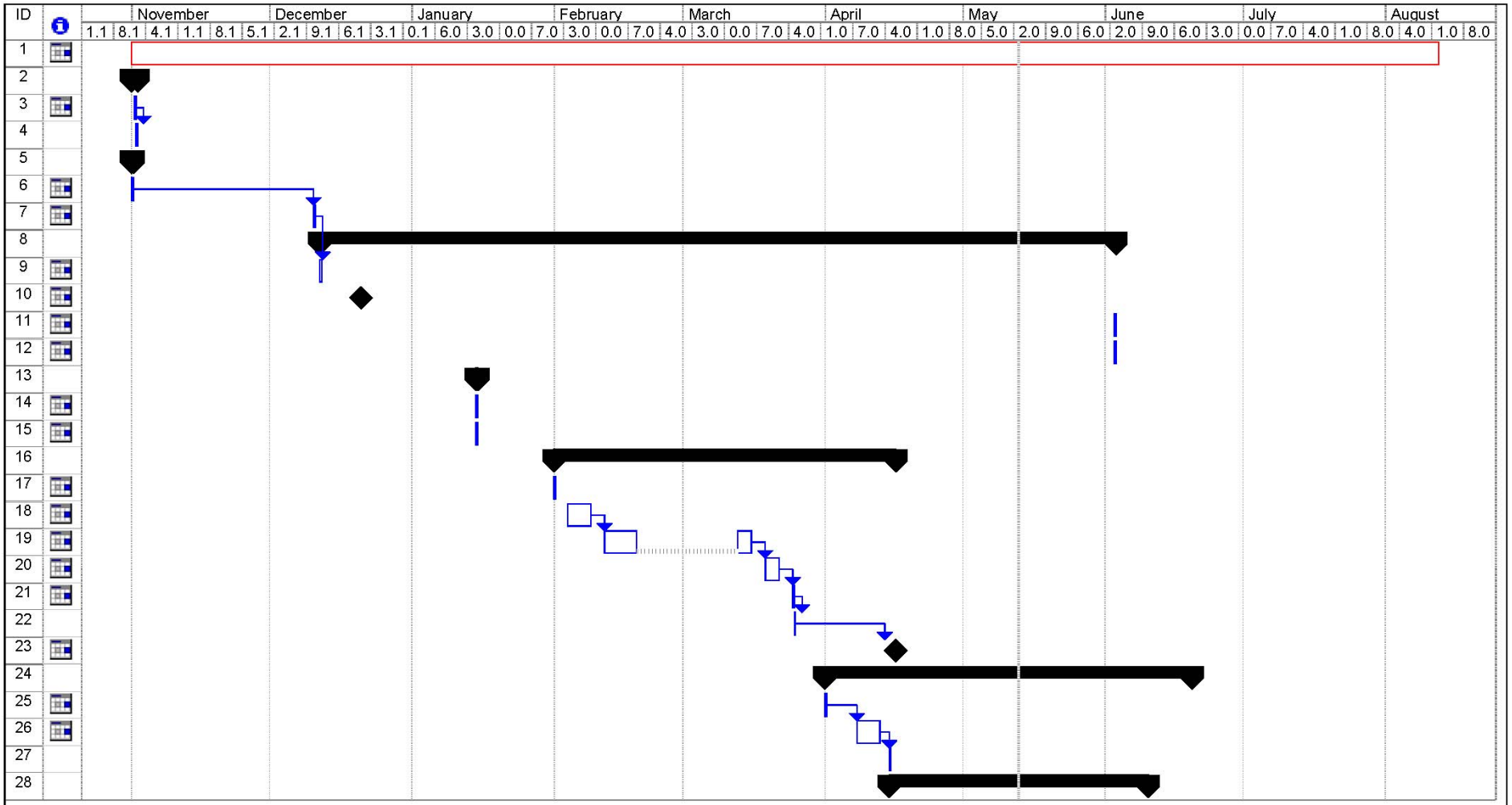
Annex no 2 - Work Breakdown Structure

ID	Task Name	Duration	Start	Finish	Predecessors
1	1 The 40th anniversary of the 1st Surface to Air Missile Brigade – a methodological guideline on organizing and promoting the event	204 days	Thu 01.11.12	Mon 12.08.13	
2	**2 Constituting the first working group for manifests conception and activity coordination of the 40th Anniversary Celebration**	**1,2 days**	**Thu 01.11.12**	**Fri 02.11.12**	
3	2.1 Projecting of the organizational structure of the project and filling it in	0,2 days	Thu 01.11.12	Thu 01.11.12	
4	2.2 Establishing the benchmarks for the project	0,2 days	Fri 02.11.12	Fri 02.11.12	3
5	**2.3 Estimating the necessary budget for the activity**	**0,2 days**	**Thu 01.11.12**	**Thu 01.11.12**	
6	2.3.1 Analyze the budget for the last ceremony and the general rules regarding this issue	0,2 days	Thu 01.11.12	Thu 01.11.12	
7	3 Introducing the activity (The 40th Anniversary Day) into the Main Plan Activity	0,2 days	Mon 10.12.12	Mon 10.12.12	6FS+1 day
8	**4 Elaborations of request and the reports to the high echelons for necessary approvals for the event**	**122,33 days**	**Wed 12.12.12**	**Mon 03.06.13**	
9	4.1 Elaborating and sending the reports to the ROU AF chief for activity approval and funds allocation	0,2 days	Wed 12.12.12	Wed 12.12.12	7FS+1 day
10	4.2 Getting the aproval of funds for ceremony from ROUAF chief	0 days	Fri 21.12.12	Fri 21.12.12	
11	4.3 Elaborating and sending the report to the higher echelons with the proposals for personal rewarding	0,2 days	Mon 03.06.13	Mon 03.06.13	
12	4.4 Elaborating and sending the report, order project and the activities schedule to the General Staff	0,2 days	Mon 03.06.13	Mon 03.06.13	
13	**5 Execution the working group for establishing the format and contents of the anniversary materials**	**0,3 days**	**Tue 15.01.13**	**Tue 15.01.13**	
14	5.1 Establishing the general rules and principles and what message should be send to the audience by promotional materials	0,3 days	Tue 15.01.13	Tue 15.01.13	
15	5.2 Estimate the necessary amount of visual and written promo materials	0,3 days	Tue 15.01.13	Tue 15.01.13	
16	**6 Elaborating the necessary documentation, by the PIO office, for the heraldic materials approval**	**52,4 days**	**Fri 01.02.13**	**Tue 16.04.13**	
17	6.1 Brainstorming for chosen the best honorific name, heraldic sign and symbols	0,2 days	Fri 01.02.13	Fri 01.02.13	
18	6.2 Consulting the specialists from National Military Museum and Defense History Service regarding the graphic elements	5 days	Mon 04.02.13	Fri 08.02.13	
19	6.3 Building the historical case of the unit	8 days	Tue 12.02.13	Fri 15.03.13	18FS+1 day
20	6.4 Drawing of the heraldic sings	3 days	Tue 19.03.13	Thu 21.03.13	19FS+1 day
21	6.5 Printing the documents and getting the commander signature	0,2 days	Mon 25.03.13	Mon 25.03.13	20FS+1 day
22	6.6 Sending the documents, by hierarchical chain, to the MoD's Heraldic and Denomination Commission for Heraldic, Honorific Titles and Heraldic Objects	0,2 days	Mon 25.03.13	Mon 25.03.13	21
23	6.7 Getting the approval from MoD's Heraldic and Denomination Commission	0 days	Tue 16.04.13	Tue 16.04.13	22FS+16 days
24	**7 Preparing and keeping the symposiums at National Military Museum and Military Aviation Museum on the 14th June and on the 19th July**	**57,13 days**	**Mon 01.04.13**	**Wed 19.06.13**	
25	7.1 Establishing the issues and themes and the persons who will prepare them	0,3 days	Mon 01.04.13	Mon 01.04.13	
26	7.2 Elaborating the materials (documentation) regarding the event having a scientific character of the history and tradition of the AD and the 1st SAM Bde	5 days	Mon 08.04.13	Fri 12.04.13	25
27	7.3 Building the agenda and the schedule for the symposiums	0,2 days	Mon 15.04.13	Mon 15.04.13	26
28	**7.4 Hiring the spaces (rooms)**	**39,33 days**	**Mon 15.04.13**	**Mon 10.06.13**	
29	7.4.1 Doing (elaborating) the needed documents for hiring and assuring all the staffs (projector, chairs, desks, pointer, speakers, computer)	0,2 days	Mon 15.04.13	Mon 15.04.13	
30	7.4.2 Assuring the beverage for the meeting (coffee, mineral water,)	0,2 days	Mon 10.06.13	Mon 10.06.13	
31	7.5 Sending the invitation to the participants	1 day	Wed 15.05.13	Wed 15.05.13	29FS+1 day
32	7.6 Receiving the feedback from the invitees	1 day	Wed 29.05.13	Wed 29.05.13	
33	**7.7 Holding the activity**	**5 days**	**Thu 13.06.13**	**Wed 19.06.13**	
34	7.7.1 Force protections into the National Military Museum (check the area one day before the event, guard the area, and apply the access procedure)	2 days	Thu 13.06.13	Fri 14.06.13	
35	7.7.2 Transportation of the invitees to the National Military Museum (means, routs)	0,67 days	Fri 14.06.13	Fri 14.06.13	32FS+1 day
36	7.7.3 Starting the symposium and following the agenda at National Military Museum	1 day	Fri 14.06.13	Fri 14.06.13	
37	7.7.4 Force protections into the Military Aviation Museum (check the area one day before the event, guard the area, and apply the access procedure)	2 days	Tue 18.06.13	Wed 19.06.13	
38	7.7.5 Transportation of the invitees to the Military Aviation Museum (means, routs)	1 day	Wed 19.06.13	Wed 19.06.13	
39	7.7.6 Starting the symposium and following the agenda at Military Aviation Museum	0,19 days	Wed 19.06.13	Wed 19.06.13	
40	**8 Calculating the amount of promotional materials necessary, taking into consideration the costs and available resource**	**35 days**	**Mon 01.04.13**	**Mon 20.05.13**	
41	8.1 Establishing the amount of each promotional material category to be made	0,3 days	Mon 01.04.13	Mon 01.04.13	

ID	Task Name	Duration	Start	Finish	Predecessors
42	8.2 Hiring a company to produce the established materials for the event, in accordance with acquisition low, no later than 1st of May	30 days	Wed 03.04.13	Wed 15.05.13	
43	8.3 Producing the promotional materials no later than 30th of June	0 days	Fri 17.05.13	Mon 20.05.13	42FS+2 days
44	**9 Elaborating and publicizing, in the military and civilian media, documents, articles s regarding the history of AD and 1st SAM Bde**	**48 days**	**Wed 22.05.13**	**Fri 26.07.13**	
45	9.1 Choosing the team work, the documents and the issue for the articles and the synthesis that should be published	1 day	Wed 22.05.13	Wed 22.05.13	
46	9.2 Elaborating the articles and synthesis	5 days	Mon 24.06.13	Fri 28.06.13	
47	9.3 Revise them and press release	1 day	Fri 26.07.13	Fri 26.07.13	
48	**10 Preparing and realizing the exposition with AD equipments at Izvor Square and Cotroceni Mall**	**12 days**	**Fri 12.07.13**	**Sat 27.07.13**	
49	**10.1 Preparing the expositions**	**8,05 days**	**Fri 12.07.13**	**Wed 24.07.13**	
50	10.1.1 Hiring the space	1 day	Fri 12.07.13	Fri 12.07.13	
51	10.1.2 Establishing and preparing the personal and equipment for exposition	0,05 days	Mon 22.07.13	Mon 22.07.13	50
52	10.1.3 Printing the visual materials for the exposition (pictures, magazines, charts)	2 days	Mon 22.07.13	Wed 24.07.13	51
53	**10.2 Realizing the exposition**	**2 days**	**Fri 26.07.13**	**Sat 27.07.13**	
54	10.2.1 Deploying/redploying the personal and equipments	0,2 days	Fri 26.07.13	Fri 26.07.13	
55	10.2.2 Presenting the equipments to the visitors	1 day	Sat 27.07.13	Sat 27.07.13	
56	11 Preparing a communicate for the military and local media regarding the event one week before the anniversary day	0,2 days	Mon 29.07.13	Mon 29.07.13	
57	**12 Preparing and executing the Open Gate Day by the training and education module one week before the ceremony from 27th of Jul**	**7 days**	**Mon 22.07.13**	**Sun 28.07.13**	
58	**12.1 Preparing the activity**	**2,3 days**	**Mon 22.07.13**	**Wed 24.07.13**	
59	12.1.1 Establishing the personal participants	0,1 days	Mon 22.07.13	Mon 22.07.13	
60	12.1.2 Establishing the equipments participants	0,1 days	Mon 22.07.13	Mon 22.07.13	
61	12.1.3 Executing the maintenance of the equipment	1 day	Tue 23.07.13	Tue 23.07.13	60
62	12.1.4 Training the participants and check their clothes	0,3 days	Wed 24.07.13	Wed 24.07.13	61
63	**12.2 Executing the Open Gate Day**	**4 days**	**Thu 25.07.13**	**Sun 28.07.13**	
64	12.2.1 Force protections (check the area one day before the event, guard the area, and apply the access procedure)	0,13 days	Thu 25.07.13	Thu 25.07.13	
65	12.2.2 Receiving the visitors	0,1 days	Sat 27.07.13	Sat 27.07.13	
66	12.2.3 Handing out the foldouts	0,03 days	Sat 27.07.13	Sat 27.07.13	
67	12.2.4 Presenting to the visitors the military equipments, the museum, displaying the demonstrative exercise, etc	2 days	Sat 27.07.13	Sun 28.07.13	
68	**13 Building a strategy to get the extra money from the civilian companies and following the necessary steps to get the money**	**79,13 days**	**Mon 15.04.13**	**Wed 31.07.13**	
69	13.1 Identifying the right persons for negotiations (with experience, that knows very well the project) and decide on it	0,1 days	Mon 15.04.13	Mon 15.04.13	
70	**13.2 Identifying the posible sponsores**	**8,2 days**	**Wed 17.04.13**	**Mon 29.04.13**	
71	13.2.1 Realizing a map with companies from the area	0,2 days	Mon 29.04.13	Mon 29.04.13	
72	13.2.2 Sending the project to the local companies to persuade them to involve into the project	0,3 days	Wed 17.04.13	Wed 17.04.13	
73	13.2.3 Trying to find out their interests into the project	0,15 days	Fri 19.04.13	Fri 19.04.13	
74	13.2.4 Involving into the action the local authority	0,1 days	Mon 22.04.13	Mon 22.04.13	
75	**13.3 Discussions rounds with the indentified sponsors**	**73,13 days**	**Tue 23.04.13**	**Wed 31.07.13**	
76	13.3.1 Meeting for making the proposals and analyzing the offers	0,2 days	Tue 23.04.13	Tue 23.04.13	
77	13.3.2 Negotiation and taking a decision	0,2 days	Thu 25.04.13	Thu 25.04.13	
78	13.3.3 Keeping a permanent contact with local companies and local authority by inviting at different activities	70 days	Mon 29.04.13	Wed 31.07.13	
79	**13.4 Finalizing the contract**	**9 days**	**Mon 29.04.13**	**Fri 10.05.13**	
80	13.4.1 Doing the formal documents for getting the many to the companies	0,3 days	Mon 29.04.13	Mon 29.04.13	
81	13.4.2 Getting the money/funds from the sponsors	0 days	Fri 10.05.13	Fri 10.05.13	42FS-3 days
82	14 Organizing the third working group, in order to reassign the tasks and responsibilities for event organization	0,12 days	Thu 13.06.13	Thu 13.06.13	106FS-37 days

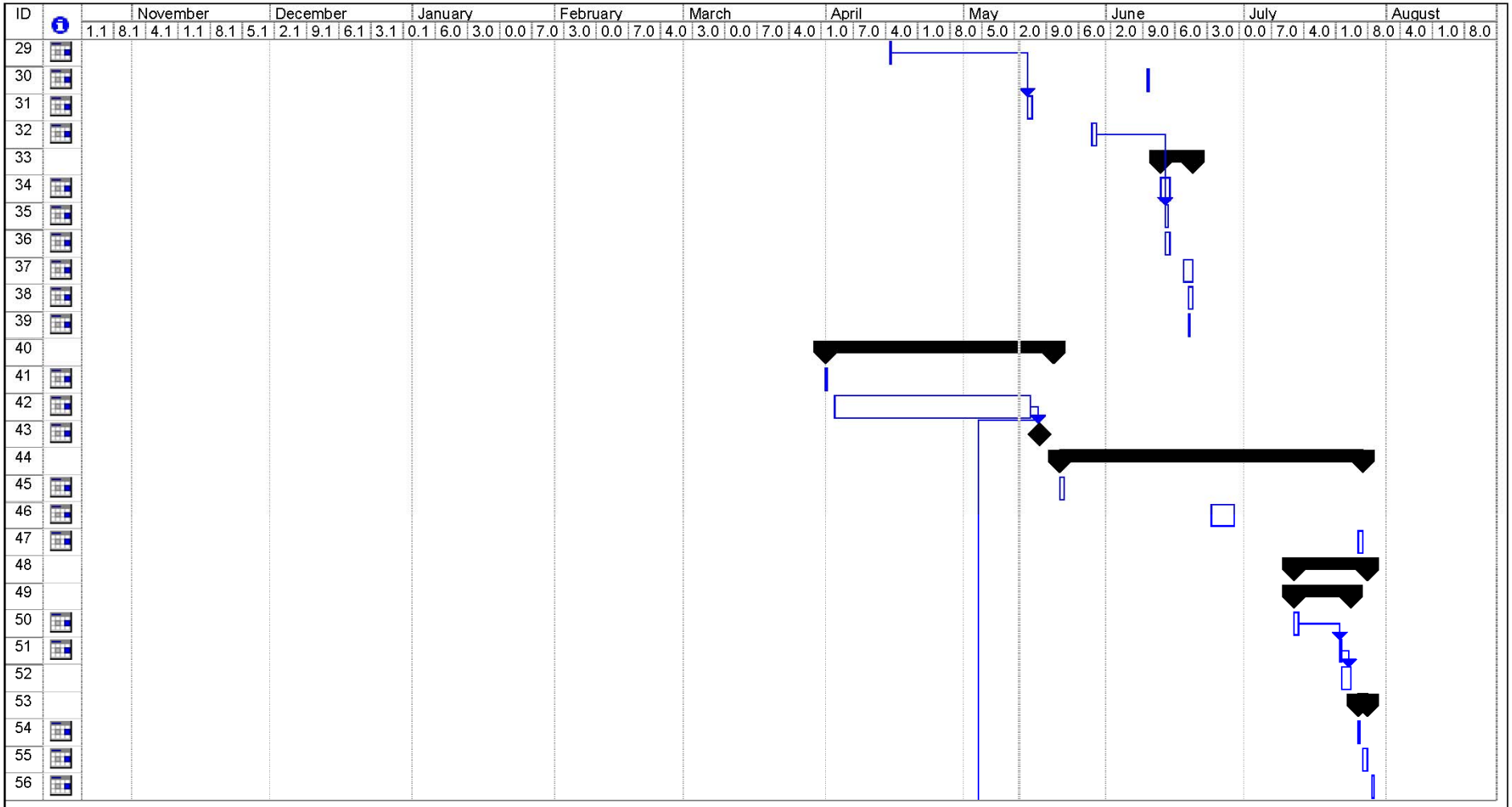
ID	Task Name	Duration	Start	Finish	Predecessors
83	**15 The logistic section will prepare the established spaces and the mess hall for the ceremony no longer than 30th of July**	**81,13 days**	**Mon 08.04.13**	**Sun 28.07.13**	
84	**15.1 Establishing the necessary maintenance works and executing them for the spaces and building involved into the activities**	**81,13 days**	**Mon 08.04.13**	**Sun 28.07.13**	
85	15.1.1 Identifying the maintenance request for the mess hall, walkways, the scene, the square and buildings that come in contact with the visitors	0,35 days	Mon 08.04.13	Mon 08.04.13	
86	15.1.2 Executing the maintenance to the buildings, the scene, the square and sidewalks	13 days	Mon 27.05.13	Wed 12.06.13	
87	15.1.3 Decorating the polls and the scene and display the flags and banners, sistaling the tents	3 days	Fri 26.07.13	Sun 28.07.13	
88	**16 Establishing the activities plan (the schedule) for the ceremony day, by the PIO**	**26,14 days**	**Mon 01.07.13**	**Fri 02.08.13**	
89	**16.1 Establishing the invitees' list for the ceremony**	**17,08 days**	**Mon 01.07.13**	**Wed 24.07.13**	
90	16.1.1 Doing the invitees list and sending the invitation	1 day	Mon 01.07.13	Mon 01.07.13	
91	16.1.2 Organizing the invitees' transportation (cars, buses, places to pick up them, schedule, etc)	0,2 days	Thu 18.07.13	Thu 18.07.13	
92	16.1.3 Establishing the welcome activities (official greeting for high ranking invitees, persons and places for entertainment)	0,08 days	Wed 24.07.13	Wed 24.07.13	
93	**16.2 Establishing the performers**	**14,3 days**	**Fri 12.07.13**	**Tue 30.07.13**	
94	16.2.1 Establishing and training of the performers	0,3 days	Fri 12.07.13	Fri 12.07.13	
95	16.2.2 Doing the rehearsals for the ceremony	4 days	Fri 26.07.13	Mon 29.07.13	
96	16.2.3 Establishing the cloths and cloths checking date	0,3 days	Tue 30.07.13	Tue 30.07.13	95
97	**16.3 Establishing the force protection measures**	**3 days**	**Tue 30.07.13**	**Thu 01.08.13**	
98	16.3.1 Checking on the area one day before, and guard the area	2 days	Wed 31.07.13	Thu 01.08.13	
99	16.3.2 Establishing parking lot	0,1 days	Tue 30.07.13	Tue 30.07.13	
100	16.3.3 Establishing no area entrance	0,2 days	Tue 30.07.13	Tue 30.07.13	
101	**16.4 Assuring the military music**	**10,1 days**	**Thu 04.07.13**	**Thu 18.07.13**	
102	16.4.1 Sending a request to garrison commander	0,1 days	Thu 04.07.13	Thu 04.07.13	
103	16.4.2 Organizing their transportation	0,1 days	Thu 18.07.13	Thu 18.07.13	
104	16.5 Preparing the food for the festive lunch	2,14 days	Wed 31.07.13	Fri 02.08.13	
105	**17 Developing the activities during the ceremony day**	**0,3 days**	**Thu 01.08.13**	**Thu 01.08.13**	
106	17.1 Transporting the invitees and military music	0,2 days	Thu 01.08.13	Thu 01.08.13	
107	17.2 Aplaying access procedures	0,3 days	Thu 01.08.13	Thu 01.08.13	
108	17.3 Greeting the invitees	0,1 days	Thu 01.08.13	Thu 01.08.13	
109	17.4 STARTING THE CEREMONY	0 days	Thu 01.08.13	Thu 01.08.13	
110	17.5 Giving the honor to the highest ranking person	0,1 days	Thu 01.08.13	Thu 01.08.13	
111	17.6 Reading the chief of MoD's order	0,1 days	Thu 01.08.13	Thu 01.08.13	
112	17.7 Flag decoration	0,1 days	Thu 01.08.13	Thu 01.08.13	
113	17.8 Military religious service paying the honor to the fallen	0,1 days	Thu 01.08.13	Thu 01.08.13	
114	17.9 The invitees' speeches	0,1 days	Thu 01.08.13	Thu 01.08.13	
115	17.10 Hand out the promotional materials and diplomas	0,1 days	Thu 01.08.13	Thu 01.08.13	
116	17.11 Medal parade	0,18 days	Thu 01.08.13	Thu 01.08.13	
117	17.12 Troops march	0,1 days	Thu 01.08.13	Thu 01.08.13	
118	17.13 Visit to the inside tradition and historic museum	0,1 days	Thu 01.08.13	Thu 01.08.13	
119	17.14 Demonstrative exercises with applicative and traditional character	0,2 days	Thu 01.08.13	Thu 01.08.13	
120	17.15 Festive lunch	0,3 days	Thu 01.08.13	Thu 01.08.13	
121	17.16 End of the ceremony	0 days	Thu 01.08.13	Thu 01.08.13	
122	**18 Planning the monitoring activity during the events by the chief of operations**	**145,13 days**	**Tue 15.01.13**	**Fri 02.08.13**	
123	18.1 Establishing the LNOs participation on each important activity and the means of monitoring	0,2 days	Tue 15.01.13	Tue 15.01.13	

ID	Task Name	Duration	Start	Finish	Predecessors
124	18.2 Monitoring the implementation of the scenario and collecting data during the project implementation	134 days	Thu 31.01.13	Fri 02.08.13	
125	**19 The project manager ensures project closeout upon finishing all activities by evaluating results disseminated data and dissolving the team**	**5 days**	**Fri 02.08.13**	**Fri 09.08.13**	
126	19.1 Evaluating of the results by comparing with the objectives	0,3 days	Fri 02.08.13	Fri 02.08.13	
127	19.2 Disseminating data	0,3 days	Tue 06.08.13	Tue 06.08.13	
128	19.3 Putting them at the lesson learned commission disposal and at the historical register	0,3 days	Thu 08.08.13	Thu 08.08.13	
129	19.4 Dissolution of the project management team	0 days	Fri 09.08.13	Fri 09.08.13	



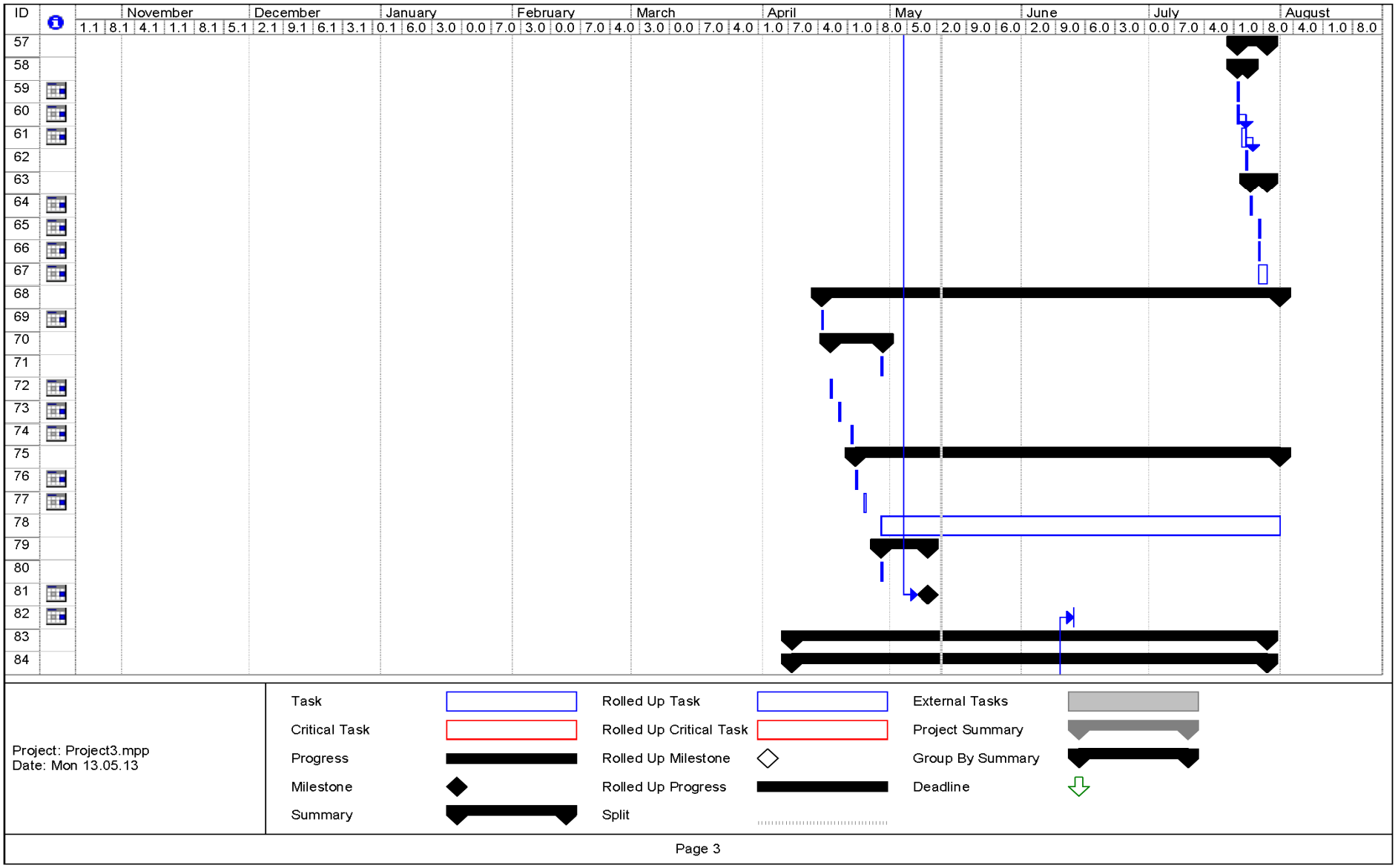
Project: Project3.mpp
Date: Mon 13.05.13

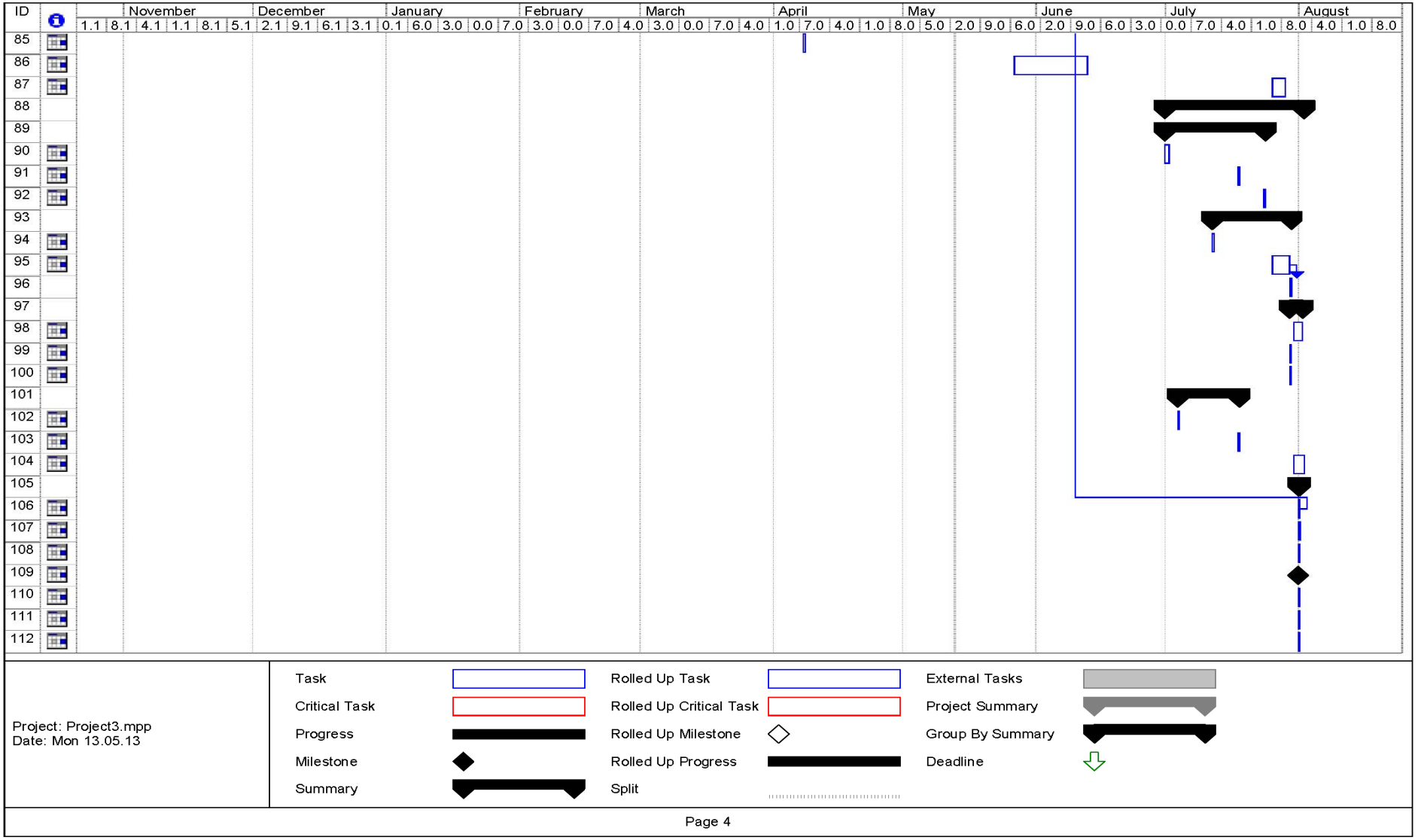
Task		Rolled Up Task		External Tasks	
Critical Task		Rolled Up Critical Task		Project Summary	
Progress		Rolled Up Milestone		Group By Summary	
Milestone		Rolled Up Progress		Deadline	
Summary		Split			

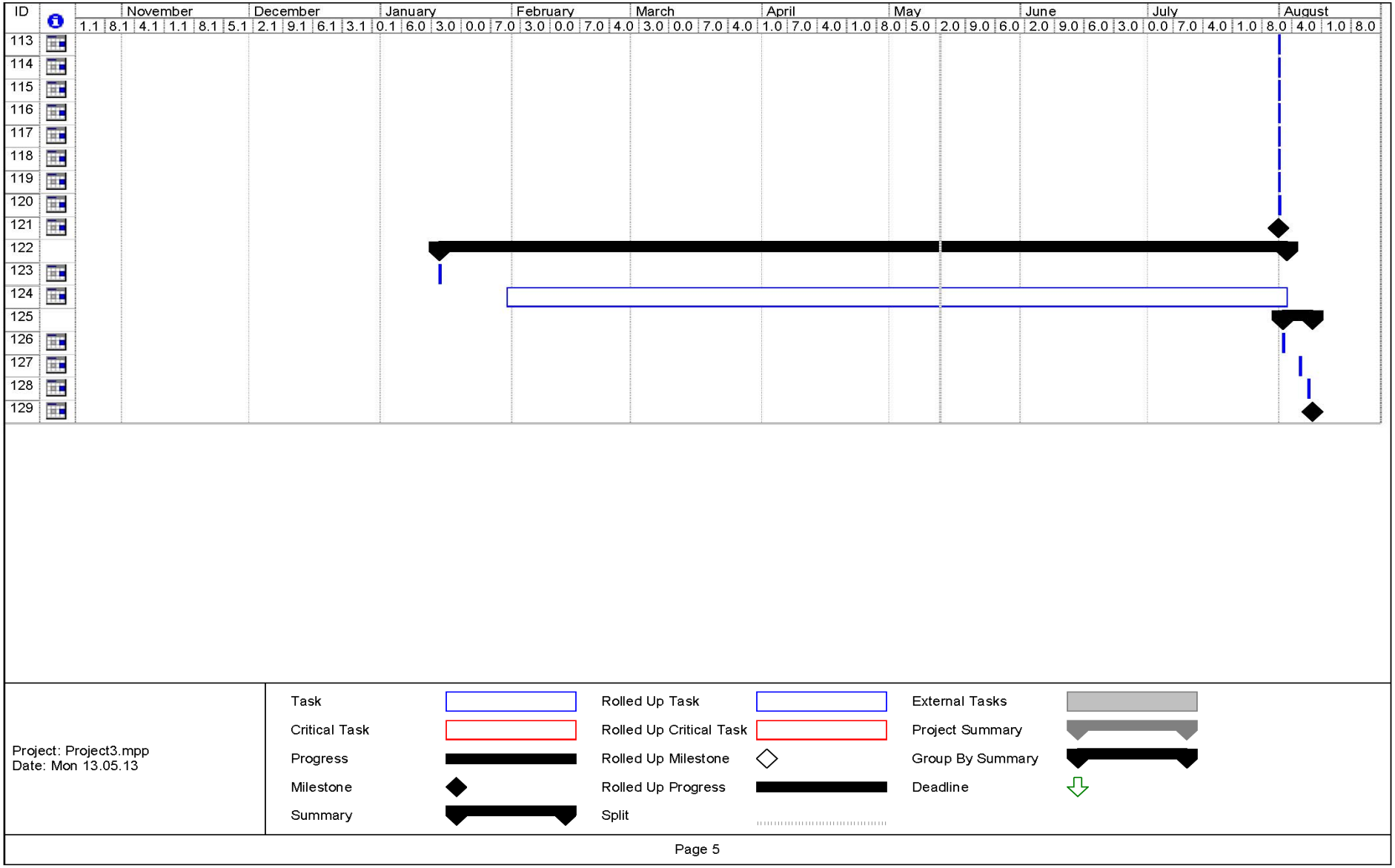


Project: Project3.mpp
Date: Mon 13.05.13

Task		Rolled Up Task		External Tasks	
Critical Task		Rolled Up Critical Task		Project Summary	
Progress		Rolled Up Milestone		Group By Summary	
Milestone		Rolled Up Progress		Deadline	
Summary		Split			


ID
November
December
January
February
March
April
May
June
July
August
1.1 8.1 4.1 1.1 8.1 5.1 2.1 9.1 6.1 3.1 0.1 6.0 3.0 0.0 7.0 3.0 0.0 7.0 4.0 3.0 0.0 7.0 4.0 1.0 7.0 4.0 1.0 8.0 5.0 2.0 9.0 6.0 2.0 9.0 6.0 3.0 0.0 7.0 4.0 1.0 8.0 4.0 1.0 8.0
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
Project: Project3.mpp
Date: Mon 13.05.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 3


ID
November
December
January
February
March
April
May
June
July
August
1.1 8.1 4.1 1.1 8.1 5.1 2.1 9.1 6.1 3.1 0.1 6.0 3.0 0.0 7.0 3.0 0.0 7.0 4.0 3.0 0.0 7.0 4.0 1.0 7.0 4.0 1.0 8.0 5.0 2.0 9.0 6.0 2.0 9.0 6.0 3.0 0.0 7.0 4.0 1.0 8.0 4.0 1.0 8.0
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
Project: Project3.mpp
Date: Mon 13.05.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 4


ID
November
December
January
February
March
April
May
June
July
August
1.1 8.1 4.1 1.1 8.1 5.1 2.1 9.1 6.1 3.1 0.1 6.0 3.0 0.0 7.0 3.0 0.0 7.0 4.0 3.0 0.0 7.0 4.0 1.0 7.0 4.0 1.0 8.0 5.0 2.0 9.0 6.0 2.0 9.0 6.0 3.0 0.0 7.0 4.0 1.0 8.0 4.0 1.0 8.0
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
Project: Project3.mpp
Date: Mon 13.05.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 5

Project3.mpp

ID	Resource Name	Type	Material Label	Initials	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1	commander	Work		c	100%	35,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
2	deputy commander	Work		d	100%	28,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
3	chief of staff	Work		c	100%	25,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
4	chief of personel	Work		c	100%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
5	chief of inteligence	Work		c	100%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
6	chief of operations	Work		c	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
7	chief of logistics	Work		c	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
8	chief of comunication anc	Work		c	100%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
9	legal officer	Work		l	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
10	public relation	Work		p	300%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
11	chief accoutant officer	Work		c	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
12	bugeting and planing offi	Work		b	100%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
13	FP chief	Work		F	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
14	staff NCO	Work		s	300%	12,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
15	graphic specialist	Work		g	100%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
16	historian defence speciali	Work		h	100%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
17	Staff training officer	Work		S	400%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
18	Project manager	Work		P	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
19	IT specilaist	Work		I	100%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
20	INTEL specialist	Work		I	200%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
21	Staff operation officer	Work		S	400%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
22	historian specialist officer	Work		h	100%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
23	ADMIN	Work		A	200%	12,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
24	Driver	Work		D	600%	9,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
25	Military policeman	Work		M	800%	9,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
26	enlisted	Work		e	2.500%	9,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
27	acquisition officer	Work		a	100%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
28	battalion commander	Work		b	200%	22,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
29	company commander	Work		c	200%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
30	public relation NCO	Work		p	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
31	NCO	Work		N	600%	12,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
32	chief negociater	Work		c	100%	24,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
33	logistics specislist	Work		l	200%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
34	accoutant specialist	Work		a	200%	12,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
35	mentenace group chief	Work		m	200%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
36	engineering	Work		e	200%	12,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
37	painter	Work		p	600%	7,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
38	carpenter	Work		c	400%	7,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
39	plumber	Work		p	200%	7,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
40	workers	Work		w	1.000%	7,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
41	cooker	Work		c	1.000%	7,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
42	provost marshal	Work		p	300%	18,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
43	waitress	Work		w	2.000%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
44	CO	Work		C	400%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
45	entertainer	Work		e	500%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
46	participants	Work		p	30.000%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
47	commander of military	Work		c	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
48	NCO logistics specialist	Work		N	200%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
49	Staff monitoring officer	Work		S	100%	2,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
50	computer	Material	buc	c		0,00 lei		0,00 lei	Prorated	
51	projector	Material	buc	p		0,00 lei		0,00 lei	Prorated	
52	speaker	Material	buc	s		0,00 lei		0,00 lei	Prorated	
53	pointer	Material	buc	p		0,00 lei		0,00 lei	Prorated	
54	car	Material	buc	c		0,00 lei		0,00 lei	Prorated	

Page 1

Project3.mpp

ID	Resource Name	Type	Material Label	Initials	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
55	truck	Material	buc	t		0,00 lei		0,00 lei	Prorated	
56	bus	Material	buc	b		0,00 lei		0,00 lei	Prorated	
57	radar	Material	buc	r		0,00 lei		0,00 lei	Prorated	
58	lancheur	Material	buc	l		0,00 lei		0,00 lei	Prorated	
59	power generater	Material	buc	p		0,00 lei		0,00 lei	Prorated	
60	command post	Material	buc	c		0,00 lei		0,00 lei	Prorated	
61	missile	Material	buc	m		0,00 lei		0,00 lei	Prorated	
62	printer	Material	buc	p		0,00 lei		0,00 lei	Prorated	
63	small weapon	Material	buc	s		0,00 lei		0,00 lei	Prorated	
64	ladder	Material	buc	l		0,00 lei		0,00 lei	Prorated	
65	painting tool box	Material	buc	p		0,00 lei		0,00 lei	Prorated	
66	carpenter tool box	Material	buc	c		0,00 lei		0,00 lei	Prorated	
67	plumber tool box	Material	buc	p		0,00 lei		0,00 lei	Prorated	
68	tent	Material	buc	t		0,00 lei		0,00 lei	Prorated	
69	radio station	Material	buc	r		0,00 lei		0,00 lei	Prorated	
70	minibus	Material	buc	m		0,00 lei		0,00 lei	Prorated	
71	table	Material	buc	t		0,00 lei		0,00 lei	Prorated	
72	dish	Material	buc	d		0,00 lei		0,00 lei	Prorated	
73	cutlery	Material	buc	c		0,00 lei		0,00 lei	Prorated	
74	gasoline	Material	l	g		6,00 lei		0,00 lei	Prorated	
75	energy power	Material	ora	e		1,00 lei		0,00 lei	Prorated	
76	cartridges	Material	buc	c		110,00 lei		0,00 lei	Prorated	
77	Papers	Material	buc	P		0,03 lei		0,00 lei	Prorated	
78	Brushers	Material	buc	B		5,00 lei		0,00 lei	Prorated	
79	Sand paper	Material	metru	S		1,00 lei		0,00 lei	Prorated	
80	Vaseline	Material	kg	V		10,00 lei		0,00 lei	Prorated	
81	Oil paint	Material	kg	O		10,00 lei		0,00 lei	Prorated	
82	paint	Material	kg	p		8,00 lei		0,00 lei	Prorated	
83	Concrete	Material	kg	C		0,50 lei		0,00 lei	Prorated	
84	Faience	Material	sqm	F		15,00 lei		0,00 lei	Prorated	
85	Grit stone	Material	sqm	G		15,00 lei		0,00 lei	Prorated	
86	Adhesive	Material	kg	A		1,00 lei		0,00 lei	Prorated	
87	Plaster	Material	kg	P		0,50 lei		0,00 lei	Prorated	
88	Pipe line	Material	ml	P		10,00 lei		0,00 lei	Prorated	
89	Nail	Material	kg	N		7,00 lei		0,00 lei	Prorated	
90	Faucet	Material	buc	F		15,00 lei		0,00 lei	Prorated	
91	Glass	Material	sqm	G		10,00 lei		0,00 lei	Prorated	
92	Mirror	Material	sqm	M		20,00 lei		0,00 lei	Prorated	
93	Board	Material	sqm	B		15,00 lei		0,00 lei	Prorated	
94	Mineral water 1	Material	l	M		1,50 lei		0,00 lei	Prorated	
95	Mineral water 2	Material	l	M		2,00 lei		0,00 lei	Prorated	
96	Coffee	Material	kg	C		50,00 lei		0,00 lei	Prorated	
97	Meat	Material	kg	M		20,00 lei		0,00 lei	Prorated	
98	Vegetable	Material	kg	V		10,00 lei		0,00 lei	Prorated	
99	Bread	Material	kg	B		5,00 lei		0,00 lei	Prorated	
100	Beans	Material	kg	B		8,00 lei		0,00 lei	Prorated	
101	Nonalcoholic beverage	Material	l	N		3,00 lei		0,00 lei	Prorated	
102	Alcoholic beverage 1	Material	l	A		40,00 lei		0,00 lei	Prorated	
103	Alcoholic beverage 2	Material	l	A		10,00 lei		0,00 lei	Prorated	
104	Preparation from meat	Material	kg	P		30,00 lei		0,00 lei	Prorated	
105	Eggs	Material	buc	E		0,60 lei		0,00 lei	Prorated	
106	Cheese	Material	kg	C		20,00 lei		0,00 lei	Prorated	
107	Potatoes	Material	kg	P		2,00 lei		0,00 lei	Prorated	
108	Fish	Material	kg	F		25,00 lei		0,00 lei	Prorated	
109	Pasta	Material	kg	P		3,00 lei		0,00 lei	Prorated	

Project3.mpp

ID	ⓘ	Resource Name	Type	Material Label	Initials	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
110		Fruits	Material	kg	F		5,00 lei		0,00 lei	Prorated	
111		Cakes	Material	kg	C		30,00 lei		0,00 lei	Prorated	
112		Oils	Material	l	O		7,00 lei		0,00 lei	Prorated	
113		Vinegar	Material	l	V		5,00 lei		0,00 lei	Prorated	
114		Biscuits	Material	kg	B		10,00 lei		0,00 lei	Prorated	
115		Tomato sauce	Material	kg	T		10,00 lei		0,00 lei	Prorated	
116		Maps	Material	buc	M		3,00 lei		0,00 lei	Prorated	
117		Insignia	Material	buc	I		3,00 lei		0,00 lei	Prorated	
118		Magazines	Material	buc	M		5,00 lei		0,00 lei	Prorated	
119		Coins	Material	buc	C		30,00 lei		0,00 lei	Prorated	
120		Plackets	Material	buc	P		70,00 lei		0,00 lei	Prorated	
121		Albums	Material	buc	A		300,00 lei		0,00 lei	Prorated	
122		Flags	Material	buc	F		100,00 lei		0,00 lei	Prorated	
123		Models	Material	buc	M		200,00 lei		0,00 lei	Prorated	
124		Banners	Material	buc	B		100,00 lei		0,00 lei	Prorated	
125		clothes	Material	kg	c		3,00 lei		0,00 lei	Prorated	
126		area map	Material	buc	a		0,00 lei		0,00 lei	Prorated	
127		phone network	Material	buc	p		0,00 lei		0,00 lei	Prorated	
128		meter	Material	buc	m		0,00 lei		0,00 lei	Prorated	
129		carpet	Material	sqm	c		0,00 lei		0,00 lei	Prorated	
130		flag	Material	buc	f		0,00 lei		0,00 lei	Prorated	
131		banner	Material	buc	b		100,00 lei		0,00 lei	Prorated	
132		the parade block	Work		t	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
133		190 people	Work		1	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
134		SOP	Material		S		0,00 lei		0,00 lei	Prorated	
135		barriers	Material		b		0,00 lei		0,00 lei	Prorated	
136		equipment for food prepa	Material		e		0,00 lei		0,00 lei	Prorated	
137		high ranking personalit	Work		h	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
138		retired representative	Work		r	100%	0,00 lei /hr	0,00 lei /hr	0,00 lei	Prorated	Standard
139		medals	Material	buc	m		70,00 lei		0,00 lei	Prorated	
140		chair	Material	buc	c		0,00 lei		0,00 lei	Prorated	
141		napkins	Material	buc	n		0,01 lei		0,00 lei	Prorated	

HOLCIM COMPANY - NEW OFFICE BUILDING

Alexandru ALEXA

CONTENTS

INTRODUCTION

Smart organizations understand that their primary goal is to enhance the performance of their people. In a knowledge work economy, people are the engine that keep companies growing, adapting, improving and innovating.

Not surprisingly, thoughtful workplace design can be a powerful tool for supporting employee performance. And a collateral benefit is that what typically supports productivity also enhances employee health and wellness – it's all interrelated.

Given the nature of today's work processes, how can the workplace better support human performance? How can the workplace support all of the different activities involved with knowledge work – things like collaboration, creativity, innovation, deep thinking and mentorship?

- A building can positively affect ability by providing comfortable ambient conditions, by enabling individual control and adjustment of conditions, and by reducing health and safety risks. Negative impacts on ability to do work are associated with conditions that are uncomfortable, distracting, hazardous or noxious.
- A building can positively affect motivation by providing conditions that promote positive affective functioning, psychological engagement and personal control. Moods create the 'affective context' for thought processes and behaviors and are directly tied to motivation.
- A building can affect opportunity by providing equitable access to conditions that reduce health and safety risks, equitable access to amenities and compensatory design options where inequities exist and are difficult to eliminate entirely.

Five fundamental design elements can positively impact the workplace environment and support the work being done:

1. Thermal Comfort and Temperature

Thermal comfort is created through the right combination of temperature, airflow and humidity. A combination of these elements is required for physical comfort in the workplace. When you hear people complaining about temperature in the workplace, chances are that airflow and humidity are part of the reason.

The ideal temperature in office environments is 21.6 degrees Celsius with a 1-2 percent decrease in performance for every 1° C above or below.2

Slightly lower temperatures are associated with higher accuracy on simulated tasks and reduced sick leave.

Personal control over ambient conditions, especially temperature, increases productivity. One research study tracked workers in an insurance company as they moved to a new building with advanced thermal controls in their workstations. The study found that productivity increases of 2.8 percent could be attributed to the new workstations.

2. Color

How people perceive color varies based on their culture and life experiences. However, there are some generalizations about how color is likely to be perceived, either overtly or subliminally, in the workplace.

Brighter colors (reds, as well as blues and greens) are associated with higher focus and task accuracy.

Blue is calming and cooling, promoting mental control and clear, creative thinking.

Pink lessens feelings of irritation, aggression, loneliness, discouragement and burden.

Red enhances feelings of strength and energy; it is associated with vitality and ambition.

Yellow makes people feel clear-headed and alert, allowing for clear thinking for decision making.

Orange helps ease emotions and boost self-esteem. It creates enthusiasm for life.

3. Noise Control

Noise is an issue in most workplace environments. Interestingly, it can enable or disable productivity, depending on individual preferences and the type of work being done. The key is enabling people to control noise by providing access to a room with a door and acoustical separation when needed.

Perceived noise (discernible by the average human ear) is typically higher in open office environments, but this depends on a space's organization, the materials and the nature of work being done.

When employees have a degree of control over the noise in their environment, they are less distracted by it.

Contrary to popular belief, noise interruptions during simple, mundane tasks can provide the stimulation needed to keep going. Interruptions during complex work, however, require a longer period of time to re-orient, and continued interruptions are likely to have negative effects on mood that reduce the motivation to resume work.

The ability to find quiet times and places is essential to support complex knowledge work, while the ability to have planned or spontaneous interactions without disturbing others is necessary for team work and relationship development. Having speech privacy is necessary for confidential interactions and work processes. 'Acoustical comfort' is achieved when the

workplace provides appropriate acoustical support for interaction, confidentiality and concentrative work.

4. Crowding

When people feel crowded they often feel stressed, which influences their satisfaction of the workplace. The perception of space and whether a person feels crowded varies greatly by cultural background, individual preferences and gender.

Lighter, brighter spaces, as well as rooms with high ceilings or those that have walls with mirrors, are perceived as less crowded.

In the same conditions, men are more likely to feel crowded than women. Men have better peripheral vision than women, and are more likely to perceive others in the same space.

People who work in high-rise buildings feel more crowded than people who do not. This effect is reduced for people who reside on the upper stories in tall buildings, likely because they have better views and access to daylight.

The perception of crowding can be reduced through the use of furniture, plants, decorative elements or pillars. These objects prevent people from feeling crowded or distracted.

5. Indoor Air Quality

Healthy workplaces are a focus for today's organizations. The health of the workforce can affect health insurance costs, sick days and productivity. In addition to supporting human factors and ergonomics, the workplace should support good health.

Americans and occupants of other post-industrial countries spend an enormous amount of time – 90 percent or more – indoors. As a result, the quality of the indoor environment has a significant influence on well-being, productivity and quality of life.18 Indoor settings often contain levels of pollutants that may be two to five times higher – and occasionally more than 100 times higher – than outdoor levels. Sources of indoor air pollution include combustion, building materials and furnishings, household cleaning, maintenance, personal care or hobby products, central heating and cooling systems, and humidification.

1. CONTENT

The HOLCIM Company, cement manufacturing, decide to create a new office building after business development and constant growth of the employees number.

The company currently has a P +2 E building of about 1500 sqm, which employees operating in offices organized the last 2 levels. Standardized area where a worker operates is 20 sqm according the romanian lows. In currently legislation the employees must have at least 20 square meters, each having 13.3 mp, under legal requirement surface.

Demand increasingly higher cement market and products derived therefrom to determiant company to expand its business and personal hire again. Once construction of the new building, parking cars will increase. The basement and ground floor will ensure parking for cars destined for the company's employees. Also, a small room in the basement will provide space for archive company, witch is totaly missing in currently building.

The new building should ensure modern conditions of development of business to increase employee productivity, to provide an environment friendly, healthy and safe

The company has submitted the specification design company a few workplace strategies for ensuring optimal working environment into new premises.

2. PROJECT SCOPE

2.1 *Scope Planning*

Holcim will contract a construction company to do the work . Project manager will be appointed from among the company's employees . The site is in the courtyard cement factory in Brasov , Feldioarei Road , No. 35 . The new building will have four floors, one underground and other 3 overground in total area of 2000 sqm. The building will be included all finishes , except furnitures witch is following to take place in a different project with a specialized company .

The exterior will be equipped with a guard sidewalk and a driveway . The roof will fit is type wood framing and for the building structure shall be used brick and concrete .

The new building will provide space for 200 new employees, 100 parking spaces and a space of 100 square meters for new archive .

The finish will be chosen with care and high quality in order to ensure an optimal environment for development of employees activity . To reduce as much as possible negative effects on workers due to the toxic environment in which they work and long hours at work , the beneficiary establishes several priority strategies to design new headquarters :

Workplace strategies for:

Thermal Comfort and Temperature*:*

Create underfloor air, which provides individual control of air flow.

Provide zoned temperature controls or, if possible, individual controls in each enclosed space (offices, conference rooms, etc.).

Provide operable windows or operable window coverings to maximize sunlight, airflow and temperature control.

Color

Use color strategically to promote desired behaviors and feelings based on psychological reactions, not personal preference.

Vary color use through the workplace. Use it as a design technique to identify circulation or the changing character of space.

Use lighter colors to help reflect light through the space and increase the amount of natural light. (See “Access to Nature, Views and Daylight.”)

Noise Control

For achieving a non-intrusive level of speech privacy, include absorption (through acoustical ceiling, fabrics and carpet), blocking (through furniture system, panels, walls, partitions and screens, and covering (sound masking).

Separate energetic, centralized and noisy spaces from quiet areas. Create opportunities for people to come together without disturbing colleagues.

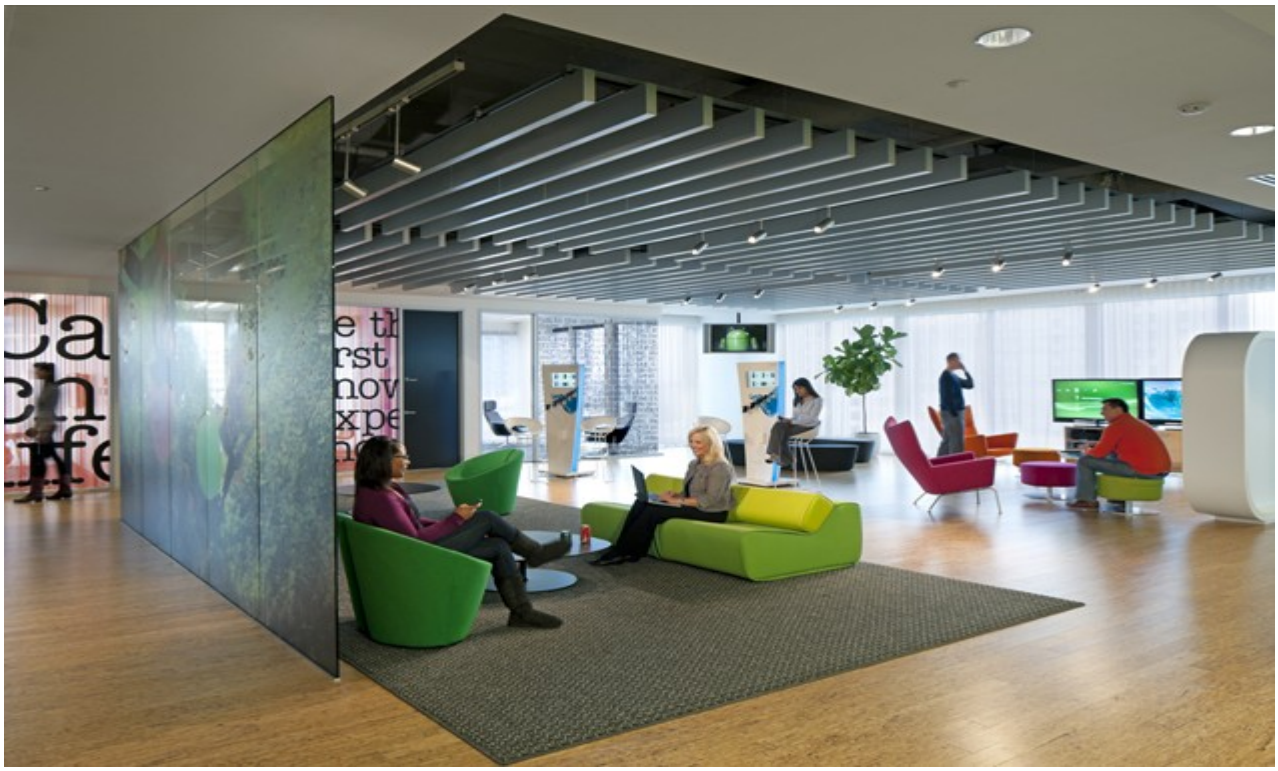
In open plan environments, ensure that people are sitting near those with similar work patterns or subjects of study.

Define policies for employees to be able to reserve quiet space and collaboration space.

Crowding

Reduce the impact of “dense” space and the impact of seeing a significant number of people at once by orienting individual workspace openings such as workstation openings or desk positions in an office to minimize views into others’ workstations while seated.

When possible, provide views to windows to reduce perception of crowding. This could be accomplished by moving circulation to the perimeter of the space and relocating fixed elements such as offices or conference rooms to the interior of the space.



Indoor Air Quality

Invest in carpet, paint, furniture and other workplace finishes with low counts of particulates, gases or volatile organic compounds (VOCs) that can trigger illness. Recommended “eco labels” to watch for include Greenguard and SCS Indoor Advantage (furniture, seating and furnishings), Green Seal (paints and coatings), Blue Angel (office equipment), Floor Score (hard surface flooring), Green Label Plus (carpet and carpet tile), SCS calCOMPliant (wood).

Invest in equipment with ENERGY STAR labels.

Ensure heating, ventilation and air conditioning (HVAC) and other office equipment is checked and maintained on a regular basis.

Train cleaning staff on how to use cleaning equipment and products such as handling vacuum cleaners with hepa-filters or nontoxic chemical cleaners.

Add plants to the office to help clean the air, but be sure to keep them clean and healthy so they do not get dusty or contribute mold spores.

2.2 Scope statement - Work Breakdown Structure:

HOLCIM Company - New office building

1.1 General conditions

1.1.2 Sign contract with a design firm

1.1.3 Finalize plans and develop estimate with owner, architect

1.1.4 Sign contract and notice to proceed

1.1.4 Obtain the planning certificate from local autority

1.1.4.1 Obtain Electric Company authorization

1.1.4.2 Obtain Gas Company authorization

1.1.4.3 Obtain RATB authorization

1.1.4.4 Obtain ApaNOVA Company authorization

1.1.4.5 Obtain ministry of Environment authorization

1.1.5 Sign contract with site inspector

1.2 Site work

1.2.1 Clear and grub lot

1.2.2 Install temporary electric power

1.2.3 Install undergroung utilities

1.3 Foundation

1.3.1 Excavate for fundation

1.3.2 Form basement walls

1.3.3 Place concrete for foundation and basement wall

1.3.4 Cure basement wall for 1 day

1.3.5 Strip basement wall

1.3.6 Form plate basement

1.3.7 ISC Inspection

1.3.8 Place concrete

1.3.9 Cure plate basement for 28 days

1.3.10 Waterproof/ insulate basement wall

1.3.11 Backfill foundation

1.3.12 Strip basement plate

1.4 Framing

1.4.1 Form ground floor wals and pillars

1.4.2 Complete ground floor - plumbing

1.4.3 Complete ground floor circuits

1.4.4 Place concrete

1.4.5 Cure ground floor wals and pillars for 1 day

1.4.6 Form ground floor plate

1.4.7 ISC Inspection

1.4.8 Place concrete

1.4.9 Cure ground floor plate for 28 days

1.4.10 Strip ground floor plate

1.4.11 Form 1 st floor wals and pillars

1.4.12 Complete 1st floor - plumbing

1.4.13 Complete 1st floor circuits

1.4.14 Place concrete

1.4.15 Cure 1 st floor wals and pillars for 1 day

1.4.16 Form 1 st floor plate

1.4.17 ISC Inspection

1.4.18 Place concrete

1.4.19 Cure 1 st floor plate for 28 days

1.4.20 Strip 1 st floor plate

1.4.21 Form 2 nd floor wals and pillars

1.4.22 Complete 2nd floor - plumbing

1.4.23 Complete 2nd floor circuits

1.4.24 Place concrete

1.4.25 Cure 2 nd floor wals and pillars for 1 day

1.4.26 Form 2 nd floor plate

1.4.27 SC Inspection

1.4.28 Place concrete

1.4.29 Cure 2 nd floor plate for 28 days

1.4.30 Strip 2 nd floor plate

1.4.31 Complete roof framing

1.5 Dry in

1.5.1 Install ground floor sheathing

1.5.2 Install 1st floor sheathing

1.5.3 Install 2nd floor sheathing

1.5.4 Install roof

1.6 Exterior finishes

1.6.1 Install windows

1.6.2 Paint 2 nd level walls

1.6.3 Paint 1 st level walls

1.6.4 Paint ground level walls

1.6.5 Pour concrete driveway and sidewalks

1.7 Interior finishes

1.7.1 Insulation

1.7.1.1 Place wall insulation ground level floor

1.7.1.2 Place wall insulation 1 st level floor

1.7.1.3 Place wall insulation 2 nd level floor

1.7.2 Drywall

1.7.2.1 Install drywall – ground level walls

1.7.2.2 Install drywall 1 st level walls

1.7.2.3 Install drywall 2 nd level wals

1.7.3 Paint

1.7.3.1 Paint the basement

1.7.3.2 Paint all ground level

1.7.3.3 Paint all 1 st level

1.7.3.4 Paint all 2 nd level

1.8 Final acceptance

1.8.1 Clean up for final acceptance

1.8.2 Complete final inspection

1.8.3 Cleanup for occupancy

3. TIME MANAGEMENT

The total duration of the project is 202 working days and split by the phases the main periods are described in the table below:

It begins at 25.11.2013 and will be finished at 02.09.2014.

WBS Dictionary

Nr.	Name	Explanations	Dependence	Duration
1	New office building			202 days
2	General conditions			38 days

3	Sign contract with a design firm	chief accountant[50%],lawyer[50%]		1 day
4	Finalize plans and develop estimate with owner, architect	chief accountant[50%]	3	14 days
5	Sign contract and notice to proceed	chief accountant[50%],lawyer[50%]	4	1 day
6	Obtain the planning certificate from local autority			22 days
7	Obtain Electric Company authorization	chief accountant[5%],lawyer[5%]	4	22 days
8	Obtain Gas Company authorization	chief accountant[5%],lawyer[5%]	4	22 days
9	Obtain RATB authorization	chief accountant[5%],lawyer[5%]	4	22 days
10	Obtain ApaNOVA Company authorization	chief accountant[5%],lawyer[5%]	4	22 days
11	Obtain ministry of Environment authorization	chief accountant[5%],lawyer[5%]	4	22 days
12	Sign contract with site inspector	chief accountant[50%],lawyer[50%]	11,7,8,9,10	1 days
13	Site work			3 days
14	Clear and grub lot	bulldozer[90%],mechanical equipment[90%],diesel[24 l],tilting[50%],laborer[200%]	12	1 day
15	Install temporary electric power	electrician,cables plugs apply[2 buc],electrical engineer[90%],laborer[200%]	14	1 day
16	Install undergroung utilities	laborer,plumber engineer[80%],plumber,sanitary pipes valves[3 buc]	15	1 day
17	Foundation			48 days
18	Excavate for fundation	tilting[50%],excavator[90%],civil engineer,mechanical equipment[90%],diesel[50 l],laborer[300%]	16	2 days
19	Form basement walls	formwork[450 mp],carpenter[300%],civil engineer[85%],laborer[300%], blacksmith[300%],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc],electrical engineer[85%],electrician[200%], plumber engineer[85%],plumber[200%], cables plugs apply[5 buc]	18	7 days
20	Place concrete for foundation and basement wall	concrete[350 mc],carpenter[300%],civil engineer[75%],mechanical equipment[80%],laborer[300%], Crane Potain IGO 36[80%]	19	1 day
21	Cure basement wall for 1 day		20	1 day
22	Strip basement wall	carpenter[300%],mechanical equipment[80%],laborer[300%], bulldozer[80%]	21	3 days

23	Form plate basement	formwork[500 mp],carpenter[300%],civil engineer[80%],laborer[300%], blacksmith[300%],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc],electrical engineer[80%],electrician[200%],plumber engineer[80%],plumber[200%],electric cables [3 buc],mechanical	22	10 days
24	ISC Inspection	civil engineer[50%],electrical engineer[50%],plumber engineer[50%]	23	0 days
25	Place concrete	concrete[75 mc],carpenter[300%],civil engineer,mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	24	1 day
26	Cure plate basement for 28 days		25	20 days
27	Waterproof/ insulate basement wall	insulator[200%],Sagitta membrane 4kg/mp PGR (1rol = 10MP)[270 mp],TEFOND[250 mp]	25	2.5 days
28	Backfill foundation	bulldozer,civil engineer[25%],mechanical equipment,diesel[50 l]	27	2 days
29	Strip basement plate	carpenter[20%],mechanical equipment[80%],laborer,Crane Potain IGO 36[80%]	26	3 days
30	Framing			105 days
31	Form ground floor wals and pillars	formwork[450 mp],carpenter[300%],civil engineer[75%],laborer[300%],blacksmith[300%],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc],electrical engineer[85%],electrician[200%],plumber engineer[85%],plumber[200%]	25	6 days
32	Complete ground floor - plumbing	plumber engineer[50%],plumber,sanitary pipes valves[10 buc]	31	2 days
33	Complete ground floor circuits	cables plugs apply[20 buc],electrical engineer[50%],electrician	31	2 days
34	Place concrete	concrete[350 mc],carpenter[300%],civil engineer[75%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	33	1 day

35	Cure ground floor wals and pillars for 1 day		34	1 day
36	Form ground floor plate	formwork[500 mp],carpenter,civil engineer[80%],laborer,blacksmith[300%],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc],electrical engineer[80%],electrician[200%],plumber engineer[80%],plumber[200%]	35	14 days
37	ISC Inspection	civil engineer[50%],electrical engineer[50%],plumber engineer[50%]	36	0 days
38	Place concrete	concrete[75 mc],carpenter[150%],civil engineer,mechanical equipment[20%],laborer[300%],Crane Potain IGO 36[20%]	37	1 day
39	Cure ground floor plate for 28 days		38	20 days
40	Strip ground floor plate	carpenter,mechanical equipment[20%],laborer[300%], Crane Potain IGO 36[20%]	39	3 days
41	Form 1 st floor wals and pillars	formwork[450 mp],carpenter[250%],civil engineer[85%],laborer[300%],blacksmith[300%],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc],electrical engineer[85%],electrician[200%],plumber engineer[85%],plumber[200%]	38	6 days
42	Complete 1st floor - plumbing	plumber engineer[50%],plumber,sanitary pipes valves[10 buc]	41	2 days
43	Complete 1st floor circuits	cables plugs apply[20 buc],electrical engineer[50%],electrician	41	2 days
44	Place concrete	concrete[350 mc],carpenter[300%],civil engineer[75%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	43	1 day
45	Cure 1 st floor wals and pillars for 1 day		44	1 day
46	Form 1 st floor plate	formwork[500 mp],carpenter[150%],civil engineer[80%],laborer[300%],blacksmith[300%],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc],electrical engineer[80%],electrician[200%],plumber engineer[80%],plumber[200%]	45	14 days

47	ISC Inspection	civil engineer[50%],electrical engineer[50%],plumber engineer[50%]	46	0 days
48	Place concrete	concrete[75 mc],carpenter[150%],civil engineer[25%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	47	1 day
49	Cure 1 st floor plate for 28 days		48	20 days
50	Strip 1 st floor plate	mechanical equipment[83%],laborer[313%],Crane Potain IGO 36[83%]	49	3 days
51	Form 2 nd floor wals and pillars	formwork[450 mp],carpenter[300%],civil engineer[75%],laborer[300%],blacksmith[300%],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc],electrical engineer[85%],electrician[200%],plumber engineer[85%],plumber[200%]	48	6 days
52	Complete 2nd floor - plumbing	plumber engineer[50%],plumber,sanitary pipes valves[10 buc]	51	2 days
53	Complete 2nd floor circuits	cables plugs apply[20 buc],electrical engineer[50%],electrician	51	2 days
54	Place concrete	concrete[350 mc],carpenter[300%],civil engineer[75%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	53	1 day
55	Cure 2 nd floor wals and pillars for 1 day		54	1 day
56	Form 2 nd floor plate	formwork[500 mp],carpenter,civil engineer[10%],laborer[150%],blacksmith[300%],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc],electrical engineer[80%],electrician[200%],plumber engineer[80%],plumber[200%]	55	14 days
57	ISC Inspection	civil engineer[50%],electrical engineer[50%],plumber engineer[50%]	56	2 days
58	Place concrete	concrete[75 mc],carpenter[300%],civil engineer[50%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	57	1 day
59	Cure 2 nd floor plate for 28 days		58	20 days
60	Strip 2 nd floor plate	carpenter[300%],mechanical equipment[80%],laborer[300%],Crane Potain IGO 36[80%]	59	3 days
61	Complete roof framing	softwood timber for roof[10 mc],carpenter,civil engineer[80%],mechanical equipment[50%],Crane Potain IGO 36[50%]	60	5 days
62	Dry in			75 days

63	Install ground floor sheathing	brick mortar for masonry[61 mc],civil engineer[20%],mason,laborer	40	5 days
64	Install 1st floor sheathing	brick mortar for masonry[61 mc],civil engineer[20%],mason,mechanical equipment[10%],Crane Potain IGO 36[10%],laborer	63	5 days
65	Install 2nd floor sheathing	brick mortar for masonry[61 mc],civil engineer[20%],mason,mechanical equipment[10%],Crane Potain IGO 36[10%],laborer	64	5 days
66	Install roof	softwood timber for roof[15 mc],carpenter,civil engineer[80%],mechanical equipment[50%],Crane Potain IGO 36[50%],laborer	61	18 days
67	Exterior finishes			10 days
68	Install windows	civil engineer[10%],locksmiths[200%],laborer[200%],PVC[45 mp]	65	3 days
69	Paint 2 nd level walls	interior paint[450 l],painter[200%]	68	1 day
70	Paint 1 st level walls	interior paint[450 l],painter[200%]	69	2 days
71	Paint ground level walls	interior paint[450 l],painter[200%]	70	2 days
72	Pour concrete driveway and sidewalks	concrete for walkways and sidewalks[20 mc],formwork[5 mp],carpenter[300%],civil engineer[75%]	71	1 day
73	Interior finishes			35 days
74	Insulation			15 days
75	Place wall insulation ground level floor	mineral wool or wool[450 mp],civil engineer[10%],insulator[200%]	68	5 days
76	Place wall insulation 1 st level floor	mineral wool or wool[450 mp],insulator[200%],civil engineer[10%]	75	5 days
77	Place wall insulation 2 nd level floor	mineral wool or wool[450 mp],insulator[200%],civil engineer[10%]	76	5 days
78	Drywall			30 days
79	Install drywall – ground level walls	Drywall[450 mp],laborer[150%],dry wallers[400%]	75	10 days
80	Install drywall 1 st level walls	Drywall[450 mp],laborer[150%],dry wallers[400%]	79	10 days
81	Install drywall 2 nd level wals	Drywall[450 mp],laborer[150%],dry wallers[400%]	80	10 days
82	Paint			12 days
83	Paint the basement	interior paint[450 l],painter[200%]	79	3 days
84	Paint all ground level	interior paint[450 l],painter[200%]	83	3 days
85	Paint all 1 st level	interior paint[450 l],painter[200%]	84	3 days
86	Paint all 2 nd level	interior paint[450 l],painter[200%]	85	3 days
87	Final acceptance			35 days

88	Clean up for final acceptance	laborer[300%],cleaning products[15 l]	86,81	7 days
89	Complete final inspection	civil engineer[10%],electrical engineer[10%],plumber engineer	88	20 days
90	Cleanup for occupancy	laborer[300%],cleaning products[15 l]	89	8 days

4. COST MANAGEMENT

The entire cost of the project will be 1,834,429.075 RON.

Direct cost = 1,467,543.26 RON

Indirect cost = 25 % x Direct cost = 366,885.815 RON

All cost presented in the project include TVA

Direct cost expenses such as production materials and labor or sales force salaries that relate directly to the build new office.

Indirect cost represent costs not directly associated with the strucutre , but incurred during the construction period. Also called soft costs.

Examples:

- Office materials
- Administrative costs
- Professional fees
- Insurance
- Project manager

For details see appendix.

5. PROJECT QUALITY

5.1 *Quality assurance*

The contractor will prepare verification processes reports verification processes as appropriate at the end of each stage of the work.

- P.V.L.A. (Hidden works report)
- P.V.F.D. (Critical phase report)
- P.V.R.C. (Reception quality report)

5.2 Quality control

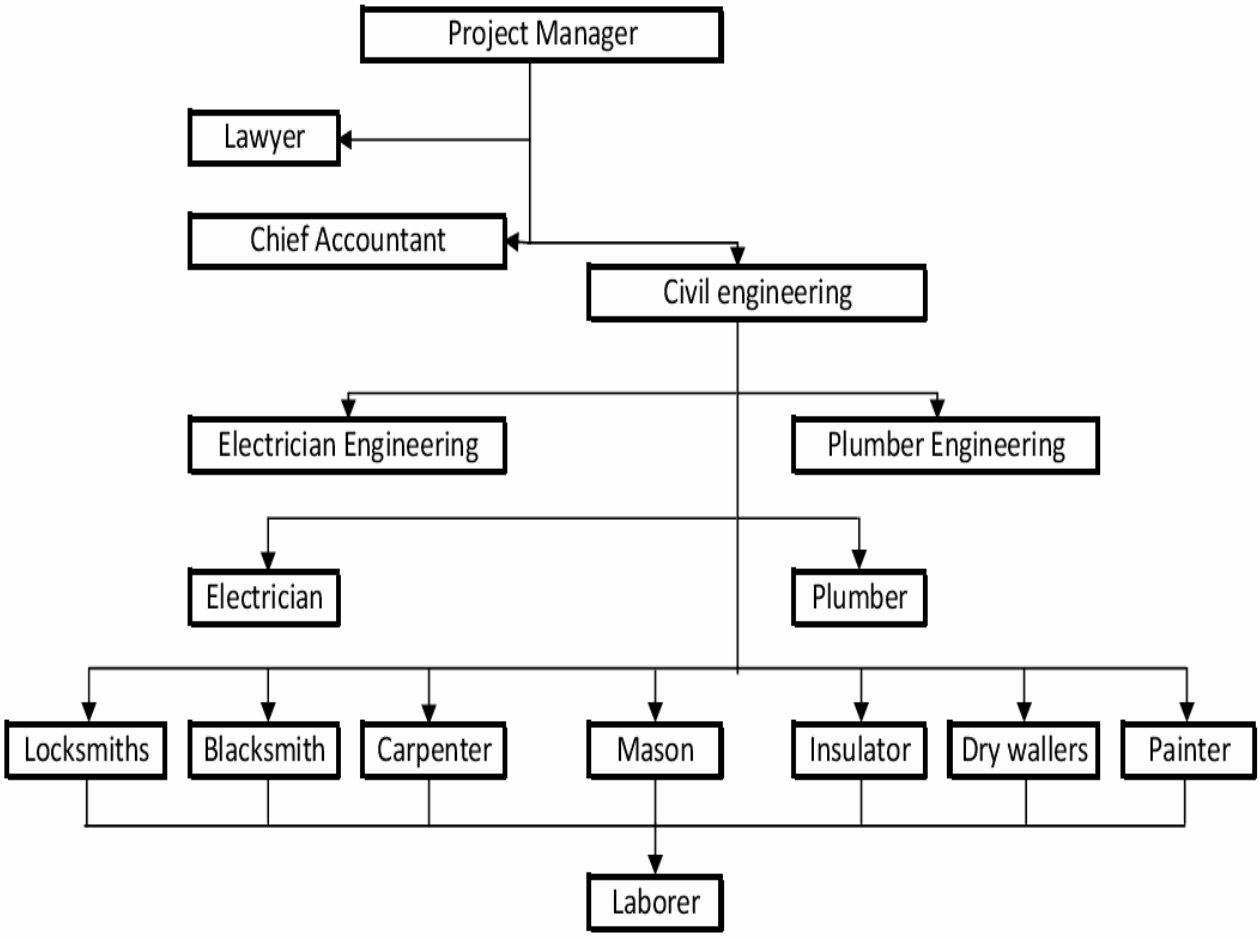
When identifying the quality problems or accidents, all construction parts with quality problems and related parts and the next construction procedure should be stopped, if necessary, and appropriate protective measures should be taken. At the same time, the actual condition should be reported to the site inspector and to the arhitect.

Name of control point	Working contents	Operational staff	Standard	Tools	Checking frequency
Formwork size	Achieving the correct size formwork	Construction workers Quality inspectors Technicians	C 11 -1974	Steel ruler Laser Visual measurement	Checking the whole surface
The colligation of independent base steel	Prevention of the deviation of reinforcing bar	Construction workers Quality inspectors Technicians	NE 012/2 -2012	Steel ruler Line hammer Visual measurement	Checking one by one
Bonding rate of brick	Bonding rate of brick masonry should be larger than 80%	Technicians Construction workers	According to standard CR6 - 2006	100 grid Visual measuremen	Sampling check
Construction of floor of balcony	Prevention of flashing and water leakage of balcony floor	Construction workers Technicians Quality inspectors	Quality Evaluation Standards of Construction C 56-1985	Level ruler Extension lead Visual measuremen	Checking balcony one by one

6. PROJECT HUMAN RESOURCE MANAGEMENT

6.1 *Organizational planning*

6.1.1 Organizational chart



6.1.2 List of resources

Resource type	Name	Number
Human Resources	lawyer	1
	chief accountant	1
	civil engineer	1
	plumber engineer	1
	electrical engineer	1

	mechanical equipment	1
	electrician	2
	insulator	2
	carpenter	4
	blacksmith	3
	mason	2
	plumber	2
	locksmiths	2
	dry wallers	4
	painter	2
	laborer	7
Machinery and equipment	tilting	1
	excavator	1
	bulldozer	1
	Crane Potain IGO 36	1
	concrete	1600 mc
	reinforcing steel	112,33 to
	Diesel fuel	215 l
	formwork	1800 mp
	Sagitta membrane 4kg/mp PGR (1rol = 10MP)	1000 mp
	TEFOND	1000 mp
	sanitary pipes valves	15 buc
	cables plugs apply	19 buc
	softwood timber for roof	25 mc
	brick mortar for masonry	183 mc
	PVC	45 mp
	plaster structured for outdoor	1350 l
	concrete for walkways and sidewalks	20 mc
	mineral wool or wool	1350 mp
	Drywall	1350 mp
	interior paint	1800 l
	cleaning products	30 l
	electric cables	100 m

6.1.3 The Responsibility Assignment Matrix

P=performing R=responsible		Resources																	
		Project Manager	lawyer	chief accountant	civil engineer	plumber engineer	electrical engineer	mechanical equipment	formwork	electrician	insulator	carpenter	blacksmith	mason	plumber	locksmiths	dry wallers	painter	laborer
ACTIVITIES	3	R	RP	RP															
	4	R		RP															
	7	R	RP	RP															
	8	R	RP	RP															
	9	R	RP	RP															

	10	R	RP	RP															
	11	R	RP	RP															
	12	R	RP	RP															
	14	R						RP											P
	15	R					R			P									P
	16	R				R									P				P
	18	R			R			RP											P
	19	R			R	R	R		P	P		P	P		P				P
	20	R			R			RP				P							P
	22	R						RP				P							P
	23	R			R	R	R		P	P		P	P		P				P
	24	R			RP	RP	RP												
	25	R			R			RP				P							P
	27	R									P								
	28	R			R			RP											
	29	R						RP				P							P
	31	R			R	R	R		P	P		P	P		P				P
	32	R				R									P				
	33	R					R			P									
	34	R			R			RP				P							P
	36	R			R	R	R		P	P		P	P		P				P
	37	R			RP	RP	RP												
	38	R			R			RP				P							P
	40	R																	
	41	R			R	R	R		P	P		P	P		P				P
	42	R				R									P				
	43	R					R			P									
	44	R			R			RP				P							P
	46	R			R	R	R		P	P		P	P		P				P
	47	R			RP	RP	RP												
	48	R			R			RP				P							P
	50	R																	
	51	R			R	R	R		P	P		P	P		P				P
	52	R				R									P				
	53	R					R			P									
	54	R			R			RP				P							P
	56	R			R	R	R		P	P		P	P		P				P
	57	R			RP	RP	RP												
	58	R			R			RP				P							P
	60	R						RP					P						P
	61	R			R			RP	P				P						
	63	R			R			RP							P				P
	64	R			R			RP							P				P

65	R			R			RP							P				P
66	R			R			RP					P						P
68	R			R											P			P
69	R																P	
70	R																P	
71	R																P	
72	R		R					P			P							
75	R		R							P								
76	R		R							P								
77	R		R							P								
79	R															P		P
80	R															P		P
81	R															P		P
83	R																P	
84	R																P	
85	R																P	
86	R																P	
88	R																	P
89	R		RP	RP	RP													
90	R																	P

6.2 Staff acquisition

Project staff assigned is selected from internal personal company, including the Project manager.

Staff acquisition is composed of Project manager, one lawyer and chief accountant.

7. PROJECT COMMUNICATION MANAGEMENT

Stakeholders: Holcim Company Manager, Chief Architect, Site inspector, ISC Inspector

Templates : Hidden works Report (PVLA) Quality documents
Critical phase Report (PVFD) Attachment
Project-Over Report (PVRTL) Work situations

Project stage	Person to	Target audience	When the message is to be	Communication type/Channel	Deliverables

	convey the message		**conveyed**		
Sign contract with a design firm	Lawyer	Project manager	Mon 11/25/13	***Newsletters and email distribution lists***	Contract
Mounth end	Site inspector	Project manager	27-30 every mounth	Meetings,	Attachment, Work situations, Quality documents
Critical phase	Site inspector	Project manager ISC Inspector Architect Site inspector	Before concrete placement	Meetings	Critical phase Report (PVFD)
End project	Site inspector	Project manager ISC Inspector Architect Site inspector	Fri 7/25/14	Meetings	Project-Over Report (PVRTL)

8. RISK MANAGEMENT

Its purpose is to generate ideas and promote good practice for those involved in the business of managing risk. All too often assessments of risk are crudely made and the consequences of getting things wrong can be serious, including lost opportunities, loss of business, loss of reputation and even life.

Risk identification, assessment, and analysis exercises form the basis for sound risk response options. A series of risk response actions can help agencies and their industry partners avoid or mitigate the identified risks. This risks may be the following:

- Unrecognized, unmanaged, or ignored (by default).
- Recognized, but no action taken (absorbed by a mater of policy).
- Avoided (by taking appropriate steps).
- Reduced (by an alternative approach).
- Transferred (to others through contract or insurance).
- Retained and absorbed (by prudent allowances).
- Handled by a combination of the above.

0 – 5 = Low Risk 6 – 10 = Moderate Risk 11 – 15 = High Risk 16 – 25 = extremely high unacceptable risk		Severity of the potential injury/damage				
		Insignificant damage to Property, Equipment or Minor Injury 1	Non-Reportable Injury, minor loss of Process or slight damage to Property 2	Reportable Injury moderate loss of Process or limited damage to Property 3	Major Injury, Single Fatality critical loss of Process/damage to Property 4	Multiple Fatalities Catastrophic Loss of Business 5
Likelihood of the hazard happening	Almost Certain 5	5	10	15	20	25
	Will probably occur 4	4	8	12	16	20
	Possible occur 3	3	6	9	12	15
	Remote possibility 2	2	4	6	8	10
	Extremely Unlikely 1	1	2	3	4	5

	Categories	Likelihood 1 (rare)-5 (very frequent)	Impact 1 (very low)-5 (very high)	Risk
		A	B	A X B
	Design risks			
D1	Design errors and omissions	4	5	20
D2	Design process takes longer than anticipated	3	4	12
D3	Stakeholders request late changes	3	3	9
D4	Failure to carry out the works in accordance with the contract	3	3	9
	External risks			
Ex1	New stakeholders emerge and request changes	2	4	8
Ex2	Public objections	1	3	3
Ex3	Laws and local standards change	1	3	3
Ex4	Tax change	1	4	4
	Environmental risks			
En1	Environmental analysis incomplete	2	4	8

En2	New alternatives required to avoid, mitigate or minimize environmental impact	2	4	8
Organizational risks				
O1	Inexperienced workforce and staff turnover	3	3	9
O2	Delayed deliveries	3	3	9
O3	Lack of protection on a construction site	2	4	8
Project management risks				
PM1	Failure to comply with contractual quality requirements	3	4	12
PM2	Scheduling errors, contractor delays	4	4	16
PM3	Project team conflicts	3	3	9
Right of way risks				
R1	Expired temporary construction permits	1	4	4
R2	Contradictions in the construction documents	2	3	6
Construction risks				
C1	Construction cost overruns	4	4	16
C2	Technology changes	2	4	8

Categories		Solving the problem
Design risks		
D1	Design errors and omissions	Thorough study of the project before starting work
D2	Design process takes longer than anticipated	Given all information todesign company
D3	Stakeholders request late changes	Anticipate Stakeholders request
D4	Failure to carry out the works in accordance with the contract	The awareness product specification By the executors
External risks		
Ex1	New stakeholders emerge and request changes	Anticipate Stakeholders request
Ex2	Public objections	Study laws and local standards
Ex3	Laws and local standards change	Alignment to new laws and local standards
Ex4	Tax change	Pay from indirect cost
Environmental risks		
En1	Environmental analysis incomplete	Obtain ministry of Environment authorization
En2	New alternatives required to avoid, mitigate or minimize environmental impact	Adopt new techniques and tehnologies for enviroment protection
Organizational risks		
O1	Inexperienced workforce and staff turnover	Hire only qualified persons
O2	Delayed deliveries	Issuing orders in a timely manner
O3	Lack of protection on a construction site	Take all safety insurance on construction site
Project management risks		
PM1	Failure to comply with contractual quality requirements	Rigorous control on construction site in critical phase
PM2	Scheduling errors, contractor delays	Carefully follow the works schedule
PM3	Project team conflicts	Settling all conflicts in project team
Right of way risks		

R1	Expired temporary construction permits	Apply for a new temporary construction permits
R2	Contradictions in the construction documents	Harmonize inconsistencies with the design firm
Construction risks		
C1	Construction cost overruns	Supported from indirect cost
C2	Technology changes	Adopt new tehnologies only if it worth financial

9. PROCUREMENT

The materials will be purchased and supplied according chart attached to a date closer to the start of work that requires the material. As an exception, the concrete will provide in the same the day with ISC Inspection acceptance.

The construction company has signed framework agreements with manufacturers and distributors of building materials. Space for storage of materials is very small and requires material supply limited amounts of time necessary activities.

The construction company present Project manager a monthly invoice (showing the balance still owing along with any 'extras') that Project team should be prepared to pay promptly.

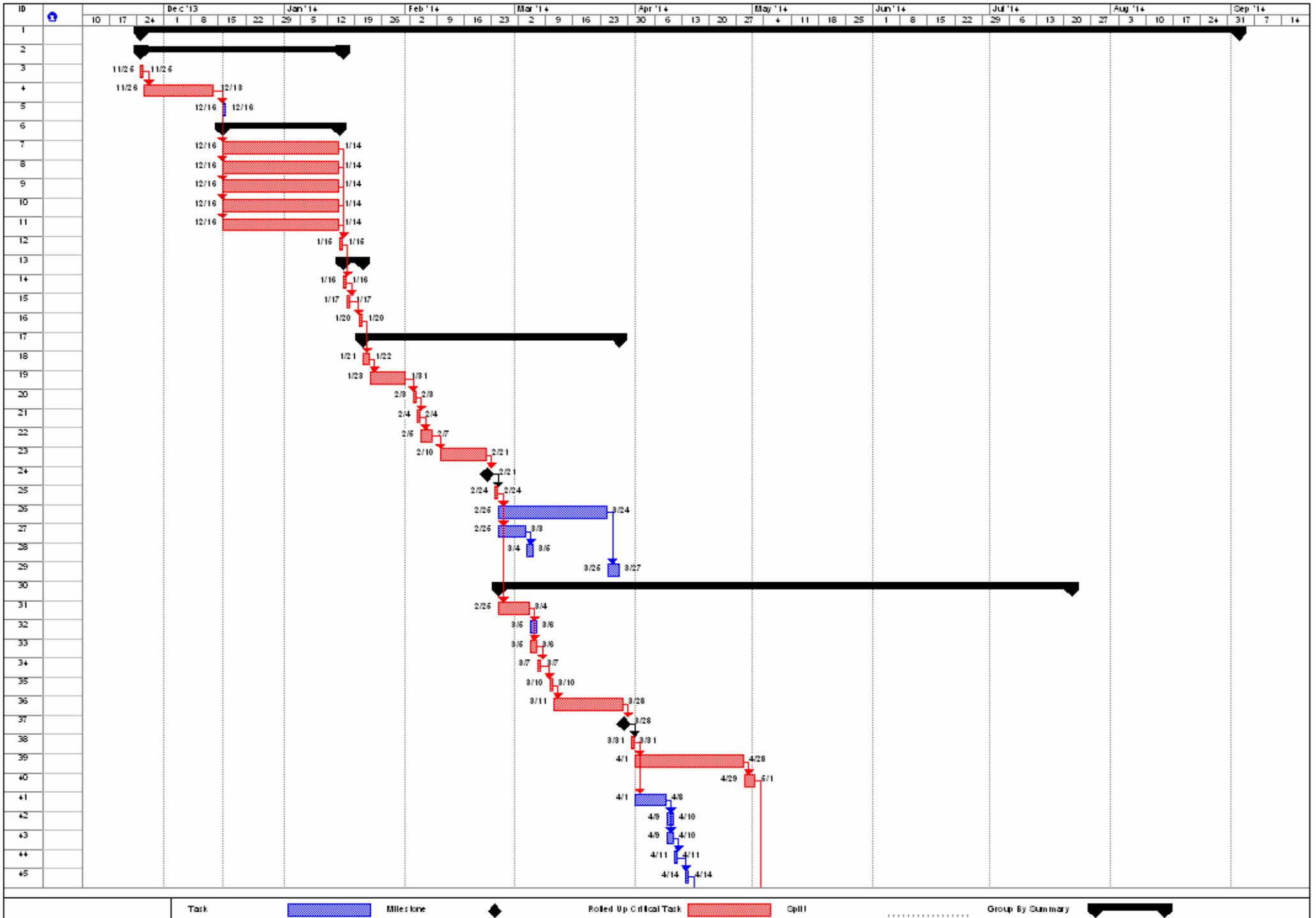
Acquisition date	Materials procured
20-Jan-14	diesel[24 l]
16-Jan-14	cables plugs apply[2 buc]
17-Jan-14	sanitary pipes valves[3 buc]
20-Jan-14	diesel[50 l
22-Jan-14	formwork[450 mp],reinforcing steel[25,150 kg],cables plugs apply[5 buc]
3-Feb-14	concrete[350 mc]
24-Feb-14	concrete[75 mc]
24-Mar-14	Sagitta membrane 4kg/mp PGR (1rol = 10MP)[270 mp],TEFOND[250 mp]
20-Jan-14	diesel[50 l]
24-Feb-14	formwork[450 mp],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc]
4-Mar-14	sanitary pipes valves[10 buc]
4-Mar-14	cables plugs apply[20 buc]
7-Mar-14	concrete[350 mc]
10-Mar-14	formwork[500 mp],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc]
31-Mar-14	concrete[75 mc]
31-Mar-14	formwork[450 mp],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc]
8-Apr-14	plumber,sanitary pipes valves[10 buc]
8-Apr-14	cables plugs apply[20 buc]
11-Apr-14	concrete[350 mc]

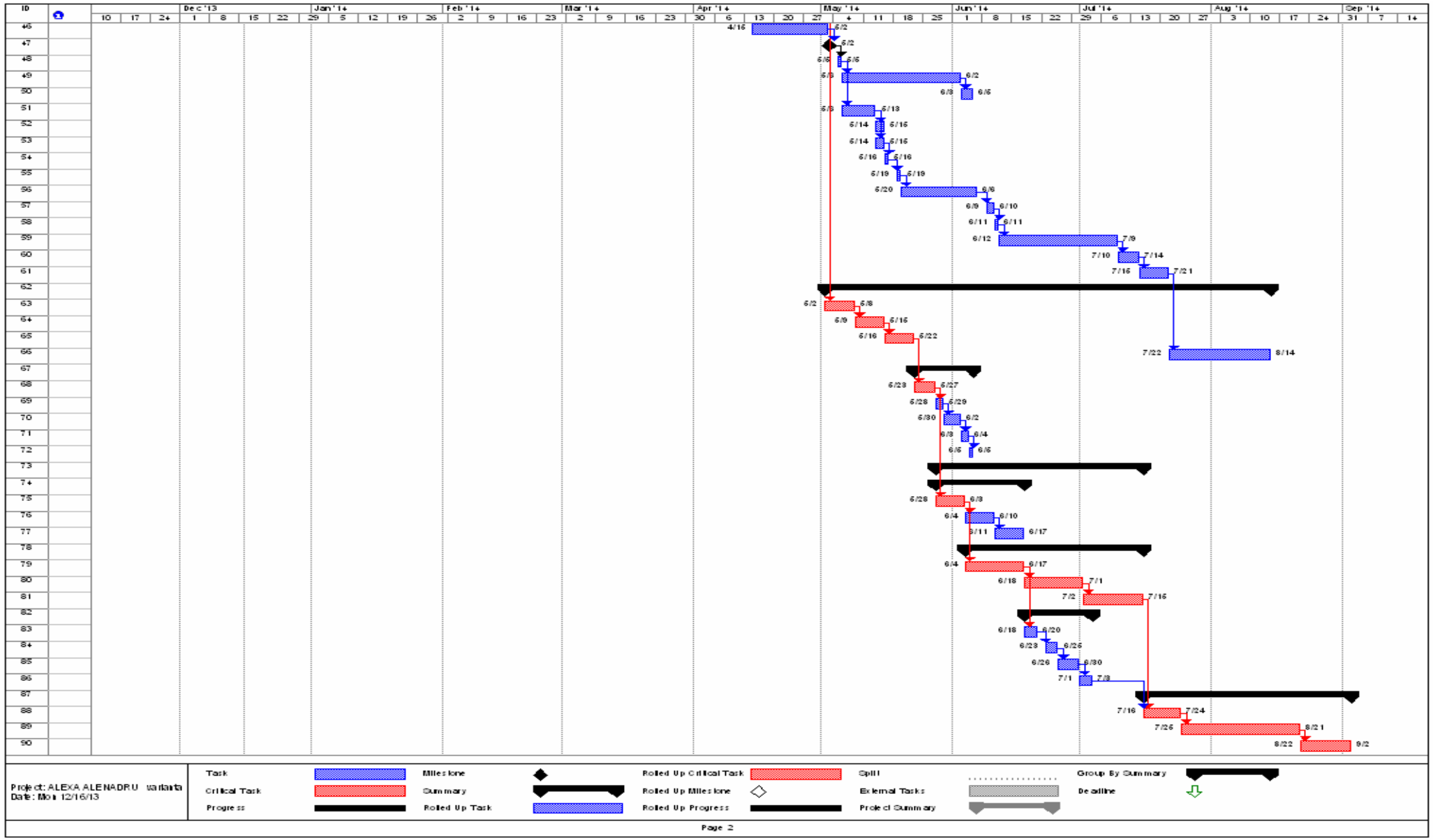
14-Apr-14	formwork[500 mp],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc]
5-May-14	concrete[75 mc]
5-May-14	formwork[450 mp],reinforcing steel[25,150 kg],sanitary pipes valves[5 buc]
13-May-14	sanitary pipes valves[10 buc]
13-May-14	cables plugs apply[20 buc]
16-May-14	concrete[350 mc]
19-May-14	formwork[500 mp],reinforcing steel[26,000 kg],sanitary pipes valves[2 buc]
11-Jun-14	concrete[75 mc]
14-Jul-14	softwood timber for roof[10 mc]
2-May-14	brick mortar for masonry[61 mc]
9-May-14	brick mortar for masonry[61 mc]
16-May-14	brick mortar for masonry[61 mc]
22-Jul-14	softwood timber for roof[15 mc]
16-May-14	PVC[45 mp]
27-May-14	interior paint[450 l]
29-May-14	interior paint[450 l]
2-Jun-14	interior paint[450 l]
5-Jun-14	concrete for walkways and sidewalks[20 mc]
27-May-14	mineral wool or wool[450 mp]
27-May-14	mineral wool or wool[450 mp]
27-May-14	mineral wool or wool[450 mp]
3-Jun-14	Drywall[450 mp]
17-Jun-14	Drywall[450 mp]
1-Jul-14	Drywall[450 mp]
17-Jun-14	interior paint[450 l]
20-Jun-14	interior paint[450 l]
25-Jun-14	interior paint[450 l]
30-Jun-14	interior paint[450 l]
15-Jul-14	cleaning products[15 l]
15-Jul-14	cleaning products[15 l]

10. PROJECT CLOSING & CONCLUSION

At the end of the project, designer, investor, ISC and the executing firm.will be complete the holl process through Project-Over Report (PVRTL). Warranty period is 24 months from the date of PVRTL. During this time the maker is responsible for all hidden erors and will remedy any defect appeared at his own expense.

In conclusion Holcim company will give employees a modern environment of business with all the necessary equipment and will solve the crowned office problem and insufficient car parking.


ID
Dec '13
Jan '14
Feb '14
Mar '14
Apr '14
May '14
Jun '14
Jul '14
Aug '14
Sep '14
Task
Milestone
Rolled Up Critical Task
Split
Group By Summary


ID
Dec '13
Jan '14
Feb '14
Mar '14
Apr '14
May '14
Jun '14
Jul '14
Aug '14
Sep '14
Project: ALEXA ALENADRU variianta
Date: Mon 12/16/13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 2

Budget Report as of Tue 12/17/13
HOLCIM Company - New Office building

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance
46	Form 1 st floor plate	RON 0.00	Prorated	RON 108,048.80	RON 0.00	RON 108,048.80
23	Form plate basement	RON 0.00	Prorated	RON 106,582.00	RON 0.00	RON 106,582.00
36	Form ground floor plate	RON 0.00	Prorated	RON 106,060.80	RON 0.00	RON 106,060.80
56	Form 2 nd floor plate	RON 0.00	Prorated	RON 104,985.60	RON 0.00	RON 104,985.60
31	Form ground floor wals and pillars	RON 0.00	Prorated	RON 96,853.00	RON 0.00	RON 96,853.00
51	Form 2 nd floor wals and pillars	RON 0.00	Prorated	RON 96,853.00	RON 0.00	RON 96,853.00
41	Form 1 st floor wals and pillars	RON 0.00	Prorated	RON 96,663.40	RON 0.00	RON 96,663.40
19	Form basement walls	RON 0.00	Prorated	RON 91,818.80	RON 0.00	RON 91,818.80
34	Place concrete	RON 0.00	Prorated	RON 86,598.00	RON 0.00	RON 86,598.00
44	Place concrete	RON 0.00	Prorated	RON 86,598.00	RON 0.00	RON 86,598.00
54	Place concrete	RON 0.00	Prorated	RON 86,598.00	RON 0.00	RON 86,598.00
20	Place concrete for foundation and bas	RON 0.00	Prorated	RON 85,966.00	RON 0.00	RON 85,966.00
25	Place concrete	RON 0.00	Prorated	RON 19,259.00	RON 0.00	RON 19,259.00
58	Place concrete	RON 0.00	Prorated	RON 19,187.00	RON 0.00	RON 19,187.00
48	Place concrete	RON 0.00	Prorated	RON 19,013.00	RON 0.00	RON 19,013.00
38	Place concrete	RON 0.00	Prorated	RON 18,881.00	RON 0.00	RON 18,881.00
65	Install 2nd floor sheathing	RON 0.00	Prorated	RON 16,234.00	RON 0.00	RON 16,234.00
64	Install 1st floor sheathing	RON 0.00	Prorated	RON 15,750.44	RON 0.00	RON 15,750.44
63	Install ground floor sheathing	RON 0.00	Prorated	RON 15,734.00	RON 0.00	RON 15,734.00
66	Install roof	RON 0.00	Prorated	RON 15,693.60	RON 0.00	RON 15,693.60
68	Install windows	RON 0.00	Prorated	RON 12,321.20	RON 0.00	RON 12,321.20
80	Install drywall 1 st level walls	RON 0.00	Prorated	RON 9,735.00	RON 0.00	RON 9,735.00
81	Install drywall 2 nd level wals	RON 0.00	Prorated	RON 9,735.00	RON 0.00	RON 9,735.00
83	Paint the basement	RON 0.00	Prorated	RON 9,480.00	RON 0.00	RON 9,480.00
84	Paint all ground level	RON 0.00	Prorated	RON 9,480.00	RON 0.00	RON 9,480.00
85	Paint all 1 st level	RON 0.00	Prorated	RON 9,480.00	RON 0.00	RON 9,480.00
86	Paint all 2 nd level	RON 0.00	Prorated	RON 9,480.00	RON 0.00	RON 9,480.00
70	Paint 1 st level walls	RON 0.00	Prorated	RON 9,320.00	RON 0.00	RON 9,320.00
71	Paint ground level walls	RON 0.00	Prorated	RON 9,320.00	RON 0.00	RON 9,320.00
69	Paint 2 nd level walls	RON 0.00	Prorated	RON 9,160.00	RON 0.00	RON 9,160.00
27	Waterproof/ insulate basement wall	RON 0.00	Prorated	RON 7,171.70	RON 0.00	RON 7,171.70
79	Install drywall – ground level walls	RON 0.00	Prorated	RON 6,375.00	RON 0.00	RON 6,375.00
61	Complete roof framing	RON 0.00	Prorated	RON 6,295.00	RON 0.00	RON 6,295.00
76	Place wall insulation 1 st level floor	RON 0.00	Prorated	RON 5,372.00	RON 0.00	RON 5,372.00
77	Place wall insulation 2 nd level floor	RON 0.00	Prorated	RON 5,372.00	RON 0.00	RON 5,372.00
72	Pour concrete driveway and sidewalks	RON 0.00	Prorated	RON 5,004.00	RON 0.00	RON 5,004.00
75	Place wall insulation ground level floor	RON 0.00	Prorated	RON 4,935.64	RON 0.00	RON 4,935.64
42	Complete 1st floor - plumbing	RON 0.00	Prorated	RON 4,316.00	RON 0.00	RON 4,316.00
52	Complete 2nd floor - plumbing	RON 0.00	Prorated	RON 4,316.00	RON 0.00	RON 4,316.00
32	Complete ground floor - plumbing	RON 0.00	Prorated	RON 4,228.00	RON 0.00	RON 4,228.00
60	Strip 2 nd floor plate	RON 0.00	Prorated	RON 2,220.00	RON 0.00	RON 2,220.00
43	Complete 1st floor circuits	RON 0.00	Prorated	RON 2,116.00	RON 0.00	RON 2,116.00
53	Complete 2nd floor circuits	RON 0.00	Prorated	RON 2,116.00	RON 0.00	RON 2,116.00
33	Complete ground floor circuits	RON 0.00	Prorated	RON 2,028.00	RON 0.00	RON 2,028.00
50	Strip 1 st floor plate	RON 0.00	Prorated	RON 1,452.52	RON 0.00	RON 1,452.52
90	Cleanup for occupancy	RON 0.00	Prorated	RON 1,452.00	RON 0.00	RON 1,452.00
16	Install undergroung utilities	RON 0.00	Prorated	RON 1,448.00	RON 0.00	RON 1,448.00
29	Strip basement plate	RON 0.00	Prorated	RON 1,159.20	RON 0.00	RON 1,159.20
4	Finalize plans and develop estimate wi	RON 0.00	Prorated	RON 1,120.00	RON 0.00	RON 1,120.00
18	Excavate for fundation	RON 0.00	Prorated	RON 955.20	RON 0.00	RON 955.20

Budget Report as of Tue 12/17/13
HOLCIM Company - New Office building

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance
40	Strip ground floor plate	RON 0.00	Prorated	RON 948.00	RON 0.00	RON 948.00
39	Complete final inspection	RON 0.00	Prorated	RON 948.00	RON 0.00	RON 948.00
38	Clean up for final acceptance	RON 0.00	Prorated	RON 636.00	RON 0.00	RON 636.00
28	Backfill foundation	RON 0.00	Prorated	RON 458.67	RON 0.00	RON 458.67
7	Obtain Electric Company authorization	RON 0.00	Prorated	RON 440.00	RON 0.00	RON 440.00
8	Obtain Gas Company authorization	RON 0.00	Prorated	RON 440.00	RON 0.00	RON 440.00
9	Obtain RATB authorization	RON 0.00	Prorated	RON 440.00	RON 0.00	RON 440.00
10	Obtain ApaNOVA Company authorizat	RON 0.00	Prorated	RON 440.00	RON 0.00	RON 440.00
11	Obtain ministry of Environment authori	RON 0.00	Prorated	RON 440.00	RON 0.00	RON 440.00
57	ISC Inspection	RON 0.00	Prorated	RON 424.00	RON 0.00	RON 424.00
15	Install temporary electric power	RON 0.00	Prorated	RON 410.00	RON 0.00	RON 410.00
22	Strip basement wall	RON 0.00	Prorated	RON 347.29	RON 0.00	RON 347.29
14	Clear and grub lot	RON 0.00	Prorated	RON 330.40	RON 0.00	RON 330.40
3	Sign contract with a design firm	RON 0.00	Prorated	RON 200.00	RON 0.00	RON 200.00
5	Sign contract and notice to proceed	RON 0.00	Prorated	RON 200.00	RON 0.00	RON 200.00
12	Sign contract with site inspector	RON 0.00	Prorated	RON 200.00	RON 0.00	RON 200.00
21	Cure basement wal for 1 day	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
24	ISC Inspection	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
26	Cure plate basement for 28 days	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
35	Cure ground floor wals and pillars for	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
37	ISC Inspection	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
39	Cure ground floor plate for 28 days	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
45	Cure 1 st floor wals and pillars for 1 d.	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
47	ISC Inspection	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
49	Cure 1 st floor plate for 28 days	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
55	Cure 2 rd floor wals and pillars for 1 c	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
59	Cure 2 rd floor plate for 20 days	RON 0.00	Prorated	RON 0.00	RON 0.00	RON 0.00
		RON 0.00		RON 1,467,543.26	RON 0.00	RON 1,467,543.26

ORGANIZING A WORKING GROUP FOR PTEC'S COMMUNITY

Catalin ANTON

CONTENTS

INTRODUCTION

Project management has become a usual method of management in all domains. In this case project management is used to draw a whole picture of what will be done by all personnel involved in this process from the Regional Department of Defense Resources Management Studies (DRESMARA) Brasov, to have an important event in Brasov, Romania, and also to inure DRESMARA's personnel in using project management methods.

DRESMARA is a military educational institution financed and supervised by the Ministry of National Defense under the direct authority of the commandant (rector) of the National Defense University "CAROL I", and is officially acknowledged by NATO as one of its 26 international Partnership Training and Education Centers (PTEC).

Together with NATO School Oberammergau and all PTECs, DRESMARA serves as a centre for individual education and training for military and civilian personnel from NATO, Partnership for Peace, Mediterranean Dialogue, Istanbul Cooperation Initiative and other NATO partners. In this respect I consider that education process requires a high degree of discussion between and among all PTECs representatives.

This activity is very important inside PTEC's Community and it is organized biannually by those PTECs which consider that can put in place this event and have enough funds to support the this activity. The planning and approving phases of these Working Groups are issued annually by participants into Commandants Conference (CC). During CC, commandants will establish which PTEC will organize each WG and an approximate period of time, in accordance with the next academic year.

Continuing, I can say that due to numerous challenges and opportunities which appear annually in the field of education and training it is mandatory that all PTECs (including here NATO School Oberammergau as a leader) to meet and to discuss, especially regarding all achievements and failures during educational process in order to enhance educational planning activities and to have a common level of teaching and training. In this respect, it is important that all PTEC representatives to prepare, present and share all consider is necessary to know by each participant during the meetings.

According to what has happened in the last years we have identified that these meetings must happen because of keeping close ties regarding educational activities and methods and how to apply for new educational programs and funds. During WGs each PTEC can provide inputs for further development into the education field, and especially for military education.

These meetings are can be attended by those NATO structures involved in educational and training activities, where they present all changes necessary to be reconsider or to be put in place by each PTEC, inasmuch as NATO top management has established a new policy regarding future of education and training into its educational institutions.

1. PROJECT SCOPE

Background

The staff element of DRESMARA has established to prepare and hold one of the two Working Groups organized by PTEC Community during this academic year. The activity must assure a mandatory moment in the educational planning process used to upgrade the last decisions which have been taken by Allied Commandment for Transformation in this field.

Summary

This Working Group is scheduled to take place in the end of June 2014, after all courses developed by each PTEC will be finished, and before the summer holiday. In this respect International Relations Office from DRESMARA prepared a draft for the event and was approved by DRESMARA's Director.

Project duration: Start date – April 01, 2014; End date – June 27, 2014

Scope Planning – The work breakdown structure will be created and defined by Head of International Relations Office as a project manager, being supported by Admin Office, IT Compartment, and Financial Office in order to define, verify and control the project, and especially about how, when and by whom it will be done.

This project is designed to assure a certain time table for all activities which will be accomplish by each participant from DRESMARA, in order to fulfill in time each task established for this event. To accomplish this project by International Relations Office, as a project manager, this structure will be supported also by Department's teachers. The activity will be verified by the DRESMARA's Director and controlled by the Head of the Section.

After all inputs will be presented, based on last WG held in Brasov, the WBS will be completed with certain duration by the Head of International Relations Office.

Scope statement

This project is important because of it represent a tool for the future international activities which can be developed in my institution. It doesn't have a final product as other technical projects, but it has to fulfill all expectations from the participants. For this reason it is important to cover all aspects regarding international relations, PR, and admin, besides all activities related to education and training processes.

As a deliverables I can emphasize all milestones that have to be completed in order to have an excellent event, and in this respect I put after each milestone a verify activity (the most important being those activities which will be accomplished from outsources).

The success of project can be assured only by having a full commitment from all personnel and, of course, a great collaboration with all stakeholders. As acceptance criteria it has

to be in the time table of the PTEC Community and to be in accordance with Allied Commandment for Transformation and NATO School Oberammergau as the main stakeholders.

This event cannot be performed with decisional activities because of this part belong to CC. Even so, during this activity all participants, in fact planners from each PTEC, can provide new inputs to be discuss in the field of military education (they have approval from their commandants) in order to be presented with some proposals for the next CC.

Regarding risks it can be taken into account only those aspects related to lack of participation. It means that few PTEC representatives will not came up with important decisions to be presented into the future CC.

WORK BREAKDOWN STRUCTURE

No.	Activity
1.1	Planning phase
1.2	Cooperation with NSO and ACT to finalize the Agenda
1.3	Sending Final Agenda to all stakeholders
1.4	Receiving registrations from stakeholders
1.5	Verify PM
1.6	Establish internal activities for event
1.6.1	Preparing documents for stakeholders
1.6.2	Advertising of the event in mass-media
1.6.3	Transportation
1.6.4	Accommodation
1.6.5	Meals
1.6.6	Locations
1.6.7	Control /Verify PM
1.6.8	Buffer /LAG
1.7	Outsourcing
1.7.1	Transportation from Bucharest to Brasov
1.7.2	Transportation from Brasov to Bucharest
1.7.3	Meals (icebreaking, breakfasts and one dinner)
1.7.4	Photo group
1.8	Equipments
1.8.1	Installing equipments
1.8.2	Control /Verify STAFF
1.8.3	Buffer
1.9	Main activity
1.9.1	Opening ceremony
1.9.2	Using IT equipments
1.9.3	Photo group
1.9.4	Event – Working Group
1.9.4.1	Utilities
1.9.5	Social activities
1.9.6	Closing Ceremony
1.9.7	Closing event
1.10	Final report – sent to stakeholders

WBS STRUCTURE – (according to Appendix 1)

2. TIME MANAGEMENT PLAN (WBS / Dictionary)

No.	Activity	Explanation	Dependencies	Duration (Days)
1.1	**Planning phase**	Establish team and agenda of the event to fulfill all activities	-	2
1.2	**Cooperation with NSO and ACT to finalize the Agenda**	As a main stakeholders they have to cooperate with DRESMARA to establish de Agenda' content	-	1
1.3	**Sending Final Agenda to all stakeholders**	All stakeholders are informed about the event and agenda	After Act.1.2 & 1.3 Finish to Start	14
1.4	**Receiving registrations from stakeholders**	All stakeholders who want to join this event must send their registration form	-	2
1.5	**Verify PM**	This activity has the role to establish if all activities were accomplished by each compartment /participant	After Act 1.4 Finish to Start	2
1.6	**Establish internal activities for event**	Project manager establish all activities which will be develop during the event	-	45
1.6.1	Preparing documents for stakeholders	BRI will complete all documents for stakeholders	-	15
1.6.2	Advertising of the event in mass-media	DRESMARA's team for project will prepare information for mass-media	After Act 1.6.1 Finish to Start	30
1.6.3	Transportation	Will be establish all means of transportation necessary for the entire activity	After Act 1.6.1 Finish to Start	1
1.6.4	Accommodation	DRESMARA's team for project will assure all needs for all attendees	After Act 1.6.1 Finish to Start	1
1.6.5	Meals	DRESMARA's team for project will be involved in assuring meals for all participants	After Act 1.6.3 Finish to Start	1
1.6.6	Locations	DRESMARA's team for project will establish all places	After Act 1.6.4 Finish to Start	1
1.6.7	Control /Verify PM	This activity has the role to establish if all activities were accomplished by each compartment /participant	After Act 1.6.6 Finish to Start	1
1.6.8	Buffer /LAG	Assure necessary space if some activities will be delayed	After Act 1.6.7 Finish to Start	2
1.7	**Outsourcing**	DRESMARA's team for project will establish private firms for each activity	-	5,1
1.7.1	Transportation from Bucharest to Brasov	DRESMARA's team for project will assure means from AFA and from internal sources	-	1

1.7.2	Transportation from Brasov to Bucharest	DRESMARA's team for project will assure means from AFA and from internal sources	After Act 1.9.6 Finish to Start	1
1.7.3	Meals (icebreaking, breakfasts and one dinner)	DRESMARA's team for project will establish a private firm for breakfasts and dinner	After Act 1.8.3 Finish to Start	3
1.7.4	Photo group	DRESMARA's team for project will establish a private firm for printing and multiplication	After Act 1.7.1 Finish to Start	0,1
1.8	**Equipments**	DRESMARA (IT Compartment) will assure all equipments for the event (IT, communication, laboratories, aula, conference rooms)	-	10
1.8.1	Installing equipments	IT compartment will install all IT elements	After Act 1.6.8 Finish to Start	3
1.8.2	Control /Verify STAFF	This activity has the role to establish if all activities were accomplished by each compartment /participant for the entire activity	After Act 1.8.1 Finish to Start	1
1.8.3	Buffer	Assure necessary space if some activities will be delayed	After Act 1.8.2 Finish to Start	4
1.9	**Main activity**	All activities inside the event when take place	-	4,3
1.9.1	Opening ceremony	All stakeholders participate in the activity which is ruled by the DRESMARA's director	After Act 1.7.1 Finish to Start	0,1
1.9.2	Using IT equipments	Participants use all IT equipments	After Act 1.8.1 Finish to Start	3
1.9.3	Photo group	All stakeholders take part in this activity and the team for project	After Act 1.9.1 Finish to Start	0,1
1.9.4	Event – Working Group	The event take place in accordance with agenda	-	4
1.9.4.1	Utilities	All costs related to event (energy, water, heating etc.)	After Act 1.8.3 Finish to Start	4
1.9.5	Social activities	DRESMARA will prepare a social program for one day	After Act 1.9.3 Finish to Start	1
1.9.6	Closing Ceremony	All stakeholders participate in the activity which is ruled by the DRESMARA's director	After Act 1.9.4 Finish to Start	0,1
1.9.7	Closing event	DRESMARA's team for project will assure all activities connected with check-out for accommodation, departure and feed-back	After Act 1.9.6 Finish to Start	0,2
1.10	**Final report – sent to stakeholders**	DRESMARA's team for project prepare all final documents which will be sent to all stakeholders, outsourcing firms (pay bill) and for event file	After Act 1.9.7 Finish to Start	1

According to the Gantt chart the implementation period of the project is 01.04.14-30.06.14.

Project Milestones

This is an outline of major milestones and timelines for the project.

Milestone	Tape	Completion Date
Status Report including summary of tasks completed	Sending Final Agenda to all stakeholders	22nd of April, 2014
Status Report including summary of tasks completed	Receiving registrations from stakeholders	22nd of May, 2014
Status Report including summary of tasks completed	Establish internal activities for event	2nd of June, 2014
Status Report including summary of tasks completed	Installing equipments	28th of May, 2014
Status Report including summary of tasks completed	Utilities	23rd of June, 2014

3. COST MANAGEMENT PLAN

The purpose of the Cost Management Plan is to set the format and establish criteria for developing and controlling the project budget. The resources needed and the costs for each activity were estimated based on actual market judgment, guided by historical analogous information and commercial databases.

In developing the Cost Management Plan, certain constraints have taken into consideration, such as the limits of calculated budget, and were also based on the assumption that no additional labor and equipment will be used specifically on the project, then those already existing and being paid for.

The material and equipment resources required for the project are in the inventory of Financial Department. The project team members will be paid with their monthly salary, according to the number of hours actually worked.

Total cost of the project is: **88.979,54** LEI – (**Budget in Appendix 2**)

4. PROJECT QUALITY MANAGEMENT PLAN

Quality Management Plan describes the Quality Management Process that the project team follows to assure and control the quality of all procedures, processes and deliverables produced during the course of the Mentoring Project.

Quality assurance

The success of the Project is dependent upon the performance and experience of the managerial team (PM and controllers).

The quality assurance of the project is represented by having all activities accomplished and to have in time all materials and outsourcing elements in order to satisfy all standards requirements. In this respect all milestones represent the moment of truth in the line of quality, when all team leaders have to finish their tasks.

- 100% employment of the team;
- 60% of DRESMARA's infrastructure will be operated for the event;
- 20% from DFRESMARA resources will be available for event.

Quality control

The Verify/Control activity is an important part of Quality Control and will be done by PM and STAFF controllers (DRESMARA Director and Head of the Section) in order to have all activities finalized in time for each sector.

For this type of event we cannot assure a set of tests because of we will not have a technical product. Having all elements prepared for the event will assure a success, but could be some problems regarding those activities which were passed for outsources.

Quality planning activities

Activity	Description	Responsible person
Set quality criteria	Set acceptance criteria for the deliverables	
Planning	Establish of all activities and schedule	PM and BRI
Staffing	Identification and assignment, or recruitment, of qualified staff (mentors and supervisors) for sustaining the mentoring process.	PM
Outsourcing	Mentoring ADMIN Office in order to complete their tasks.	ADMIN Office

Quality control activities

Activity	Description	Responsible person
In-Process Audits	Audits of deliverables to ensure completeness and consistency of deliverables, according to all requests.	ACT PTEC Community PM
Monitoring	Continuous monitoring of all activities planned; recommend action for improvement; monitor the corrective actions.	PM Supervisors for each activity
Communication	Continuous communication to all team members of any needed information.	All stakeholders, according to the Communication Plan
Status Reporting	Periodical activity reports and project status reports	All stakeholders according to the Communication Plan

Key quality concepts measurement

Efficiency

The mentoring strategy is designed to provide long term benefits with a minimum of resource consumption. It meets the real needs of the participants regarding their activity by developing their potential, expanding their leadership abilities and increasing their management skills and bring them up to the event's requirements. The project also helps each participant in enhancing experience in their areas of expertise and to obtain an actual perspective of a subject.

Adaptability

The Project is based on a strategy that is tailored on each person's skills and expectations.

Accessibility

The project allows participants to benefit from PM support whenever and wherever they may find themselves, through handy communication tools.

Reliability

The Mentoring Project continuously offers PM and planning personnel qualified expertise and support for future international activities.

Portability

The mentoring strategy developed by the project can be used in future projects, inside International Relations Office.

Deliverables and acceptance criteria

The following table provides the deliverables of the project and their acceptance criteria:

Deliverable	**Acceptance criteria**
PM profile	Established by the main stakeholders,
Supervisor group	Specialists with high expertise from DRESMARA
International Relations Office activity	Planning specialists and list of planning activities
The list of opportunities and measurements	Realistic list of opportunities and measurements
Articles in mass-media	At least one informational activity /week
Lessons learned	Correct, consistent and relevant

5. PROJECT HUMAN RESOURCES MANAGEMENT PLAN

The **Project Manager** is the head of the project.

Management team is made up of 12 members:

1. Project manager approve and will be responsible for carrying out of all indicators. He is the one responsible for the relationship with stakeholders. Project manager would be helped by 1 planner for planning activity.

2. The financial expert will be responsible for drawing up all financial documents and reports.

3. The admin coordinator will be responsible for drawing up all admin documents and reports.

4. For this activity will not be necessary a jurist expert.

5. Due to all personnel is trained to accomplish all activities will not be necessary to select other members into the project.

Acronyms

PM = project manager,

D/S = controller,

FE = financial expert,

P = planner,

A = administrative manager,

IT = IT expert)

Implementation Team

PM = project manager

FE = financial expert

P = planner

A = administrative manager

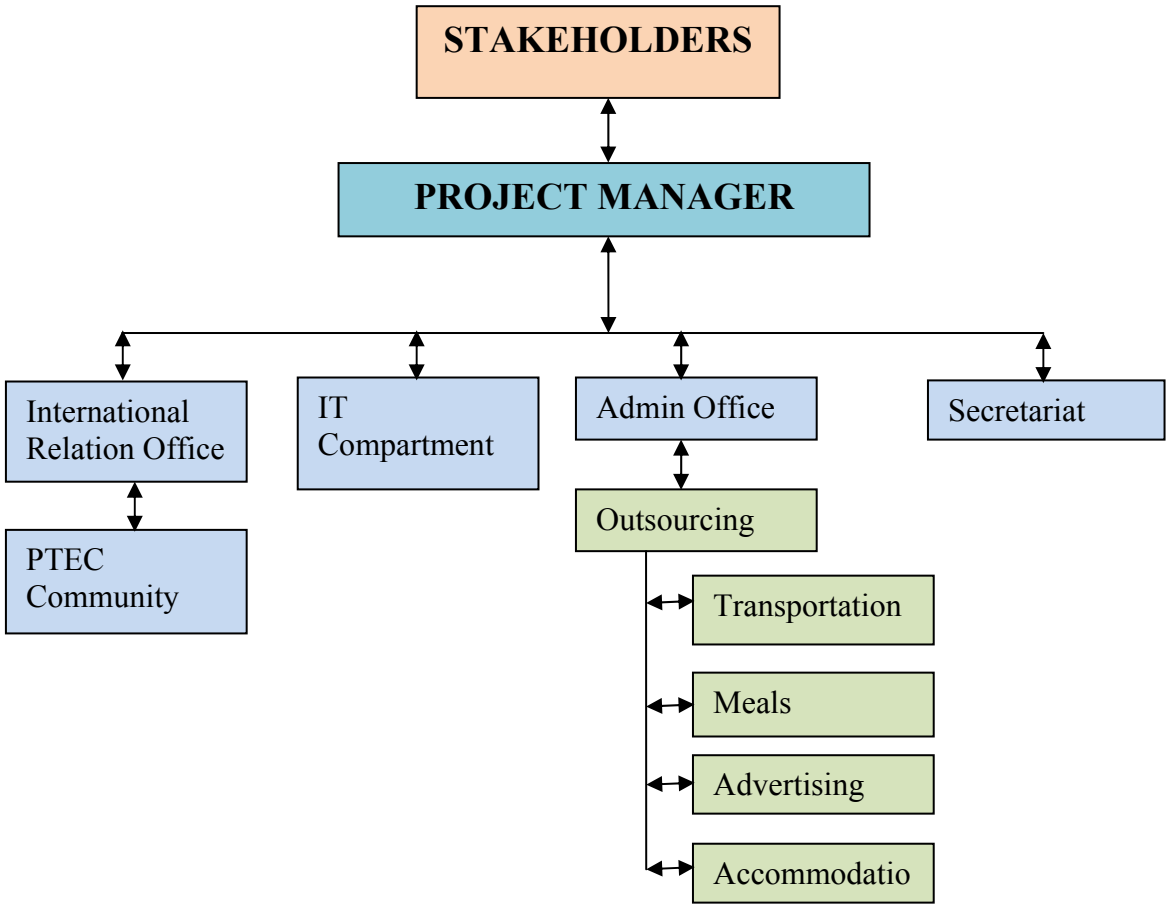
IT = IT expert = 2

STAFF = executing personnel = 2

SECRETARIAT = executing personnel = 1

D = driver = 1

Organizational Chart



Sample Responsibility Assignment Matrix (RAM)

No.	D/S	PM	Planner	It specialist	Admin specialist	Financial specialist	Secretariat	Staff	Driver
1.1		RP	P						
1.2		R	P						
1.3		R					P		
1.4		R					P		
1.5		RP							
1.6		RP							
1.6.1			RP						
1.6.2			RP						
1.6.3					RP	P		P	P
1.6.4					RP			P	P
1.6.5					RP	P			
1.6.6					RP				
1.6.7		RP							
1.6.8		RP							
1.7					RP				
1.7.1					R				P
1.7.2					R				P
1.7.3					R		P	P	
1.7.4			P		R				
1.8				RP			P		
1.8.1				RP			P		
1.8.2	/R			P					
1.8.3		R		P					
1.9		R	P	P	P	P	P	P	P
1.9.1	RP/ RP	RP	P	P	P	P	P	P	P
1.9.2		R		P				P	
1.9.3		R	P						
1.9.4	R/P	R	P	P	P	P	P	P	P
1.9.4.1					RP	P	P	P	
1.9.5		RP	P		P		P	P	P
1.9.6	R/P	RP	P						
1.9.7		RP	P	P	P	P	P	P	
1.10	R/R	RP	P	P	P	P			

R – Responsible

P – Performing

Staff acquisition

PM has established for each compartment all activities they have to accomplish. There are no problems related to recruiting and retentions because of all personnel involved in this activity belong to the same organization.

According to what has happened in the past regarding this kind of events inside our institution, we established that the personnel can work in the working time every day, being a part from daily activity.

Overallocation

According to PM schedule there are no overallocations for resources at a given time because of PM has calculated all resources (personnel and materials) needed and has established a time table for each activity. In order to prevent any disturbances PM also has establish to the end of each main activity a time buffer.

6. COMMUNICATION MANAGEMENT PLAN

Communications Management Plan sets the communications framework for project and will be updated when is needed.

Stakeholder Analysis

Stakeholders	Document name	Document format	Contact person	Due
ACT	Planning report	E-mail	Wilma Thor	April 15th
PTECs	Final agenda	E-mail	PTEC's POC	April 22nd
Outsourcing firms	Schedule Activities Meals, Locations, Means of transportation	Fax	Radu Carp Mihai Ion Grigore Iona	June 23rd

Templates - Project description

Objective – to assure a place where stakeholders can discuss all activities which were done during the academic year and to plan future activities for PTEC community.

Scope – at the end of activity will be established final program for next academic year.

Assumption – ACT and all PTECs will have a common approach related to teaching and training activities

Schedule - according Gantt chart.

All documents have to be done in direct link with timetable in order to have all stakeholders informed in time with final documents, in order to have no surprises regarding the whole event. To have a common understanding this project will be discuss with ACT and NSO, than will be establish the final Agenda which will be sent after to the PTECs.

Project communication plan ensures that all stakeholders are equally informed of how, when and why communication will happen. The table below is various methods communication in

order to implement the project successfully.

Target audience	Person to convey the massage	When the message is conveyed	Format of message	Message content
ACT	PM	15th April	E-mail	Project introduction Teams and members Time for event
PTEC	Secretariat	22nd April	E-mail	Event activities Registration
DRESMARA	PM	1st April-28th June	Meetings E-mail Documents	Planning activities Tasks to be accomplish
Outsources	Admin	24th April – 28th June	E-mail Fax	Outsourcing activities inside the project
Media	PR	22nd April – 2nd June	Letter	Press release for the media regarding event

Tools and techniques

- Planning meetings (where all activities are debated and discussed to establish the final documents)
- E/mails (in order to have inputs form outside stakeholders)
- Phone (to establish direct and on the spot changes)
- Fax (to send and receive final documents)
-

7. PROJECT RISK MANAGEMENT PLAN

The process of risk management is designed to reduce or eliminate the risk of certain kinds of events happening or having an impact on the event. The risks implied by the project development are:

1. Some personnel involved into the planning process could miss doe to different causes (illness, missions, etc.)

Solution: Because of all personnel involved in the project are well trained and the project doesn't require a full time involvement other participant in the project can assume additional task to accomplish.

2. Some PTECs will not participate into the event.

Solution: At the end of the event each stakeholder from PTEC Community will receive a MINUTA which contain all elements established during the events.

3. Some private firms will renounce to assure outsourcing activities.

Solution: Admin office will establish in initial contract that outsourcing activities have to be confirmed with 10 days before the event.

List of possible risks	**Likelihood**	**Impact**	**Likelihood x Impact [Score]**	**Actions required**	**Risk manager**
Personnel miss	1	1	1	those activities will be reassign to another member from project	PM will establish who will receive additional tasks
PTEC default	3	2	6	All problems related to costs have to be adjusted	PM must recalculate all costs
Private firm default	3	4	15	The contract will stipulate that the private firm must inform with 10 days before the event or will pay a fee	Admin chief has to prepare a contingency plan regarding outsources.

The score of each listed risk was calculated using the indicators provided by the following risk assessment matrix:

LIKELIHOOD (A)						
	Very Likely 5	5	10	15	18	25
	Likely 4	4	8	12	16	20
	Feasible 3	3	6	9	12	15
	Slight 2	2	4	6	8	10

	Very unlikely 1	1	2	3	4	5
		Insignificant 1	**Minor 2**	**Significant 3**	**Major 4**	**Critical 5**
	IMPACT (B)					

Green = Low risk, Amber 9 = Medium risk, Red = High risk

Likelihood of Occurrence (A)	Severity of Impact (B)
1- Very unlikely (hasn't occurred before)	1 - Insignificant (have no effect)
2 - Slight (rarely occurs)	2 - Minor (little effect)
3 - Feasible (possible, but not	3 - Significant (may pose a problem)
4 - Likely (has before, will again)	4 - Major (Will pose a problem)
5 - Very Likely (occurs frequently)	5 - Critical (Immediate action required)

8. PROCUREMENT PLAN

Material /Tools /Services		Sdt. rate	Cost /use
Materials	**utilities**	**-**	3000,00 lei
	printer (toner)	-	300,00 lei
	hotel room	-	25.000,00 lei
	paper	-	500,00 lei
Tools	**photo**		50,00 lei
	car	-	1.000,00 lei
Services	**catering**	10,00 lei/h	1.200,00 lei
	photo	25,00 lei/h	150,00 lei
	transportation (+driver)	15,00 lei/h	800,00 lei

All tools and services will be approved with at least 1 month before the event, and with 10 days before the event each outsourcing firm has to reconfirm their status in case of renouncing.

All contracts regarding outsourcing will be unit price contract (**According to Appendix 3**).

DRESMARA has all specialists to develop all activities for this event and will be not necessary to hire additional personnel.

9. PROJECT CLOSING AND CONCLUSION

According to what has happened during the event all deliverables were completed. In this respect all participants and stakeholders were informed that the project was finished at the end of it.

All participants and stakeholders to the project are informed regarding what are next steps in order to have in time all documents issued during the event.

According to formal understanding all private firms will be paid for all activities they done during the event.

All stakeholders from PTEC Community will receive lessons learned and best practices, and archival of project deliverables for subsequent reference if they needed.

The work has been completed and the deliverables were accepted by the project sponsors - the project is 100% completed.

Appendices

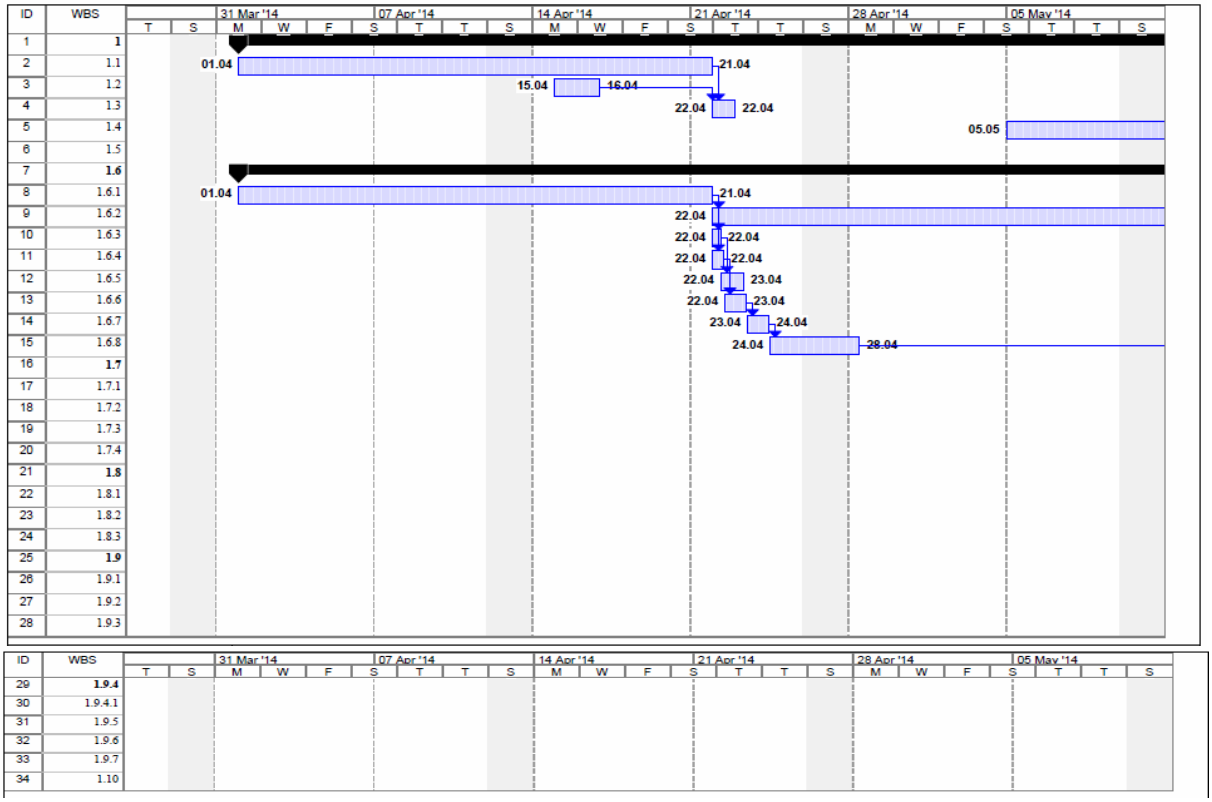
Appendix 1:Budget Report

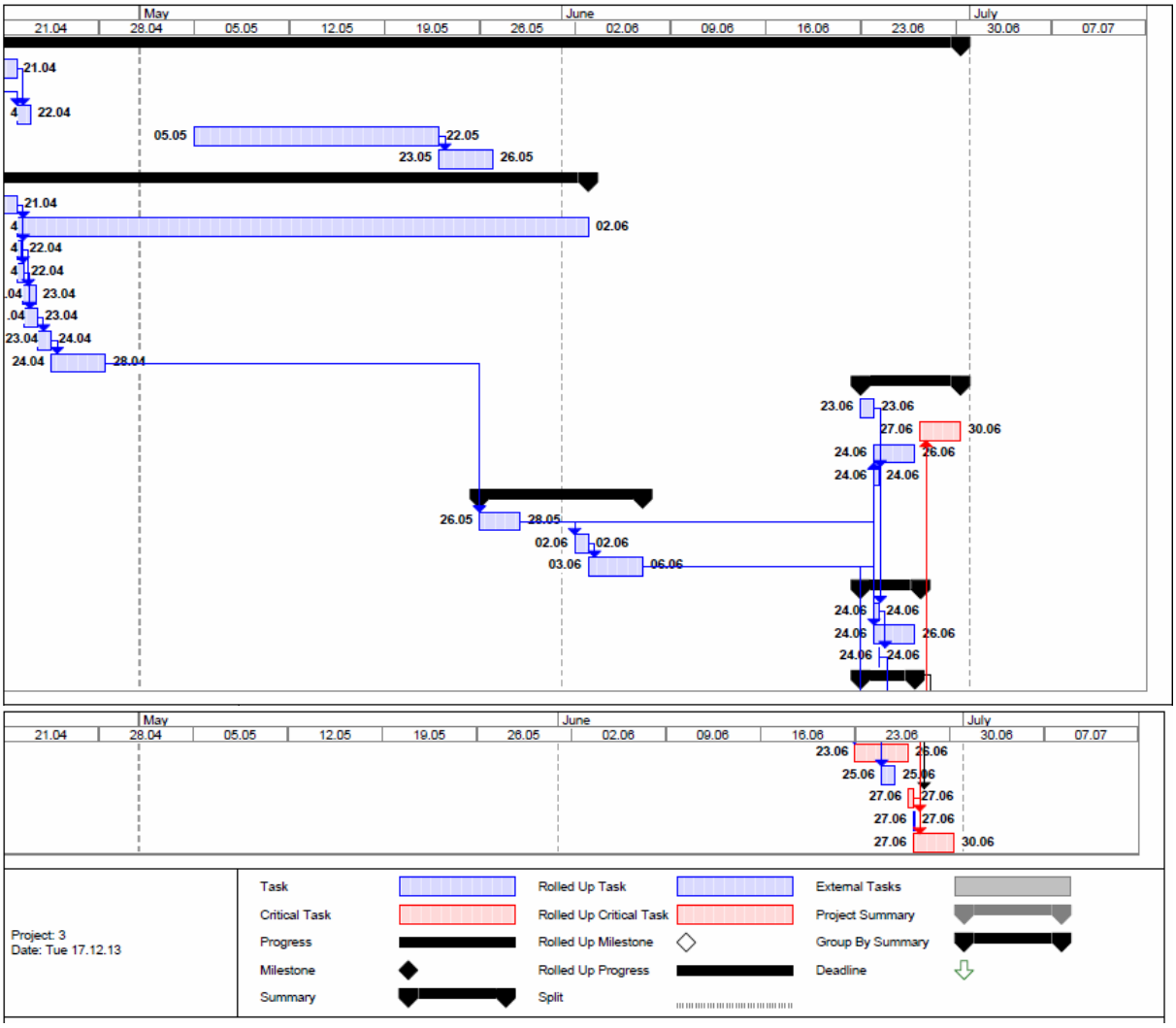
Budget Report as of Tue 17.12.13
3

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance
19	Meals (icebreaking, breakfasts and or	0,00 lei	Prorated	28.877,51 lei	0,00 lei	28.877,51 lei
11	Accommodation	0,00 lei	Prorated	25.579,20 lei	0,00 lei	25.579,20 lei
30	Utilities	0,00 lei	Prorated	3.480,00 lei	0,00 lei	3.480,00 lei
18	Transportation to	0,00 lei	Prorated	3.396,00 lei	0,00 lei	3.396,00 lei
17	Transportation from	0,00 lei	Prorated	3.376,00 lei	0,00 lei	3.376,00 lei
2	Planning phase	0,00 lei	Prorated	2.800,00 lei	0,00 lei	2.800,00 lei
27	Using IT equipments	0,00 lei	Prorated	2.340,00 lei	0,00 lei	2.340,00 lei
6	Verify PM	0,00 lei	Prorated	2.160,00 lei	0,00 lei	2.160,00 lei
22	Instaling equipments	0,00 lei	Prorated	1.920,00 lei	0,00 lei	1.920,00 lei
13	Locations	0,00 lei	Prorated	1.850,40 lei	0,00 lei	1.850,40 lei
31	Social activities	0,00 lei	Prorated	1.630,00 lei	0,00 lei	1.630,00 lei
10	Transportation	0,00 lei	Prorated	1.601,20 lei	0,00 lei	1.601,20 lei
26	Opening ceremony	0,00 lei	Prorated	1.562,26 lei	0,00 lei	1.562,26 lei
8	Preparing documents for stakeholders	0,00 lei	Prorated	1.540,57 lei	0,00 lei	1.540,57 lei
5	Receiving registrations from stakehol	0,00 lei	Prorated	1.539,20 lei	0,00 lei	1.539,20 lei
9	Advertising of the event in mass-medi	0,00 lei	Prorated	912,00 lei	0,00 lei	912,00 lei
34	Final report – sent to stakeholders	0,00 lei	Prorated	640,00 lei	0,00 lei	640,00 lei
23	Control / Verify STAFF	0,00 lei	Prorated	604,57 lei	0,00 lei	604,57 lei
28	Photo group	0,00 lei	Prorated	550,48 lei	0,00 lei	550,48 lei
12	Meals	0,00 lei	Prorated	542,13 lei	0,00 lei	542,13 lei
14	Control /Verify PM	0,00 lei	Prorated	540,00 lei	0,00 lei	540,00 lei
4	Sending Final Agenda to all stakehold	0,00 lei	Prorated	526,80 lei	0,00 lei	526,80 lei
32	Closing Ceremony	0,00 lei	Prorated	510,24 lei	0,00 lei	510,24 lei
3	Cooperation with NSO and ACT to fin	0,00 lei	Prorated	320,80 lei	0,00 lei	320,80 lei
15	Buffer	0,00 lei	Prorated	104,00 lei	0,00 lei	104,00 lei
20	Photo group	0,00 lei	Prorated	76,18 lei	0,00 lei	76,18 lei
24	Buffer	0,00 lei	Prorated	0,00 lei	0,00 lei	0,00 lei
33	Closing event	0,00 lei	Prorated	0,00 lei	0,00 lei	0,00 lei
		0,00 lei		**88.979,54 lei**	**0,00 lei**	**88.979,54 lei**

Actual	Remaining
0,00 lei	28.877,51 lei
0,00 lei	25.579,20 lei
0,00 lei	3.480,00 lei
0,00 lei	3.396,00 lei
0,00 lei	3.376,00 lei
0,00 lei	2.800,00 lei
0,00 lei	2.340,00 lei
0,00 lei	2.160,00 lei
0,00 lei	1.920,00 lei
0,00 lei	1.850,40 lei
0,00 lei	1.630,00 lei
0,00 lei	1.601,20 lei
0,00 lei	1.562,26 lei
0,00 lei	1.540,57 lei
0,00 lei	1.539,20 lei
0,00 lei	912,00 lei
0,00 lei	640,00 lei
0,00 lei	604,57 lei
0,00 lei	550,48 lei
0,00 lei	542,13 lei
0,00 lei	540,00 lei
0,00 lei	526,80 lei
0,00 lei	510,24 lei
0,00 lei	320,80 lei
0,00 lei	104,00 lei
0,00 lei	76,18 lei
0,00 lei	0,00 lei
0,00 lei	0,00 lei
0,00 lei	**88.979,54 lei**

Appendix 2: Gantt Chart




May
June
July
21.04
28.04
05.05
12.05
19.05
26.05
02.06
09.06
16.06
23.06
30.06
07.07
21.04
22.04
05.05
22.05
23.05
26.05
02.06
23.04
24.04
28.04
23.06
27.06
30.06
24.06
26.06
28.05
03.06
06.06
25.06
Project: 3
Date: Tue 17.12.13
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

EXTENDING ITC INFRASTRUCTURE IN A NEW OFFICE BUILDING

Andrei BONDOC

CONTENTS

5. INTRODUCTION

Due to the expansion of Android OS terminals our company needs 50 new employees to develop compatible applications. Since our offices are already crowded, the CEO identified a new building situated few kilometers away from the main center.

In order to create 60 working places in the new location, we need to create a 60 computers network connected with the main network. Doing that, our company will be able to employ new peoples and that will increment the profit and productivity.

I am the head of the IT office in my organization. Our CEO wants a computers network in a 2 floors building located 5 kilometers away from the main center. The new network will have 60 workstations (50 for new employees and 10 for existing ones), 2 printers and a Secondary Domain Controller server. In the same time we will have in the new location a backup machine for the 3 servers located currently on the main center: files, e-mails and SQL. Both locations will be connected through an optical fiber link able to provide high transfer speeds. The technical solution chosen for the servers will be 1 physical machine with 4 virtual machines running Windows Server 2012.

The project will be done mostly in-house by the IT & maintenance office. The only work that we need to outsource is the connection between locations – for this part we will rent the line from a specialized company.

6. PROJECT SCOPE

6.1 Scope planning

At the end of this project, all the employees of the company (regardless the location) must be able to access their windows accounts, e-mail accounts, the web portal of the company and the files from the share drives. Also on the new computers they need all the office related software's, but also the specific software for each branch. Those premises will allow every employee to do his job in a timely manner.

The connections between computers will be made on copper, and the connection with the main center will be made on optical fiber.

The communication equipment (router, media convertor, 2 switches, patch Panel) and the servers will be rack mounted on the 1st floor in a technical room. For the 2nd floor we will have a small rack with 1 patch Panel and 2 switches.

On every room (both floors) we will have structured cabling that includes cable channels and network sockets for each computers/printers.

The printers will be located one at every floor and will be managed by the print server.

As of power supplies UPSs will be used (1 for every 2 PCs where it's possible, 1 for each printer/PC and 1 for every rack), so we will need a double electrical socket for every equipment (PC/server/printer/rack)

At the end of this project, all the employees of the company must be able to access their windows accounts, e-mail accounts, the web portal of the company and the files from the share drives. Also on the computers they need all the office related software's, but also the specific software for each office.

6.2 Scope statement - Work Breakdown Structure:

1. Extending ITC infrastructure
    - 1.1. Design
        - 1.1.1. Design network architecture
    - 1.2. Acquisitions
        - 1.2.1. Products acquisition
        - 1.2.2. Hiring new IT engineer
    - 1.3. Connection between locations
        - 1.3.1. Creating the connection
        - 1.3.2. Check the new connection
    - 1.4. Electricity supply network
        - 1.4.1. Creating the supply network
    - 1.5. Structured cabling infrastructure
        - 1.5.1. Creating patch cords for equipment
        - 1.5.2. Creating FO patch cords and FO between the 2 racks
        - 1.5.3. Installing racks for communications equipment
        - 1.5.4. Installing sockets and connecting them to the patch panels
        - 1.5.5. Installing patch panels and switches
        - 1.5.6. Verifying every connection
    - 1.6. Configuring equipment

1.6.1. Routers

1.6.2. Printers

1.6.3. Servers

1.6.4. PCs

1.6.5. Creating user accounts (for new users) and user rights management

1.7. Installing equipment

1.7.1. Install and connect all the equipment

1.8. Cleaning

1.8.1. Offices cleaning

1.9. Testing network

1.9.1. Testing the network and software functionality

1.10. Project Checking

1.10.1. Phase 1.2 check

1.10.2. Phase 1.3 check

1.10.3. Phase 1.4 check

1.10.4. Phase 1.5 check

1.10.5. Phase 1.6 check

1.10.6. Final check

1.11. Presenting Project

7. TIME MANAGEMENT

The total duration of the project is 43 working days and spilt by the phases the main periods are described in the table below:

WBS dictionary:

WBS #	Name	Explanation	Dependencies	Duration (day)
1	***Extending ITC infrastructure***	***A new network, in a 2 floors building located 5 kilometers away from the main center. The network will have 60 new workstations, 2 printers and a Secondary Domain Controller***		***43***

		server.		
1.1	**Design**	**Designing network architecture**		**5**
1.1.1	Design network architecture	The first stage of the project and probably the most important. We will establish the approximate position for every desk in order to be able to accomplish the structured cabling.		5
1.2	**Acquisitions and hiring**	**At this stage it will start the process of acquisition and will hire an IT engineer**		**15**
1.2.1	Products acquisition	Buying PCs, servers, software, routers, switches, patch panels, network cables, FO cable, RJ45 plugs, network sockets, cables and electrical outlets	1.1.1	10
1.2.2	Hiring new IT engineer	Hiring a IT engineer, to administer the new network		10
1.3	**Connection between locations**	**In step 2 an external company will ensure communication between locations, and our specialists will test the line**		**15**
1.3.1	The connection	Company employee, provide fiber optic connection, which will be equipped with converters to RJ 45	1.1.1	3
1.3.2	Checking the line	Test speeds on the connection and availabilities tests	1.3.1	12
1.4	**Electricity supply network**	**Creating the electricity supply network**		**5**
1.4.1	Creating the supply network	Double electrical outlet for each device and each cable will be pulled through cable channels.	1.1.1	5

1.5	**Structured cabling infrastructure**	**Making structured cabling for star network topology, through RJ 45 technology**		**9.5**
1.5.1	Creating Patch cords	Creating 124 patch cords (for racks and equipment)	1.2.1	2.5
1.5.2	Creating FO patch cords and FO between the 2 racks.	Creating 2 communication lines between floors and 2 patch cords for server and 1 switch	1.2.1, 1.5.1	1
1.5.3	Installing racks for communications equipment	Installing racks on each floor	1.2.1	0.5
1.5.4	Installing sockets and connecting them to the patch panels	Mounting the sockets on the same cable channel as the electrical supply network	1.4.1	2,5
1.5.5	Installing patch panels and switches	Mounting patch panels and switches and inserting cables in patch panel (putting cables in place)	1.2.1, 1.5.3	2,5
1.5.6	Testing	Testing each cable	1.5.2, 1.5.4, 1.5.5	2
1.6	**Configuring equipment**	**Configuring all the equipment (routers, PCs, Printers, server)**		**24**
1.6.1	Routers	Configuring the routers for communication between locations	1.2.1	1
1.6.2	Printers	Configuring printers and add them to the print server	1.2.1	1
1.6.3	Servers	Installing OS, drivers. Configuring the 4 virtual machines as servers (SDC, Mail, File and Print, SQL).	1.2.1, 1.6.2	3
1.6.4	PCs	Installing OS, drivers and all other programs needed. Adding workstation to domain.	1.2.1, 1.6.3	20

		Preliminary tests.		
1.6.5	Creating user accounts (for new users) and user rights management	Creating user accounts (for new users) and user rights management	1.2.2FS+5d	8
1.7	**Installing equipment**	**Install and connect all the equipment (PCs, Servers, Printers and Routers)**		**2**
1.7.1	Install all the equipment;	Install and connect all the equipment (PCs, Servers, Printers and Routers)	1.5, 1.6.4FF+1d	2
1.8	**Cleaning**	**Offices cleaning**		**2**
1.8.1	Offices cleaning	Offices cleaning	1.5	2
1.9	**Testing network**	**Testing network functionality.**		**2**
1.9.1	Testing the network and software functionality.	Testing computers, network equipment and software functionality.	1.7.1	2
1.10.	**Project checking**	**Activity conducted by the project manager**		**35**
1.10.1	Phase 1.2 check		1.3.1	1
1.10.2	Phase 1.3 check		1.4.1	1
1.10.3	Phase 1.4 check		1.5	1
1.10.4	Phase 1.5 check		1.6.4SS, 1.10.3	2
1.10.5	Phase 1.6 check		1.9.1SS	2
1.10.6	Final check	Project Manager will check the entire functionality.	1.9.1	1
1.11	**Presenting project**	Project Manager will present to CEO the new network. Closing the project.	**1.10.6**	**0**

The detailed time management plan of the project is represented by the Gantt chart from the Microsoft Project in the Appendix 1.

8. COST MANAGEMENT

The entire cost of the project will be 255,559.00 RON. Money spent for Human Resources will be 22,980.00 RON and for materials and outsourced services 232,519.00 RON.

Excepting the external connection that will be outsourced the project will be made in-house.

It is assumed that the human resource is not exclusively dedicated for this project, the percentage of time spent for project activities being on average 75% (during all project phases).

A detailed description of costs can be seen on the Appendix 2.

9. PROJECT QUALITY

9.1 Quality assurance

The goal for this project will be that all the employees of the company (regardless the location) must be able to access their own windows and e-mail accounts, the web portal of the company and the files from the share drives.

Deliverables	Acceptance criteria
Communication line	Min. speed: 100 Mbps UP time: 99% Technical assistance: 24/7
Internal connection lines	Min. speed:1Gbps Up time: 99%
Computers	Up time: 99 %
Software and network resources	Up time: 99%

9.2 Quality control

Deliverables	Acceptance criteria	How to control?
Communication line	Min. speed: 100 Mbps UP time: 99% Technical assistance: 24/7	This line will be outsourced to "**Conecticall**" company, which will be compelled through the "Service Level Agreement" to provide these criteria.
Internal connection lines	Min. speed:1Gbps Up time: 99%	Our IT specialists will measure the lines and they will provide extra patches or assistance when needed.
Computers	Up time: 99 %	The new hired IT engineer or another one from the main center will provide support.
Software and network resources	Up time: 99%	

10. PROJECT HUMAN RESOURCE MANAGEMENT

10.1 Organizational planning

The human resources involved in that project will be mainly in-house personnel.

The resource pool detailing is illustrated bellow

Resource type	Name	Number
Human resources	Project Manager	1
	IT engineer	2
	IT engineer - junior	1
	Electrician	2
	IT specialist	2
	Acquisition personnel	1
	Human Resources personnel	1
	Cleaning personnel	1
Materials/services	Outsourced connection	1 contract
	PC	60 pcs
	Server	1 pcs
	Large rack	1 pcs
	Small rack	1 pcs

	Patch panel	2 pcs
	Switch	4 pcs
	Double socket RJ45	27 pcs
	Simple Socket RJ45	12 pcs
	Cable - RJ45	500 meter
	Jack - RJ45	300 pcs
	OF cable	32 meter
	Jack - OF	16 pcs
	Double electrical socket	66 pcs
	Electrical cable	300 meter
	Cable channel	270 meter
	Router	2 pcs
	Network printer	2 pcs
	UPS small	36 pcs
	UPS big	1 pcs

A very important step in project management will be to establish a responsible for each activity. The Responsibility Assignment Matrix is presented below:

R=responsible P=performing		**Resources**											
		Project Manager	**IT eng 1**	**IT eng 2**	**IT eng junior**	**Electrician 1**	**Electrician 2**	**IT spec 1**	**IT spec 2**	**Acq 1**	**Acq 2**	**HR 1**	**Cleaning**
Activities	**1.1.1**	RP	P										
	1.2.1		P							RP	P		
	1.2.2			P								RP	
	1.3.1	R											
	1.3.2		RP	P									
	1.4.1					RP	P						
	1.5.1							RP	P				
	1.5.2							P	RP				
	1.5.3							RP	P				
	1.5.4							RP	P				
	1.5.5							RP	P				
	1.5.6							P	RP				
	1.6.1		RP										
	1.6.2		RP										

	1.6.3			RP									
	1.6.4		P	RP	P								
	1.6.5		RP		P								
	1.7.1							RP	P				
	1.8.1												RP
	1.9.1		RP	P									
	1.10.1	RP											
	1.10.2	RP											
	1.10.3	RP											
	1.10.4	RP											
	1.10.5	RP											
	1.10.6	RP											

10.2 Staff acquisition

The staff working on this project will be selected mostly from internal personnel. That fact will provide implementation of attributions and responsibilities that are already known by every team member.

Team cohesion will not be an issue as the company already has strong team building policy.

10.3 Over allocations

In order to reduce costs, the resources will not be over allocated. Moreover, on almost every stage more than one human resource is allocated without being involved on a full time basis. This will allow the deadlines to be respected even if one of the team members is not available as planned.

11. COMMUNICATION MANAGEMENT

A good communication plan may represent the difference between a successful project and a failed one. In order to release a communication plan as in the table, the project manager has to identify the communication stakeholders, their type and expectations and the frequency of communication.

Project stage	Person to convey the message	Target audience	When the message is to be conveyed	Communication type/Channel	Deliverables	Message content
Executing stage	Project manager	- Project team - CEO	31.01.2014	Kickoff Meeting	- Agenda - Meeting Minutes	Introducing the project team and establishing the person responsible for each stage (team leaders)
Executing stage	Team leader	Project Manager	Daily (when day have activities)	E-mail	Notes	Stage of the works
Executing stage	Project manager	CEO	Every Friday	Short brief	Official note	Stage of the works
Executing stage	Project manager	CEO	04.03.2014	E-mail	Official note	Stage on the internal connections
Executing stage	Project manager	- Project team - CEO	07.04.2014	Meeting	Official note	Shows the network and its functions

12. RISK MANAGEMENT

A simple definition of 'risk' is "a problem that has not yet happened but which could cause some loss or threaten the success of the project if it did"[12]

Although a seemingly simple project, even this project may face a number of risks bigger or smaller. Many of these risks have been taken into account at the planning stage, so in the execution phase, the one where we are now, these risks have been largely reduced to achieve a minimum acceptable level.

The table below presents the main risks identified for the project.

Risk Factor	Risk description	Rating		Solving the problem
Human Resorces	People involved in project execution may be sick or have other personal problem that leads them to miss the program.	4	L= 2 I= 2	In most activities 2 persons from the same department are involved, but they are not 100% allocated for this project. During the remaining time, they will fulfill their regular tasks.
Human Resorces	The Project Manager is sick or has other personal problems	10	L= 2 I= 5	The chief of the IT engineer's team will be informed on a continuous basis on the progress of the project.
Cost	The estimated costs for some of the products may be higher than expected.	5	L= 1 I= 4	During the planning phase a 10% margin for the acquisition costs was discussed with the CEO.
Quality	Team members are poorly trained.	4	L= 1 I= 4	When teams were selected the best specialists were chosen.
Human Resources	Accidents involving team members while they move	9	L= 3 I= 3	Activities linked to stage 1.5 will only take place in the

[12] Karl E. Wiegers, Know your enemy: software risk management, page 6.

	between locations.			main center.
Technical issues	Errors occurred especially during software installation on stage 1.5	9	L= 3 I= 3	Take into consideration the possibility to request team members to work overtime.
Quality	In-house personnel are not sufficiently trained in order to install fiber optic cables outside.	20	L= 5 I= 4	Outsourcing connection between locations.
Miscellaneous	Natural disasters	10	L= 2 I= 5	Safety data copies will be created (folders, active directory, etc.).

Legend:

Likelihood of Occurrence (L)	**Severity of Impact (I)**
1 - Very unlikely (hasn't occurred before)	1 - Insignificant (have no effect)
2 - Slight (rarely occurs)	2 - Minor (little effect)
3 - Feasible (possible, but not problem)	3 - Significant (may pose a
4 - Likely (has before, will again)	4 - Major (Will pose a problem)
5 - Very Likely (occurs frequently)	5 - Critical (Immediate action required)

Rating: ***1 – 8*** Low Risk; ***9 – 12*** Medium Risk; ***15 – 25*** High Risk.

13. PROCUREMENTS

This project is entirely made with internal funds and most of the works are made with in-house personnel.

Only one contract will be signed, the one for creating the external connection between locations. The contract is composed from two sides. The first part consists in providing communication lines, at quality standards specified. The second part constitutes a contract for maintenance and quality assurance services to be renewed each year.

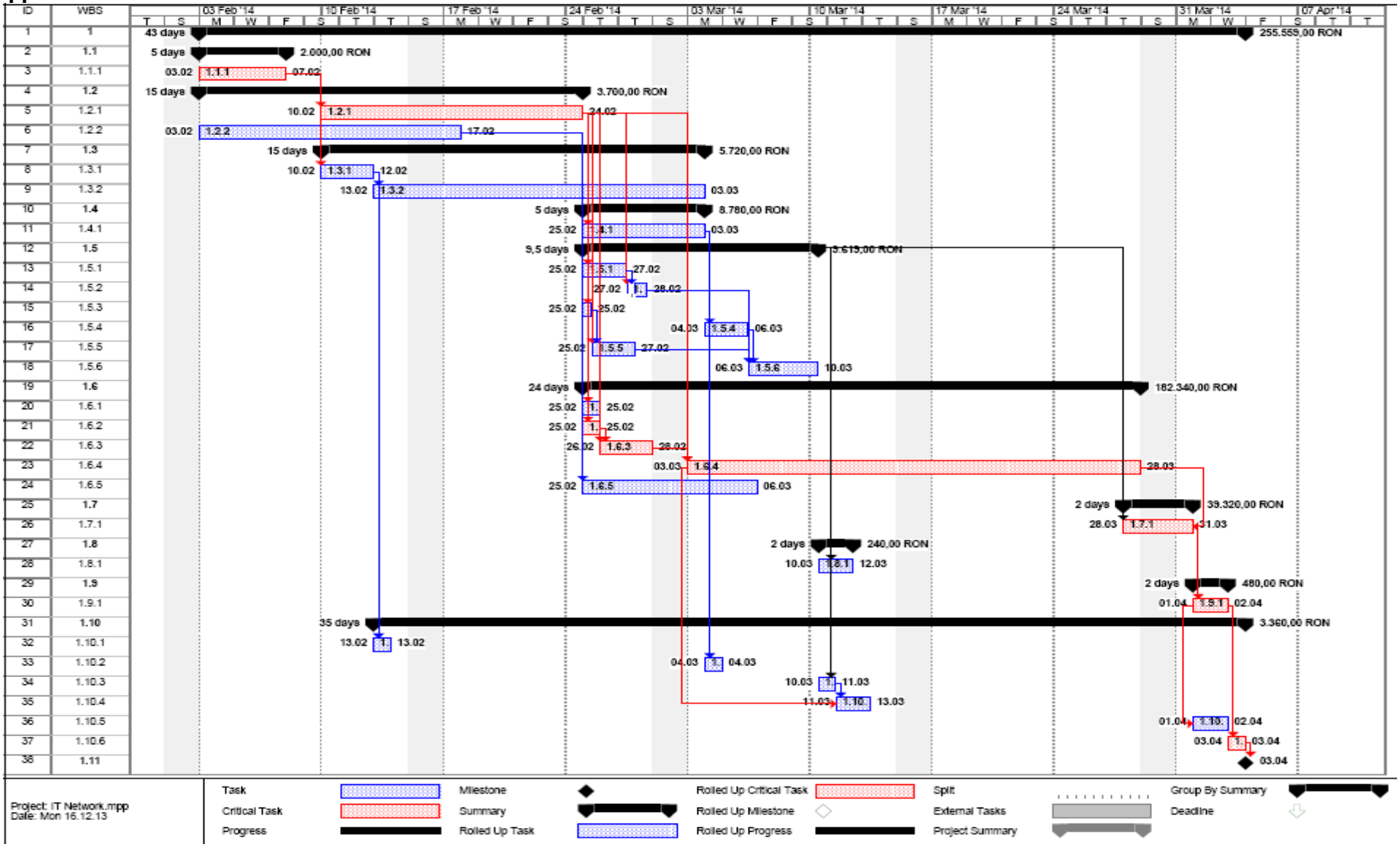
A list of all materials and services bought it's available below

Material	Costs	Quantity
PC	150,000.00 RON	60 pcs
Server	12,000.00 RON	1 pcs
Large rack	1,000.00 RON	1 pcs
Small rack	300.00 RON	1 pcs
Patch panel	600.00 RON	2 pcs
Switch	4,000.00 RON	4 pcs
Double socket RJ45	945.00 RON	27 pcs
Simple Socket RJ45	300.00 RON	12 pcs
Cable - RJ45	500.00 RON	500 meter
Jack - RJ45	150.00 RON	300 pcs
OF cable	64.00 RON	32 meter
Jack - OF	160.00 RON	16 pcs
Double electrical socket	3,300.00 RON	66 pcs
Electrical cable	1,500.00 RON	300 meter
Cable channel	2,700.00 RON	270 meter
Router	3,000.00 RON	2 pcs
Network printer	8,000.00 RON	2 pcs
UPS small	36,000.00 RON	36 pcs
UPS big	3,000.00 RON	1 pcs
TOTAL	**227,519.00 RON**	

The price for PCs and the server also includes de OS for those machines.

Also the routers are equipped with the SEC-K9 module which will provide an encrypted line between locations.

Appendix 1


ID
WBS
03 Feb '14
10 Feb '14
17 Feb '14
24 Feb '14
03 Mar '14
10 Mar '14
17 Mar '14
24 Mar '14
31 Mar '14
07 Apr '14
43 days
255.559,00 RON
5 days
2.000,00 RON
15 days
3.700,00 RON
15 days
5.720,00 RON
5 days
8.780,00 RON
9,5 days
24 days
182.340,00 RON
2 days
39.320,00 RON
2 days
240,00 RON
2 days
480,00 RON
35 days
3.360,00 RON
Project: IT Network.mpp
Date: Mon 16.12.13
Task
Milestone
Rolled Up Critical Task
Split
Group By Summary
Critical Task
Summary
Rolled Up Milestone
External Tasks
Deadline
Progress
Rolled Up Task
Rolled Up Progress
Project Summary

Appendix 2 Cost management table

up

WBS	HR				Materials					TOTAL
	Specialist	Cost/h	Qty	Costs	Material	U.o.M	Qty	Cost/U.o.M	Costs	
1			**736**	**22980**					**232519**	**255499**
1.1			40	**2000**					**0**	**2000**
1.1.1	Project Manager	70	20	1400						
1.1.1	IT engineer	30	20	600						
1.2			140	**3700**					**0**	**3700**
1.2.1	Acquisition specialist	25	80	2000						
1.2.1	IT engineer	30	20	600						
1.2.2	HR specialist	25	20	500						
1.2.2	IT engineer	30	20	600						
1.3			**24**	**720**					**5000**	**5720**
1.3.1				0	Connection made by external company	work	1	5000	5000	
1.3.2	IT engineer	30	24	720					0	
1.4			**64**	**1280**					**7500**	**8780**
1.4.1	Electrician	20	64	1280	Cable channel	m	270	10	2700	
1.4.1				0	Double electrical socket	pcs	66	50	3300	
1.4.1				0	Electrical cable	m	300	5	1500	
1.5			**80**	**1600**					**8019**	**9619**

1.5.1	IT specialist	20	20	400	Jack - RJ45	pcs	300	0.5	150	
1.5.1				0	Cable - RJ45	m	100	1	100	
1.5.2	IT specialist	20	8	160	Jack – Optical Fiber	pcs	16	10	160	
1.5.2					Optical Fiber cable	m	32	2	64	
1.5.3	IT specialist	20	4	80	Large rack	pcs	1	1000	1000	
1.5.3					Small rack	pcs	1	300	300	
1.5.4	IT specialist	20	20	400	Double socket RJ45	pcs	27	35	945	
1.5.4					Simple Socket RJ45	pcs	12	25	300	
1.5.4					Cable - RJ45	m	400	1	400	
1.5.5	IT specialist	20	20	400	Patch panel	pcs	2	300	600	
1.5.5					Switch	pcs	4	1000	4000	
1.5.6	IT specialist	20	8	160					0	
1.6			**334**	**9340**					**173000**	**182340**
1.6.1	IT engineer	30	2	60	Router	pcs	2	1500	3000	
1.6.2	IT engineer	30	2	60	Network printer	pcs	2	4000	8000	
1.6.3	IT engineer	30	18	540	Server	pcs	1	12000	12000	
1.6.4	IT engineer	30	160	4800	PC	pcs	60	2500	150000	
1.6.4	IT engineer (junior)	25	120	3000						
1.6.5	IT engineer	30	16	480					0	
1.6.5	IT engineer (junior)	25	16	400						

1.7			**16**	**320**					**39000**	**39320**
1.7.1	IT engineer	20	16	320	UPS big	pcs	1	3000	3000	
1.7.1					UPS small	pcs	36	1000	36000	
1.8			**16**	**240**					**0**	**240**
1.8.1	Cleaning personnel	15	16	240						
1.9			**16**	**480**					**0**	**480**
1.9.1	IT engineer	30	16	480						
1.10			**48**	**3360**					**0**	**3360**
1.10.1	Project Manager	70	6	420					0	
1.10.2	Project Manager	70	6	420					0	
1.10.3	Project Manager	70	6	420					0	
1.10.4	Project Manager	70	12	840					0	
1.10.5	Project Manager	70	12	840					0	
1.10.6	Project Manager	70	6	420					0	

Back

HOVERCRAFT (LCAC –military concept)

Dragoş DINCĂ

CONTENTS

6. Project deliverables
7. Statement of Work
8. Project Goals (by objectives)
9. Work Breakdown Structure

II. Project time management

III. Project cost management

IV. Project quality management

1. Quality assurance
2. Quality Standards and Metric
3. Quality control

V. Human resources management

1. Project Organization Chart
2. Organizational planning – Responsibility Assignment Matrix (RAM)

VI. Project Communications Management

1. Confidentiality Statement and Public Access
2. News media communications
3. Document repository and access rights
4. Documentation standards
5. Reporting Deliverables, Recipients and Frequencies
6. Communication Purpose and Target Audiences
7. Communication Message and Delivery
8. Communication Message Contents

VII. Project Risk Management

1. Project Risk Analysis
2. Risk identification and qualitative analysis
3. Risk conditions
4. Risk Response Planning

VIII. Procurement

1. Tools list
2. Materials list
3. Equipments list
4. Contract Types

IX. Project closing and conclusions

1. Project closing

2. Conclusions

References

I.Introduction

1. Environment

Doctrinal changes regarding the country's security in the context of integration into the North Atlantic, even in the absence of direct threats require Navy endowment with a new class of ships - modern hovercraft vessel under the NATO standards, able to operate to a proper distance by ports base in Operations theatre, in areas characterized by different environmental conditions and threats. International terrorist organizations facts determined need for new response mechanisms and new state strategies to counter asymmetric risks. International terrorist organizations facts determined need for new response mechanisms and new state strategies to counter asymmetric risks. The Interference space of the three areas geopolitical and geostrategic - Southern Europe, Eastern Europe and Middle East - Black Sea area is marked by politico-military and economic riparian's disputes and determine concern of other states to review interests in the area. Strengthening NATO's presence in the area shows that the southern flank - NATO's Eastern moves from the eastern Mediterranean to the Black Sea. If in the years 1994-1998 took place on average 20 to 30 entries foreign warships in Black Sea ports in recent years, the number has continued to grow. Despite the apparent calm and favourable climate of cooperation that seems to be set up in the region lately, there are still enough threats to security and stability in the Black Sea.

2.Navy vision and mission

- Romania to become leader in quality of hovercraft (military LCAC) in South East Europe.
- To produce a project management plan name Hovercraft (LCAC military concept) and to put it in place between 2014-2015.

3.Navy Strategies

Navy Strategies response to the follwing requirments:

- Charter new project development teams appointed representatives of the Ministry of Defence and Ministry of Transport.
- Implement a trade-in, trade-up, and trade-out program.
- Assess and improve the manufacturing process of each new line of products.
- Implement a new training program.
- Engage in a customer research.

4.Project vision and mission

- To produce in premiere a hovercraft (military LCAC) for Romanian military and civilian activities;
- To produce an affordable, safe, competitive and modern Hovercraft (LCAC) prototype for military and civilian activities in delta and the lagoon.

5. Project purpose

Naval Forces's endowment with 1 military LCAC and of the authorities carrying out activities in the delta and lagoon with another civil LCAC.

Navy ships need to respond to concept remote design force, with capabilities to participate in the multinational maritime forces. The project aims start building a new hovercraft ship prototype that can be used both for civilian and military. In response to the risks, threats and missions aforementioned hovercraft vessel must have capabilities to combat forces and means as follow:

- the diversion forces of potential adversaries that can act on communications with available weapons, on owns shipping ways and on targets in coastal area of Romania (in the sea and river),
- enemy aviation weapons available that can act on communications and on targets in coastal area of Romania (in the sea and river)
- Surface ships performing actions contrary to Romanian legislation in the area of national jurisdiction.

The needs to endow Navy with this class of ship stems from:

- Increase and diversification of terrorist threats;
- Strengthening the position of NATO in the Black Sea;
- Eliminate any threats to maritime interests;
- Immediate reaction enhancement;
- Fulfillment of Navy missions;
- Needs to cover the full range of missions that the Navy has to execute in the Delta and the lagoon;
- Designing distance force;
- Part of the international maritime forces;
- Modern means of transport less polluting allowing rapid intervention in delta;

6. Business need for the project

The issue of environmental protection in the Danube Delta as a result of uncontrolled exploitation of its obsolete ships which sailing on the river causing a high degree of water pollution, also tourism development in recent years along with increasing needs for products supply , health services, necessity of raising the living standards of the inhabitants of the delta in a battle with unpredictable and unfriendly factors of weather, are the factors that led the Romanian Government to require starting a project endowment with air-cushion vessels to cover current requirements in this respect. Another reason for this project will be sustained is a military necessity in order to support Navy to fulfill missions in the delta and also in the lagoon in parallel with emergency interventions that incumbent in these zone.

7. Sponsors

Funding design is made from a single source, the government budget over a maximum thirteen months in two installments. The first installment of the two institutions shared design completion stage platform (body ship propulsion systems, navigation, communications) and separately by the two ministries, the Ministry of Defense and Ministry of Transport, as completing the process design phase on the provision of specific equipment and integration platforms (equipment necessary for carrying out civilian missions and military equipment). Funding building naval platforms and their endowment with specific equipment will be made during thirteen months gradually as completions phases of execution / reception separately by the two ministries involved. The contract will be awarded to a local shipyard as one single integrator.

8. High level description

Starting from the real transport needs, missions, equipment needed in order to fulfill their autonomy and technical parameters required by the nature of the land and waters that will be moving, it must approach the concept of air-cushion vessel, in particular *Landing Craft, Air Cushion* (LCAC). Rescue and surveillance companies and institutions, as well as the need of the scientific and environmental research communities, have found that a hovercraft can go places other "all terrain" or four wheel drive vehicles simply cannot go.

The military in particular have, not surprisingly, embraced the hovercraft as a vehicle for many uses.

A hovercraft, also known as an air-cushion vehicle or ACV, is a craft capable of travelling over land, water, mud or ice and other surfaces both at speed and when stationary.
Hovercrafts are hybrid vessels operated by a pilot as an aircraft rather than a captain as a marine vessel.

Except for the many fun uses of hovercraft on a personal level, the professional use of hovercraft include Search and Rescue, Mass Transportation, Recreational, Research and Military uses. Hovercraft are being used as passenger ferries, it can transport passengers, goods and vehicles. Military and Rescue hovercraft are exceptionally suited to various tasks as they are not dependent on road conditions and can quickly move across the various terrains in pursuit of their goal. Most military hovercrafts however are amphibious air cushion vehicles, used for landing troops and equipment, rather than transport over land or water. Many armed forces around the world now have military hovercraft in their arsenal.

The Landing Craft, Air Cushion (LCAC) is a high-speed (in excess of 40 knots and a nominal range of up to 200 nautical miles), over-the-beach fully amphibious landing craft, capable of carrying a 60-75 ton payload. It is used to transport the weapons systems, equipment, cargo and personnel of the assault elements of the Marine Air-Ground Task Force from ship to shore and across the beach. LCAC can carry heavy payloads, at high speeds. Carrying equipment, troops, and/or supplies, the LCAC launches from inside the well deck of an amphibious warship, then travels the waves at high speed, runs right through the surf zone near the beach, and stops at a suitable place on land.

The LCAC payload capability and speed combine to significantly increase the ability of the Marine Ground Element to reach the shore. Air cushion technology allows this vehicle to reach more than 70 percent of the world's coastline, while only about 15 percent of that coastline is accessible by conventional landing craft.

Hovercraft vessels are best suited for coastal and river activities, focusing primarily on only one area of fighting, while having proper self defense capabilities in all areas of combat. These are platforms capable of integrating sensors, weapons and combat systems to act independently in an environment with threats, up to 2-3 days.

They can perform a variety of missions, usually in support of other forces acting on the coast and the river , but can also be designated for specific combat missions in the roles set.

Hovercraft vessels must be able to perform the following tasks , as follows: air defense, war against surface ships (asw), special operations support, other mission – search and rescue.

9.Project management approach

Hovercraft, as we know them today, have been around for about half a century, since the 1950's, but have somehow never managed to get into the mainstream use of transportation. This has been for various reasons. Its inability for precise maneuvering control and its relatively high maintenance and noise levels compared to the automobile have been sufficiently difficult to overcome to keep the air cushion vehicle at the fringe of modern transport. The popularity of hovercraft has seen a marked increase in the last decade, with many practical uses for a hovercraft being recognized and exploited.

Subject Romanian air cushion vessels is very little known, and largely because most projects have not reached the stage of mass production.

One of the most interesting of these projects has been known under the code "1043" aim an air cushion vessel with rigid sidewall (Sidewall Hovercraft) ICEPRONAV was developed and the prototype was launched in Galati Shipyard 1976 or 1977.

Concept combines qualities Sidewall Hovercraft air cushion vessels flexible skirt with those of catamarans, giving the first amphibious capacity in favor of the efficiency of the latter.

Like the rest of Romanian air cushion vessels or Project 1043 has not passed the prototype phase, for unknown reasons, although it was already designed a family of ships based on it. Sidewall Hovercraft idea was however successfully used elsewhere, perhaps the most famous example being the recent military application on Norwegian Navy ship very fast and equipped with missile Skjold , which holds the speed record for military ships (60 knots/110kmph). Concept deserves to be reconsidered therefore in Navy endowment process , except the maximum speed advantage already mentioned above, a very important feature is the lower vulnerability at marine mines compared to conventional ships.

Romania, with the lowest season, the length of all the riparian states is comparatively more vulnerable to mines located in purpose offensive threat in its territorial waters. After all, a fleet, whether modern or ancient, is useful as long as you can leave the port and if the above essential ships are relatively safe can overcome mine fields. Although Skjold is the best known

product of the idea Sidewall Hovercraft was used by the Norwegian Navy and two relatively similar classes cute and mine hunter Oksoy and Alta.



Class -Skjold Class Alta Class Oksoy

these ships with low dimensions are based on draft air cushion vessels, which results in an increased resistance when occurs explosion of mines and have a reduced sound signature as a result of using water jet propulsion besides low magnetic signature feature of all ships in this category.

In summary, the Romanian authorities want to start a project to build two LCAC based on the same concept and will result in getting the same type of air-cushion vessel of which one will be designated for civil activities and second one for military activities , of course with related facilities. The second project is the responsibility of Navy which has the overall authority and responsibility for managing and executing this project according to this Project Plan

The project team will consist of personnel from Navy Staff, Armaments Department (Marine research agency) and ICEPRONAV. This team is responsible for initiating, planning, executing, controlling, closing processes.

Basically starting, adapting and developing an existing prototype ultimately aims to obtain a modern product adapted to the current requirements in the field of intervention for special operations troops, marines and divers in the lagoon and delta areas, equipped with the latest equipment and armament.

10. Constrains/assumption

Fitted with equipment, materials and technologies that lead to a greater adaptability in base missions; air-cushion vessels will be able to meet the most demanding requirements of a future war. Market analysis for the air cushion vessel aiming at the provision of techniques and equipment to satisfy, at least in the medium term (10-15 years), the needs of the mission, as follows:

Stealth technology and composite materials in the construction of the body (using irregular shapes, using silencers and nonmagnetic materials, increase resistance to countermeasures and reduce the needs for maintenance);

- Specify appropriate high speed and radius of action;
- Use of the integrated fire control;
- New propulsion architecture (integrated electric propulsion systems);
- Quick guns capable of providing support its forces in the coastal offensive actions and execute intense and accurate fire on targets naval, land and air.
- Achieving state board functions under the similar NATO countries;
- Providing the necessary facilities for 23 people and possibilities supplied material storage;
- Equipment, weapons, fighting techniques and equipment of ships to satisfy professional military standards and be compatible with NATO countries on ships;
- Ensure safe and easy operation of combat systems and technology on board;
- Ensure, spare parts , ammunition and technical assistance at least in the first period of operation in the country;
- Maintenance is defined in the instructions for maintenance of the supplier, their execution falling into pregnancy shipboard personnel ;
- Repairs to planning based on the principle of necessity prevention and repair ;
- Supplier to provide technical documentation necessary for the proper operation and maintenance of the ship;
- Documentation for equipment placed on board will ensure full and ship inventory will move;
- Frequency and duration of repairs and maintenance to be provided for both the supplier's documentation and information to the commander;
- After running tests (marching and stationary), outcome (operating parameters and use in battle) will be recorded in the information to the commander;
- Be provided tools and materials boarding team action.

A critical part of the program can be considered need to finance the design phase, design, construction and equipment common to both versions of the LCAC from two sources (MoD budget and MoT budget).

II.Project Scope

1.Project Scope Planning

The desired outcome of this project is to develop a clear, adaptable and flexible documentation in order to cover all activities by the initiation, the execution, control and reception of the air-cushion vessels that will be produced using a LCAC modern concept.

2.*Scope statement - Project justification*

Currently, the Navy does not have any hovercraft warship that has capabilities needed to undertake complex missions. Navy with Shipyard Mangalia support began construction of a hovercraft vessel M 1043 project, which is currently inoperable and whose construction was halted due to the nautical and equipment performances well below to any existing vessel of this type (equipment, weapons and combat equipment obsolete of eastern origin).

Mission needs can only be achieved by equipping Navy with a hovercraft ship which integrate seamlessly the endowing concept principles with multipurpose vessels

There is not identified an alternative in this way and so it leads to the conclusion that fore the only viable option to ensure spectrum of missions and fulfilling obligations under NATO, the Navy 's contribution to military action in the theaters of operations within the boundaries or within multinational groups of vessels , is to purchasing one new air cushion vessel , modern with integrated logistics support .

Air-cushion vessel capabilities will be: reduced visual and electric signature achieved through stealth technology and composite materials used in construction of hull, air defense systems (AAW), surface combat ships (ASuW), electronic warfare (EW) , detection and avoidance of Mines (MCM) and special operations facilities .

Procurement program will run simultaneously with the development of integrated logistic support needed to sustain the operation..

3.Scope statement Products description

A hovercraft (LCAC) represents an air cushioned vehicle for transporting, ship-to-shore and across the beach, personnel, weapons, equipment, and cargo of the assault elements of the Marine Air-Ground Task Force. A hovercraft, also known as an air-cushion vehicle or ACV, is a craft capable of travelling over land, water, mud or ice and other surfaces both at speed and

when stationary. Hovercrafts are hybrid vessels operated by a pilot as an aircraft rather than a captain as a marine vessel.

Hovercraft use blowers to produce a large volume of air below the hull that is slightly above atmospheric pressure. The pressure difference between the higher pressure air below the hull and lower pressure ambient air above it produces lift, which causes the hull to float above the running surface. For stability reasons, the air is typically blown through slots or holes around the outside of a disk or oval shaped platform, giving most hovercraft a characteristic rounded-rectangle shape. Typically this cushion is contained within a flexible "skirt", which allows the vehicle to travel over small obstructions without damage. The first practical design for hovercraft derived from a British invention in the 1950s to 1960s. They are now used throughout the world as specialized transports in disaster relief, coastguard, military and survey applications as well as for sport or passenger service.

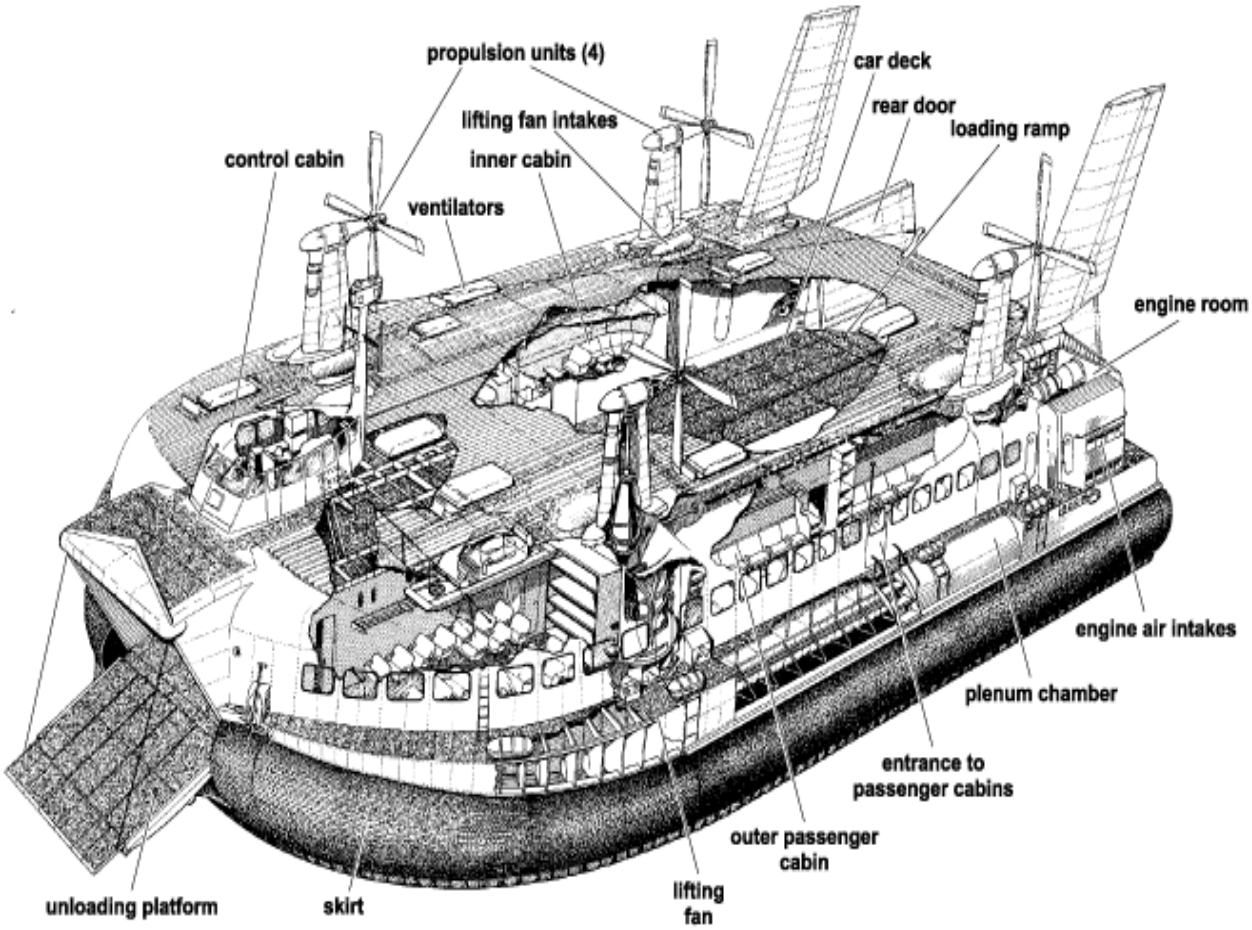


Figure. LCAC's major components LCAC

General requirements of the new LCAC are:

– Displacement: 150-200 tons, autonomy: at least 2 days 3 days targets, range : minimum 200 mm, the maximum speed of not more than 40 Nd , 23 people fighting related equipment;

- Performing a water qualities: high maneuverability, the vessel must be reasonably stable (low roll and pitch) to allow effective use of weapons in relatively agitated sea conditions, suitable climate for the crew and on-board;
- Shorter reaction weapon system based on the tactical situation, achieved by: automatic data acquisition of the target from different sources , processing and data management, early detection and automatic alarm in case of threat targets from air, surface, indicating the system automatically controls the ship, made by the surveillance system, effective fire control system , integrated battle management system that provides a response time according to requirements of a highly dynamic tactical images;
- Autonomy and increased range , achieved by: equipment for refueling at sea, desalinator (freshwater generator), propelling economic unit and generators high performance with very good yields, N.B.C. 's protection , achieved through, detection equipment, alarm, notification NBC, protection system with water curtain, decontamination systems,
- Perfect footprint, achieved by: minimum acoustic fingerprint, reduced electromagnetic fields, low thermal footprint, low radar footprint;
- The number of crew members will be kept to a minimum, depending on the final solution design and requirements to meet operational requirements;
- Vitality , achieved by : fire prevention systems and monitoring of damage , vessel sharing independent areas , to provide a high degree of vitality, detection systems water seepage and other departments need to be monitored in this regard, smoke detection sensors, install surveillance zones, sensors for triggering splashes, installed in warehouses and in other areas where there is danger of fire, manually initiated system for spraying and flooding in certain compartments installed, system of internal calls for vitality team members and between team members vitality and vitality control center (possibly via UHF communications equipment integrated helmet);
- High degree of environmental protection achieved by: Specialized mechanical equipment for oil recovery, unprocessed waste collector, waste water collector tank,
- Capacity NATO integration groups , with similar vessels ;
- Various communication opportunities through integrated naval communications , both military and civilian purposes ;
- Optimal ratio between the quantities of ammunition , fuel and other material taken on board in order to achieve maximum efficiency in battle ;
- Electronic warfare equipment (fixed assets and liabilities).

4.Ship building and facilities description

***4.1.Hull and superstructure requirments are** :*

- Body and superstructure - will be based on stealth technology and will be built from composite materials, non-magnetic and fire;
- The vessel will be able to support at least two watertight compartments flooded, without being endangered stability (at a standstill without sustentation cushion);
- fuel reserves , water and oil will be stored in tanks ;
- The vessel compartments will be included special sections:
- SAM system equipment (ship -to-air missiles) ;
- Quickly cannon and small arms ;
- Propulsion and generators ;
- Radar and communications antennas ;
- Navigation equipment and signaling ;
- Close defense weapon system (CIWS);
- Wheelhouse ;
- Stores of ammunition , food and supplies;
- Spaces for the accommodation and care.
- Smallest possible section radar and IR footprint located above deck equipment ;
- For equipment located below deck, it shall ensure the lowest possible acoustic magnetic fingerprint .

4.2.Combat systems

Ship combat system will provide capabilities that enable it to perform the main tasks with maximum efficiency , both independently and as part of national naval group under the auspices of NATO or PfP . Battle Management System (CMS) will be able to provide :

- All facilities available to ship order to assess and monitor the tactical situation , to plan and coordinate the actions of their control , and control of the means of action;
- Centralization continuous real-time monitoring of tactical situation (air , surface, within the range of the ship or the naval group) ;
- Automatic and manual acquisition targets selected for automatic accompaniment to assess the situation;
- Management of all information generated by all sensors and accompanying surveillance radar target / targets accompaniment ;
- Transmission of data on the state 's naval NATO network ;

- Presentation of the real-time (semi real) and situation management oversight theater air and surface action ;
- Targets Allocation of symbols together ;
- Threat assessment and assignment h accompanying sensors and weapons to engage the target (TEWA) ;
- Continuous monitoring , automated availability and status of all sensors and weapons stores;
- High flexibility in the allocation of hardware and software ;
- Remote control sensors and remote management of their resources;
- l Facilities Data- Link ;
- Support for supplying tactical databases , general data and information (intelligence) and associated management system ;
- Applications supporting navigation software and a wide range of facilities for short and long term planning ;
- Facilities for preparing command ship;
- Advanced modular system architecture based on multi- operator console connected to a network

4.3.Surveillance radar system must:

- Air and surface surveillance at small and medium distances;
- Alarm immediate;
- Real-time Data Management System of Struggle (CSM) and fire control system (FCS);
- Target acquisition and automatic generation of target information;
- Stability operation under clutter and disturbing magnetic fields;
- Raw radar image relative to the bow and geographic north;
- Integration of friend - enemy recognition (IFF) ;
- Full remote control;
- Limits of stability: Roll: + / -10 degrees , Pitching : + / -10 degrees ;
- Emission control planning;
- Low secondary lobes of the antenna;
- l Operation antenna from winds ;
- Controls the rotation speed of the antenna according to the distance scales ;
- High tech signal processing;
- Power supply compatible with the ship's generators.

4.5.Accompanying air targets and surface targets subsystems requirments are :

- Tracking systems are controlled by command and control system via the system bus in order ordering small caliber gun (SCG) and ship -to-air missile system (SAM);
- Technical and tactical data systems cover:
- Maximum speed:
- Distance accompanying instrument:
- Maximum acceleration accompanying target:
- Accompanying the angular limits of the target:
- Target elements:
- The ability to separate the targets:
- Average unadjusted errors:
- Calculating the length of the pulling elements (from the beginning of the accompaniment): max. 5 sec;
- Mechanical and climatic characteristics for equipment will be considered based on the requirements related to climatic conditions resistance to shock and vibration requirements for naval equipment (NES 1000).
- Telemeter laser range finder (component of FCS);
- IR sensor (FCS component);
- Column d sight ;
- Electronic Warfare (EW).

4.6.RESM subsystem will provide the following capabilities:

- A response to signals integrated EW ESM intercepted;
- Detection of signals , their measurement , pulse processing , tracking , identification, alarm , recording / playback RF pulses and provide impulses blank for own radars ;
- Search the library ESM ;
- Time and accompanying identification ;
- Processing Time SEA ;
- Dynamic Distance ESM ;
- Ability signal density ;
- Accuracy in bearing the ESM;
- ESM resolution in azimuth ;
- Frequency resolution ;
- Types of Pulse able to be analyzed ;
- Types of scan analysis : circular sector cons can , lock-on , unknown ;

- Able to be analyzed PI types : fixed , staggered , jittered ;
- Ability and analysis accompanying transmitters will be transmitters of 200 files, of which a minimum of 50 will be sent to the battle management system . Files character alarm transmitters will be forwarded automatically to the battle management system ;
- Database (library) transmitters
- Subsystem traps (Decoy subsystem);
- Communications ESM ;
- Laser alarm system ;

4.7.Weapons systems will provide the following capabilities:

The closest self defense weapons (CIWS);

Ship -to-air missile system;

System –caliber xx machine guns;

4.8.Integrated marine communications will provide the following capabilities:

- Management and supervision system will be made centrally computerized by the communications subsystem management;
- The software used in the system will be implemented on the commercial version of the operating system;
- The system will provide radio communication frequency bands VLF, MF, HF, VHF, and UHF, in accordance with the International Regulations for Radio GENEVA 1995.
- Management of the communication subsystem will provide integrated communication system (ICS) and management of all communication channels and all related equipment , according COMPLAN, will perform all the function of self ICS BIT, will be able to monitor the status of all ICS , will provide command and control of the entire ICS ;
- Configuring and reconfiguring the ICS will be achieved through supervisory console ;
- Communications management system will not allow unauthorized access channels Communications external to the database of the ICS ;
- Management subsystem will prohibit sending secret messages through channels unprotected.
- Message handling system (MHS): Message handling subsystem will provide training messages , distribution, storage and offers formatting messages military formats ;
- The external communication will provide external radio communication channels such as: ship -to-ship , ship-helicopter/plane , ship - shore , ship - satellite;

- Subsystem will provide communications channels for civil applications in the bands SMEs and ICAO ;
- Control and status monitoring radio equipment will be made through the console supervisor ;
- Radio equipment will be fully included in the ICS ;
- The transmitters will be granted only in low power mode or using the equivalent antenna .
- HF , VHF – UHF, UHF SATCOM Subsystems
- subsystem GMDSS
- Tactical data transmission subsystem (Tactical Data Link)
- The encryption subsystem, The audio equipment, Phones without batteries;
- Public address and alarm subsystem;
- Magnetic loop subsystem;
- UHF an emergency communication subsystem;
- PABX and Communications subsystem registration;
- Centralized distribution subsystem clock;
- software Applications;
- Applications are usable in peacetime, crisis and war. Each level of management will have access only to the data necessary to fulfill its mission ;
- Ensure data protection and security ;
- Application development will be in line with open systems architecture to allow under sequential changes or adaptations to new potential requirements;
- Applications will be developed so that the user be able to concentrate on his duties ;
- Managing software maintenance can be done by military personnel ;
- Provide specific mechanisms maximum security software installed ;
- Include system maintenance and quick repair in case of accidental failures (System Fault Tolerance). Hardware and software repairs will be performed interactively ;
- COTS software products (operating system environment) will have unlimited license with update versions during the first year of use;
- Secure network communications at the quay (SNAC) ;
- Portable handheld radios ;
- The hardware will be configured to optimum functioning of the software ;
- The hardware will necessarily UPS (UPS) and power management software ;

- Applications integrated communication system designed for Romania will have opportunities privacy and intellectual property rights are transferred , delivery, Romania;
- Menu (messages, signals) from the supervisory console will be in English. Supplier shall establish precisely the potential to change the menu in Romanian;
- Applications for the execution of orders operator ;
- The functions provided : Procedures (sequence operator orders), Menu and messages displayed on the console, Applications surveillance and automated decision :
- The software will be equipped with rapid rehabilitation software (Quick Recovery) ;
- Analysis software included in the integrated communications will be made according to STPM 40533-99 (MIL- STD- 1521 B).

4.9.Navigation system

General requirements for equipment : integration functional battle system of the vessel, accurate navigation in all weather conditions, stable operation, provide to the weapons systems navigation data path ship and reference data on the horizon , high degree of reliability, ensuring electromagnetic compatibility of equipment, display the remote data , power supply board network , Short setting.

Composition of the system:cruise, gyro compass and gyro azimuth horizon, magnetic compass, loch, probe, radar navigation, gps navigation system, plotter for maps, gyro -repeat , meters ship tilt, emergency conning positioned (fully portable navigation device), fully weather to provide: winds , wind direction , air temperature, air humidity, pressure, timer and receiver for satellite weather fluid situation .

4.10.Propulsion system

Propulsion system thrusters have two independent drives (gas turbines , gearboxes , fans, propellers). The propulsion system must provide travel speeds imposed by the ship's mission .Optimal solution endowment will be made after samples pool and comparative analysis of physical fields .

Power plant - the ship is equipped with two generating units with the following features: minimum 70 KVA power , Voltage 3 x 400 V , Frequency 50/60 Hz .

The sustentation - to achieve Flap , the ship will be equipped with two centrifugal fans monoaspirante driven heat engine . Hovercraft use blowers to produce a large volume of air below the hull that is slightly above atmospheric pressure. For stability reasons, the air is typically blown through slots or holes around the outside of a disk or oval shaped platform,

giving most hovercraft a characteristic rounded-rectangle shape. Typically this cushion is contained within a flexible "skirt", which allows the vehicle to travel over small obstructions without damage.

Flow and load fans will be based on operational tests .

4.11.Measures and protection systems

- To obtain a reduced acoustic fingerprints, ship project will incorporate appropriate measures to reduce noise irradiated under water, such as: elastic mounting pedestals engines, loudspeakers, design reducers, acoustic insulation of the hull;
- In order to obtain prints as low IR, high temperatures will be reduced and high temperatures of the outer surfaces of the exhaust gas by cooling the exhaust pipes, thermal insulation and so on ;
- Reduced radar cross-section;
- NBC protection measures to increase survivability and operation in contaminated environment ;
- Fight for the vitality of the vessel and damage monitoring will be coordinated by the control center vitality and damage monitoring .

4.12.Equipment body . deck machinery and equipment various are:

- Anchor equipment (one anchor and one Winch);
- Anchoring and attachment accessories;
- Rescue equipment ;
- Fixed fire fighting (salt water , foam, halo) ;
- Ballast system;
- Drainage system;
- Freshwater plant;
- Installation saltwater;
- Air conditioner;
- Heating system;
- Fire warning system;
- Sprinkler;
- Adorned and means of lighting;
- Active roll stabilizers;
- Refrigeration;
- Means for handling of loads (up to 1 t);

- Motorboat;
- Rigid hull boat boarding team (RHIB)
- 220V/50Hz portable feeders;
- Different materials and equipment.

5.Operating requirements

The ship will have limited navigation area. It will meet the criteria of stability UK Royal Navy being able to navigate to Sea State 3, except training centers of the cyclones. The battle system will be operable to Sea State 3 inclusive. Restoration fighting capacity: max. 4 hours.

6. Project deliverables

- requirements document tasks that can be performed;
- LCAC operational requirements document ;
- documentation regarding the election, arguing and procurement procedure;
- product technical specification;
- LCAC final execution plan ;
- team manual ;
- final instructions for use of the ship and equipment specific combat posts;
- documentation on getting the final cost phased sub-stages, indices and financial factors that can lead to fluctuations in financial size of the project;
- build a working, amphibious hovercraft prototype;
- ship identification documents;
- a formal presentation with our project portfolio

7.Statement of Work

To achieve the plan objectives, the project team has to make sure that exist an expert in all technical fields, to explore the competition and make the hovercraft amphibious.

To complete the objectives precisely, the project is split in to four parts (modules) structure/steering, lift/thrust, navigation and integrated marine communications and equipments to be integrated base on modularity principle (Combat, Surveillance radar, Accompanying air targets and surface targets, RESM, Weapons systems). Modularity is the principle that the capabilities (equipment) can be used on other ships that have similar missions.

The project team has the responsibility for the research, design,, testing, modifying,. It will appoint appropriate people to specific tasks. There are both team members that have a lot of experience with AutoCAD and Solid Works, so they will have exclusive responsibility to make 3-D models and other models of the prototype. There are environmental safety majors on the team. They will be in charge of making sure that the hovercraft prototype will operate safely. Leader/manager will have the responsibility to make sure that everything gets done on time, within budget and within specs. Everyone will play a role in the designing, testing, modifying and finalizing of the hovercraft. The project team will seek for an outside source (a national shipyard) that effectively will take next responsibilities:

- Building, finalizing and initial testing of the LCAC's lift and the thrust systems (Hull and superstructure, Propulsion system, Navigation system, Integrated marine communications and Equipment body deck machinery and equipment various) for the first two ship (military prototype and civilian prototype);
- Acquisition, integration and initial reception of the LCAC's Combat systems, Surveillance radar system, accompanying subsystems air targets and surface targets, RESM subsystem, Weapons systems.

8.Project Goals (by objectives)

The following list describes the project objectives and the measurable statements of work.

Objective 1: Completion of documents on the planning stage

- Goal1: Completion requirements document tasks that can be performed and submission it for approval of Defence Planning Committee
- Goal2: Completion the operational requirements document LCAC and submission it for approval of Defence Planning Committee
- Goal3: Completion technical specification of the product
- Goal4: Completion the final execution plan of LCAC and submission it for approval of Defence Planning Committee
- Goal5:Completion documentation regarding the election, arguing and procurement procedure

Level 0

Objective 2: To research a variety of hovercrafts through the Internet and magazine sources

- Goal 1: To search for a variety of parts within our budget
- Goal 2: To search for a variety of suppliers which are available

- Goal 3: To search for available math principles
- Goal 4: To search for available properties of material
- Goal 5: To search for available equipments existing on the market;

Level 1

Objective 3: To design the hovercraft

- Goal 1: To research different properties of materials through
- Goal 2: Internet sources and different vendors
- Goal 3: To research available parts for hovercrafts that are available
- Goal 4: To research available integration equipment base on modularity principle for Hovercrafts that are available
- Goal 5: To research available materials, parts and equipments designated to Structure/sheering's build for hovercrafts that are available
- Goal 6: To research available materials, parts and equipments designated to lift/thrust's
- build for hovercrafts that are available
- Goal 7: To research available materials, parts and equipments designated to navigation
- and integrated marine communication's build for hovercrafts that are available
- Goal 8: To research available materials, parts and equipments to be integrated base on
- modularity principle on build for hovercrafts that are available
- Goal 9: To investigate different companies, manufacturers, and vendors for donations
- Goal 10: To draw basic sketches on AutoCAD
- Goal 11: To draw complete plans for the project on AutoCAD and Solid Works

Level 2

Objective 4: Purchase

- Goal 1: Purchase all materials and equipment needed to make Structure/Steering
- Goal 2: Purchase "equipment body deck machinery, equipments various and safety "
- Goal 3: Purchase lift/thrust systems - propulsion and generator system and skirt
- Goal 4 Purchase navigation system
- Goal 5: Purchase Integrated maritime communications system
- Goal 6: Purchase equipments to be integrated base on modularity principle (military)

Objective 5: To build the hovercraft

- Goal 1: To fully assemble the hull, skirt and superstructure equipment body deck

- machinery and equipment various
- Goal 2: To fully assemble the propulsion system
- Goal 3: To fully assemble the navigation and integrated marine communications
- systems
- Goal 4: To fully assemble the Combat system
- Goal 4: To fully assemble the Surveillance radar, Accompanying air targets and surface
- targets and RESM systems
- Goal 5: To fully assemble the Weapons systems
- Goal 6: To fully assemble the entire hovercraft

Level 3

Objective 5: To test the hovercraft modify the prototype (If necessary)

- Goal 1: To test the Structure/steering/ Equipment body deck machinery, equipments various and safety 's functioning and resistance
- Goal 2:To modify the hull
- Goal 3: To test the Lift/thrust systems that is necessary to move the hovercraft
- Goal 4: To modify the skirt
- Goal 5:To modify the propulsion
- Goal 6 To test the propulsion speed that is necessary to move the hovercraft
- Goal 7: To test the stability of the hovercraft
- Goal 8: To test the navigation and integrated marine communication systems of the hovercraft
- Goal 9: To test the Combat, Surveillance radar, Accompanying air targets and surface targets and RESM systems
- Goal 10:To test the Weapons systems

Level 4

Objective 7: **To finalize the project**

- Goal 1: To get ready for Operational manual
- Goal 1To get ready for "Portfolio, Website, Drawings/Specs "
- Goal 3: To get ready for final presentation

Level 5

9.Work Breakdown Structure

The following work breakdown structure divides the overall project into all the different work elements (activities):

1. **Hovercraft**

1.1. Completion of documents on the planning stage and submission it for approval of DPC

1.1.1. Mission needs document LCAC

1.1.2. The operational requirements document LCAC

1.1.3. Technical specification of the product LCAC

1.1.4. Final execution plan of LCAC

1.1.5. Documentation regarding the election, arguing and procurement procedure

1.2. Research

1.2.1. Hull/Structure/steering/Equipment body deck machinery, equipments various and safety

1.2.2. Lift/thrust systems (Propulsion and generator system / Skirt)

1.2.3. Navigation and integrated marine communications systems (Navigation systems, Integrated marine communications system -Military version only

1.2.4. Equipments to be integrated base on modularity principle -Military version only

1.5.4.1. Combat systemBattle Management System (CMS)

1.5.4.1. Surveillance radar system

1.5.4.1. Accompanying subsystems air targets and surface targets

1.5.4.1. RESM subsystem

1.5.4.1. The closest self defense weapons (CIWS) system

1.5.4.1. Ship -to-air missile system

1.5.4.1. Machine guns System

1.2.5. Aesthetics

1.2.6. Parts/Materials

1.2.7. Suppliers

1.3. Design

1.3.1. Hull/Structure/steering/Equipment body deck machinery, equipments various and safety

1.3.2. Lift/thrust systems (Propulsion and generator system / Skirt)

1.3.3. Navigation and integrated marine communications systems (Navigation systems, Integrated marine communications system -Military version only

1.3.4. Equipments to be integrated base on modularity principle -Military version only

1.3.4.1. Combat systemBattle Management System (CMS)

1.3.4.2. Surveillance radar system

1.3.4.3. Accompanying subsystems air targets and surface targets

1.3.4.4. RESM subsystem

1.3.4.5. The closest self defense weapons (CIWS) system

1.3.4.6. Ship -to-air missile system

1.3.4.7. Machine guns System

1.3.5. Aesthetics

1.3.6. AutoCAD drawings

1.4. Purchase

1.4.1. Hull/Structure/steering/Equipment body deck machinery, equipments various and safety

1.4.1.1. Sheet metal

1.4.1.2. Special Steel

1.4.1.3. Fasteners

1.4.1.4. Battery

1.4.1.5. Gas tank

1.4.1.6. Gas/oil

1.4.1.7. Battery cables

1.4.1.8. Wires

1.4.1.9. Cables/accessories

1.4.1.10. Styrofoam

1.4.1.11. Welding materials

1.4.1.12. Composite materials , non-magnetic and fire

Equipment body deck machinery and equipments various

1.4.1.13. 2x.Anchor equipment (one anchor and one Winch);

1.4.1.14. 2x Anchoring and attachment accessories;

1.4.1.15. 2x Rescue equipment;

1.4.1.16. 2x Fixed fire fighting (salt water , foam, halo) ;

1.4.1.17. 2x Ballast system;

1.4.1.18. 2x Drainage system;

1.4.1.19. 2x Freshwater plant;

1.4.1.20. 2x Installation saltwater;

1.4.1.21. 2 x Air conditioner;

1.4.1.22. 2x Heating system;

1.4.1.23. 2x Fire warning system;

1.4.1.24. 2x Sprinkler

1.4.1.25. 2xAdorned and means of lighting;

1.4.1.26. 2xActive roll stabilizers;

1.4.1.27. 2x Refrigeration;

1.4.1.28. 2x Means for handling of loads (up to 1 t) ;

1.4.1.29. 2x Motorboat;

1.4.1.30. 2x Rigid hull boat boarding team (RHIB) 2x 220V/50Hz portable feeders ;

1.4.1.31. 2x Safety (Measures and protection system)

1.4.2. Lift/thrust systems (Propulsion and generator system / Skirt)

1.4.2.1. 4x independent drives (gas turbines , gearboxes , fans, propellers).

1.4.2.2. 2x power plant

1.4.2.3. 2x flexible "skirt"

1.4.3. Navigation and integrated marine communications systems (Navigation systems, Integrated marine communications system -Military version only)

Navigation

1.4.3.4. 2xCruise

1.4.3.5. 2xGyro compass, gyro azimuth horizon

1.4.3.6. 2xMagnetic compass

1.4.3.7. 2xLoch

1.4.3.8. 2xProbe

1.4.3.9. 2xRadar navigation

1.4.2.10. 2xRadar antenna

1.4.2.11. 2xGPS navigation system

1.4.2.12. 2xPlotter for maps

1.4.2.13. 2xGiro –repeat

1.4.2.14. 2xMeters ship tilt

1.4.2.15. 2xEmergency Conning positioned (fully portable navigation device)

1.4.2.16. 2xFully weather system

Integrated marine communications system

1.4.2.17. 2xManagement and supervision system

1.4.2.18. 2xManagement of the communication subsystem

1.4.2.19. 2xMessage handling system (MHS)

1.4.2.20. 2xExternal communication system;

1.4.2.21. 2xControl and status monitoring radio equipment;

1.4.2.22. 2xRadio equipment - ICS;

1.4.2.23. 2xThe transmitters

1.4.2.24. 2xAntenna.

1.4.2.25. 2xaudio equipment

1.4.2.26. 2xPhones without batteries system.

1.4.2.27. 2xPublic address and alarm subsystem

1.4.2.28. 2xMagnetic loop subsystem

1.4.2.29. 2xUHF an emergency communication subsystem

1.4.2.30. 2xPABX and Communications subsystem

1.4.2.31. 2xCentralized distribution subsystem clock

1.4.2.32. 2xApplications

1.4.2.33. 2xCOTS software products (operating system environment)

1.4.2.34. 2xPortable handheld radios;

1.4.2.35. 2xhardware and software

Military version only

1.4.2.36. HF, VHF – UHF, UHF SATCOM Subsystems

1.4.2.37. GMDSS subsystem

1.4.2.38. Tactical data transmission subsystem (Tactical Data Link)

1.4.2.39. The encryption subsystem

1.4.2.40. Secure network communications at the quay (SNAC);

1.4.4. Equipments to be integrated base on modularity principle -Military version only

1.4.2.41. Combat systemBattle Management System (CMS)

1.4.2.42. Surveillance radar system

1.4.2.43. Accompanying subsystems air targets and surface targets

1.4.2.44. RESM subsystem

1.4.2.45. The closest self defense weapons (CIWS) system

1.4.2.46. Ship -to-air missile system

1.4.2.47. Machine guns System

1.5. Build an integration

1.5.1. Hull/Structure/steering/Equipment body deck machinery, equipments various and safety

1.5.2. Lift/thrust systems (Propulsion and generator system / Skirt)

1.5.3. Navigation and integrated marine communications systems (Navigation systems, Integrated marine communications system -Military version only

1.5.4. Equipments to be integrated base on modularity principle -Military version only

1.5.4.1. Combat systemBattle Management System (CMS)

1.5.4.2. Surveillance radar system

1.5.4.3. Accompanying subsystems air targets and surface targets

1.5.4.4. RESM subsystem

1.5.4.5. The closest self defense weapons (CIWS) system

1.5.4.6. Ship -to-air missile system

1.5.4.7. Machine guns System

1.5.5. Assemble

1.5.6. Aesthetics

1.6. Test (Asses and modify)

1.6.1. Hull and Structure

1.6.2. Steering

1.6.3. Equipment body deck machinery and equipments various

1.6.4. Propulsion and generator system

1.6.5. Skirt

1.6.6. Navigation systems

1.6.7. **I**integrated marine communications system

1.6.8. Combat systemBattle Management System (CMS)

1.6.9. Surveillance radar system

1.6.10. Accompanying subsystems air targets and surface targets

1.6.11. RESM subsystem

1.6.12. The closest self defense weapons (CIWS) system

1.6.13. Ship -to-air missile system

1.6.14. Machine guns System

1.7. Project completion

1.7.1. Operational manual

1.7.2. Website

1.7.3. Presentation

1.8. Record Keeping, communication and solving legal problems

II. Project time management

Project time management is detailed in table nr.1 and includes the processes required to ensure timely completion of a LCAC -project. Processes are as follow:

- Activity definition involves developing a more detailed WBS and supporting explanations to understand all the work to be done by teams all structure components that handle this project in order to develop a realistic duration estimates. Basically the plan has seven main activities totaling 46 sub-activities;
- Activity explanations
- Activity sequencing (Dependencies)

– Activity duration estimating (program begins at 05.01.2014 and is expected to be finalized in 20.01.2015 when the two LCAC will complete the evidence, and go under the authority of the two entities receiving.

Table nr. 1 - TIME MANAGEMENT

No	Activity definition	Explanations	Dependencies	Duration
1	Completion of documents on the planning stage and submission it for approval of Defense Planning Committee			
1.1	Completion of the Mission needs document LCAC (military and civilian version)			5
1.2	Completion of the Operational requirements document LCAC (military and civilian version) - ORD			5
1.3	Completion of the Technical specification of the product LCAC (military and civilian version) -TSP		FS 1.1.2	5
1.4	Completion of the Final execution plan of LCAC (military and civilian version) - FEC		FS 1.1.3	10
1.5	Completion of the Documentation regarding the election, arguing and procurement procedure			5
1.2	Research - (military and civilian versions)			
1.2.1	Research common parts: hull and structure / steering / equipment body deck machinery and equipments various	Research will be done on the hull that is currently available to the public. The research will be conducted through books, magazines, and Internet sources. Special attention will be given to the math principles of parts and materials involved with the Hull and Structure / Steering / Equipment body deck machinery and equipments various weight and air flow of the skirt and basic plans for designing the hull and skirt;	FS 1.1.5	20
1.2.2	Research common parts lift/thrust systems - propulsion, generator system and skirt	The research will be conducted through books, magazines, and Internet sources. Special attention will be given to math principles involved with lift/thrust systems – propulsion and skirt	FS 1.1.5	20
1.2.3	Research common parts - navigation	The research will be conducted through books,	FS 1.2.1	20

No	Activity definition	Explanations	Dependencies	Duration
	and integrated maritime communications systems	magazines, and Internet sources. Special attention will be given to math principles involved with navigation and integrated maritime communications systems.		
1.2.4	Research equipments to be integrated base on modularity principle (military only): -Combat system -Surveillance radar system -Accompanying air and surface targets subsystems -RESM subsystem -The closest self defense weapons system (CIWS) -Ship -to-air missile system -Guns machine system	The research will be conducted through books, magazines, and Internet sources. Special attention will be given to math principles involved with: -Surveillance radar system -Surveillance radar system -Accompanying air and surface targets subsystems -RESM subsystem -The closest self defense weapons system (CIWS) -Ship -to-air missile system -Guns machine system	FS 1.2.1	20
1.2.5	Aesthetics		FS 1.2.4	5
1.2.6	Suppliers		FS 1.2.5	5
1.3	Design - (military and civilian versions)			
1.3.1	Design common parts -hull and structure / steering / equipment body deck machinery and equipments various	It will be developed and tested in the laboratory final form templates	FS 1.2.6	14
1.3.2	Design common parts - lift/thrust systems - propulsion, generator system and skirt		FS 1.2.6	14
1.3.3	Design common parts -navigation and integrated maritime communications systems		FS 1.3.1	10
1.3.4	Design equipments to be integrated base on modularity principle (military only): - Combat system system -Surveillance radar system	It will be developed and tested in the laboratory final form layout military variant, equipped with specific military equipment	FS 1.3.1	10

No	Activity definition	Explanations	Dependencies	Duration
	-Accompanying air and surface targets subsystems -RESM subsystem -The closest self defense weapons system (CIWS) -Ship -to-air missile system -Guns machine system			
1.3.5	Aesthetics		FS 1.3.4	5
1.3.6	AutoCAD drawings		FS 1.3.4	5
1.4	Purchase			
1.4.1	Purchase all materials and equipment needed to make the hull and steering	To purchase all materials and equipment needed to make the hovercraft. This includes the special metal, Styrofoam, fasteners, battery, gas tank, gas and oil, battery cables, wires, cables and accessories, pulleys, steel, welding materials, drive belt, drive pulley, and steering pulley, Equipment body deck machinery, equipments various and safety. CFO shipyard (program integrator), as representative , will purchase all equipment with two specialized departments financial and acquisitions by the legislation in force on acquisitions	FS 1.3.6	60
1.4.2	Purchase common parts - Equipment body deck machinery, equipments various and safety		FS 1.3.6	60
1.4.3	Purchase common parts -lift/ thrust systems - propulsion , generator system and skirt	To purchase all the equipment needed to make the hovercraft. This includes the special Lift/thrust systems - Propulsion and generator system, Navigation, Integrated marine communications system. FO shipyard (program integrator), the representative will purchase all equipment with two specialized financial and procurement departments in collaboration with the Department for Armaments	FS 1.3.6	60
1.4.4	Purchase common parts - Navigation		FS 1.3.6	80
1.4.5	Purchase common parts - Integrated maritime communications system		FS 1.3.6	80

No	Activity definition	Explanations	Dependencies	Duration
1.4.6	Purchase equipments to be integrated base on modularity principle (military only): - Combat system system -Surveillance radar system -Accompanying air and surface targets subsystems -RESM subsystem -The closest self defense weapons system (CIWS) -Ship -to-air missile system -Guns machine system	To purchase all equipment needed to make the hovercraft. This includes the equipments to be integrated base on modularity principle. FO shipyard (program integrator), the representative will purchase all equipment with two specialized financial and procurement departments in collaboration with the Department for Armaments	FS 1.3.6	80
1.5	Build an integration - (military and civilian versions)			
1.5.1	Build an integration common parts - hull and structure / steering / equipment body deck machinery and equipments various	The hull and steering will be built with steel and Styrofoam that will allow the hovercraft to float on water and be lights enough to hover on land. The skirt will be sewed by an outside contractor and bolted to the hulls outside frame.		120
1.5.2	Build an integration common parts - lift/ thrust systems - propulsion , generator system and skirt	Propulsion system will be integrated on board the care manufacturer, which is required to interconnect the system with other related systems, provide the requested guarantees and attend high load samples	FS 1.4.6	60
1.5.3	Build an integration common parts - Navigation and Integrated marine communications systems	Navigation and Integrated marine communications systems will be integrated on board by manufacturer, which is required to interconnect the system with other related systems, provide the requested guarantees and attend high load samples	FS 1.4.6	60

No	Activity definition	Explanations	Dependencies	Duration
1.5.4	Build an integration equipments to be integrated base on modularity principle (military only): - Combat system system -Surveillance radar system -Accompanying air and surface targets subsystems -RESM subsystem -The closest self defense weapons system (CIWS) -Ship -to-air missile system -Guns machine system	Equipments to be integrated base on modularity principle marine communications systems will be integrated on board by manufacturer, which is required to interconnect the system with other related systems, provide the requested guarantees and attend high load samples.	FS 1.4.6	60
1.5.5	Assemble		FS 1.5.4	10
1.5.6	Aesthetics		FS 1.5.4	5
1.6.	Test- (military and civilian versions)			
1.6.1	Test-common parts - Hull and Structure	To test the performance of the hull. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.2	Test-common parts - Steering	To test the performance of the steering. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.3	Test-common parts - Equipment body deck machinery and equipments various	To test the performance of the Equipment body deck machinery and equipments various. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.4	Test-common parts - Propulsion and generator system	To test the performance of the Propulsion and generator system. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11

No	Activity definition	Explanations	Dependencies	Duration
1.6.5	Test-common parts - Skirt	To test the performance of the Skirt. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.6	Test-common parts - Navigation systems	To test the performance of the Navigation systems. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.7	Test-common parts - Integrated marine communications system	To test the performance of the Integrated marine communications system. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.8	Test Combat system Battle Management System (CMS)	To test the performance of the Combat system Battle Management System (CMS). To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.9	Test Surveillance radar system	To test the performance of the Surveillance radar system. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.10	Test Accompanying air targets and surface targets subsystems	To test the performance of the Accompanying subsystems air targets and surface targets. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.11	Test equipments to be integrated base on modularity principle (military only)	To test the performance of the RESM subsystem. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11

No	Activity definition	Explanations	Dependencies	Duration
1.6.12	Test The closest self defense weapons system (CIWS)	To test the performance of the closest self defense weapons (CIWS) system. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.13	Test Ship -to-air missile system	To test the performance of the Ship -to-air missile system xx. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.6.14	Test Guns machine system	To test the performance of the System –caliber xx machine guns. To assess the results of the test and decide if modifications are necessary. If so, make the required modifications.	FS 1.5.6	11
1.7	Project completion			
1.7.1	Operational manual	The team Operational manual will centralize in a manual all instructions given by manufacturer and integrator mainly on the components, their operation, maintenance and use	FS 1.6.14	10
1.7.2	Website	The team website will consist of everything involved in making the hovercraft.	FS 1.6.14	10
1.7.3	Presentation	To give a twenty minute oral and visual presentation of designing, building, testing, modifying, and finalizing of the hovercraft.	FS 1.6.14	10
1.81	Record Keeping, communication and solving legal problems			255

More details on the timing and duration of these activities can be found in Appendix C

III. Project cost management

Project cost management is detailed in table nr.2 and includes the processes required to ensure that the LCAC project is completed within an approved budget off 131,.84 millions ROL. Cost estimates will use the following assumptions:

- exchange rate of 1 euro = 4.5 ROL
- the average personnel costs / time used in Romania
- ship construction will be done in a shipyard in the country in order to protect the national economy;
- costs for materials and utilities are practiced in Romania;
- military specific equipment will be purchased and integrated on board by the principle of modularity so that it can be used on similar other vessels.

Table nr.2 – COST MANAGEMENT **Millions lei**

No	Activity	Humans resources costs	Tools costs	Material resources costs	Equipments costs	Utilities costs	Rental space /equipments	Depreciation costs	Total costs
1.1	Completion of documents on the planning stage and submission it for approval of DPC								
1.1.1	Completion of the Mission needs doc. LCAC	0.01	-	-	-	-	-	-	0.01
1.1.2	Completion of the Operational requirements document LCAC - ORD	0.01	-	-	-	-	-	-	0.01
1.1.3	Completion of the Technical specification of the product LCAC -TSP	0.01	-	-	-	-	-	-	0.01
1.1.4	Completion of the Final execution plan of LCAC – FEC	0.01	-	-	-	-	-	-	0.01
1.1.5	Completion of the Documentation regarding the election, arguing and procurement procedure	0.01	-	-	-	-	-	-	0.01
1.2	Research – (military and civilian versions)								
1.2.1	Research: hull and structure / steering / equipment body deck machinery and equipments various	0.02	-	-	-	0.07	-	-	0.10
1.2.2	Research lift/thrust systems propulsion, generator system and skirt	0.02	-	-	-	0.09	-	-	0.11
1.2.3	Research navigation and integrated maritime communications systems	0.04	-	-	-	0.09	-	-	0.13
1.2.4	Research equipments to be integrated base on modularity principle (military only)	0.07	-	-	-	0.05	-	-	0.11
1.2.5	Aesthetics	0.04	-	-	-	0.01	-	-	0.05
1.2.6	Suppliers	0.01	-	-	-	0.01	-	-	0.02
1.3	Design – (military and civilian versions)								

No	Activity	Humans resources costs	Tools costs	Material resources costs	Equipments costs	Utilites costs	Rental space /equipments	Depreciacion costs	Total costs
1.3.1	Design Hull and Structure /steering/ Equipment body deck machinery, equipments various and safety	0.02	0.83	-	-	0.05	-	-	0.90
1.3.2	Design Lift/thrust systems	0.02	1.80	-	-	0.06	-	-	1.88
1.3.3	Design Navigation systems and integrated maritime communic. Systems	0.02	1.08	-	-	0.05	-	-	1.15
1.3.4	Design equipments to be integrated base on modularity principle (military only)	0.03	-	-	-	0.02	-	-	0.06
1.3.5	Aesthetics	0.04	-	-	-	0.01	-	-	0.05
1.3.6	AutoCAD drawings	0.01	-	-	-	0.01	-	-	0.02
1.4	Purchase								
1.4.1	Purchase all materials and equipment needed to make Structure/Steering	0.04	-	-	-	-	-	-	0.04
1.4.2	Purchase Equipment body deck machinery, equipments various and safety	0.04	-	-	-	-	-	-	0.04
1.4.3	purchase Lift/thrust systems	0.05	-	-	-	-	-	-	0.05
1.4.4	purchase Navigation	0.05	-	-	-	-	-	-	0.05
1.4.5	purchase Integrated maritime communic. system	0.05	-	-	-	-	-	-	0.05
1.4.6	Purchase equip. to be integrated base on modularity principle (milit. Only)	0.05	-	-	-	-	-	-	0.05
1.5	Build an integration – (military and civilian versions)								
1.5.1	Build and integration Hull and Structure/steering/ Equipment body deck machinery, equipments various and safety	1.13	13.50	22.43	14.45	1.62	0.81	0.90	54.84
1.5.2	Build and integration Lift/thrust systems	0.17	-	-	23.85	0.16	0.08	0.18	24.45
1.5.3	Build and integration navigation systems and integrated marine communications systems	0.09	-	-	5.41	-	-	-	5.50
1.5.4	Build and integration equipments to be integrated base on modularity principle (military only)	0.05	3.04	-	21.74	-	-	-	24.83
1.5.5	Aesthetics	0.08	-	-	-	0.01	-	-	0.09

No	Activity	Humans resources costs	Tools costs	Material resources costs	Equipments costs	Utilites costs	Rental space /equipments	Depreciacion costs	Total costs
1.5.6	Assemble	0.16	-	-	-	-	-	-	0.16
1.6	Test- (military and civilian versions)								
1.6.1	Test-Hull and Structure	0.01	-	0.90	-	-	-	-	0.91
1.6.2	Test Steering	0.01	-	0.07	-	-	-	-	0.07
1.6.3	Test-Equipment body deck machinery and equipments various	0.01	-	0.07	-	-	-	-	0.07
1.6.4	Test-Propulsion and generator system	0.01	-	0.45	-	-	-	-	0.46
1.6.5	Test-Skirt	0.01	-	4.50	-	-	-	-	4.51
1.6.6	Test-Navigation systems	0.03	-	-	-	-	-	-	0.03
1.6.7	Test-Integrated marine communications system	0.01	-	-	-	-	-	-	0.01
1.6.8	Test CMS	0.01	-	-	-	-	-	-	0.01
1.6.9	Test Surveillance radar system	0.01	-	-	-	-	-	-	0.01
1.6.10	Test Accompanying air targets and surface targets subsystems	0.01	-	-	-	-	-	-	0.01
1.6.11	Test RESM	0.01	-	-	-	-	-	-	0.01
1.6.12	Test CIWS	0.01	-	-	-	-	-	-	0.01
1.6.13	Test Ship –to-air missile system	0.01	-	2.25	-	-	-	-	2.26
1.6.14	Test System machine guns	0.01	-	0.54	-	-	-	-	0.55
1.7	Project completion								
1.7.1	Operational manual	0.01	-	0.45	-	-	-	-	0.46
1.7.2	Website	0.01	-	0.01	-	-	-	-	0.02
1.7.3	Presentation	0.00	-	0.05	-	-	-	-	0.05
1.8.	Record Keeping, communication and solving legal problems								1.15
PROJECT COSTS									**124.37**
Indirect costs (6%)									**7.46**
TOTAL COSTS									**131.84**

More details on the costs activities and its estimation can be found in Appendix A and Appendix D.

IV. Project quality management

1. Quality assurance .Quality assurance includes all the activities related to satisfying the relevant quality standards for LCAC project, as follows:

2.Quality Standards and Metric:

In this case quality based on conformance to requirements meeting in written specifications, which are next:

All equipments, including the ship, have similar parameters and are NATO compatible, as follows:

- LCAC speed - in excess of 40 knots and a nominal range of up to 200 nautical miles), over-the-beach fully amphibious landing craft, capable of carrying a 60-75 ton payload.
- These are platforms capable of integrating sensors, weapons and combat systems to act independently in an environment with threats, up to 2-3 days.
- Displacement: 150-200 tons, autonomy: at least 2 days 3 days targets, range: minimum 200 mm, the maximum speed of not more than 40 Nd, 23 people fighting related equipment.
- convention and standards which will take into account in the design and execution of ship (SOLAS74),(MARPOL 73/78 (STCW 78 (COLREG 72), (ITC 69), (ILO No 147), (CLC 92), ISO 9001 and ISO/TC 8Ships and marine technology;
- Accompanying subsystems air targets and surface targets : Mechanical and climatic characteristics for equipment will be considered based on the requirements related to climatic conditions resistance to shock and vibration requirements for naval equipment (NES 1000) .
- Integrated marine communications - The system will provide radio communication frequency bands VLF , MF , HF, VHF , UHF, in accordance with the International Regulations for Radio GENEVA 1995.
- Analysis software included in the integrated communications will be made according to STPM 40533-99 (MIL- STD- 1521 B).

3. Quality control

To monitoring specific project results and to ensure that shipyard comply with the relevant quality standards, at the MoD and MoT level the identifying ways to improve overall quality used in our project will be the seven run rule states that if seven data points in a row are all below the mean, above, the mean, or increasing or decreasing, then the process needs to be examined for non-random problems. Shipyard shall have the right to conduct quality control after the method adopted inside.The following chart describes each determined standard and the predetermined metrics to determine if the standards are met.

Quality Chart

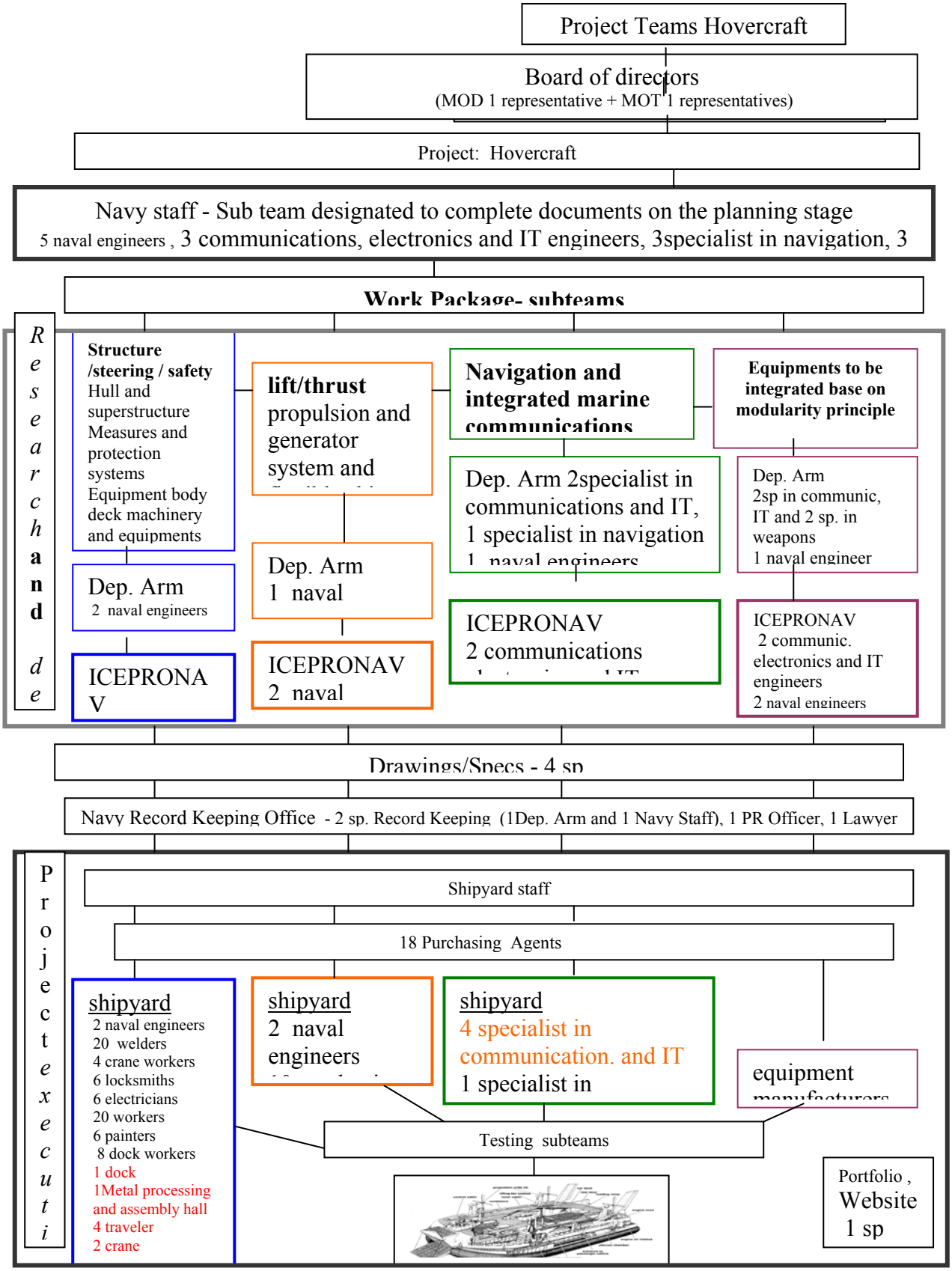
Standards	Metric Process	Metric Tool
MoD and MoT		
Timeline deadline	Develop Project 2000 charts and follow the timelines and graphs	Project 2000 graphs
Budget	Develop a standard budget for the shipyard to follow. Seek o make timely payments by the two customers	Microsoft Word
Customer recommendation	Finish a quality project on time,and within budget.	Buy product 20.01.2015
Project		
Payload weight	60 tons (up to 75 tons in an overload condition)(54/68 metric tons). Test payload weight behind Engineering Building.	Calculations Visual inspection
Length	87 feet 11 inches (26.4 meters)	Calculations Visual inspection
Width	47 feet (14.3 meters)	Calculations Visual inspection
Main armament	two XX mm machine guns. Gun mounts will support: XX mm grenade launcher; two Ship -to-air missile system Tests conducted by firing 1000 blow ammo and launching 2 rockets	Calculations Visual inspection
Lift Height	Must lift at least 10” off the ground. Test lift height behind the Engineering Building.	Calculations Tape measure
Balance standard	Must be visibly level by MoD and MoT representatives hovering. Test for balance will be held behind them.	Calculations Visual inspection
Engine	gas turbine	Visual inspection
Propulsion speed	40+ knots (46+ mph; 74 km/h) with full load, 70+ knots maximum speed Test speed behind the MoD and Dep for Arm. representative	Radar gun
Operational range	200 miles at 40 kt (370 km at 75 km/h) with payload 300 miles at 35 kt (550 km at 65 km/h) with payload	Calculations
Flotation ability	Is able to allow for the hull to go no more than 60” in the water. Test will be in the east lagoon with MoD and MoT representatives hovering.	Calculations East Lagoon Tape measure

The product will be test in according with WBS activities no 1.6 .

V. Human resources management

1. Project Organization Chart:

Below is an organizational chart for the project:



More details on personnel involved in the project and its specialty can be found in Appendix B.

2. Organizational planning –Responsibility Assignment Matrix (RAM)

Below is an Sample Responsibility Assignment Matrix (RAM) for the project:

Main stakeholders	Obs / WBS activities	1.1	1.2..	1.3.	1.4.	1.5.	1.6.1	1.7
Navy staff	Planning documents completion and approval	RP						
	Research		CS					
	Design			CS				
	Purchase				C			
	Build and integration					CS		
	Tests						RS	
	Project termination							RS
	Formal communication with stakeholders		RMu	RMu	RMu	RMu	RMu	RMu
	Website postings				Mu			Mu
	Finances		RMu	RMu	RMu	RMu	RMu	RMu
	Changes in budget or expenditures		RMu	RMu	RMu	RMu	RMu	RMu
	Changes to goals		RMu	RMu	RMu	RMu	RMu	RMu
	Changes to timeline		RMu	RMu	RMu	RMu	RMu	RMu
Armaments Department	Planning documents completion and approval	C						
	Research		RP					
	Design			RP				
	Purchase				C			
	Build and integration					CS		
	Tests						RS	

Main stakeholders	Obs / WBS activities	1.1	1.2..	1.3.	1.4.	1.5.	1.6.1	1.7
	Project termination							
	Formal communication with stakeholders		R	R	R	R	R	R
	Website postings				R			R
	Finances		My	My	My	My	My	My
	Changes in budget or expenditures		My	My	My	My	My	My
	Changes to goals		My	My	My	My	My	My
	Changes to timeline		My	My	My	My	My	My
ICEPRONAV MOT	Planning documents completion and approval	C						
	Research		RP					
	Design			RP				
	Purchase				C			
	Build and integration					CS		
	Tests						RS	
	Project termination							RS
	Formal communication with stakeholders		My	My	My	My	My	My
	Website postings				My			My
	Finances		My	My	My	My	My	My
	Changes in budget or expenditures		My	My	My	My	My	My
	Changes to goals		My	My	My	My	My	My
	Changes to timeline		My	My	My	My	My	My
SHIPYARD	Planning documents completion and							

Main stakeholders	Obs / WBS activities	1.1	1.2..	1.3.	1.4.	1.5.	1.6.1	1.7
	approval							
	Research							
	Design							
	Purchase				RP			
	Build and integration					RP		
	Tests						RP	
	Project end							RP
	Formal communication with stakeholders		RMyN	RMyN	RMyN	RMyN	RMyN	RMyN
	Website postings				RMyN			RMyN
	Finances		RMyN	RMyN	RMyN	RMyN	RMyN	RMyN
	Changes in budget or expenditures		RMyN	RMyN	RMyN	RMyN	RMyN	RMyN
	Changes to goals		RMyN	RMyN	RMyN	RMyN	RMyN	RMyN
	Changes to timeline		RMyN	RMyN	RMyN	RMyN	RMyN	RMyN

R- Responsible members belonging sub teams
P- Performing members belonging sub teams
C-collaborating members belonging sub teams
S - Supervising members belonging

M u - Must be consulted sub teams
My - May be consulted sub teams
N - Must be notified sub teams

Below is an **RAM Showing Stakeholder Roles** for the project:

Main stakeholders / Items	Navy staff	Arm. Dep.	ICEPRONAV	SHIPYARD
Test equipment body deck machinery, equipments various and safety	P,R,S	P,R	P,R	A,P,I
Test steering system	P,R,S	P,R	P,R	A,P,I
Test equipment body deck machinery, equipments various and safety	P,R,S	P,R	P,R	A,P,I
Test Propulsion and generator system	P,R,S	P,R	P,R	A,P,I
Test skirt	P,R,S	P,R	P,R	A,P,I
Test navigation system	P,R,S	P,R	P,R	A,P,I
Test Integrated maritime communications system	P,R,S	P,R	P,R	A,P,I
Test Combat system Battle Management System (CMS)	P,R,S	P,R	P,R	A,P,I
Test Surveillance radar system	P,R,S	P,R	P,R	A,P,I
Test Accompanying subsystems air	P,R,S	P,R	P,R	A,P,I

Main stakeholders / Items	Navy staff	Arm. Dep.	ICEPRONAV	SHIPYARD
targets and surface targets				
Test RESM subsystem	P,R,S	P,R	P,R	A,P,I
Test The closest self defense weapons (CIWS) system	P,R,S	P,R	P,R	A,P,I
Test Ship -to-air missile system	P,R,S	P,R	P,R	A,P,I
Test System –caliber xx machine guns	P,R,S	P,R	P,R	A,P,I

A -Accountable
P –participant
R- Review required
I – Input required
S - Sign off required

VI. Project Communications Management

The purpose of the communication plan is to ensure the Project Management Improvement Project provides relevant, accurate, and consistent project information to project stakeholders and other appropriate audiences. By effectively communicating the project can accomplish its work with the support and cooperation of each stakeholder group.

The communication plan provides a framework to manage and coordinate the wide variety of communications that take place during the project. The communication plan covers who will receive the communications, how the communications will be delivered, what information will be communicated, who communicates, and the frequency of the communications. Project participants are Navy staff, Armaments Department, ICEPRONAV and one local shipyard. Their role and project responsibilities were defined Sample Responsibility Assignment Matrix (RAM)

Basically mixed teams of Navy staff members, Dep. Arm and ICEPRONAV will handle document preparation and promotion planning and execution of the project, periodic monitoring of quality and compliance with technical documentation and execution by managing and financing the project after approval of funding lines from both ministries MoD and MoT. Shipyard will return the main task of implementation (execution) of beneficiaries' requirements after completion in prior of the necessary purchases and site organization. In adds shipyard is obliged to follow the milestones regarding tests, offer and registration in accordance with recording standards in force, of the two vessels as the final product.

1. Confidentiality Statement and Public Access

The project is highly confidential in nature, can not be discussed because project details cannot be discussed with anyone outside of the project team. The degree of confidentiality is top secret. Confidentiality Project Requirements are:

- technical details of the project will not publish without permission and only with the MoD;

- data mentioned as confidential in the contract after it's signing will not be made public except with the MoD agreement
- staff with access to execution plans, testing and reception will be mandatory certificate attesting their access level required;
- equipment and military products suppliers, will ORNIS OMCAS certificates
- Information that will be circulated among stakeholders will run only through secure networks.

2. News media communications

In the project organization Navy Staff has the authority to discuss details of the project with external news and media organizations. Board of directors has the authority to:

Disseminate information to online newspapers, magazines, topical or industry websites

Disseminate information via twitter, blogs, online forums or other internet and IP based communications methods

3. Document repository and access rights

All project participants should store project documents in a single location **Navy Record Keeping Office**. As not all documents will be accessible by all project participants, the network administrators should establish the central storage folders using appropriate security and access rights permissions. **Navy Record Keeping Office is** the location of this shared storage area, as well as which documents should be stored there.

4. Documentation standards

Most communication is in written form and some verbal. The documents should be stored and the methods used for this storage.

Meetings should be summarized and documented. Also key phone calls should be summarized and documented.

All email correspondence relating to the project should be centrally stored. Physical contracts can be handled in the military way.

5. Reporting Deliverables, Recipients and Frequencies

List details regarding specific communication deliverables include:

- The Project Manager will provide an updated project plan, sent via email each Friday and stored in specified location. Specify which project participants will receive the updated plan.

- The Project Manager will provide a project status report, sent via email each Friday and stored in specified location. Specify which project participants will receive the updated plan.
- The Project Manager will provide an updated project issues log, sent via email each Wednesday (and more frequently if necessary) and stored in specified location. Specify which project participants will receive the updated plan.
- The Project Manager will provide project Earned value reporting to the Project Executive Committee on a bi-weekly basis. This information will be sent via email. A follow-up meeting will be arranged for in depth analysis of the project performance.

6. Communication Purpose and Target Audiences

This section identifies the audiences targeted in this Communication Plan, and the purpose of communicating with each audience. A complete list of the participants in each audience can be found in the next table.

Audience	Communication Purpose
DPC	Project plans, project progress, project issues
Project Core Team	Project direction, project deliverables, clear direction and delegation of tasks
Project Tests Team	Project direction, project deliverables, changes in work processes
Navy Record Keeping Office	Project Strategy, changes to business operations and policy, project deliverables, project progress
Management Group Board of directors	Project Strategy, changes to business operations and policy, project deliverables, project progress
Project manager	Project Strategy, impact due to changes in procedures or policies, project deliverables, project progress
Navy Staff	Impact due to changes in procedures or policies, changes in business procedures and policies, project progress

7. Communication Message and Delivery

The following outlines the targeted audiences, the key communication messages to be delivered, and the method for delivering the information, the communicator, and the frequency of the delivery.

Audience	Message	Delivery Method	Delivery Frequency	Communicator

Audience	Message	Delivery Method	Delivery Frequency	Communicator
MoD and MoT	Project Plans Status Reports	Meeting Report published in My Webspace with DoITnet and PSST link	Weekly Biweekly	Project Manager Project Manager
Project Core Team	Project Plans Status Reports	Meeting Report published in My Webspace with DoITnet and PSST link	Weekly Biweekly	Project Manager Project Manager
Project test Team	Project Briefing Status Reports	Meeting: Oral briefing and presentation slides Report published in My Webspace with DoITnet and PSST link	Monthly Biweekly	Project Manager Project Manager
Navy Record Keeping Office	Status Reports Project Briefing	Report published in My Webspace with net and PSST link Meeting: Oral briefing and presentation slides	Biweekly Quarterly	Project Manager Project Manager
Management Group Board of directors	Status Reports Project Briefing	Report published in My Web space with net and PSST link Meeting: Oral briefing and presentation slides (briefings held more frequently as requested)	Biweekly Quarterly Quarterly Semi-annually Annually	Project Manager Project Manager
project manager	Project Briefing	Project Management Forum Meeting: Oral briefing and briefing notes	Monthly	Project Manager Project Core Team
Navy staff	Project Briefing	All Staff Meeting: Oral briefing and presentation slides	Annually	Project Manager

8. Communication Message Contents

The contents of the key communications are:

1. **Project Plans**

- Current and Future Plans
- Project Issues and Problems

- Planned Project Deliverables for Next Period

Status Report

- Status Summary
- Status of Schedule
- Status of Budget
- Status of Scope
- Accomplishments Achieved
- Concerns/Issues
- Next Steps
- Project Team Members

2. Project Briefing

- Goals of Project Management Improvement
- Project Status
- Project Problems and Issues
- Project Checklist
- Project Risk Management
- Project Constraints:

There are some constraints that can hold back and create stress for the sub teams and these are listed below:

- extension of domestic economic difficulties , financial and social functioning affecting critical and vital Romanian society;
- impossibility of accessing stealth technology
- reqiurements going over our allocated budget
- delays the provision of goods from different suppliers ;
- Some sub team composition: Lack of naval engineers and weapons specialists
- Budget concerns: Funds needed for completion of the project may be underestimated
- Time constraints for total project to be completed
- Approval process for new parts is too comprehensive
- Limited resources
- Scope creep
- Lab availability time
- Lack of team coordination
- Team leader does not communicate to others
- Inadequately defined objectives and strategies

- Team communication between members
- Materials not delivered in adequate time frame
- Inconsistent quality of materials ordered
- Lack of stakeholder support
- 'Crashing' could cause a decline in quality
- Work packages not balanced between group members
- Not getting presentation material composed
- Environmental concerns require remaking of parts and pieces
- Weather concerns (rain, snow, sleet, ice) will cause the team to be unable to test the project

VII. Project risk management

1.Project Risk Analysis:

The following list describes the project hazards, dangers, or potential losses that may prevent to complete the project.

Hazards and Dangers:

Extension of domestic economic difficulties, financial and social functioning affecting critical and vital Romanian society;

Market risk -Impossibility of accessing stealth technology knowing that ship's hull and superstructure will be constructed of composite materials, non-magnetic and fire ;

Technology risk -Lack of consensus between MOD and MOT regarding the final version of the ship prototype.

Financial risk-Possible negative budget adjustment that will lead to slowing actions, modification initial funding lines profile and ship delays testing and reception;

Financial risk-large fluctuations of exchange rate

Financial risk-reqiurements going over our allocated budget

Technology risk - Shipyard not being able to finish in the specified time frame and to complete our performance standards because of bad organization, holding an outdated technology and low-skilled workers

Potential Losses:

Financial risk-lose all research and design costs because of time constraints

Technology risk- Shipyard not receiving customer recommendations

Market risk -delays the provision of goods from different suppliers and especially of those with special status , namely the suppliers of materials and military equipment

Market risk -delays in the procurement process due to cumbersome legislation in force and the contestations of the participants in this process

Concerns weather (rain , snow , Sleet , ice) Will cause the team to be Unable to test the project

2.Risk identification and qualitative analysis

Code	Risk	Percentage	Impact	Rating score
A	Extension of domestic economic difficulties, financial and social functioning affecting critical and vital Romanian society;	1	4	4
B	Impossibility of accessing stealth technology knowing that ship's hull and superstructure will be constructed of composite materials, non-magnetic and fire ;	1	3	3
C	Lack of consensus between MOD and MOT regarding the final version of the ship prototype	2	3	6
D	Possible negative budget adjustment that will lead to slowing actions, modification initial funding lines profile and ship delays testing and reception;	4	4	16
E	Large fluctuations of exchange rate	4	3	12
F	Requirements going over our allocated budget	2	3	6
G	Shipyard not being able to finish in the specified time frame and to complete our performance standards because of bad organization, holding an outdated technology and low-skilled workers	3	3	9
H	Lose all research and design costs because of time constraints. These costs are generated by the need to purchase materials needed for the construction and testing of various models in the laboratory	2	3	6
I	Shipyard not receiving customer common recommendations	1	3	3
J	Delays the provision of goods from different suppliers and especially of those with special status, namely the suppliers of materials and military equipment	2	3	6
K	Delays in the procurement process due to cumbersome legislation in force and the contestations of the participants in this process	4	2	8
L	Concerns weather (rain , snow , Sleet , ice)	2	2	4

Quantitative / Risk matrix

PD	Very Likely 5	5	10	15	20	25
	Likely 4	4	8	12	16	20

	K	E	D	

	Feasible 3	3	6	9	12	15
	Slight 2	2	4	6	8	10
	Very unlikely 1	1	2	3	4	5
		Insignificant	Minor	Significant	Major	Critical
		1	2	3	4	5
IMPACT (B)						

			G			
		L	C,F, H,J			
			B, I	A		
Insign.	Minor	Significant		Major	Critical	
1	2	3		4		
IMPACT (B)						

3.Risk Conditions /Contingency/Tradeoff Chart:

The following charts details what risks may occur, it's conditions and the current contingencies that are in place if the risks do occur.

Risk conditions

Code	**Risk**	**Risk conditions**
	Extremely High Risk	
D	Possible negative budget amendment leads to normal slowing of project financing due to lower	It will delay the completion of the project, doubling the duration of its execution, noncompliance and decisions taken jointly with NATO partners, accumulation of penalties purchase bills of materials and equipment as a result of delayed payments, unacceptably growth project costs, delay objectives of national interest. Need to request additional funds.
	High Risk	
E	Large fluctuations of exchange rate	*positive (rate decrease)* recover a portion of costs in favor of decreasing the total cost of the project *negative (rate growth*) additional costs will be particularly in procurement and payment of utilities which will lead to increase the final cost of the project and the need to request additional funds
	Moderate Risk	
G	Shipyard not being able to finish in the specified time frame and our performance standards because of bad organization, holding an outdated technology and low-skilled workers	It will delay the ship completion. It will lead to subcontracting other outsources able to reduce waste of time, who have the necessary technology and can offer products and services that will ensure quality coverage requirements and obtaining final tests. This will lead to increased costs of the project and its completion time. Poor attitude toward quality; substandard design/materials/workmanship; inadequate quality assurance program.

Code	**Risk**	**Risk conditions**
K	Delays in the procurement process due to cumbersome legislation in force and the contestations of the participants in this process	Unenforceable conditions or contract clauses; adversarial relations. Delay execution and testing phases and therefore extension of recipes and teaching ships.
	Low Risk	
A	Extension of domestic economic difficulties, financial and social functioning affecting critical and vital Romanian society;	It will postpone the start of the project
B	Impossibility of accessing stealth technology knowing that ship's hull and superstructure will be constructed of composite materials, non-magnetic and fire ;	It will delay the completion of the ship's hull and structure and the default of other components of it
C	Lack of consensus between MOD and MOT regarding the final version of the ship prototype	It will postpone the start of the execution phase. Carelessness in planning or communicating; lack of consultation .
F	Requirements going over our allocated budget	Estimating errors; inadequate productivity, cost, change, or contingency control.
H	Lose all research and design costs because of time constraints. These costs are generated by the need to purchase materials needed for the construction and testing of various models in the laboratory	Errors in estimating time or resource availability; poor allocation and management of float. There is a danger of weaknesses in ship construction which can lead to life-endangering crews, vessel instability and loss of final tests on ships functional parameters and construction quality. It will postpone the concluding approval of the research and design phases and therefore the entire project
I	Shipyard not receiving customer common recommendations	It will postpone the concluding approval of the research and design phases and therefore the entire project. It will delay the completion of different execution phases. The tests will not be finalized
J	Delays the provision of goods from different suppliers and especially of those with special status, namely the suppliers of materials and military equipment	It will delay the completion of different execution phases. The tests will not be finalized at time and therefore the entire project
L	Concerns weather (rain , snow , Sleet , ice)	It will delay the completion of different execution phases. The tests will not be finalized at time and therefore the entire project

4.Risk Response Planning

Code	Risk	Contingency	Tradeoff
	Extremely High Risk		
D	Possible negative budget amendment leads to normal slowing of project financing due to lower	Use contingency budget. Supplementing the final budget will slow project completion and cause beneficiaries to revise priorities to be included in next year's budget	Time, Budget, NATO commitments, national goals
	High Risk		
E	Large fluctuations of exchange rate	Use contingency budget. Supplementing the final budget will slow project completion and cause beneficiaries to revise priorities to be included in next year's budget. In awarding contract specific clauses will be introduced in this regard	Time, Budget
	Moderate Risk		
G	Shipyard not being able to finish in the specified time frame and our performance standards because of bad organization, holding an outdated technology and low-skilled workers	Research for the work packages that need to be done. Crash on 5 days/week from 4 to 6 p.m. Consult outside resource to keep project within specs	Time , Performance, Budget
K	Delays in the procurement process due to cumbersome legislation in force and the contestations of the participants in this process	Procurement process will be made by the shipyard like main integrator with Armaments Department specialized support.	Time
	Low Risk		
A	Extension of domestic economic difficulties, financial and social functioning affecting critical and vital Romanian society;	Financing is made by two ministries involved with government accord. In awarding contract specific clauses will be introduced in this regard	Time
B	Impossibility of accessing stealth technology knowing that ship's hull and superstructure will be constructed of composite materials, non-magnetic and fire ;	Procurement process will be made by the shipyard like main integrator with Armaments Department specialized support. Also, if necessary It will appeal to subcontracting other outsources able to provide the materials and technology needed. It will special work in order to gain the support of all NATO partners.	Time
C	Lack of consensus between MOD and MOT regarding the final version of the ship prototype	ICEPRONAV involvement in the research and design phase. Schedule frequent stakeholders meetings. Have an open question and answer session	Time , Performance, Budget

Code	Risk	Contingency	Tradeoff
F	Requirements going over our allocated budget	Supplementing the final budget will slow project completion and cause beneficiaries to revise priorities to be included in next year's budget	Budget
H	Lose all research and design costs because of time constraints. These costs are generated by the need to purchase materials needed for the construction and testing of various models in the laboratory	It will use l ICEPRONAV lab designated to testing layouts. These two phases are vital for the project and because of that, budget will be increased if necessary at budget amendment, by the beneficiaries current budget	Time , Performance
I	Shipyard not receiving customer common recommendations	Follow current objectives and Strategies already in place. Achieve project goals and only. Improve once all major goals are successfully accomplished	Time , Performance and Customer Recommendation
J	Delays the provision of goods from different suppliers and especially of those with special status, namely the suppliers of materials and military equipment	Purchases will be made by the shipyard like main integrator with Armaments Department specialized support . Establish communication with vendor before project begins. Allow more time to receive parts, tools, materials, equipments than vendor states	Time
L	Concerns weather (rain , snow , Sleet , ice)	In awarding contract specific clauses will be introduced in this regard	Time

VIII. Procurement

Funding building naval platforms and their endowment with specific equipment will be made during thirteen months gradually as completions phases of execution / reception separately by the two ministries involved. The contract will be awarded to a local shipyard as one single integrator.

1.Tools list

No	Activity (WBS)	module	Tools	Unit price (euro)	Quantity	Tools costs (euro)
1.3.1	Design Structure/steering/ Equipment body deck machinery, equipments various and safety	Hull and Structure	specific	2,500	10	25,000
		Steering	specific	350	100	35,000
		Equipment body deck machinery and equipments various	specific	500	250	125,000

No	Activity (WBS)	module	Tools	Unit price (euro)	Quantity	Tools costs (euro)
1.3.2	Design Lift/thrust systems	Propulsion and generator system	specific	500	500	250,000
		Skirt	specific	1,500	100	150,000
1.3.3	Design Navigation and integrated marine communications systems	Navigation systems	specific	2,500	60	150,000
		Integrated marine communications system	specific	600	150	90,000
1.4.1	Purchase tools , materials, equipments necessary building Structure/steering/ Equipment body deck machinery, equipments various and safety	Structure/steering/ Equipment body deck machinery, equipments various and safety	specific	1,000	3,000	3,000,000
1.4.6	Purchase tools , materials, equipments necessary integrating maritime communic. system (military only)	Integrated marine communications system	specific	4,500	150	675,000
TOTAL						**4,500,000**

2. Materials list

No	Activity (WBS)	Material resources	Unit price (euro)	Quantity	Material resources costs (euro)
1.4.1	Purchase tools , materials, equipments necessary building Structure/steering/ Equipment body deck machinery, equipments various and safety	Different Materials	35,000	80	2,800,000
		Sheet metal	24,000	30	720,000
		Special Steel	40,000	10	400,000
		Fasteners	2,500	10	25,000
		Battery	250	40	10,000
		Gas tank	5,000	4	20,000
		Gas/oil	1,000	10	10,000
		Battery cables	2,000	50	100,000
		Wires	3,500	100	350,000
		Cables / accessories	2,000	50	100,000
		Styrofoam	4,500	20	90,000
		Welding materials	20,000	8	160,000
		composite materials , non-magnetic and fire	10,000	20	200,000
1.6.1	Test Hull and Structure	fuel and oil	1,000	200	200,000

.1.6.2	Test Steering	consumables and spare parts	15,000	1	15,000
1.6.3	Test Equipment body deck machinery and equipments various	consumables and spare parts	15,000	1	15,000
.1.6.4	Test Propulsion and generator system	fuel and oil	1,000	100	100,000
1.6.5	Test Skirt	2 skirts	500,000	2	1,000,000
	Test Ship -to-air missile system	missile	250,000	2	500,000
.1.6.14	Test machine guns system	ammo	30	4,000	120,000
1.7.1	Operational manual	specific	1,000	100	100,000
1.7.2	Portfolio , Website, Drawings/Specs	specific	1,500	2	3,000
1.7.3	Presentation	specific	1,000	10	10,000
TOTAL					**7,048,000**

3. Equipments list

No	Activity (WBS)	Equipments	Unit price (euro)	Quantity	Equipments costs (euro)
.1.4.2	Purchase Equipment body deck machinery, equipments various and safety	2x.Anchor equipment (one anchor and one Winch);	10,000	2	20,000
		2x Anchoring and attachment accessories ;	10,000	2	20,000
		2x Rescue equipment ;	30,000	2	60,000
		2x Fixed fire fighting (salt water , foam, halo) ;	8,000	2	16,000
		2x Ballast system ;	450,000	2	900,000
		2x Drainage system ;	350,000	2	700,000
		2x Freshwater plant ;	150,000	2	300,000
		2x Installation saltwater ;	25,000	2	50,000
		2 x Air conditioner ;	2,000	2	4,000
		2x Heating system ;	4,500	2	9,000
		2x Fire warning system ;	1,000	2	2,000
		2x Sprinkler ;	1,000	2	2,000
		2xAdorned and means of lighting;	1,500	2	3,000
		2xActive roll stabilizers ;	40,000	2	80,000
		2x Refrigeration ;	5,000	2	10,000
		2x Means for handling	14,000	2	28,000

No	Activity (WBS)	Equipments	Unit price (euro)	Quantity	Equipments costs (euro)
		of loads (up to 1 t) ;			
		2x Motorboat ;	25,000	2	50,000
		2x Rigid hull boat boarding team (RHIB)	450,000	2	900,000
		2x 220V/50Hz portable feeders ;	3,500	2	7,000
		2x Measures and protection systems	25,000	2	50,000
1.4.3	Purchase Lift/thrust systems - Propulsion and generator system	4x independent drives (gas turbines, gearboxes, fans, propellers).	800,000	4	3,200,000
		2x power plant	550,000	2	1,100,000
		2x flexible "skirt"	500,000	2	1,000,000
1.4.4	Purchase Navigation system	2xCruise	60,000	2	120,000
		2xGyro compass, gyro azimuth horizon	2,500	2	5,000
		2xMagnetic compass	2,500	2	5,000
		2xLoch	2,500	2	5,000
		2xProbe	2,500	2	5,000
		2xRadar navigation	300,000	2	600,000
		2xRadar antenna	10,000	2	20,000
		2xGPS navigation system	5,000	2	10,000
		2xPlotter for maps	2,500	2	5,000
		2xGiro –repeat	2,500	2	5,000
		2xMeters ship tilt	2,500	2	5,000
		2xEmergency Conning positioned (fully portable navigation device)	2,500	2	5,000
		2xFully weather system	2,500	2	5,000
.1.4.5	Purchase Integrated maritime communications system	2xManagement and supervision system	2,500	2	5,000
		2xManagement of the communication subsystem	2,500	2	5,000
		2xMessage handling system (MHS)	2,500	2	5,000
		2xExternal communication system;	2,500	2	5,000
		2xControl and status monitoring radio	50,000	2	100,000

No	Activity (WBS)	Equipments	Unit price (euro)	Quantity	Equipments costs (euro)
		equipment;			
		2xRadio equipment - ICS ;	15,000	2	30,000
		2xThe transmitters	15,000	2	30,000
		2xAntenna.	5,000	2	10,000
		2xaudio equipment	1,500	2	3,000
		2xPhones without batteries system.	1,000	2	2,000
		2xPublic address and alarm subsystem	4,000	2	8,000
		2xMagnetic loop subsystem	1,000	2	2,000
		2xUHF an emergency communication subsystem	20,000	2	40,000
		2xPABX and Communications subsystem	20,000	2	40,000
		2xCentralized distribution subsystem clock	20,000	2	40,000
		2xApplications	20,000	2	40,000
		2xCOTS software products (operating system environment)	20,000	2	40,000
		2xPortable handheld radios ;	500	2	1,000
		2xhardware and software	500	2	1,000
1.4.6	Purchase Integrated maritime communications system (military only)	HF, VHF – UHF, UHF SATCOM Subsystems	350,000	1	350,000
		GMDSS	100,000	1	100,000
		Tactical Data Link	450,000	1	450,000
		The encryption subsystem	50,000	1	50,000
		SNAC	50,000	1	50,000
	Purchase Equipments to be integrated base on modularity principle	CMS	280,000	1	280,000
		Surveillance radar system	150,000	1	150,000
		Accompanying subsystems air targets and surface targets	250,000	1	250,000
		RESM	250,000	1	250,000
		CIWS	300,000	1	300,000
		Ship -to-air missile system	800,000	1	800,000

No	Activity (WBS)	Equipments	Unit price (euro)	Quantity	Equipments costs (euro)
		System machine guns	1,800,000	1	1,800,000
TOTAL					**14,543,000**

4. Contract Types

According to article 5 of the Government Emergency Ordinance No 34/2006, MoD by the contracting authority Armaments Department as a funds user for Navy major program, will conclude a supply contract with a local shipyard (fixed-price or lump-sum contract)

In accordance with Article 18 of Government Emergency Ordinance no 34/2006 letter d, award procedure will be negotiated procedure with prior publication of a contract notice. Negotiation is namely the procedure whereby the contracting authority carries consultation with the chosen candidates and negotiates contract terms, including price, with one or more of them. According to article 5 of the Government Emergency Ordinance No 34/2006, MoT by the contracting authority ICEPRONAV, will conclude a supply contract with the same shipyard. And the award procedure will be the same negotiated procedure with prior publication of a contract notice. Both institutions will begin proceedings at the same time and it will use the same technical documentation. Difference between the two specifications being on specific military equipment imposed by the ship military variant.

The MoD contract not exceed the value of 80.704.000 ROL including added tax value and 6% indirect costs. The MoT contract not exceed the value of 51.135.000 ROL including added tax value and 6% indirect costs.

Shipyard that wins the procurement procedure and the contracts will contract obligation-end supply (tools, materials and equipment) with various local businesses or foreigners. Also it may subcontract the services necessary for the smooth running of the project. Ship decommissioning deadline is 23.01.2015.

IX. Project closing and conclusions

1. Project closing

Procurement programs will run simultaneously with the development of integrated logistic support needed to sustain the operation. Munitions (rockets, missiles) will provide the first step for at least 1 unit of fire.

Air-cushion vessel will be the main means of specific action for a period of 10-15 years. Each testing phase will end by signing and approval of specific reception stages documents. In addition, the shipyard has the obligation to deliver the following documents:

- operating instructions
- knowledge of technical manuals
- instructions on performing the maintenance
- guarantees required for each equipment on board
- under article 30 of Order 889/2013 - the recording and registration of ships - documents on the ship's identity as follow:
  - ✓ provisional license to fly the flag of the Romanian Naval Authority newly built vessels in shipyards in Romania , during the march tests :
  - ✓ granted the right to fly the Romanian flag issued by the specialized department of the NRA
  - ✓ transcription ownership
  - ✓ ship registration in the national register of ships and international register of ships
  - ✓ board certified
  - ✓ Acer standard for granting the right to fly the Romanian flag and registration of the vessel, including optional three name proposals ;
  - ✓ manufacturer's certificate for newly built ships ;
  - ✓ inspection report for registration or certificate issued by NRA class and statutory certificates issued by a recognized organization ;]
  - ✓ confirmation class issued by the classification society of the vessel, as applicable;
  - ✓ tonnage certificate ;
  - ✓ certificate issued by competent authority showing the nationality and domicile / residence , as applicable;
  - ✓ newly built vessels , the document issued by the State stating that they are newly built ships and unregistered , as appropriate affidavit stating that newly built ship was not registered ;
  - ✓ the schedule for registration subject to the tax authority , as appropriate;

2. Conclusions

Given the economic potential of the country, Navy Staff put and supports option of this alternative which involves financial and material consumption average value and appreciate that, at least at the present stage, other options or alternatives are difficult to achieve because high cost and time necessary to develop and initiate programs.

Project getting viable and effective capabilities that will be an enable real counter of a possible aggression or violation of national maritime and land space in the north east.

Finally project offer some benefits as:

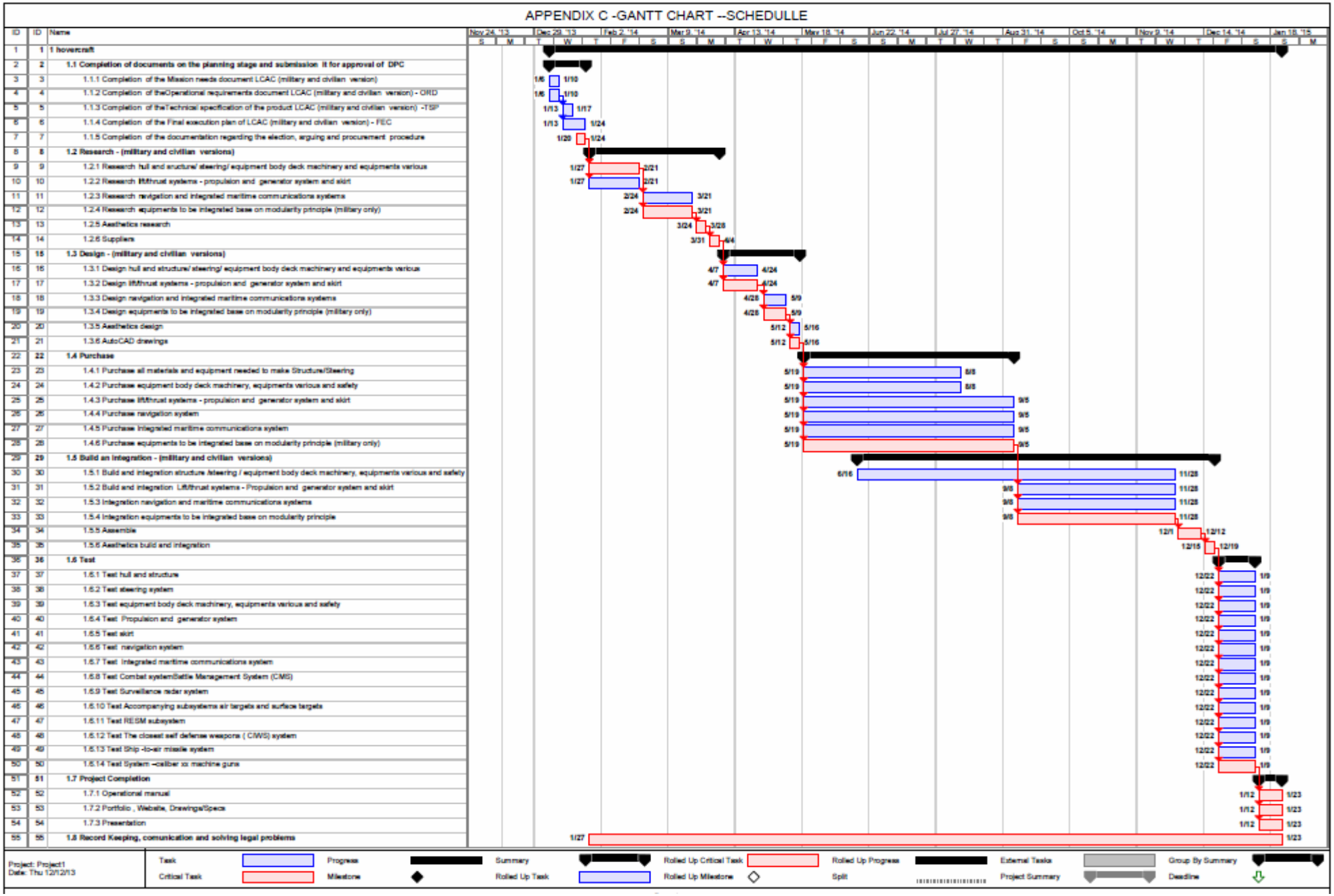
- Fulfillment of Navy missions
- full range of missions that the Navy has to execute in the Delta and the lagoon
- less polluting
- Regional tourism development
- Raising the living standards of the inhabitants of the area and cover their needs for transport, health services, insurance products logistics;
- Interventions in the area during weathering.

Hovercraft vessels proposed for acquisition are clear opportunities to support operations of Navy forces / allies and effective participation in asymmetric conflict resolution

References

- LCAC Hovercraft: US Navy's Champion Schleppers Get SLEPped www.defenseindustrydaily.com/lcac-hovercraft.
- Nave-pe-perna-de-aer-romanesti www.rumaniamilitary.ro/tag/nave-pe-perna-de-aer-romanesti
- Nave care nu au intrat in dotarea Marinei Militare www.resboiu.ro/forum/index.php?topic=59.0
- Hovercraft From Wikipedia, the free encyclopedia www.en.wikipedia.org/wiki/Hovercraft
- Hovercraft construction www.links999.net/hovercraft/.../hovercraft_mat.
- HOVERCRAFT: LIFT SYSTEM AND STEERING www.drc.libraries.uc.edu/.../MET2011_Knapp_Kelly.
- Teamplan03 www.learningace.com/doc//teamplan03

APPENDIX C -GANTT CHART --SCHEDULLE



APPENDIX D - Activities COSTS

ID	WBS	Task Name	Total Cost	Baseline	Variance	Actual	Remaining
30	1.5.1	Build and integration structure /steering / equipment body deck machinery,	euro12,186,312	euro0	euro12,186,312	euro0	euro12,186,312
33	1.5.4	Integration equipments to be integrated base on modularity principle	euro5,516,995	euro0	euro5,516,995	euro0	euro5,516,995
31	1.5.2	Build and integration Lift/thrust systems - Propulsion and generator systen	euro5,432,403	euro0	euro5,432,403	euro0	euro5,432,403
32	1.5.3	Integration navigation and maritime communications systems	euro1,222,334	euro0	euro1,222,334	euro0	euro1,222,334
41	1.6.5	Test skirt	euro1,001,466	euro0	euro1,001,466	euro0	euro1,001,466
49	1.6.13	Test Ship -to-air missile system	euro501,525	euro0	euro501,525	euro0	euro501,525
17	1.3.2	Design lift/thrust systems - propulsion and generator system and skirt	euro417,732	euro0	euro417,732	euro0	euro417,732
18	1.3.3	Design navigation and integrated maritime communications systems	euro254,890	euro0	euro254,890	euro0	euro254,890
37	1.6.1	Test hull and structure	euro201,466	euro0	euro201,466	euro0	euro201,466
16	1.3.1	Design hull and structure/ steering/ equipment body deck machinery and ec	euro199,932	euro0	euro199,932	euro0	euro199,932
50	1.6.14	Test System –caliber xx machine guns	euro121,525	euro0	euro121,525	euro0	euro121,525
52	1.7.1	Operational manual	euro102,998	euro0	euro102,998	euro0	euro102,998
40	1.6.4	Test Propulsion and generator system	euro101,466	euro0	euro101,466	euro0	euro101,466
34	1.5.5	Assemble	euro35,965	euro0	euro35,965	euro0	euro35,965
55	1.8	Record Keeping, comunication and solving legal problems	euro33,150	euro0	euro33,150	euro0	euro33,150
11	1.2.3	Research navigation and integrated maritime communications systems	euro29,779	euro0	euro29,779	euro0	euro29,779
12	1.2.4	Research equipments to be integrated base on modularity principle (militar	euro25,542	euro0	euro25,542	euro0	euro25,542
10	1.2.2	Research lift/thrust systems - propulsion and generator system and skirt	euro25,331	euro0	euro25,331	euro0	euro25,331
9	1.2.1	Research hull and sructure/ steering/ equipment body deck machinery and	euro21,331	euro0	euro21,331	euro0	euro21,331
35	1.5.6	Aesthetics build and integration	euro20,604	euro0	euro20,604	euro0	euro20,604
38	1.6.2	Test steering system	euro16,466	euro0	euro16,466	euro0	euro16,466
39	1.6.3	Test equipment body deck machinery, equipments various and safety	euro16,466	euro0	euro16,466	euro0	euro16,466
19	1.3.4	Design equipments to be integrated base on modularity principle (military o	euro12,771	euro0	euro12,771	euro0	euro12,771
13	1.2.5	Aesthetics research	euro11,998	euro0	euro11,998	euro0	euro11,998
20	1.3.5	Aesthetics design	euro11,996	euro0	euro11,996	euro0	euro11,996
54	1.7.3	Presentation	euro11,333	euro0	euro11,333	euro0	euro11,333
25	1.4.3	Purchase lift/thrust systems - propulsion and generator system and skirt	euro10,675	euro0	euro10,675	euro0	euro10,675
26	1.4.4	Purchase navigation system	euro10,675	euro0	euro10,675	euro0	euro10,675
27	1.4.5	Purchase integrated maritime communications system	euro10,675	euro0	euro10,675	euro0	euro10,675
28	1.4.6	Purchase equipments to be integrated base on modularity principle (militar	euro10,675	euro0	euro10,675	euro0	euro10,675
23	1.4.1	Purchase all materials and equipment needed to make Structure/Steering	euro8,006	euro0	euro8,006	euro0	euro8,006
24	1.4.2	Purchase equipment body deck machinery, equipments various and safety	euro8,006	euro0	euro8,006	euro0	euro8,006
42	1.6.6	Test navigation system	euro7,455	euro0	euro7,455	euro0	euro7,455
14	1.2.6	Suppliers	euro4,443	euro0	euro4,443	euro0	euro4,443
53	1.7.2	Portfolio , Website, Drawings/Specs	euro4,300	euro0	euro4,300	euro0	euro4,300
21	1.3.6	AutoCAD drawings	euro4,155	euro0	euro4,155	euro0	euro4,155
44	1.6.8	Test Combat systemBattle Management System (CMS)	euro3,237	euro0	euro3,237	euro0	euro3,237
46	1.6.10	Test Accompanying subsystems air targets and surface targets	euro3,237	euro0	euro3,237	euro0	euro3,237
48	1.6.12	Test The closest self defense weapons (CIWS) system	euro3,237	euro0	euro3,237	euro0	euro3,237
6	1.1.4	Completion of the Final execution plan of LCAC (military and civilian versi	euro2,998	euro0	euro2,998	euro0	euro2,998
43	1.6.7	Test Integrated maritime communications system	euro2,445	euro0	euro2,445	euro0	euro2,445
45	1.6.9	Test Surveillance radar system	euro2,445	euro0	euro2,445	euro0	euro2,445
47	1.6.11	Test RESM subsystem	euro2,445	euro0	euro2,445	euro0	euro2,445
3	1.1.1	Completion of the Mission needs document LCAC (military and civilian ver	euro1,499	euro0	euro1,499	euro0	euro1,499
4	1.1.2	Completion of theOperational requirements document LCAC (military and	euro1,499	euro0	euro1,499	euro0	euro1,499
5	1.1.3	Completion of theTechnical specification of the product LCAC (military and	euro1,499	euro0	euro1,499	euro0	euro1,499
7	1.1.5	Completion of the documentation regarding the election, arguing and procu	euro1,499	euro0	euro1,499	euro0	euro1,499
			euro27,638,881	**euro0**	**euro27,638,881**	**euro0**	**euro27,638,881**

THE INSTITUTE FOR REVIVING AND PRESERVING TRADITIONAL CRAFTS

Liviu DOBRITOIU

CONTENTS

INTRODUCTION

A nation's identity is defined by its cultural specificity, mainly found in its customs and traditions. Nowadays, in a world filled with technology, local communities seem to need more help in rediscovering their cultural awareness.

The main goal of this project is to lay the foundation for The Institute for Reviving and Preserving Traditional Crafts, a template-institution which once established can be used as a model in different locations, corresponding to specific geographical and cultural areas.

The objectives of the project are focused on its cultural and sociological implications. Firstly, the Institute will insist on the artisan traditions, with reference to them being rediscovered, put into value and passed on to the new generation. Secondly, the project will be an important tool in the vocational training of unqualified and unemployed youth.

The Institute for Reviving and Preserving Traditional Crafts will mainly consist in an architectural complex in which prior identified artisans, can both work and teach their traditional crafts. The Institute would also provide teaching spaces (classrooms and workshops) and accommodation, mainly for the students but also, within a limited space, for visitors. The so created handicrafts could then be exposed and sold within the Institute's own shop.

Beyond the obvious cultural and touristic implications of developing such a project, another aspect stands out: it offers a new approach to solving the contemporary social problem of unqualified and unemployed youth.

Of course, such a high scale project is likely to be subjected to some constraints, such as:

- Budget cuts
- Lack of needed human resources (ethnography specialists)
- Lack of interest from the main stakeholders.

Nevertheless, once those constraints are overpassed, the Institute for Reviving and Preserving Traditional Crafts will prove to be a successful project which will contribute in a positive manner to the development of both culture and the community's social value orientation.

I. SCOPE MANAGEMENT

This project intends to put into practice the main principles regarding cultural identity debated in the content of the Lisbon Treaty. As said in Article 3.3. "(…) **The Union shall respect its rich cultural and linguistic diversity, and shall ensure that Europe's cultural heritage is safeguarded and enhanced".**

In the Directives provided by the European Commission it is stated that the member countries are bound to preserve their traditions and their cultural value and to facilitate full access to all interested in discovering them.

The latest studies carried out by specialized national and international institutions have revealed that craftsmanship and manual labor are highly praised within the people's conscience, reviving in an individual's mind the need of a return to the forgotten old fashioned way of living in a communion to the natural environment.

Also, recent surveys have proven that the touristic value of a region is mainly provided by its uniqueness, embodied especially in its customs and traditions.

I.1. SCOPE STATEMENT

The project will provide a set of utilities able to concentrate the most of the cultural uniqueness of an area and to ensure that the ethnographic specificity of that particular region will be exploited properly in terms of tourism, and thus economic potential.

Firstly, the Institute will provide the necessary human resources for a qualitative approach of all its future endeavors. In order to do that, during the research phase of the project, one intends to recruit the best specialists in ethnography. Subsequently, using the knowledge provided by the recruited personnel, the Institute will identify unique local crafts and those expert craftsmen who preserve them.

Because the Institute also intends to be a center for training unskilled rural youth, another action which will be endeavored during the documentation stage of the project will be the detection of potential students. This will be done resorting mainly to official calls to local authorities and through an appropriate media campaign.

During the building phase of the project, following a public tender procedure, a designated construction firm will build the ensemble of architectonical structures intended to ensure the development of the following facilities: workshops for four different crafts, classrooms, accommodation spaces for both some of the craftsmen and the students, a craft store and office spaces for the institute's employees.

After that, the project will handle the acquisition of the necessary equipment for the previously built facilities. In this stage, the spaces intended to become workshops will be

supplied with all the necessary materials in order to give them the specific destination for one of the four adopted themes of the Institute:

1. Crampons
2. Woodworking
3. Glass and ceramics
4. Traditional fabrics.

In the final phase the Institute for Reviving and Preserving Traditional Crafts will open up both to the previously identified students and to the interested tourists and visitors. As planned, while the students will attend the craftsmen's practical courses, the tourists will have a bird's-eye view of the entire manufacture process. Visitors will then be able to buy the final hand-made products from the Institute's shop.

I.2. WORK BREAKDOWN STRUCTURE

See Appendix 1

II. TIME MANAGEMENT

See Appendix 2

III. COST MANAGEMENT

See Appendix 3

IV. QUALITY MANAGEMENT

IV.1. Defining quality

The quality of the project can be defined as the ensemble of requirements that both its individual phases and its final result must fulfill in order for the Institute for Reviving and Preserving Traditional Crafts to function optimally and according to its intended purpose.

IV.2. Key quality concepts

Professionalism – The Institute will achieve its objectives only resorting to the services of the most experienced and qualified personnel

Cultural awareness – The Institute is mainly designed to highlight the importance of preserving our traditions in order to maintain our cultural identity

Social value orientation – In parallel with its cultural purpose, the Institute will consist in a vocational training center for the unemployed rural youth

IV.3. Deliverables and acceptance criteria

The following table provides the deliverables of the project and their acceptance criteria:

Activity(according to WBS)	Deliverables	Acceptance criteria
1.1.2.1	-press release -radio and TV spot	-a clear and concise message regarding the exact employment requirements for folklorists and ethnographers
1.1.2.2	-the list of recruited specialized personnel	-PHD in ethnography, arts, history or anthropology -field work experience
1.1.3.3	-full coverage of the researched area	-at least four different kinds of crafts and at least a dozen craftsmen
1.1.3.4	-the list of possible craftsmen	-unique technique for each artisan -at least ten years of experience -teaching skills
1.2.1.1	-a suitable location for building the Institute	-close to the main access roads -easily included inside a flourishing touristic tour
1.2.1.2.1	-the public auction announcement	Fulfilling the requirements of the Government Emergency Ordinance no. 30/2006
1.2.2	-the receipt of the buildings	- Fulfilling the tender specifications
1.3	-a list of necessary equipment	- Fulfilling the specifications provided by the Logistics specialist
1.4.1.1	-the courses curricula	-in accordance with the provisions of the Ministry of Education -able to provide entrepreneurship skills to the students
1.5.	-opening ceremony	-assuring that all the facilities are in working order

V. HUMAN RESOURCES MANAGEMENT

The main phases of the project will be conducted in accordance to the following RACI matrix:

Task	Project Manager	Logistics specialist	Accountant	HR specialist	PR specialist	Ethnographer
1.1	R			A	A	A
1.2	R	A	A			C
1.3	I	R	A			C
1.4	I			R	A	C
1.5	R	C		I	A	

R-responsible; A-accountable; C-to be consulted: I-to be informed

VI. COMMUNICATIONS MANAGEMENT

Message to be conveyed	Date	Message recipients	Message sender	Communication method
The start of the project	6th March 2014	-Public authorities	Project Manager	Hard Copy
Completion of the documentation phase	11th June 2014	-Project Manager	HR specialist	Written report
Initiation of the public tender procedure	19th June 2014	-Public authorities -Potential bidders	Project Manager	- Hard Copy -media announcements
List of specific equipment	5th August 2015	Project Manager	-Logistics specialist -Accountant	Written report
The opening of the Institute	4th February 2016	-Public authorities -Travel agencies -Media	PR specialist	-Hard Copy -Media announcements

VII. RISK MANAGEMENT

In order to prevent any unplanned negative results, the present project management plan provides a list with all the identified risks, grouped as follows:

Category	Risk name	Risk likelihood	Risk impact	Risk rate	Required actions
Financial	-budget cuts	3	4	12	-prioritizing activities and postponing those who may suffer delay
Human resources	-insufficient specialists	2	3	6	-lowering some of the recruitment criteria in order to fill up the unoccupied staff positions
	-work overallocation	3	2	6	-involving all available personnel in the activities that don't require a high degree of specialization
Materials	-bad quality materials	1	5	5	-quality tests
Other	-lack of interest from the main stakeholders	2	4	8	-reconsidering and intensifying the communication with the stakeholders

The score of each listed risk was calculated using the indicators provided by the following risk assessment matrix:

LIKELIHOOD (A)						
	Very Likely 5	5	10	15	20	25
	Likely 4	4	8	12	16	20
	Feasible 3	3	6	9	12	15
	Slight 2	2	4	6	8	10
	Very unlikely 1	1	2	3	4	5
		Insignificant 1	Minor 2	Significant 3	Major 4	Critical 5
	IMPACT (B)					

Green = Low risk, Amber 9 = Medium risk, Amber 10 –12 high risk, Red = High risk

Likelihood of Occurrence (A)		Severity of Impact (B)	
1- Very unlikely	(hasn't occurred before)	1 - Insignificant	(have no effect)
2 - Slight	(rarely occurs)	2 - Minor	(little effect)
3 - Feasible	(possible, but not	3 - Significant	(may pose a problem)
4 - Likely	(has before, will again)	4 - Major	(Will pose a problem)
5 - Very Likely	(occurs frequently)	5 - Critical	(Immediate action required)

VIII. PROCUREMENT MANAGEMENT

VIII.1 Overview

The Project's procurement management will follow the public procurement system in Romania, similar to those in other EU member states, as a result of the transposal in the Romanian Legislation of the 2004/18/CE and 2004/17/CE Directives of the European Parliament and the European Union Council.

The Project procurement management plan is governed by the principles set by the European directives – non-discrimination, equal treatment, mutual recognition, transparency, proportionality, the efficient use of public funds, accountability. Besides G.E.O. 34/2006, which sits at the core of the public procurement system in Romania, its enforcement norms and the secondary legislation are also important.

The procedures for the award of public procurement contracts provided by the Romanian legislation are: open bid, restricted bid, competitive dialogue, negotiation with or without prior publication of a contract notice, request for tenders and design contest.

VIII.2 Specific needs

The project for developing the Institute for Reviving and Preserving Traditional Crafts will resort only to the open bid procedure (for contracting the construction firm) and the request for tenders (for the acquisition of the necessary materials and equipment).

In order to conduct these award procedures, the following steps are required:

1. Identifying the requirements;

2. Posting the invitation on SEAP – The Electronic System for Public Procurement;

3. Checking whether the participant comply with the qualification and award criteria and identifying possible partners;

4. Transmitting the communication on the award procedure result and signing the public procurement contract.

VIII. PROJECT CLOSING

The project closing will include the following activities:

-the official reception by the representatives of the state institutions;

-a press-conference in which the entire project's deliverables will be presented to the public.

CONCLUSIONS

Maintaining cultural identity and promoting it is the only way for a nation to stand out in a globalized world. And if in this process the social factor of helping unemployed and unqualified rural youth is added, that is certainly a plus that will ensure the success of a project such as the Institute for Reviving and Preserving Traditional Crafts

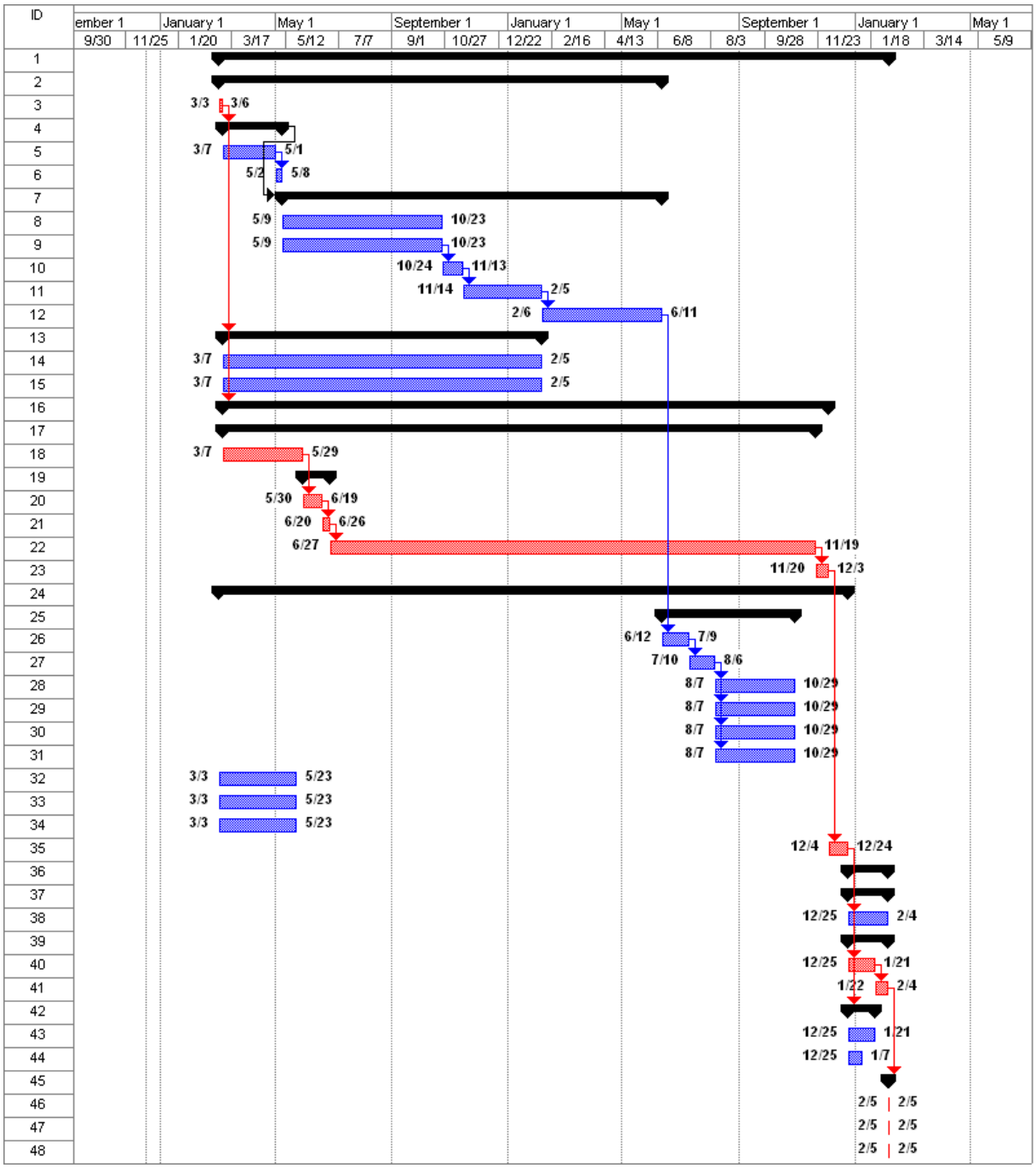
Appendix 1

Work breakdown structure

ID	Task Name	Duration	Finish	Start
1	**1 Developing the Centre for Reviving and Preserving the Crafts**	**505 days**	**Fri 2/5/16**	**Mon 3/3/14**
2	**1.1 Research work**	**334 days**	**Thu 6/11/15**	**Mon 3/3/14**
3	1.1.1 Informing the Ministry of Cultural and National Heritage about the start of the Project	4 days	Thu 3/6/14	Mon 3/3/14
4	**1.1.2 Identifying and recruiting folklorists and ethnographers**	**45 days**	**Thu 5/8/14**	**Fri 3/7/14**
5	1.1.2.1 Announcement in the media	40 days	Thu 5/1/14	Fri 3/7/14
6	1.1.2.2 Selection of the most representative folklorists and ethnographers	5 days	Thu 5/8/14	Fri 5/2/14
7	**1.1.3 Identifying areas, crafts and craftsmen**	**285 days**	**Thu 6/11/15**	**Fri 5/9/14**
8	1.1.3.1 Media campaign – setting a slogan	120 days	Thu 10/23/14	Fri 5/9/14
9	1.1.3.2 Solicitations to local authorities	120 days	Thu 10/23/14	Fri 5/9/14
10	1.1.3.3 Field work	15 days	Thu 11/13/14	Fri 10/24/14
11	1.1.3.4 Making a list of possible craftsmen and selecting the most skilled ones	60 days	Thu 2/5/15	Fri 11/14/14
12	1.1.3.5 Contracting the selected craftsmen	90 days	Thu 6/11/15	Fri 2/6/15
13	**1.1.4 Identifying potential students**	**240 days**	**Thu 2/5/15**	**Fri 3/7/14**
14	1.1.4.1 Media campaign	240 days	Thu 2/5/15	Fri 3/7/14
15	1.1.4.2 Solicitations to local authorities and to NGOs	240 days	Thu 2/5/15	Fri 3/7/14
16	**1.2 Building the main facilities**	**455 days**	**Thu 12/3/15**	**Fri 3/7/14**
17	**1.2.1 Building the facilities**	**445 days**	**Thu 11/19/15**	**Fri 3/7/14**
18	1.2.1.1 Identifying a location	60 days	Thu 5/29/14	Fri 3/7/14
19	**1.2.1.2 Contracting a firm**	**20 days**	**Thu 6/26/14**	**Fri 5/30/14**
20	1.2.1.2.1 Organizing a public auction	15 days	Thu 6/19/14	Fri 5/30/14
21	1.2.1.2.2 Signing off the contract with the winning firm	5 days	Thu 6/26/14	Fri 6/20/14
22	1.2.1.3 Efective construction	365 days	Thu 11/19/15	Fri 6/27/14
23	1.2.2 Receiving the construction	10 days	Thu 12/3/15	Fri 11/20/15
24	**1.3 Buying the materials**	**474 days**	**Thu 12/24/15**	**Mon 3/3/14**
25	**1.3.1 Buying the materials for the workshops**	**100 days**	**Thu 10/29/15**	**Fri 6/12/15**
26	1.3.1.1 Consulting with specialists and identifying the required equipment	20 days	Thu 7/9/15	Fri 6/12/15
27	1.3.1.2 Identifying the best offers on the market	20 days	Thu 8/6/15	Fri 7/10/15
28	1.3.1.3 Buying the materials for the fabric facility	60 days	Thu 10/29/15	Fri 8/7/15
29	1.3.1.4 Buying the materials for the smithery	60 days	Thu 10/29/15	Fri 8/7/15
30	1.3.1.5 Buying the materials for the wood facility	60 days	Thu 10/29/15	Fri 8/7/15
31	1.3.1.6 Buying the materials for the glass and ceramic facility	60 days	Thu 10/29/15	Fri 8/7/15
32	1.3.2 Buying the materials for the classrooms	60 days	Fri 5/23/14	Mon 3/3/14
33	1.3.3 Buying the materials for the staff's office	60 days	Fri 5/23/14	Mon 3/3/14
34	1.3.4 Buying the materials for the shop	60 days	Fri 5/23/14	Mon 3/3/14
35	1.3.5 Equipping the facilities	15 days	Thu 12/24/15	Fri 12/4/15
36	**1.4 Organising courses, inviting media, allowing the access of visitors, opening the shop**	**30 days**	**Thu 2/4/16**	**Fri 12/25/15**
37	**1.4.1 Organizing free and payed courses**	**30 days**	**Thu 2/4/16**	**Fri 12/25/15**
38	1.4.1.1 Establishing the curricula for the courses	30 days	Thu 2/4/16	Fri 12/25/15
39	**1.4.1.2 Organizing free courses**	**30 days**	**Thu 2/4/16**	**Fri 12/25/15**
40	1.4.1.2.1 Recruiting the potential students who were identified in the research phase	20 days	Thu 1/21/16	Fri 12/25/15
41	1.4.1.2.2 Checking in the students in the accomodation spaces	10 days	Thu 2/4/16	Fri 1/22/16
42	**1.4.1.3 Organizing payed courses**	**20 days**	**Thu 1/21/16**	**Fri 12/25/15**
43	1.4.1.3.1 Media campaign	20 days	Thu 1/21/16	Fri 12/25/15
44	1.4.1.3.2 Recruiting students for the payed courses	10 days	Thu 1/7/16	Fri 12/25/15
45	**1.5 Starting the activitity of the Center**	**1 day**	**Fri 2/5/16**	**Fri 2/5/16**
46	1.5.1 Starting the courses	1 day	Fri 2/5/16	Fri 2/5/16
47	1.5.2 Allowing acces to to visitors	1 day	Fri 2/5/16	Fri 2/5/16
48	1.5.3 Opening the shop	1 day	Fri 2/5/16	Fri 2/5/16

Appendix 2

Gantt chart



Appendix 3

Project cost

ID	Task Name	Total Cost
3	Informing the Ministry of Cultural and	€384.00
5	Announcement in the media	€1,600.00
6	Selection of the most representative fi	€200.00
8	Media campaign – setting a slogan	€104,800.00
9	Solicitations to local authorities	€3,840.00
10	Field work	€3,600.00
11	Making a list of possible craftsmen an	€1,200.00
12	Contracting the selected craftsmen	€1,800.00
14	Media campaign	€9,600.00
15	Solicitations to local authorities and tc	€7,680.00
18	Identifying a location	€3,840.00
20	Organizing a public auction	€1,560.00
21	Signing off the contract with the winni	€320.00
22	Efective construction	€4,000,000.00
23	Receiving the construction	€640.00
26	Consulting with specialists and identif	€2,720.00
27	Identifying the best offers on the mark	€2,880.00
28	Buying the materials for the fabric faci	€24,200.00
29	Buying the materials for the smithery	€6,680.00
30	Buying the materials for the wood faci	€12,600.00
31	Buying the materials for the glass anc	€39,810.00
32	Buying the materials for the classroon	€13,600.00
33	Buying the materials for the staff's offi	€3,500.00
34	Buying the materials for the shop	€900.00
35	Equipping the facilities	€4,560.00
38	Establishing the curricula for the cour:	€3,600.00
40	Recruiting the potential students who	€1,120.00
41	Checking in the students in the accor	€0.00
43	Media campaign	€100,800.00
44	Recruiting students for the payed cou	€360.00
46	Starting the courses	€89.07
47	Allowing acces to to visitors	€72.00
48	Opening the shop	€72.00
		€4,358,627.07

MOBILE COMPUTING AND COMMUNICATIONS PLATFORM (2ComP) FOR AGILITY PURPOSE.
A PROJECT PLAN

Cosmin DOMINCIUC

CONTENTS

1. INTRODUCTION

Project Charter

The Board of INT Group has approved the development and implementation of a new IT&C system's Pilot Project in order to identify the opportunities for diversification of access to their own information resources at any time, at any place, and in any form and to improve management of land resources and to ensure a good cooperation between their employees.

Stakeholders:

- the Board of INT Group;
- the project team – project manager, IT specialists, business analyst, procurement specialist;
- support staff – legal advisor, financial accounting department;
- the INT Group's IT department;
- users;
- suppliers;

Purpose of the Project

The Mobile Computing and Communications Platform (2ComP) for Agility Purpose Project Plan describes the necessary steps to develop a new IT&C system, based on private cloud computing technology and mobile broadband communications' services and to adjust the IT department and processes to the new operational requirements related to the mobile access of the users to the company's informational resources.

The Project Plan will provide a description of 2ComP system and it will serve as an agreement between the stakeholders and will guide the project's execution.

Business Need for the Project

The general context is defined by the idea that the improving of the employees' efficiency and productivity is in connection with the use of mobile devices, cloud computing and social network.

The 2ComP Pilot is designed to conduct the business operations and, according to the conclusions, it will be widely implemented. In according with the INT Group's missions, it will provide the same basic functionality as the INT Group's WAN. The effective adoption of 2ComP is not just about the technology, it's about the action taken to ensure that the promised business benefits may be achieved:

- improving employees productivity and partners satisfaction;

- increase IT agility whilst reducing costs;
- focus business on core competencies;
- an extension of the company's WAN, giving high bandwidth access to the informational resource;
- flexibility to scale IT resources to meet business needs and react to the opportunities.

High Level Description of Product

The 2ComP system is based on mobile computing and mobile broadband communications technologies, it offers a way to enhance the world of mobile application by providing disk space and freeing the user of the local storage needs, this way providing cheaper storage, wider accessibility and greater speed for business.

2ComP is an IT&C system that becomes an extension of WAN, giving secure and high bandwidth access to informational resources, in which the users through the terminals like tablets have access to these services:

- databases consultation;
- email, internet;
- voice and video calls within the group;
- voice and video teleconference within the group;
- instant messaging;
- real time information sharing about actions in progress.

In terms of management of organizational resources, the 2ComP's implementation gives also some facilities:

- management of land resources;
- management of various business situations;
- management of portfolio of communications equipment and services, including security;
- adapting workflows depending on the situation.

Assumptions and Constrains

In the appropriate analysis process for developing and implementing 2ComP were defined following relevant issues:

a. The 2ComP Pilot Project is planned to be functional on the 3rd of March 2014;
b. Implementation of the new system involves organizational changes related to IT&C;
c. Project Resources:
    - Human Resources

- Project Manager – PM;
- IT Engineer – IT;
- Business Analyst – BA;
- HR Specialist – HR;
- Procurement Specialist – P;
  - Material Resources
- Tablets - T;
- Application Server – APPS.
  - Mobile Broadband Communications Services – COMM;

d. Initial estimated budget: 65.000 Euro

e. Risks:

- Inadequate appointment of the project team members;
- Incorrect assessment of activities, namely their duration;
- Unrealistic estimate of the budget needed for the project;
- Ineffective communication and heavy or distorted information exchange;
- Delays in the acquisition of equipments and services;
- Rejection of the new working procedures by users;
- IT department resistance to change;

2. PROJECT SCOPE

Scope Planning

The overall scope of the project is the design, development and implementation of information and communications system 2ComP, as well as IT processes and structure adjustment in order to enhance communications opportunities and the access to their information resources:

- Ensuring the access, in terms of mobility, to the internet, email, instant messaging, voice, video, video conferencing communications services;
- Providing opportunities for databases consultation, in terms of mobility;
- Real time co-operation in order to accomplish tasks;
- Managing portfolio of mobile communications resources, including its security aspect.

Deliverables:

- the description of the pilot for 2ComP;
- the documentation for the use and administration of the 2ComP;

- new operational procedures for the activities driven by the specific features of the new system;
- IT restructuring plan;
- the new work methodology for the IT department;
- training plans for administrators and users.

Scope Statement/Work Breakdown Structure (WBS):

ID	NAME	EXPLANATION
1.1	**Initial 2ComP stage**	
1.1.1	Wording 2ComP pilot project scope	Setting up a document by which the employees involved in the project accomplishment are taking on their responsabilities
1.1.2	Define preliminary resources	The initial process for identification of the project necessary resources
1.1.3	Scope complete	The receipt of the approval for the operational requirements and for the documents referring to the initiation of the 2ComP project accomplishment
1.2	**Analysis**	
1.2.1	Review hardware, software and communications environment	Identification of the elements related to the IT infrastructure, which could have an impact on the project development
1.2.2	Review support environment	Identification of the elements within the company, which can and must support the project development
1.2.3	Review organizational environment	Identification of the processes and the structural elements which are influencing the project development and the ones which should be customized as a result of the project implementation
1.2.4	Review current context complete	Becoming conscious of and assuming the changes which will take place as a result of the project implementation on the INT Group level.
1.3	**Design 2ComP**	
1.3.1	Hardware design	Setting up the functional design of the system
1.3.2	Requirements for applications	Setting up the operational requirments which are specific to the applications related to the new system
1.3.3	Requirements for communications services	Setting up the operational requirments which are specific to the communications services needed within 2ComP
1.3.4	Develop detailed 2ComP design documents complete	Designing the equipments and services available within the new system
1.3.5	Align 2ComP design with business goals	Alignment of the IT processes to the needs for access to the informational resources within the company
1.3.6	Identify required changes in IT	Idetifying the necessary IT changes for 2ComP administration
1.3.7	Design complete	Receipt of the approval for the identified

		transformations related to 2ComP development and deployment
1.4	**Budget 2ComP**	
1.4.1	Develop budget based on detailed 2ComP documents	Assigning the financial resources for the system development and deployment
1.4.2	Align budget request with business goals	Completing the cost – benefit analysis related to 2ComP development in order to assign the financial resources
1.4.3	Budget complete	Receipt of the approval for assigning the financial resources needed for 2ComP development and deployment
1.5	**Deployment 2ComP**	
1.5.1	Hardware, software and communications procurement	Setting up the necessary documents for procurement and for development of the specific procedures
1.5.2	Hardware and software configuration	Configuration of the system elements in order to deliver the specified services
1.5.3	Test 2ComP functionalities	Testing on the project team level of the services provided within the system
1.5.4	Release to operations environment	Releasing the system to the final users
1.5.5	Obtain feedback	Centralization, processing and capitalization of the feedback related to the services provided within the system
1.5.6	Wording documentation	Setting up the technical and operational documentation
1.5.7	Deployment complete	Description of the way the IT&C services provided within 2ComP are complying with the operational requirements
1.6	**IT Processes Implementation**	
1.6.1	Wording new IT structure's methodology	Defining the new responsabilities within IT department for 2ComP administration
1.6.2	Team training	Training the specialists with responsabilities in 2ComP administration
1.6.3	Users training	Training the users in order to optimize their activity results by using the 2ComP services
1.7	**2ComP Pilot Project implementation complete**	Approving the launch of 2ComP system, establishing the period for pilot project activity

3. PROJECT TIME MANAGEMENT

The timeframe necessary for the development and implementation of the 2ComP pilot project is determined by the time limit established by the INT Group management, the end of the first quarter of the year 2014, and the activity will be planned accordingly.

The timeframe of the project is established for 43 days and it has 6 stages: initial stage (2 days) – needed for the receipt of the approval for the operational requirements and for the documents referring to the initiation of the 2ComP project accomplishment, analysis stage (2 days) – needed for INT Group to become conscious of and to assume the changes which will

take place as a result of the project implementation, design stage (9 days) – for receiving the approval for the identified transformations related to 2ComP development and deployment, budget stage (2 days) – for receiving the approval for assigning the financial resources needed for 2ComP development and deployment, deployment stage (25 days) – for development of the IT&C services in compliance with the operational requirements and IT processes implementation stage (5 days) – for modeling the IT processes and structure and for training the administrators and users.

The detailed time management plan of the project is represented by the Gantt chart from the Microsoft Project in the Appendix no. 1.

4. PROJECT COST MANAGEMENT

The available budget assigned for the development and deployment of the 2ComP pilot project was the equivalent in RON of 65.000 EUR.

After the technical solution is set up, the necessary budget for developing and deploying the 2ComP system is established for the amount of 257.820 Lei, detailed as follows:

- human resources cost - 40.320 lei
- equipments cost - 215.000 lei
- communications services cost - 2.500 lei

A list of all the resources implied and the costs of those which still need to be purchased and their distribution for the activities scheduled, is provided in the table below.

	Resource name	Cost	Work
1	Project Manager	11,040.00 Lei	184h
2	IT enginier	25,280.00 Lei	632h
3	Business Analyst	3,120.00 Lei	104h
4	HR specialist	480.00 Lei	16h
5	Procurement Specialist	400.00 Lei	16h
6	Tablet	200,000.00 Lei	50 pcs
7	App Server	15,000.00 Lei	1 pcs
8	Communications services	2,500.00 Lei	50 subscription

5. PROJECT QUALITY

Quality planning

The success of the project for development and implementation of 2ComP system will be evaluated by taken into consideration the following indicators:

- Growth in efficiency and celerity of employee' reaction to the tasks received;
- Availability of the system's services;
- Easyness for the employees to use the new services;
- The rate of matching the work processes with the 2ComP procedures
- Ability to shape the processes and the IT structure.

There are 6 milestones planned, in order to establish the checkpoints of the critical path of the project. In these milestones a stage analysis of the achieved outcome will be done:

- Conformation to the project schedule;
- Disposal of the deliverables:
    - the description of the pilot for 2ComP;
    - the documentation for the use and administration of the 2ComP;
    - new operational procedures for the activities which are based by the new system specific features;
    - IT restructuring plan;
    - the new work methodology for the IT department;
    - training plans for administrators and users.

Quality assurance

The assessment of the way the quality within 2ComP system is achieved, have to take into consideration the technical and security standards of the equipments and information and communications services specific to the system.

The changes which will take place at the level of the processes and IT structure of the company are observing the legislation related to the human resources management and to the internal rules and procedures.

Quality control

The graphic with the activities defined as stage milestones of the way the project is developed, is presented in Appendix no 2.

6. PROJECT HUMAN RESOURCES MANAGEMENT

Organizational planning

The human categories which are involved in initiation, development, deployment and running of the 2ComP project are:

- the Board of INT Group – identifies the need for the development of the new system, evaluates and approves the operational requirements, as well as the documents for the initiation and running of the project;
- the project team – defines the project, identifies all the necessary resource categories, submits the development strategy for approval, runs the project stages;
- support staff – ensures the running of the specific procedures along the project course, in conformity with their own expertise;
- the INT Group's IT department – participates to the system's testing and undertakes the 2ComP administration;
- users – participate to the system's testing and provide feedback on its performance;
- suppliers – deliver the necessary equipments and services needed for 2ComP development and implementation;

In Appendix no. 3 is described the way the human resources are used within the project.

Staff acquisition

The selection of the members of the project team took into consideration the project scopes, the observance of the time limit for completing the project, the activity types which are ran for development and implementation of the system.

Designation of the members of the project team doesn't only take into account their specialization, but also other qualities and abilities useful for documentation, on phases, of the project stage, for communication within the team and outside, to the future users within INT Group, for setting up the technical and operational documentation of the system and for elaboration of the new work procedures and accommodation of the documents for organizing the IT department.

Over allocations

The way the project team and the support staff were designated didn't generate over allocation.

7. PROJECT COMMUNICATIONS MANAGEMENT

Disseminating information about the project is essential to the project's success. Project participants expect information of what the status of the project is and how they are affected by it. Furthermore, they are anxious to participate. The more the employees are

educated about the progress of the project and how it will help them in the future, the more they are likely to participate and benefit.

This plan provides a framework for informing, involving, and receiving reactions from all participants throughout the project lifetime.

Stakeholders analysis

The interested entities participate to the communication process in order to ensure the consistency in achieving the proposed objectives within the project:

- The Board of INT Group remits the operational requirements, approves the solutions and the development and implementation time limits, receives, by stages, notes and reports about the project;
- the project team – project manager, IT specialists, business analyst, procurement specialist – ensure the information about the project stage, inform each other on the elements that could impact the established graphic, collaborate with support staff and suppliers in order to fulfill particular procedures, transfer the information required by IT department, participate to the users training, analyze the users feedback, participate to the procurement procedures;
- support staff – legal advisor, financial accounting department – advise the project team about the progress of certain specific procedures;
- the INT Group's IT department – take over the information from the project team, participate to the users training;
- users – provide feedback on satisfaction provided by 2ComP services;
- suppliers – collaborate with the project team within the procurement procedures.

Schedule

Weekly Status Reports

The Project Manager shall provide weekly written status reports to the Board. The reports shall include the following information tracked against the Project Plan:

- Summary of tasks completed in previous week
- Summary of tasks scheduled for completion in the next week
- Summary of issue status and resolutions

Weekly Status Meeting

These status meetings are held at least once per week and are coordinated by the Project Manager. Every member of the project team participates in the meeting. The Project Manager sends the status report to each member of the team prior to the meeting time so everyone can review it in advance.

Status Meetings on stage end (milestones)

These status meetings are organized after the end of the main project stages and when the entire project is finalized and are coordinated by the project manager. Every member of the project team participates to the meeting. The Project Manager sends the status report to each member of the team prior to the meeting time so everyone can review it in advance. Reports for informing the company management are elaborated on these meetings.

Types of documents

- Weekly report for informing the company management;
- Stage end report for informing the company management;
- Stage report for every project member on project team meeting;
- Commercial contracts with the suppliers of equipments and services;
- Feedback form for the users;
- Questionaire for the interview with the stakeholders.

Communications method

The communications method utilizes two directions for effective communication:

Top-Down

It is absolutely crucial that all participants in this project sense the executive support and guidance for this effort. The executive leadership of the INT Group needs to speak with a unified, enthusiastic voice about the project and what it holds for everyone involved. This will be 'hands-on' change management, if it is to be successful. Not only will the executives need to speak directly to all levels of the organization, they will also need to listen directly to all levels of the organization, as well.

The transition from the project management practices of today to the practices envisioned for tomorrow will be driven by a sure and convinced leadership focused on a vision and guided by clearly defined, strategic, measurable goals.

Bottom-Up

To ensure the confidence of the personnel involved in bringing the proposed changes to reality, it will be important to communicate the way in which the solutions were created. If the perception in the organization is that only the Board or Project Team created the proposed changes, resistance is likely to occur. However, if it is understood that all participants were consulted, acceptance seems more promising.

8. PROJECT RISK MANAGEMENT

Risk planning

The initial Risk Assessment attempts to identify, characterize, prioritize and document a mitigation approach relative to those risks which can be identified prior to the start of the project.

The Risk Assessment will be continuously monitored and updated throughout the life of the project, with weekly assessments included in the status report (see Communications Plan) and open to amendment by the Project Manager.

Because mitigation approaches must be agreed upon by project leadership (based on the assessed impact of the risk, the project's ability to accept the risk, and the feasibility of mitigating the risk), it is necessary to allocate time into each Project Team meeting, dedicated to identifying new risks and discussing mitigation strategies.

The Project Manager will convey amendments and recommended contingencies to the Board weekly, or more frequently, as conditions may warrant.

Identification and qualitative analysis

ID	RISKS IDENTIFIED	QUALITATIVE ANALYSIS
A	Inadequate appointment of the project team members	Selection of less adequate technical solutions, extention of the development and implementation time limit, users insatisfaction.
B	Incorrect assessment of activities, namely their duration	Inobservance of the established due dates or unjustified breaks between the project stages, which will lead to decrease of efficiency and effectiveness.
C	Unrealistic estimate of the budget needed for the project	Possibility of ending the financial resources without fulfilling all the assumed objectives.
D	Ineffective communication and heavy or distorted information exchange	Delays or inaccuracies in reporting, in identification of new risks that could appear on the project development lifetime, incorrect assessment of the development stage with impact on the observance of the assumed time limits.
E	Delays in the acquisition of equipments and services	Delay in the development stage and possibility of overtaking the final time limit.
F	Rejection of the new working procedures by users	Building a negative impression about the system due to deficient communication with the users.
G	IT department resistance to change	Inadequate transfer of knowledge to the IT department burden the acceptance procedure.

Quantitative analysis

In order to build a quantitative analysis of the risks, a 5 x 5 matrix is used, in which the risk level is made by the values of emergence probability and by the event impact:

Likelihood of Occurrence (A)		Severity of Impact (B)	
1- Very unlikely	(hasn't occurred before)	1 - Insignificant	(have no effect)
2 - Slight	(rarely occurs)	2 - Minor	(little effect)
3 - Feasible	(possible)	3 - Significant	(may pose a problem)
4 - Likely	(has before, will again)	4 - Major	(Will pose a problem)
5 - Very Likely	(occurs frequently)	5 - Critical	(Immediate action required)

Likelihood of Occurrence (A)						
	5 Very Likely	5	10	15	20	25
	4 Likely	4	8	12	16	20
	3 Feasible	3	6	9	12	15
	2 Slight	2	4	6	8	10
	1 Very unlikely	1	2	3	4	5
		1 Insignificant	2 Minor	3 Significant	4 Major	5 Critical
		Severity of Impact (B)				

Green = Low risk Amber = Medium risk Red = High risk

Risk mitigation

Risk ID	Likelihood	Impact	Risk level	Mitigation	Risk level
A	1	4	**4**		**4**
B	1	3	**3**		**3**
C	2	4	**8**	Reevaluation of the budget proposal by consulting the possible suppliers.	**4**
D	2	4	**8**	Adoption of an appropriate and fast communication system within the project.	**4**
E	1	5	**5**		**5**
F	2	5	**10**	Elaboration of the operational documentation in easy to understand words, establishment of some training sessions.	**5**
G	2	5	**10**	Effective transfer of knowledge and highlight of the benefic sides of the system resources administration.	**5**

9. PROJECT PROCUREMENT MANAGEMENT

For developing and implementing the 2ComP system, the procurement of equipments and information and communication services is needed.

This procurement is performed in base of the frame agreements INT Group concluded with the main suppliers of equipments and information and communication services.

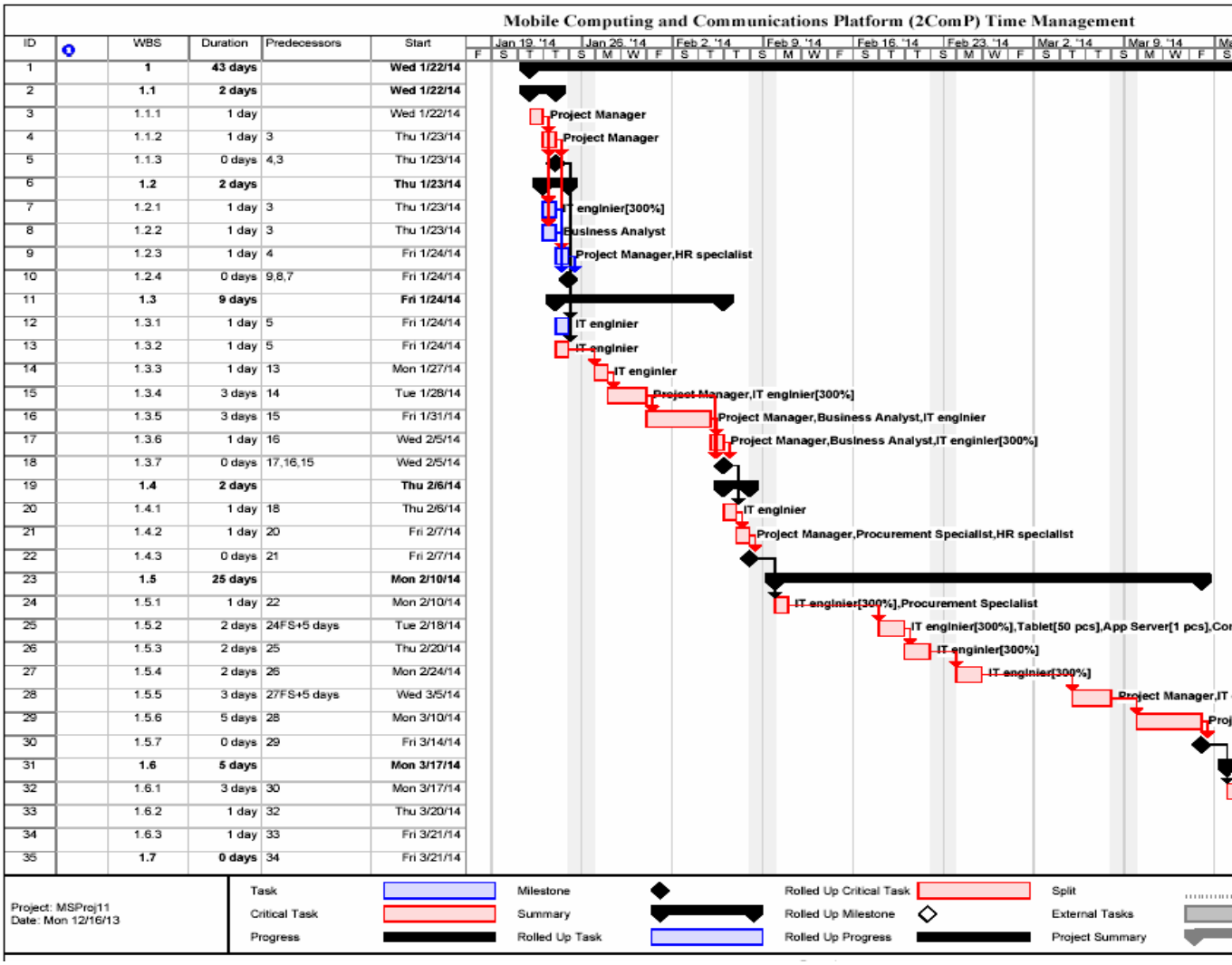
The procurement of equipments, software and mobile communication services doesn't have to last more than 5 days.

In case of procurement of the application server and i-pads, to the evaluation of the costs were taken into consideration also the applications and the licenses needed for accomplishment, implementation and performance of 2ComP.

10. PROJECT CLOSING

Project closing is related to the adoption of the new system into the INT Group activity and the transfer to the IT department of the administration responsibilities and of the deliverables list which include elements of which execution are underlining the achievement of the assumed objective: new operational procedures for the activities driven by the specific features of the new system, IT restructuring plan, the new work methodology for the IT department, training plans for administrators and users.

APPENDIX NO. 1



ID	WBS	Duration	Predecessors	Start
1	**1**	**43 days**		**Wed 1/22/14**
2	**1.1**	**2 days**		**Wed 1/22/14**
3	1.1.1	1 day		Wed 1/22/14
4	1.1.2	1 day	3	Thu 1/23/14
5	1.1.3	0 days	4,3	Thu 1/23/14
6	**1.2**	**2 days**		**Thu 1/23/14**
7	1.2.1	1 day	3	Thu 1/23/14
8	1.2.2	1 day	3	Thu 1/23/14
9	1.2.3	1 day	4	Fri 1/24/14
10	1.2.4	0 days	9,8,7	Fri 1/24/14
11	**1.3**	**9 days**		**Fri 1/24/14**
12	1.3.1	1 day	5	Fri 1/24/14
13	1.3.2	1 day	5	Fri 1/24/14
14	1.3.3	1 day	13	Mon 1/27/14
15	1.3.4	3 days	14	Tue 1/28/14
16	1.3.5	3 days	15	Fri 1/31/14
17	1.3.6	1 day	16	Wed 2/5/14
18	1.3.7	0 days	17,16,15	Wed 2/5/14
19	**1.4**	**2 days**		**Thu 2/6/14**
20	1.4.1	1 day	18	Thu 2/6/14
21	1.4.2	1 day	20	Fri 2/7/14
22	1.4.3	0 days	21	Fri 2/7/14
23	**1.5**	**25 days**		**Mon 2/10/14**
24	1.5.1	1 day	22	Mon 2/10/14
25	1.5.2	2 days	24FS+5 days	Tue 2/18/14
26	1.5.3	2 days	25	Thu 2/20/14
27	1.5.4	2 days	26	Mon 2/24/14
28	1.5.5	3 days	27FS+5 days	Wed 3/5/14
29	1.5.6	5 days	28	Mon 3/10/14
30	1.5.7	0 days	29	Fri 3/14/14
31	**1.6**	**5 days**		**Mon 3/17/14**
32	1.6.1	3 days	30	Mon 3/17/14
33	1.6.2	1 day	32	Thu 3/20/14
34	1.6.3	1 day	33	Fri 3/21/14
35	**1.7**	**0 days**	34	Fri 3/21/14

APPENDIX NO. 2

Mobile Computing and Communications Platform (2ComP) Mi

ID	WBS	Duration	Predecessors	Start	Finish
1	**1**	**43 days**		**Wed 1/22/14**	**Fri 3/21/14**
2	**1.1**	**2 days**		**Wed 1/22/14**	**Thu 1/23/14**
6	**1.2**	**2 days**		**Thu 1/23/14**	**Fri 1/24/14**
5	1.1.3	0 days	4,3	Thu 1/23/14	Thu 1/23/14
11	**1.3**	**9 days**		**Fri 1/24/14**	**Wed 2/5/14**
10	1.2.4	0 days	9,8,7	Fri 1/24/14	Fri 1/24/14
18	1.3.7	0 days	17,16,15	Wed 2/5/14	Wed 2/5/14
19	**1.4**	**2 days**		**Thu 2/6/14**	**Fri 2/7/14**
22	1.4.3	0 days	21	Fri 2/7/14	Fri 2/7/14
23	**1.5**	**25 days**		**Mon 2/10/14**	**Fri 3/14/14**
30	1.5.7	0 days	29	Fri 3/14/14	Fri 3/14/14
35	1.7	0 days	34	Fri 3/21/14	Fri 3/21/14

APPENDIX NO. 3

Mobile Computing and Communications Platform (2ComP) HRM

ID	Resource Name	Cost	Work
1	Project Manager	11,040.00 Lei	184 hrs

ID	Task Name	Units	Work	Delay	Start	Finish
3	Wording 2ComP pilot project scope	100%	8 hrs	0 days	Wed 1/22/14	Wed 1/22/14
4	Define preliminary resources	100%	8 hrs	0 days	Thu 1/23/14	Thu 1/23/14
9	Review organizational environment	100%	8 hrs	0 days	Fri 1/24/14	Fri 1/24/14
16	Align 2ComP design with business goals	100%	24 hrs	0 days	Fri 1/31/14	Tue 2/4/14
15	Develop detailed 2ComP design documents complete	100%	24 hrs	0 days	Tue 1/28/14	Thu 1/30/14
17	Identify required changes in IT	100%	8 hrs	0 days	Wed 2/5/14	Wed 2/5/14
21	Align budget request with business goals	100%	8 hrs	0 days	Fri 2/7/14	Fri 2/7/14
28	Obtain feedback	100%	24 hrs	0 days	Wed 3/5/14	Fri 3/7/14
29	Wording documentation	100%	40 hrs	0 days	Mon 3/10/14	Fri 3/14/14
32	Wording new IT structure's methodology	100%	24 hrs	0 days	Mon 3/17/14	Wed 3/19/14
33	Team training	100%	8 hrs	0 days	Thu 3/20/14	Thu 3/20/14

2	IT enginier	25,280.00 Lei	632 hrs

ID	Task Name	Units	Work	Delay	Start	Finish
12	Hardware design	100%	8 hrs	0 days	Fri 1/24/14	Fri 1/24/14
13	Requirements for applications	100%	8 hrs	0 days	Fri 1/24/14	Fri 1/24/14
14	Requirements for communications services	100%	8 hrs	0 days	Mon 1/27/14	Mon 1/27/14
16	Align 2ComP design with business goals	100%	24 hrs	0 days	Fri 1/31/14	Tue 2/4/14
15	Develop detailed 2ComP design documents complete	300%	72 hrs	0 days	Tue 1/28/14	Thu 1/30/14
17	Identify required changes in IT	300%	24 hrs	0 days	Wed 2/5/14	Wed 2/5/14
20	Develop budget based on detailed 2ComP documents	100%	8 hrs	0 days	Thu 2/6/14	Thu 2/6/14
24	Hardware, software and communications procurement	300%	24 hrs	0 days	Mon 2/10/14	Mon 2/10/14
25	Hardware and software configuration	300%	48 hrs	0 days	Tue 2/18/14	Wed 2/19/14
26	Test 2ComP functionalities	300%	48 hrs	0 days	Thu 2/20/14	Fri 2/21/14
28	Obtain feedback	300%	72 hrs	0 days	Wed 3/5/14	Fri 3/7/14
29	Wording documentation	300%	120 hrs	0 days	Mon 3/10/14	Fri 3/14/14
32	Wording new IT structure's methodology	300%	72 hrs	0 days	Mon 3/17/14	Wed 3/19/14
34	Users training	300%	24 hrs	0 days	Fri 3/21/14	Fri 3/21/14
7	Review hardware, software and communications environment	300%	24 hrs	0 days	Thu 1/23/14	Thu 1/23/14
27	Release to operations environment	300%	48 hrs	0 days	Mon 2/24/14	Tue 2/25/14

3	Business Analyst	3,120.00 Lei	104 hrs

ID	Task Name	Units	Work	Delay	Start	Finish
8	Review support environment	100%	8 hrs	0 days	Thu 1/23/14	Thu 1/23/14
16	Align 2ComP design with business goals	100%	24 hrs	0 days	Fri 1/31/14	Tue 2/4/14
17	Identify required changes in IT	100%	8 hrs	0 days	Wed 2/5/14	Wed 2/5/14
29	Wording documentation	100%	40 hrs	0 days	Mon 3/10/14	Fri 3/14/14
32	Wording new IT structure's methodology	100%	24 hrs	0 days	Mon 3/17/14	Wed 3/19/14

4	HR specialist	480.00 Lei	16 hrs

ID	Task Name	Units	Work	Delay	Start	Finish
9	Review organizational environment	100%	8 hrs	0 days	Fri 1/24/14	Fri 1/24/14
21	Align budget request with business goals	100%	8 hrs	0 days	Fri 2/7/14	Fri 2/7/14

5	Procurement Specialist	400.00 Lei	16 hrs

ID	Task Name	Units	Work	Delay	Start	Finish
21	Align budget request with business goals	100%	8 hrs	0 days	Fri 2/7/14	Fri 2/7/14
24	Hardware, software and communications procurement	100%	8 hrs	0 days	Mon 2/10/14	Mon 2/10/14

CONSTRUCTION FIELD SPECIALISTS ONLINE COMMUNITY

Bebe Răducu IONAŞCU

CONTENTS

Sponsor

National Association of Construction Field Specialists

Executing

SC Web 4D SRL

1. INTRODUCTION

o *Purpose of the project*

The purpose of the project is to create an online community for the Romanian specialists in the construction field with communication facilities, a web portal with lists of specialists involved in construction process from all the country, projects examples.

o *Business need for the project*

The construction field is in change. Starting with 2008, the constructions in Romania decreased constantly. That's why construction companies and all the specialists involved in construction process must change their way of doing business. They cannot rely on quantity anymore, they must rely on quality, innovation and good publicity. It is very important for them to be in constant touch with each other, to cooperate.

Also the beneficiaries are changing. They are more exigent, well informed.

o *Project description*

The online community will be a web portal with the main scope of presenting all the specialists in construction field based on their category and grouped by their county. The categories of specialists presented in the community are: Architecture, Design, Landscaping, Structure, Plants, Geology, Topography, Energy auditors, Technical experts, Construction companies, Furniture, Real estate, Green energy and Students.

Other important features will be:

- The project examples. Every specialist will be able to publish up to 10 projects from their portfolio.
- Useful information area with articles about legislation, tutorials and advices.
- A forum that will provide the communication between specialists and beneficiaries.

o *Constraints*

The success of the project depends on the good communication between all the people involved.

2. PROJECT SCOPE

o *Scope planning*

For defining the features implemented in the portal, a good and constant communication and cooperation with specialists in the construction field is required. For this purpose there will be scheduled periodic meetings with a group of specialists from different categories in the construction field.

o *Scope statement*

The result of the project consists in a live and fully functional web portal.

- The design of the portal should be bright, intuitive and very user friendly.
- The portal will have five main areas: Specialists, Useful information, Projects, Forum, Registration and Contact.
- On the front page users should choose the category of the specialist they need from a side menu and their county on the Romanian map with the number of specialists available in each county.
- In useful information area users will find articles about legislation, tutorials and advices for building or designing a house.
- In Specialists area users will find lists with specialists in construction field based on their category and grouped by their county. If a user clicks on a item in the list, the specialist profile will open with contact information, activity description, projects portfolio and a contact form. The categories of specialists presented in the community are: Architecture, Design, Landscaping, Structure, Plants, Geology, Topography, Energy auditors, Technical experts, Construction companies, Furniture, Real estate, Green energy and Students.
- In Projects area users will find all the projects published by specialists. Every specialist will be able to publish up to 10 projects from their portfolio.
- A forum that will provide the communication between specialists and beneficiaries.

o *Work Breakdown Structure (WBS)*

- Design
    - Meeting

    - Portal Design Template Style
    - Meeting
    - Useful information
    - Specialists
    - Meeting
    - Projects
    - Forum
    - Procure Hardware / Software
- Development
    - Portal Design Template Style
    - Useful information
    - Specialists
    - Projects
    - Forum
- Testing
    - Specialists
    - Projects
    - Useful information
    - Forum
- Closeout
    - Install Live System
    - Instruction
    - Documentation
    - Final acceptance Meeting

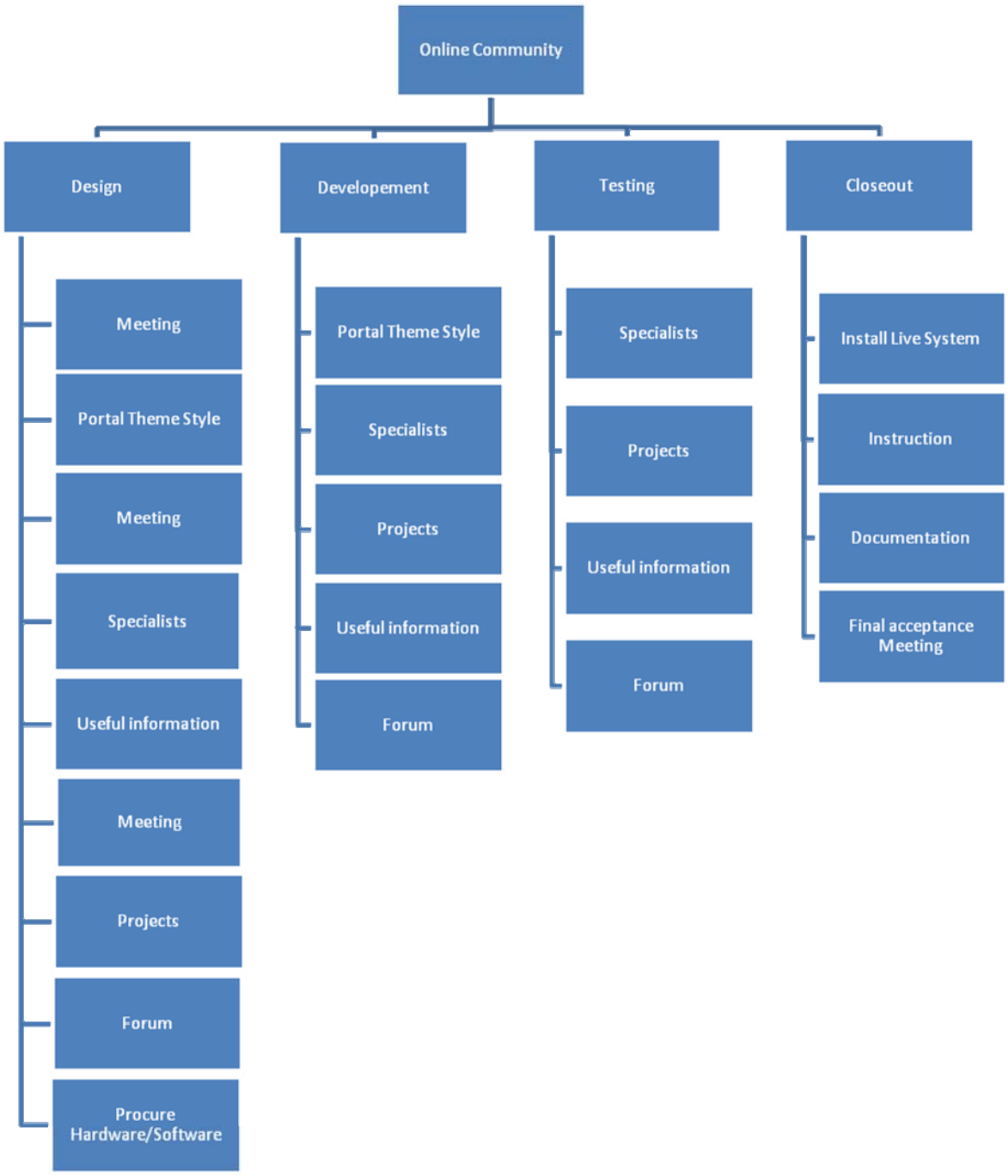


Figure 10 WBS

3. TIME MANAGEMENT

The project is implemented in 34 days. The start date of the project is 06 January 2014 and the end date is 20 February 2014. The duration and the description of each activity can be seen in the following table:

WBS #	Task	Description of Task	Est. Level of Effort
1	**DESIGN**		
1.1	Meeting	Meeting with specialists for designing Portal Theme style	1
1.2	Portal Theme style	Designing the Theme style templates, graphical elements, creating css files	3
1.3	Meeting	Meeting with specialists for designing Useful information and Specialists presentation	1
1.4	Useful information	Designing articles, legislation, downloads	2
1.5	Specialists	Designing Specialists presentation – lists, profiles.	5
1.6	Meeting	Meeting with specialists for designing Projects presentation and the Forum	1
1.7	Projects	Designing Projects presentation – lists, fields based on projects category	5
1.8	Forum	Designing the Forum, Sections, Categories, Topics	2
1.9	Procure Hardware / Software	Procuring all the software components	1
2	**DEVELOPMENT**		
2.1	Portal Theme style	Development of the Theme style templates, graphical elements, creating css files	3
2.2	Specialists	Develop Specialists presentation component lists templates, profiles templates,	5
2.3	Projects	Develop Projects presentation component – lists templates, categories of projects, fields based on projects category	5
2.4	Useful information	Develop articles and downloads components, templates	3
2.5	Forum	Develop the Forum, Sections, Categories, Topics	2
3	**TESTING**		
3.1	Specialists	Testing Specialists presentation – lists, profiles.	1
3.2	Projects	Testing Projects presentation – lists, fields based on projects category	1
3.3	Useful information	Testing articles, legislation, downloads	1
3.4	Forum	Testing the Forum, Sections, Categories, Topics	1

WBS #	Task	Description of Task	Est. Level of Effort
4	**CLOSEOUT**		
4.1	Install Live System	Installing the portal on the web hosting server	1
4.3	Instruction	Assigned personnel trained to upload information and documents to the website	2
4.4	Documentation	Support documentation implemented for website users	1
4.5	Final acceptance meeting		1

4. COST MANAGEMENT

The resources needed to execute the project are the following:

- human resources – assured by SC Web 4D SRL
- the project manager at 50 Lei Cost/Hour
- the programmer at 30 Lei Cost/Hour
- the technical writer at 15 Lei Cost/Hour
- Tools – assured by SC Web 4D SRL
- two computers at 0.5 Lei Cost/Hour
- Materials
- Software component – Joomla Theme
- Software component – CB custom field module
- Software component – CB – AdsManager integration module
- Software component – AdsManager gallery module

WBS #	Human resources				Tools				Materials			
	Item	cost/h	Qty.	Total	Item	cost/h	Qty.	Total	Type	Cost/unit	Qty.	Total
1.1												
1.1.1	Manager	50	2	100								
1.1.2	Manager	50	8	400	Computer	0.5	16	8				
	Programmer	30	8	240								
1.1.3	Manager	50	2	100								
1.1.4	Manager	50	4	200	Computer	0.5	8	4				
	Programmer	30	4	120								
1.1.5	Manager	50	12	600	Computer	0.5	24	12				
	Programmer	30	12	360								
1.1.6	Manager	50	2	100								
1.1.7	Manager	50	12	600	Computer	0.5	24	12				
	Programmer	30	12	360								
1.1.8	Manager	50	4	200	Computer	0.5	8	4				
	Programmer	30	4	120								
1.1.9	Technical writer	15	8	120								
1.2												
1.2.1	Programmer	30	24	720	Computer	0.5	24	12	Portal theme	250	1	250
1.2.2	Programmer	30	40	1200	Computer	0.5	40	20	CB custom module	80	1	80
1.2.3	Programmer	30	40	1200	Computer	0.5	40	20	CB - AdsManager integration	100	1	100
									AdsManager Gallery	80	1	80

WBS #	Human resources				Tools				Materials			
	Item	**cost/h**	**Qty.**	**Total**	**Item**	**cost/h**	**Qty.**	**Total**	**Type**	**Cost/unit**	**Qty.**	**Total**
1.2.4	Programmer	30	24	720	Computer	0.5	24	12				
1.2.5	Programmer	30	16	480	Computer	0.5	16	8	Forum component	100	1	100
1.3												
1.3.1	Technical writer	15	8	120	Computer	0.5	8	4				
1.3.2	Technical writer	15	8	120	Computer	0.5	8	4				
1.3.3	Technical writer	15	8	120	Computer	0.5	8	4				
1.3.4	Technical writer	15	8	120	Computer	0.5	8	4				
1.4												
1.4.1	Programmer	30	8	240	Computer	0.5	8	4				
1.4.2	Manager	50	8	400								
1.4.3	Programmer	30	4	120	Computer	0.5	4	2				
	Technical writer	15	4	60	Computer	0.5	4	2				
1.4.4	Manager	50	4	200								
Total				9440	**Total**			136	**Total**			610
Total												10186

Table 32 Cost management

4. PROJECT QUALITY

The following success criteria will be reviewed during the project close phase and will be used to measure how successful the project has been:

- Website built as specifications.
- All test in testing phase are successful
- Website delivered in time.
- Assigned personnel trained to upload information and documents to the website.
- All users able to log in and use the site.
- Support documentation implemented for website users.

5. HUMAN RESOURCE MANAGEMENT

The project's team has 3 members:

- The project manager
- One programmer
- One technical writer

All the members are assigned from the existing personnel of SC Web 4D SRL.

Table 25 – Responsibility and HR allocation matrix presents the humans resource allocation for the project's activities.

The team members are allocated according to the **Table 25 – Responsibility and HR allocation matrix**. The responsible for each major activity and / or objective is marked with an „A".

Code	Task	Project manager	Programmer	Technical writer
1	**DESIGN**	**A**	**1**	
1.1	Meeting	A		
1.2	Portal Theme style	A	1	
1.3	Meeting	A	1	
1.4	Useful information	A	1	
1.5	Specialists	A	1	
1.6	Meeting	A	1	

Code	Task	Project manager	Programmer	Technical writer
1.7	Projects	A	1	
1.8	Forum	A	1	
1.9	Procure Hardware / Software			A
2	**DEVELOPMENT**		**A**	
2.1	Portal Theme style		A	
2.2	Specialists		A	
2.3	Projects		A	
2.4	Useful information		A	
2.5	Forum		A	
3	**TESTING**			**A**
3.1	Specialists			A
3.2	Projects			A
3.3	Useful information			A
3.4	Forum			A
4	**CLOSEOUT**	**A**		
4.1	Install Live System		A	
4.3	Instruction	A	1	
4.4	Documentation		A	1
4.5	Final acceptance Meeting	A		

Table 33 – Responsibility and HR allocation matrix

6. COMMUNICATIONS MANAGEMENT

The communications between all the persons involved in the project is very important.

- team members
- team members <---> project manager
- project manager <---> sponsor (the key stakeholder)
- project manager <---> the group of specialists

Communication	Presented to	Information Provider	Frequency of communication	Method of Communication
Problems occurred	Project manager	Team member	When necessary	Email / Phone Call
Start phase meeting	Team members	Project manager	At start of each phase	Meeting/Conference Call
End Phase meetings	Project manager	Team members	At end of each phase	Meeting
End Phase meetings	Project manager	Sponsor	At end of each phase	Meeting
Activity status	Project manager	Team members	At end of each activity	Email
End Project Meeting	All stakeholders	Project manager	At end of project	Meeting

Table 34 Communication management

7. RISK MANAGEMENT

The risks identified in the projects are defined in the table below. Each risk has a code, a description, the probability, the impact, the value and the risk mitigation strategy.

Legend:

Val. - Value (impact X probability)

Impact - Im	Probability – Pb
1 – Insignificant (no impact)	1- Very unlikely (hasn't occurred before)
2 - Minor (little effect)	2 - Slight (rarely occurs)
3 – Significant (may pose a problem)	3 - Feasible (possible, but not common)
4 - Major (Will pose a problem)	4 - Likely (has before, will again)
5 – Critical (Immediate action required)	5 - Very Likely (occurs frequently)

Code	Description	Pb.	Im.	Val.	Mitigation strategy

R1	One of the team members becomes unavailable	**3**	**5**	**15**	The project manager finds potential team members replacements
R2	Key staff will not be available when needed	**4**	**3**	**12**	Allocation of extra time
R3	The software components will have technical or performance limitations that endanger the project	**3**	**3**	**9**	Allocation of extra time
R4	One of the development computers becomes unavailable	**2**	**2**	**4**	
R5	The office will be damaged by fire, flood, or other catastrophe	**1**	**4**	**4**	

Table 35 Risk management

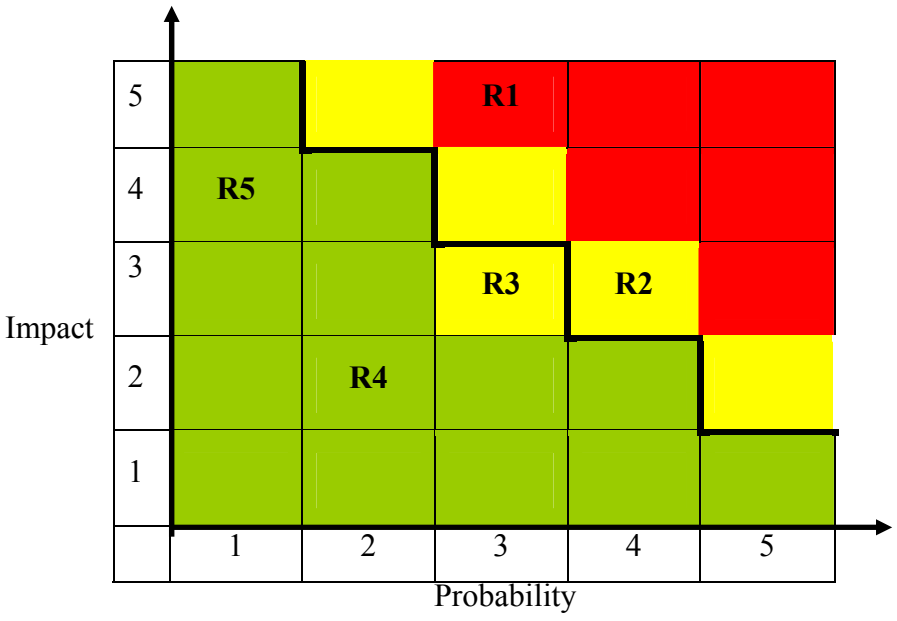


Figure 11 Risk management

8. PROCURMENT

In the procurement activity, the Project Manager will be responsible for selecting vendor or external resource. The Project Manager will also measure performance as it relates to the

vendor providing necessary goods and/or services and communicate this to the technical writer, the responsible for the acquisition.

9. PROJECT CLOSING

Once all the project objectives have been completed, the following activities will be completed to bring the project to a full and complete close:

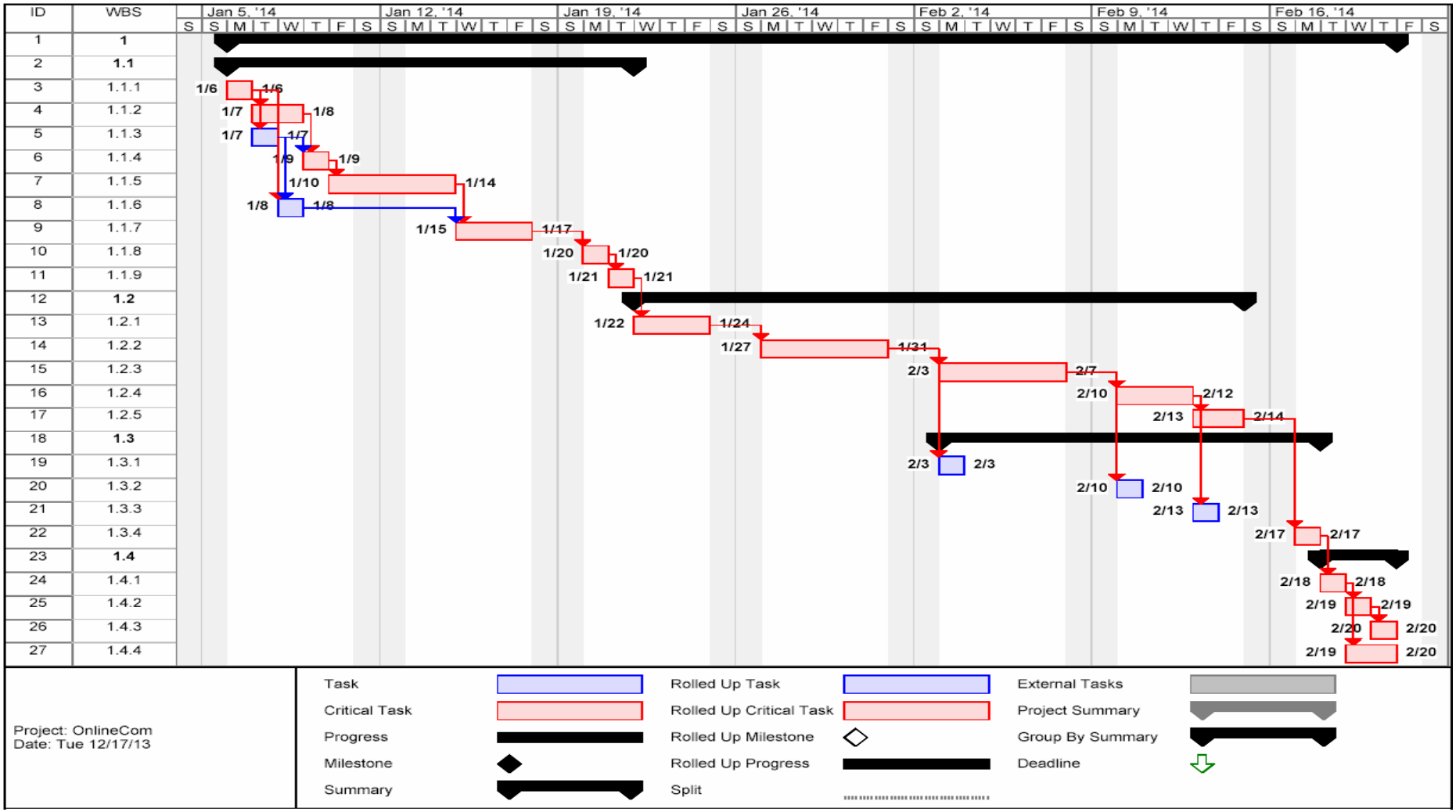
1. Install Live System – the portal will be installed on the web hosting server (provided by the sponsor) and the domain name (provided by the sponsor) will be correlated with the web hosting server.
2. Instruction – Assigned personnel will be trained to upload information and documents to the website.
3. Documentation – Support documentation implemented for website users.
4. Final acceptance Meeting

LIST OF TABLES AND FIGURES

APPENDICES

	Task Name	Total Cost
1	**1 CONSTRUCTION FIELD SPECIALISTS ONLINE COMMUNITY**	**10,186.00 Lei**
2	**1.1 DESIGN**	**3,660.00 Lei**
3	1.1.1 Meeting	100.00 Lei
4	1.1.2 Portal Theme style	648.00 Lei
5	1.1.3 Meeting	100.00 Lei
6	1.1.4 Useful information	324.00 Lei
7	1.1.5 Specialists	972.00 Lei
8	1.1.6 Meeting	100.00 Lei
9	1.1.7 Projects	972.00 Lei
10	1.1.8 Forum	324.00 Lei
11	1.1.9 Procure Hardware / Software	120.00 Lei
12	**1.2 DEVELOPMENT**	**5,002.00 Lei**
13	1.2.1 Portal Theme style	982.00 Lei
14	1.2.2 Specialists	1,300.00 Lei
15	1.2.3 Projects	1,400.00 Lei
16	1.2.4 Useful information	732.00 Lei
17	1.2.5 Forum	588.00 Lei
18	**1.3 TESTING**	**496.00 Lei**
19	1.3.1 Specialists	124.00 Lei
20	1.3.2 Projects	124.00 Lei
21	1.3.3 Useful information	124.00 Lei
22	1.3.4 Forum	124.00 Lei
23	**1.4 CLOSEOUT**	**1,028.00 Lei**
24	1.4.1 Instruction	400.00 Lei
25	1.4.2 Install Live System	244.00 Lei
26	1.4.3 Documentation	184.00 Lei
27	1.4.4 Final acceptance Meeting	200.00 Lei

Appendix 1 - Costs of the project



Appendix 2 - Gant Chart

	Task Name	Duration	Start	Finish	Resource Names
1	**1 CONSTRUCTION FIELD SPECIALISTS ONLINE COMMUNITY**	**34 days**	**Mon 1/6/14**	**Thu 2/20/14**	
2	**1.1 DESIGN**	**12 days**	**Mon 1/6/14**	**Tue 1/21/14**	
3	1.1.1 Meeting	1 day	Mon 1/6/14	Mon 1/6/14	Manager[25%]
4	1.1.2 Portal Theme style	2 days	Tue 1/7/14	Wed 1/8/14	Manager[50%],Progammer[50%],Computer
5	1.1.3 Meeting	1 day	Tue 1/7/14	Tue 1/7/14	Manager[25%]
6	1.1.4 Useful information	1 day	Thu 1/9/14	Thu 1/9/14	Manager[50%],Progammer[50%],Computer
7	1.1.5 Specialists	3 days	Fri 1/10/14	Tue 1/14/14	Manager[50%],Progammer[50%],Computer
8	1.1.6 Meeting	1 day	Wed 1/8/14	Wed 1/8/14	Manager[25%]
9	1.1.7 Projects	3 days	Wed 1/15/14	Fri 1/17/14	Manager[50%],Progammer[50%],Computer
10	1.1.8 Forum	1 day	Mon 1/20/14	Mon 1/20/14	Manager[50%],Progammer[50%],Computer
11	1.1.9 Procure Hardware / Software	1 day	Tue 1/21/14	Tue 1/21/14	Technical writer
12	**1.2 DEVELOPMENT**	**18 days**	**Wed 1/22/14**	**Fri 2/14/14**	
13	1.2.1 Portal Theme style	3 days	Wed 1/22/14	Fri 1/24/14	Progammer,Portal theme[1],Computer
14	1.2.2 Specialists	5 days	Mon 1/27/14	Fri 1/31/14	CB custom field module[1],Progammer,Computer
15	1.2.3 Projects	5 days	Mon 2/3/14	Fri 2/7/14	Computer,Progammer,CB - AdsManager integration[1],AdsManager Gallery[
16	1.2.4 Useful information	3 days	Mon 2/10/14	Wed 2/12/14	Computer,Progammer
17	1.2.5 Forum	2 days	Thu 2/13/14	Fri 2/14/14	Computer,Progammer,Forum component[1]
18	**1.3 TESTING**	**11 days**	**Mon 2/3/14**	**Mon 2/17/14**	
19	1.3.1 Specialists	1 day	Mon 2/3/14	Mon 2/3/14	Computer,Technical writer
20	1.3.2 Projects	1 day	Mon 2/10/14	Mon 2/10/14	Technical writer,Computer
21	1.3.3 Useful information	1 day	Thu 2/13/14	Thu 2/13/14	Technical writer,Computer
22	1.3.4 Forum	1 day	Mon 2/17/14	Mon 2/17/14	Technical writer,Computer
23	**1.4 CLOSEOUT**	**3 days**	**Tue 2/18/14**	**Thu 2/20/14**	
24	1.4.1 Instruction	2 days	Tue 2/18/14	Wed 2/19/14	Manager[50%]
25	1.4.2 Install Live System	1 day	Tue 2/18/14	Tue 2/18/14	Progammer,Computer
26	1.4.3 Documentation	1 day	Wed 2/19/14	Wed 2/19/14	Technical writer[50%],Progammer[50%],Computer
27	1.4.4 Final acceptance Meeting	1 day	Thu 2/20/14	Thu 2/20/14	Manager[50%]

Appendix 3 - Schedule and resources

SOFTWARE USED IN TEACHING AND LEARNING PHYSICS

Marilena LAZAR

CONTENTS

I. INTRODUCTION

Physics is part of a core subject in the Romanian national curriculum. Until some years ago physics has been taught at the elementary and high school level primarily by the lecture method and sometimes with laboratory experiments intended to help students understand the concepts presented in the lectures. But the concepts presented are better understood when lectures are accompanied with simulations, movies, experiment demonstration, solved problems, etc. All these make the students to reflect at what will happen in an experiment or how a phenomenon take place and help them to learn through self discovery.

The lecture method often fails to help students overcome the misconceptions about the physical world because almost all elementary concepts in physics are abstract and teaching through analogies can lead to confusions. So, to overcome these misconception and confusions have been developed a variety of interactive learning methods. One of these learning methods, used with success in physics teaching and learning, is specialized software which can collect and analyze data, visualize the concept, support the construction of the science concepts, help in decision making process, etc.

This project is developed in order to create a software application to support the physics teaching and learning process in elementary schools where students do not have an advanced background in math. This software can help to consolidate physics teaching and learning process in Romanian schools providing a lot of instruments that can be easily used in classrooms. A better understanding of physics at a lower level (elementary school) can be a bridge between school and university level physics so that many more students will graduate technical faculties. Also physics helps to develop basic skills in the collecting and analysis of experimental data so that the students will be able to follow later courses not only in physics but in any other physical sciences.

The cost associated with the successful design and development of this software will be recovered as a result of the improved performance in physics understanding for students which could lead at a growth of the number of specialists in technical domain.

The project is made at the request of the Ministry of Education (ME) and the contract and preliminary conditions are stated in the “Project Charter” which is already approved.

To achieve this project must take into account some **constraints**:

- limited resources available to support the project;
- the cost of the project cant overcome the allocated sum;

- considering the fact that some employees who will work in this project are also involved in other projects participation in this project could be received as an additional burden;
- the reduced number of team members comparing to the complexity of the project;
- the project duration must be as short as possible due to the fact that the team members work in other projects too.

Several **assumptions** for the project are settled once the main constraints were assumed:

- the contract with the ME (the customer) has been signed;
- all department heads of the company will provide necessary support for successfully project completion;
- the project has the full support of the Financial and Acquisition Departments of the company;
- is no need to hire any people because the company has already all needed specialists for this project;
- the team members involved in this project have enough experience and don't need any training courses;
- the hardware and software resources necessary for this project are already available.

The estimated duration of the project is 161 days starting from 01.06.2014 and finishing on 08.18.2014.

II. PROJECT SCOPE

The goal of the project is to develop a new software application that can be used in the classroom to enhance the teaching and the learning process. It will provide simulations, samples of movies, experiments, etc. that could be used for teaching purposes. Also this software will help the students to acquire new knowledge and to improve their skills and physics understanding.

Moreover this software will help the teachers to communicate easier the key principles of physics and help students to understand the concepts and develop skills in solving problem in basic physics.

The software application is divided into modules each of them containing many units. Each module is designed for a physics domain that is included in the national curriculum for elementary school (VI –VIII classes) (e.g. mechanical, electrical, optical phenomena, etc.).

Each unit is designed using the notions from a lesson. Each unit will contain not only written text but also examples of solved problems, drawings, simulations, etc so that all

Each unit will contain not only written text but also examples of solved problems, drawings, demonstration, simulation, graphical representations of a physical event, movies, games, etc. so that all the material from the physics national curriculum will be taught visually. This possibility of watching an phenomenon happen or directly observing a graphical representation of a physical event as if it is happening may give students a firmer grasp of concepts.

The project has thirty six activities and sub-activities grouped in five phases: analysis, design, development, testing and handover of the software.

For smoothly development of the project are established the terms for following milestones:

- Finalize the establishment of the software requirements and specific functionality (technical specifications for the product): 01.21.2014;
- Finalize the software architecture design (Software specifications) : 03.03.2014;
- Release the alpha version of the software : 06.06.2014;
- Release the beta version of the software : 08.06.2014;
- Project closing : 08.18.2014;

The project deliverables are:

- "Software technical specifications" which contain all necessary software requirements and functionality;
- "Software design and architecture";
- the alpha and beta versions of the software;
- "Testing procedures for the software";
- "Testing report" which contain measurement bulletin;
- software installation kit.

The initial risks in development of this project are:

- problems that can arise for developers and managers in estimating and scheduling development time;
- in the project development can be issues that hasn't been identified at the in the analysis phase and can create a last-minute hurdle to meeting deadlines;
- some of the developers can leaves and take critical information with him/he leading to some delay, and sometimes even compromising the entire project;
- requirements established in the analysis phase might conflict or the specification might be unclear or incomplete;

- rush in the design-process can lead to compromising on software design;
- improper process implementation, conflicting priorities, or a lack of clarity in responsibilities can lead to some problems in the operational activities.

II.1 Work Breakdown Structure

The WBS consists of 36 activities and sub-activities, starting with the definition of technical requirements according with the established objectives, continue with the software design, development and testing, and finally handover of the software to the customer.

Table 1: Work Breakdown Structure

Task Name	Duration	Start	Finish	Predecessors
1 Software used in teaching and learning physics	**161 days**	**Mon 1/6/14**	**Mon 8/18/14**	
1.1 Analysis software requirements	**12 days**	**Mon 1/6/14**	**Tue 1/21/14**	
1.1.1 Define specific functionality	4 days	Mon 1/6/14	Thu 1/9/14	
1.1.2 Define technical requirements and performance criteria for software	6 days	Thu 1/9/14	Fri 1/17/14	3
1.1.3 Develop preliminary budget and establish team and time limits	1 day	Mon 1/20/14	Mon 1/20/14	4
1.1.4 Obtain approvals to proceed (concept, team, timeline, budget)	1 day	Tue 1/21/14	Tue 1/21/14	5
1.1.5 Analysis complete	0 days	Tue 1/21/14	Tue 1/21/14	6
1.2 Software architecture design	**29 days**	**Wed 1/22/14**	**Mon 3/3/14**	
1.2.1 Elaborate the software architecture	7 days	Wed 1/22/14	Thu 1/30/14	7
1.2.2 Realize the software design	15 days	Thu 1/30/14	Thu 2/20/14	9
1.2.3 Verify and obtain approval to proceed	3 days	Fri 2/21/14	Tue 2/25/14	10
1.2.4 Design software buffer	3 days	Wed 2/26/14	Fri 2/28/14	11
1.2.5 Submit the software design to development team	1 day	Mon 3/3/14	Mon 3/3/14	12
1.2.6 Design software architecture complete	0 days	Mon 3/3/14	Mon 3/3/14	13
1.3 Software development	**70 days**	**Tue 3/4/14**	**Mon 6/9/14**	
1.3.1 Develop the main software interface	10 days	Tue 3/4/14	Mon 3/17/14	14
1.3.2 Develop the modules of the software	25 days	Thu 3/13/14	Wed 4/16/14	
1.3.3 Develop the unit of the software	46 days	Fri 3/21/14	Fri 5/23/14	
1.3.4 Interconnect all the units and modules previously developed	5 days	Fri 5/23/14	Fri 5/30/14	18
1.3.5 Developer testing (primary debugging)	64 days	Tue 3/4/14	Fri 5/30/14	
1.3.6 Development software buffer	4 days	Mon 6/2/14	Thu 6/5/14	19
1.3.7 Release the alpha version of the software	2 days	Fri 6/6/14	Mon 6/9/14	21
1.3.8 Software development complete	0 days	Mon 6/9/14	Mon 6/9/14	22
1.4 Software testing	**45 days**	**Tue 6/10/14**	**Mon 8/11/14**	
1.4.1 Develop unit and integrations test plans using product specifications	5 days	Tue 6/10/14	Mon 6/16/14	23
1.4.2 Test each function, unit and module	10 days	Tue 6/17/14	Mon 6/30/14	25
1.4.3 Test links between different units and modules	5 days	Tue 7/1/14	Mon 7/7/14	26
1.4.4 Solve the errors occurred and optimize the functions if necessary	15 days	Tue 7/8/14	Mon 7/28/14	27
1.4.5 Test the functionality of the software	3 days	Tue 7/29/14	Thu 7/31/14	28
1.4.6 Acceptance test of the software	3 days	Fri 8/1/14	Tue 8/5/14	29
1.4.7 Release the beta version of the software	2 days	Wed 8/6/14	Thu 8/7/14	30
1.4.8 Realize the software installation kit	2 days	Fri 8/8/14	Mon 8/11/14	31
1.4.9 Software testing complete	0 days	Mon 8/11/14	Mon 8/11/14	32
1.5 Software handover	**5 days**	**Tue 8/12/14**	**Mon 8/18/14**	
1.5.1 Obtaining the final user signoff acknowledging that the software fully meets initial requirements	2 days	Tue 8/12/14	Wed 8/13/14	33
1.5.2 Invoice issued by software developer	1 day	Thu 8/14/14	Thu 8/14/14	35
1.5.3 Invoice paid	2 days	Fri 8/15/14	Mon 8/18/14	36

III. TIME MANAGEMENT

The total duration of the project is 161 days. The main phases and periods are:

- analysis phase : 12 days;
- architecture design phase : 29 days;
- software development phase: 70 days;
- software testing phase : 45 days;
- closing phase: 5 days.

Detailed work breakdown structure including explanations, dependencies and the duration of activities is presented in the table 2.

Table 2: Work Breakdown Structure Dictionary

No.	Activity name	Explanation	Dependencies	Duration
1	ASR	Analysis software requirements. Obtain the specifications of the product with emphasis on performance criteria	All other tasks cannot start before ASR finishes.	01.6.2014 - 01.21.2014
1.1	DSF	Define the specific functionality of the software. Meetings with the customer and final user to establish the main functionality of the software.	All other tasks cannot start before DSF finishes, DTR may begin.	01.6.2014 - 01.9.2014
1.2	DTR	Establish the technical requirements and performance criteria for the software. Meetings with the customer and final user to obtain all the data necessary to extract all the software requirements.	It starts after DSF finished. After DTR finishes, DPB may begin.	01.9.2014- 01.17.2014
1.3.	DPB	Based on the requirements is establish the preliminary budget for the project, team project and the time limits of the project.	It starts after DTR finished. After DPB finishes, OAP may begin	1.20. 2014- 1.20. 2014
1.4.	OAP	Obtain approvals to proceed (concept, team, timeline, budget)	It starts after DPB finished. After OAP finishes, ESA may begin	01.21.2014- 01.21.2014
1.5	AC	Analysis is complete. The design software architecture phase may begin.	It starts after OAP finished. After AC finishes, DRM may begin	1.21.2014- 1.21.2014
2	SAD	Based on the software requirements and its performance criteria is elaborated the software architecture	It starts after ASR finished. After SADA finishes, SD may begin.	1.22. 2014- 3.3. 2014
2.1	ESA	Elaborate the software architecture. Based on the software requirements are identified software modules, units and functions of the software.	It starts after AC finished. After ESA finishes, RSD may begin.	1.22.2014- 1.30.2014

2.2	RSD	Realize the software design. Based on all software components previously established (modules, units, functions) is realized the software design.	It starts after ESA finished. After RSD finishes, OA may begin.	1.30. 2014- 2.20. 2014
2.3	VOA	Verify the project design and obtain approval to proceed	It starts after RSD finished. After OA finishes, SSD may begin.	2.21.2014- 2.25.2014
2.4	SSD	Submit the software design to the development team.	It starts after OA finished. After SSD finishes, DSI may begin.	2.26.2014- 2.28.2014
2.5	DSB	Time buffer for the design software phase.	It starts after DSB finished. After DSB finishes, DSAC may begin.	3.3.2014- 3.3. 2014
2.6	DSAC	Design software architecture complete. The software development phase may begin.	It starts after DSB finished. After DSAC finishes, SD may begin.	3.3.2014- 3.3.2014
3.	SD	Software development. The software is developed based on the design specification.	It starts after DSA finished. After SD finishes, ST may begin.	3.4.2014- 6.9.2014
3.1	DSI	Develop the main software interface. Based on the software design is developed the software interface. It will be specified what menus, buttons, etc will be used.	It starts after DSAC finished. After DSI finishes, DMS may begin.	3.4.2014- 3.17.2014
3.2	DMS	Develop the modules of the software.	It starts after DSA finished. After DMS finishes, DUS may begin.	3.13.2014- 4.16. 2014
3.3	DUS	Develop the units and functions of the software and the functions for each unit.	It starts after DMS finished. After DUS finishes, IUM may begin.	3.21.2014- 5.23. 2014

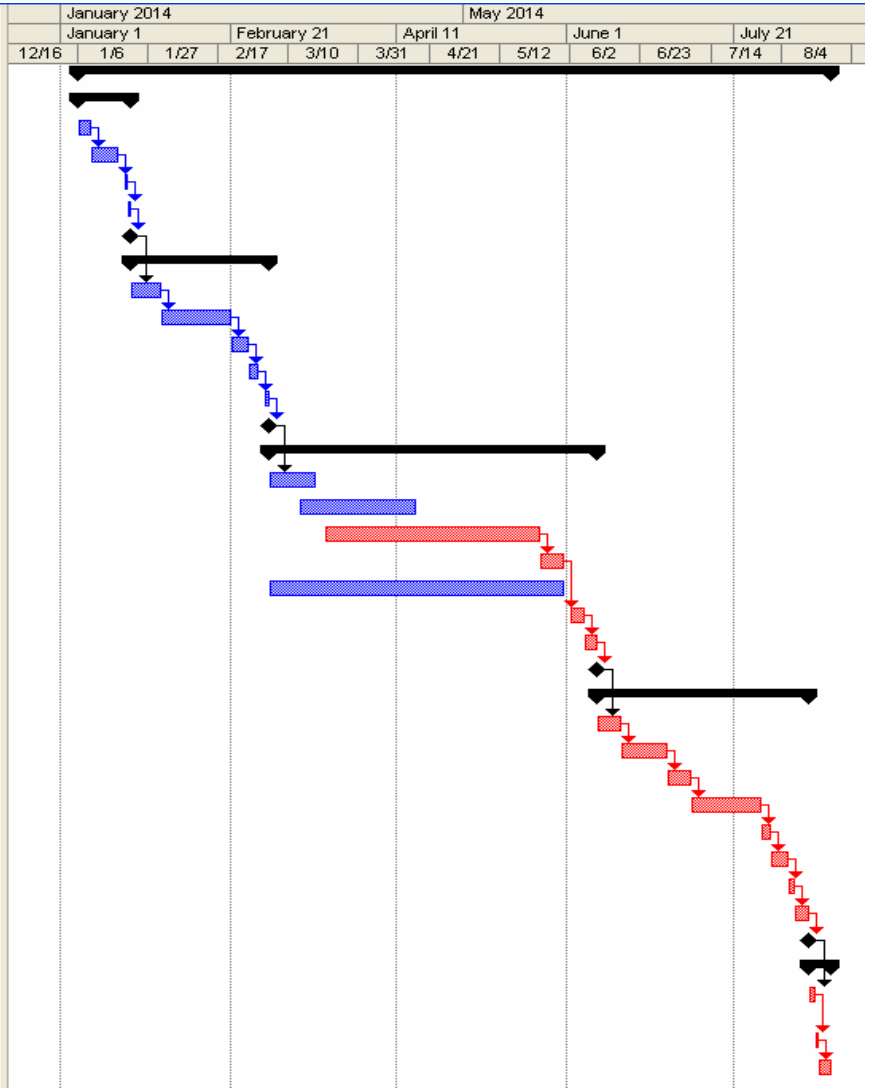
3.4	IUM	All the units and modules previously developed are interconnected.	It starts after DUS finished. After IUM finishes, RAV may begin.	5.23. 2014- 5.30.2014
3.5	DT	Developer testing (primary debugging). All the functions, units, and modules are tested when and after they are developed.	It starts after DSA finished. After DT finishes, RAV may begin.	3.4. 2014- 6.2. 2014
3.6	BDS	Buffer for the development software phase	It starts after DT finished. After BDS finishes, RAV may begin.	6.2. 2014- 6.5. 2014
3.7	RAV	After all the software components previously developed are introduced in the interface and is released the alpha version of the software.	It starts after DT finished. After RAV finishes, SIK may begin.	6.6. 2014- 6.9. 2014
3.8	SDC	Software development complete	It starts after RAV finished. After SDC finishes, ST may begin.	6.9. 2014- 6.9. 2014
4	ST	Software that previously was developed is tested to see if it meets the requirements establish at the beginning of the project.	It starts after SD finished. After ST finishes, SH may begin	6.10. 2014- 8.11. 2014
4.1	DUIT	Develop unit and integrations test plans using product specifications.	It starts after ST finished. After DUIT finishes, UMT may begin.	6.10.2014- 6.16. 2014
4.2	UMT	Each function, unit and module is tested to see if it meets the software requirements stated at the beginning of the project.	It starts after DUIT finished. After UMT finishes, TL may begin.	6.17. 2014- 6.30. 2014
4.3	TL	All links between functions, units and modules are tested to see if the software requirements are met.	It starts after UMT finished. After TL finishes, SR may begin.	7.1.2014- 7.7.2014
4.4	SR	Solve the errors occurred in the testing phase and optimize the functions, units and modules if necessary.	It starts after TL finished. After SR finishes, SR may begin.	7.8. 2014- 7.28. 2014

4.5	FT	The software functionality is tested according.	It starts after SR finished. After FT finishes, AT may begin.	7.29.2014- 7.31.2014
4.6	AT	The acceptance tests are executed to prove to the customer that the requirements of the software are met and the specific functionality is the desired one.	It starts after FT finished. After AT finishes, RBV may begin	8.1.2014- 8.5.2014
4.7	RBV	Release the beta version of the software	It starts after AT finished. After RBV finishes, SR may begin	8.6. 2014- 8.7. 2014
4.8	SIK	The software installation kit is realized. Also are elaborated and the install and user manual.	It starts after RBV finished. After SIK finishes, SH may begin.	8.8.2014- 8.11. 2014
4.9	STC	Software testing complete	It starts after SIK finished. After STC finishes, SH may begin.	8.11. 2014- 8.11. 2014
5	SH	Software handover	It starts after ST finished. After SH finishes the project is finished.	8.12. 2014- 8.18. 2014
5.1	SAS	Obtaining the final user signoff acknowledging that the software fully meets initial requirements	It starts after ST finished. After SAS finishes, IS may begin.	8.12. 2014- 8.13. 2014
5.2	IS	Invoice issued by software developer	It starts after SAS finished. After IS finishes, IV may begin.	8.14.2014- 8.14.2014
5.3	IV	The invoice is paid and the project is finished.	It starts after IS finished. After IV finishes the project is finished.	8.15.2014- 8.18.2014

The detailed time management plan of the project is presented in the table 3 (Gantt chart).

Table 3: Gantt chart

Task Name	Duration	Start	Finish
Software used in teaching and learning physics	**161 days**	**Mon 1/6/14**	**Mon 8/18/14**
Analysis software requirements	**12 days**	**Mon 1/6/14**	**Tue 1/21/14**
Define specific functionality	4 days	Mon 1/6/14	Thu 1/9/14
Define technical requirements and performance criteria for software	6 days	Thu 1/9/14	Fri 1/17/14
Develop preliminary budget and establish team and time limits	1 day	Mon 1/20/14	Mon 1/20/14
Obtain approvals to proceed (concept, team, timeline, budget)	1 day	Tue 1/21/14	Tue 1/21/14
Analysis complete	0 days	Tue 1/21/14	Tue 1/21/14
Software architecture design	**29 days**	**Wed 1/22/14**	**Mon 3/3/14**
Elaborate the software architecture	7 days	Wed 1/22/14	Thu 1/30/14
Realize the software design	15 days	Thu 1/30/14	Thu 2/20/14
Verify and obtain approval to proceed	3 days	Fri 2/21/14	Tue 2/25/14
Design software buffer	3 days	Wed 2/26/14	Fri 2/28/14
Submit the software design to development team	1 day	Mon 3/3/14	Mon 3/3/14
Design software architecture complete	0 days	Mon 3/3/14	Mon 3/3/14
Software development	**70 days**	**Tue 3/4/14**	**Mon 6/9/14**
Develop the main software interface	10 days	Tue 3/4/14	Mon 3/17/14
Develop the modules of the software	25 days	Thu 3/13/14	Wed 4/16/14
Develop the unit of the software	46 days	Fri 3/21/14	Fri 5/23/14
Interconnect all the units and modules previously developed	5 days	Fri 5/23/14	Fri 5/30/14
Developer testing (primary debugging)	64 days	Tue 3/4/14	Fri 5/30/14
Development software buffer	4 days	Mon 6/2/14	Thu 6/5/14
Release the alpha version of the software	2 days	Fri 6/6/14	Mon 6/9/14
Software development complete	0 days	Mon 6/9/14	Mon 6/9/14
Software testing	**45 days**	**Tue 6/10/14**	**Mon 8/11/14**
Develop unit and integrations test plans using product specifications	5 days	Tue 6/10/14	Mon 6/16/14
Test each function, unit and module	10 days	Tue 6/17/14	Mon 6/30/14
Test links between different units and modules	5 days	Tue 7/1/14	Mon 7/7/14
Solve the errors occurred and optimize the functions if necessary	15 days	Tue 7/8/14	Mon 7/28/14
Test the functionality of the software	3 days	Tue 7/29/14	Thu 7/31/14
Acceptance test of the software	3 days	Fri 8/1/14	Tue 8/5/14
Release the beta version of the software	2 days	Wed 8/6/14	Thu 8/7/14
Realize the software installation kit	2 days	Fri 8/8/14	Mon 8/11/14
Software testing complete	0 days	Mon 8/11/14	Mon 8/11/14
Software handover	**5 days**	**Tue 8/12/14**	**Mon 8/18/14**
Obtaining the final user signoff acknowledging that the software fully meets initial requirements	2 days	Tue 8/12/14	Wed 8/13/14
Invoice issued by software developer	1 day	Thu 8/14/14	Thu 8/14/14
Invoice paid	2 days	Fri 8/15/14	Mon 8/18/14



IV. COST MANAGEMENT

The human and materials resources needed during the project, as well as the corresponding costs are presented in the table 4.

Table 4: Resource pool

No.	Resource type	Name	Quantity	Hours of work	Cost per hour	Total cost (lei)
1.	**Human resources**	Project manager	1	103	100	10,276.73
		Software design team leader	1	232	90	20,871.75
		Software development team leader	1	394	90	35,460.00
		Software designer	2	249	80	19,895.59
		Software developer	5	1249	80	99,914.67
		Physicist	1	33	60	1,992.00
		Tester	2	416	70	29,120.00
2.	**Materials /Equipment resources**	Computers for development	5	2097	1	2,097.33
		Computers for design	3	552	1	552
		Computers for testing	2	416	1	416
		Visual Studio 2010 Professional license	5	-	-	17

No.	Resource type	Name	Quantity	Hours of work	Cost per hour	Total cost (lei)
		Enterprise Architect 10 professional licence	2	-	-	3.50
		Printer	1	160	1	160
		Ink tonner	1	-	-	8,000
		Paper	1	-	-	43.50
		DVDs	5	-	-	20
3.	**Overall costs**		10% of the estimated cost			22893.297
4.	**TOTAL**					251,726.26

The project cost is about 251727 lei and it is detailed in the table 5 presented below.

Table 5: Cost Summary

	Resource Name	Max. Units	Std. Rate	Cost	Work
	Unassigned	100%	0.00lei/hr	0.00lei	0 hrs
1	Project manager	100%	100.00lei/hr	10,276.73lei	102.77 hrs
2	Software design team leader	100%	90.00lei/hr	20,871.75lei	231.92 hrs
3	Software development team leader	100%	90.00lei/hr	35,460.00lei	394 hrs
4	Software designer	200%	80.00lei/hr	19,895.59lei	248.7 hrs
5	Software developer	500%	80.00lei/hr	99,914.67lei	1,248.93 hrs
6	Physicist	100%	60.00lei/hr	1,992.00lei	33.2 hrs
7	Tester	200%	70.00lei/hr	29,120.00lei	416 hrs
8	Computers for design	300%	1.00lei/hr	552.00lei	552 hrs
9	Computers for development	600%	1.00lei/hr	2,087.73lei	2,087.73 hrs
10	Computers for testing	200%	1.00lei/hr	416.00lei	416 hrs
11	Visual Studio 2010 Professional license		0.50lei	17.00lei	34 % of usage
12	Enterprise Architect 10 professional licence		0.50lei	6.00lei	12 % of usage
13	Printer	100%	1.00lei/hr	160.00lei	160 hrs
14	Ink tonner		1,000.00lei	8,000.00lei	8 % of usage
15	Paper		3.00lei	43.50lei	14.5 x 100 sheets
16	DVDs		5.00lei	20.00lei	4 piece

V. QUALITY MANAGEMENT

To verify that the developed software meet written specifications and ensure that it can be used as it was intended we must continuous control and monitoring all activities and results during the project. For that certain quality acceptance criteria have been established to assess if the software performances and functionality is according to requirements stated in the analysis phase.

In the table 6 is presented a list of the quality factors, their description, the deliverables and the acceptance criteria for each of them, as well as the activities that generate those deliverables.

Obtaining quality products is also sustained by the fact that the company has an integrate quality management system, in conformance with ISO 9001 requirements and the software is developed according to ISO/IEC 12207.

Table 6: List of deliverables and acceptance criteria

Activities	Deliverables	Quality acceptance criteria
DSF DTR	Software technical specifications	According with the template provided by the quality management of the company. All necessary software requirements and functionality are presented in a logical and precise way. Compliance with project goal and objectives. Compliance with software requirements and functionality.
ESA RSD VOA	Software design and architecture	According with the template provided by the quality management of the company. Compliance with software specifications. All information needed to develop the software must be presented in a logical and precise way.
DSI DMS DUS IUM DT RAV	The alpha version of the software	Compliance with software design. Software application interface must be: user friendly, easy to use and intuitive.
DUIT	Testing procedures for the software	According with the template provided by the quality management of the company.

		The software components comply with technical requirements. Testing criteria are clearly formulated. Tests should cover all the objectives of a unit adequately with more emphasis on those objectives that are considered more important than others. The errors rate should be less than 10%. All errors discovered within the testing phase where solved. The software runs properly and accordingly with the technical requirements.
UMT TL SR FT AT	Test data results (measurement bulletin) Testing report	The templates are provided by the quality management of the company. The tests results will be analyzed and the software will be corrected if needed.
RBV	The beta version of the software	Software application interface must be: user friendly, easy to use and intuitive. Compliance with software design All errors discovered within the testing phase where solved.
RBV	User manuals	According with the template provided by the quality management of the company. The instructions are presented in a logical and precise way.
SIK	Software installation kit	Software is easy to install.
SAS IS IV	Document for reception of the project	According with the template provided by the quality management of the company.

VI. HUMAN RESOURCES MANAGEMENT

The team that will work for this project and the subordinations graph for the team members is presented in the organizational chart presented below. All the team members,

including the project manager, are permanent employees of the company. The entire team is composed of 13 people.

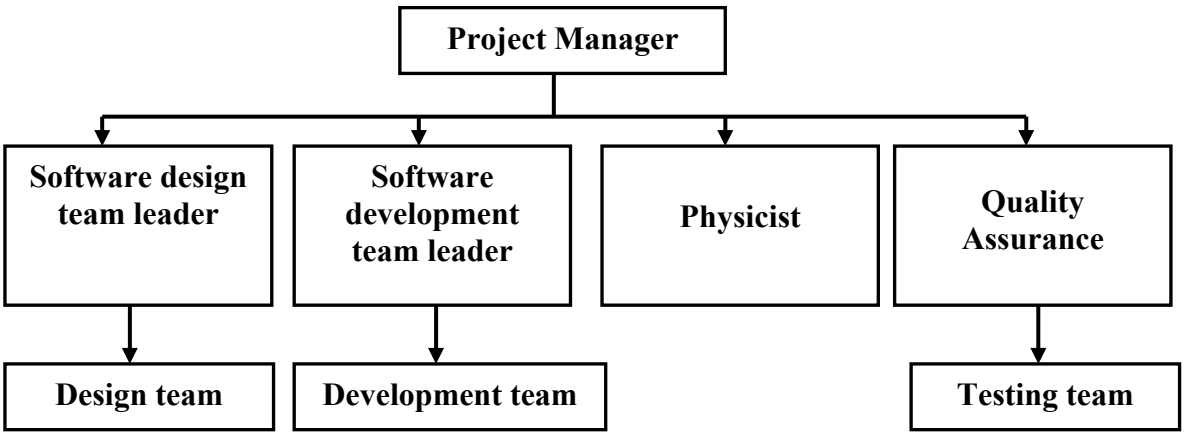


Figure 1: Project organizational chart

The responsibility in the framework of the project for each project member is presented in the responsibility assignment matrix (RAM) presented in table 7.

Table 7: Project Management Relationship

Position / Activity	Project manager	Software design team leader	Software development team leader	Software designer	Software developer	Physicist	Tester
DSF	R, P	P	P	-	-	P	-
DTR	R, P	P	P	-	-	P	-
DPB	R, P	-	-	-	-	-	-
OAP	R, P	-	-	-	-	-	-
AC	R, P	-	-	-	-	-	-
ESA	P	R, P	-	P	-	P	-
RSD	-	R, P	-	P	-	-	-
VOA	P	R, P	-	P	-	-	-
SSD	-	R, P	-	-	-	-	-
DSI	-	-	R, P	-	P	-	-
DMS	-	-	R, P	-	P	-	-
DUS	-	-	R, P	-	P	-	-
IUM	-	-	R, P	-	P	-	-

Position / Activity	Project manager	Software design team leader	Software development team leader	Software designer	Software developer	Physicist	Tester
DT	-	-	R, P	-	P	-	-
RAV	-	-	R	-	P	-	-
DUIT	-	-	-	-	-	-	R, P
UMT	-	-	-	-	-	-	R, P
TL	-	-	-	-	-	-	R, P
SR	-	-	R, P	-	P	-	-
FT	-	-	-	-	-	-	R, P
AT	-	-	-	-	-	-	R, P
RBV	-	-	R,P	-	P	-	-
SIK	-	-	R,P	-	P	-	-
STC		-	R	-	-	-	-
SAS	R, P	-	-	-	-	-	-
IS	R, P	-	-	-	-	-	-
IV	R	-	-	-	-	-	-

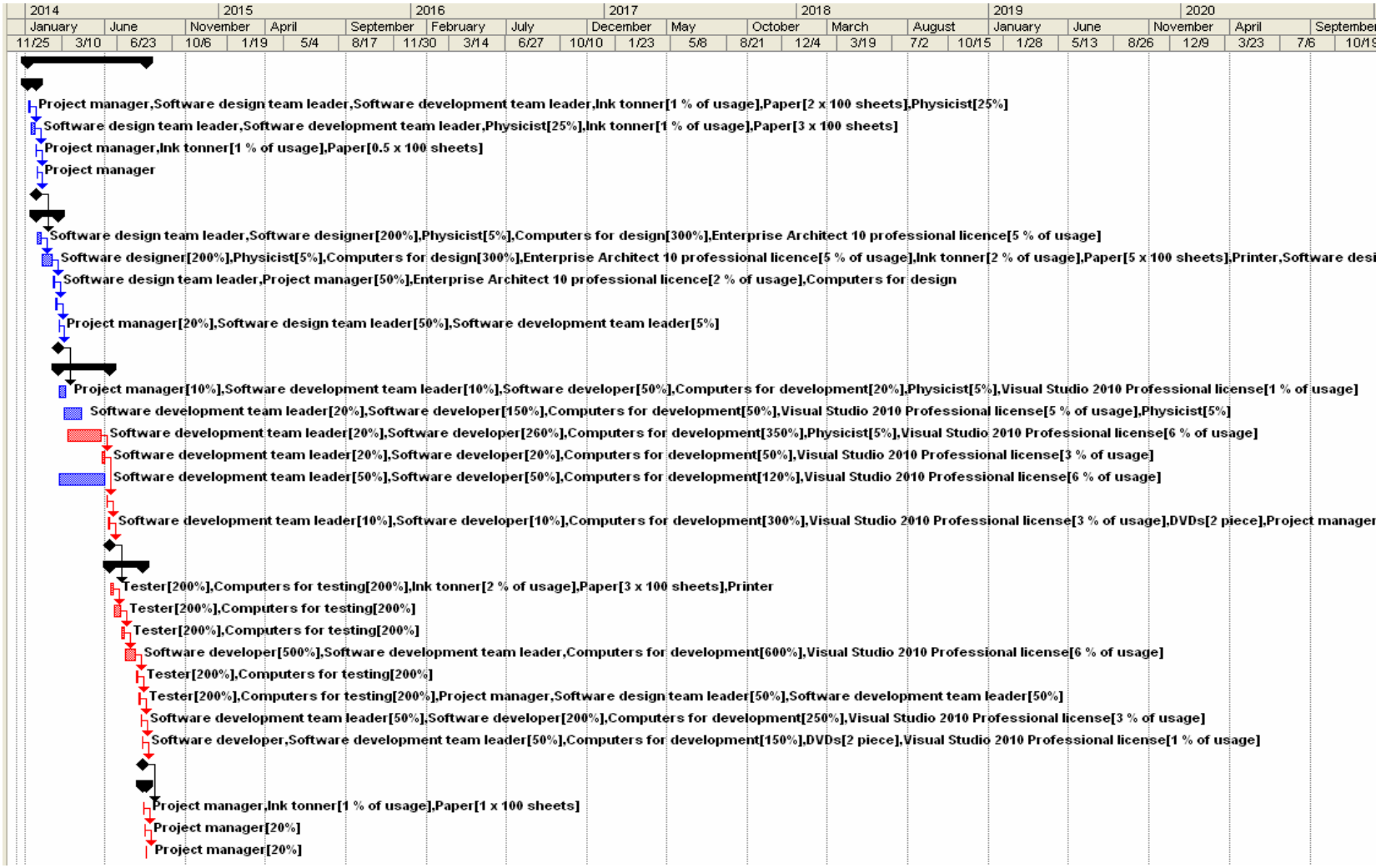
Legend:

R = Responsible organizational unit

P = Performing organizational unit

The project management resources necessary during each phases of the project and the corresponding cost are presented in the table 7.

Table 7: Project Management Resources



VII. COMMUNICATIONS MANAGEMENT

In order to achieve project objectives and successfully finish the project it must be assured timely and effective communication to all of the stakeholders involved in the project. For that is important to get the right information to the right people at the right time in a useful format. The communication will be based on the scope and the project phases.

Communication during the project will be done using the communication facilities (fax machines, telephones, teleconferencing systems, document management systems, word processors, etc.) provided by and customer. Communications will be realized using the company existing templates for all communication documents (fax, written reports, Status reports, Progress reports, etc.) or the template provided by the customer.

The methods of communications used in order to successfully implement the project are presented in the table below.

Table 8: Communication management plan

Stakeholder	**Information requirements**	**Methods of communication**	**Responsible for delivery**	**When/ frequency**	**Template requirement**
Customer	Project progress	Status reports Testing report Meetings (formal or informal)	Project manager	At the end of analysis phase (first milestone) During testing phase At the end of the project	According with the templates provided by company
Decision makers from company	Project progress Technical Issues Test result	Written reports Status review meetings Final project report Formal meetings	Project manager	At request	Progress reports template

Work Team members	Project presentation Project phases and deliverables Project progress Task assignment Troubles and changes occurring in the project	Written information Formal and informal meetings Presentations Oral discussions E-mail Phone	Project manager	When necessary	According with the templates provided by company
Potential end user	Technical issue impact	Workshops Posters Meetings (formal or informal) E-mail Feedback quiz	Project Manager	At the end of the project	According with the templates provided by company Power Point Presentation
Project Manager	Project progress	Written reports Status reports Progress reports	Software design team leader Software development team leader	When necessary	According with the templates provided by company

VIII. RISKS MANAGEMENT

The main risks that can occur in different phases of the project and can negatively influence the outcome are presented in table 9.

Table 9: List of risks that may appear during the project

Risk name	Risk description	Risk category	Risk level	Risk approach
Problems in estimation and scheduling	The project manager and team leaders of the project didn't estimate correctly the time needed to perform a task.	organization management	low	A good monitoring of all the projects of the company and apply lessons learnt in the future.
Conflict within project team	Communication problems among team members	organization management	low	Organizing briefing to choose and implement the best ideas
Team members resignations	Some team members may decide to quit their jobs.	cost	low	Provide them internal maximum salary increases in order to not quit their jobs.
Growth of the requirements number	In the developing of the project can arise some issues that have not been identified in analysis phase.	cost	medium	To establish the initials requirements and specific functionality use the best developers and try to anticipate the worst-case scenario.
Unclear or incomplete specifications	Some of the requirements established in the analysis phase might	technical	medium	When the specifications are established use the best developers and designers.

Risk name	Risk description	Risk category	Risk level	Risk approach
	conflict or are not clearly stated.			
Compromising on design	Usually developer tend to rush the design phase	Technical	medium	Because designing is the most critical part of software development set a realistic schedule and stick to it.
Technical risks	The company might reduce the functionality of the software to compensate for overruns pertaining to high budgets and scheduling.	Technical	medium	A better scheduling of the project.
User acceptance	Users agree with the software design	Legal	Low	The initials requirements and specific functionality are established together with the customer.
Budget constrains	The allocation of the budget for the project	cost	low	The project costs have been established and approved.
Cost Exchange rate	Insufficient funding for project due to Euro/RON exchange rate	cost	high	When develop the preliminary budget take in account overall costs (about 10% of the estimated cost)

Risk name	Risk description	Risk category	Risk level	Risk approach
Quality	Not enough measurable quality criteria could be addressed.	Quality criteria	low	For quality assurance purposes, team members trained to deal with quality issues will play a key role in the project

IX. PROCUREMENT

All material and equipment needed in this project are procured by the Acquisition department of the company and are available at beginning of the project.

7. PROJECT CLOSING

After the testing phase is closed and is obtained the final user signoff acknowledging that the software fully meets initial requirements all the documents that have been released in the project are archived. The project is close after the customer pay the invoice and the company receive the money.

COMPUTER RECOGNITION OF HUMAN BODY LANGUAGE

Diana MILITARU

CONTENTS

INTRODUCTION

Human body language interpretation in machine learning context

According to various researchers, body language is thought to account for between 50 to 70 percent of all communication.

To do an automatic interpretation of the body language is a real challenge because it needs to learn a machine to recognize body positions and signals using hybrids machine learning methods.

Machine learning is a branch of artificial intelligence. It concerns the construction and study of automatic systems that can learn from data. After learning, it can be used to classify or recognize another data.

The core of machine learning deals with representation and generalization. Representation of data instances and functions evaluated on these instances are part of all machine learning systems. Generalization is the property that the system will perform well on unseen data instances; the conditions under which this can be guaranteed are a key object of study in the subfield of computational learning theory.

Human body language may provide clues as to the attitude or state of mind of a person. It may indicate aggression, attentiveness, boredom, pleasure, amusement, etc. It is significant to communication and relationships. Body language is relevant to management and leadership in business and also in places where it can be observed by many people. Body language signals happen on both a conscious and unconscious level. Although body language is non-verbal or non-spoken communication, it can reveal clues as to some unspoken intention or feeling through their physical behavior. These behaviors can include body posture, gestures, facial expressions, and eye movements (Figure 12, Figure 13 and Figure 14). Body language is typically subconscious behavior, and is therefore considered distinct from sign language, which is a fully conscious and intentional act of communication ([1], [2], [3], [4], [5], [6], [7]).

Figure 12. The people who bite their lip are vulnerable, embarrassed and shy.

Figure 13. Crossing the arms is a telltale sign of disapproval or inaccessibility.

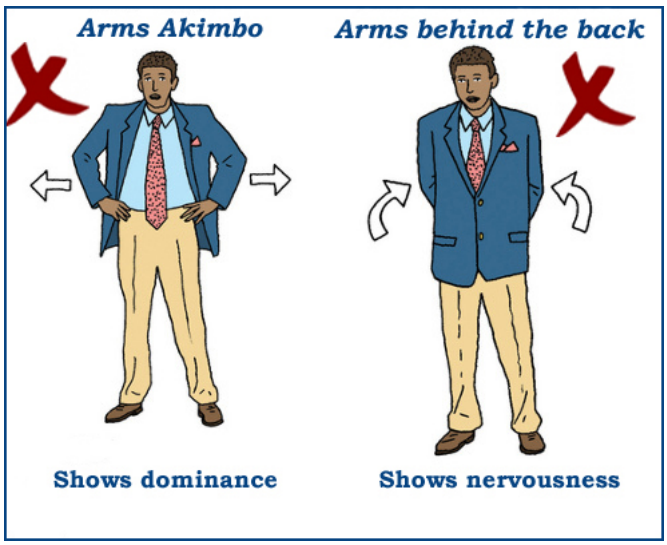


Figure 14. Some psychological interpretation of arm positions

Vision is the most important sense on which the majority of organisms depend for life. Scene reflectance properties in various spectral bands provide invaluable information about an object's characteristics, including its shape, material, temperature, illumination and dynamism. This information, however, is very difficult to capture with an electronic device. A real visual scene to be captured is subject to variable illumination as well as variable observation conditions. Furthermore, single objects of interest can be partially occluded or shaded, may be positioned at various distances from the capturing device, data can be noisy and/or incomplete; thus successful interpretation of imaging sensor data requires sophisticated and complex analytical methods and computing power.

Automatic video understanding is a growing need for many applications in order to manage and exploit the enormous and increasing volume of available video data. Modeling and recognizing human body language is a difficult issue. One of the main challenges is how to easily find particular events in video-surveillance data.

The video data is characterized by a great variability and the lack of available prior knowledge applicable to:

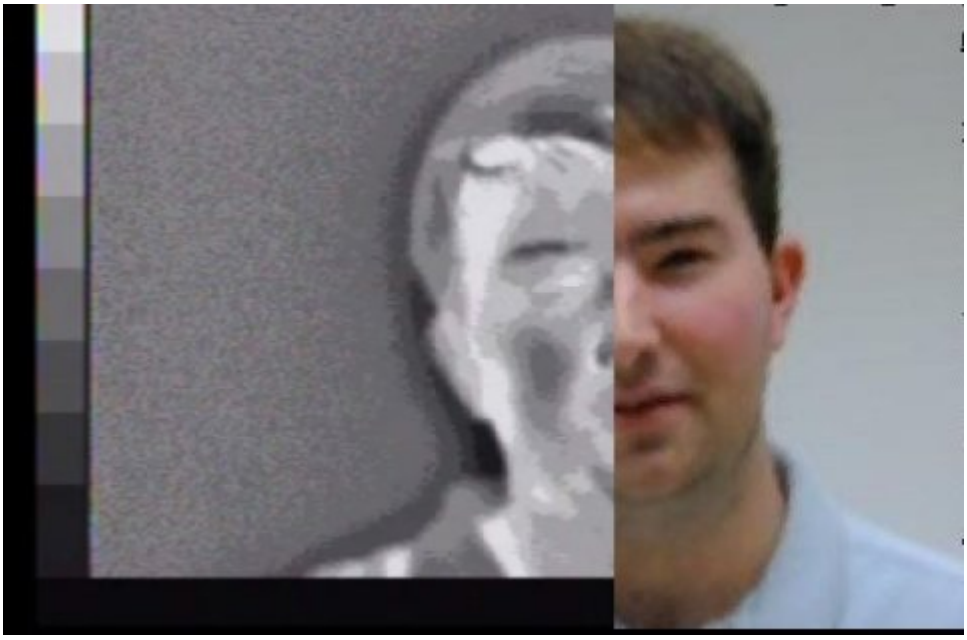
(a) the recording process (the viewpoint, the camera motion, the video quality, and the resolution),

(b) the scene (indoors or outdoors, crowded or not, moving and cluttered backgrounds, occlusions, lighting conditions),

(c) the actions performed (fast or slow motions, interactions).

Computer recognition of the human body language

To use the computer recognition of the human body language in all illumination conditions and to capture the face details there is necessary to use both infrared and visible cameras and combine their features in a useful manner. The methods used in this project are described in [9], [10]. Detection of a facial feature in a thermal image is an essential step in these applications. Unfortunately, it is difficult to directly extract some face features, even for salient features in the thermal image because of the poor contrast between the features and the face in these images. On the other hand, face features can more easily be detected in visible images. This suggests that an effective algorithm is used to fuse visible and infrared face images, which allows one to find facial features in infrared images by finding them first in the visible counterpart. These methods require a special apparatus to work in conjunction with the infrared images and they are expensive and require elaborate calibrations. Eye and mouth corners (Figure 15) are detected in the visible image, and the head pose with respect to the visible camera is estimated based on the features. Then, the corresponding feature points in the infrared image can be found by the head pose and the known 3-D geometric relationship between the visible and thermal cameras. By doing so, skin temperature range within the infrared image can be superimposed over the visible face image and vice versa.



(a) *(b)*

Figure 15. Thermal (a) and visual (b) image and the face characteristics

The performance of face recognition systems varies significantly according to the environment where face images are taken and according to the way user-defined parameters

are adjusted in several applications. Recognition based only on the visual spectrum remains limited in uncontrolled operating environments such as outdoor situations and low illumination conditions. The infrared spectrum comprises mid-wave infrared (3-5μm), and long-wave infrared (8-12μm), all longer than the visible spectrum (0.4-0.7μm). Infrared imagery is independent of ambient lighting since their sensors only measure the heat emitted by objects. The use of thermal imagery has great advantages in poor illumination conditions, where visual face recognition systems often fail.

Action recognition encompasses two main tasks: classification and localization. The classification assigns a semantic label to an entire video focused on an action. The localization provides both the semantic label and its spatio-temporal extent in videos. The major difficulty lies in how to identify, represent, and integrate in a learning framework the relevant structural aspects of actions. For computers to be capable of such a high-level interpretation, they need models to represent the various inter-related motions caused by the temporal evolution of the body parts entities over the course of an action.

The main features of an image are:

(a) Colors – a relevant feature when dealing with the perception of static and moving images.

(b) Texture – a tactile or visual characteristics of a surface; image texture gives us information about the spatial arrangement of colours or intensities in an image or selected region of an image.

(c) Edges – large discontinuities in the image.

The main steps of the face expression recognition are:

(1) Face identification even in crowds of people (Figure 16)

(2) Face cropping to eliminate the unuseful image parts (Figure 16)

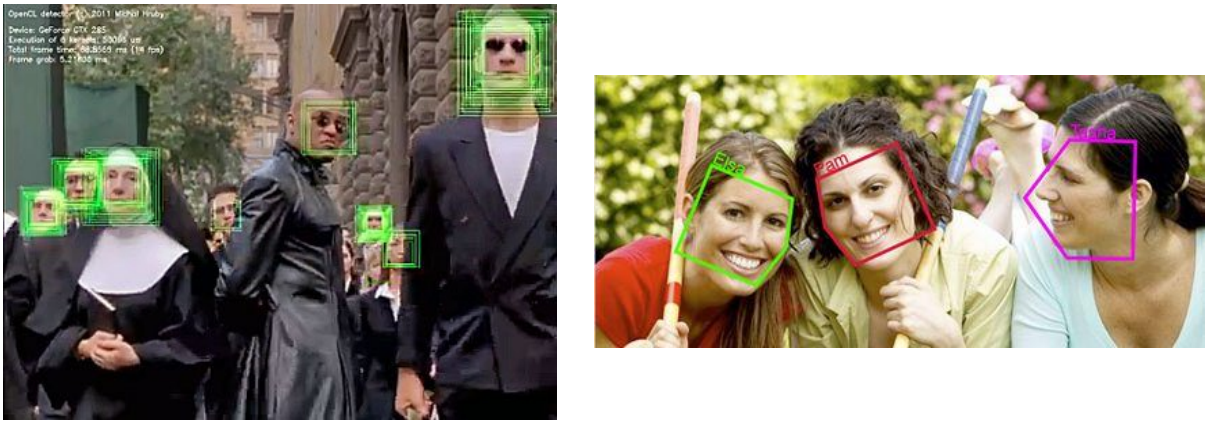


Figure 16. Face identification and cropping

(3) Dividing the images in blocks (Figure 17)

(4) Extracting the image blocks features to determine colors, illumination, texture, edges (Figure 17)

(5) Identifying the face parts

(6) Face orientation determination to identify the emotions target

(7) Recognition of face expression using psychological annotated image database

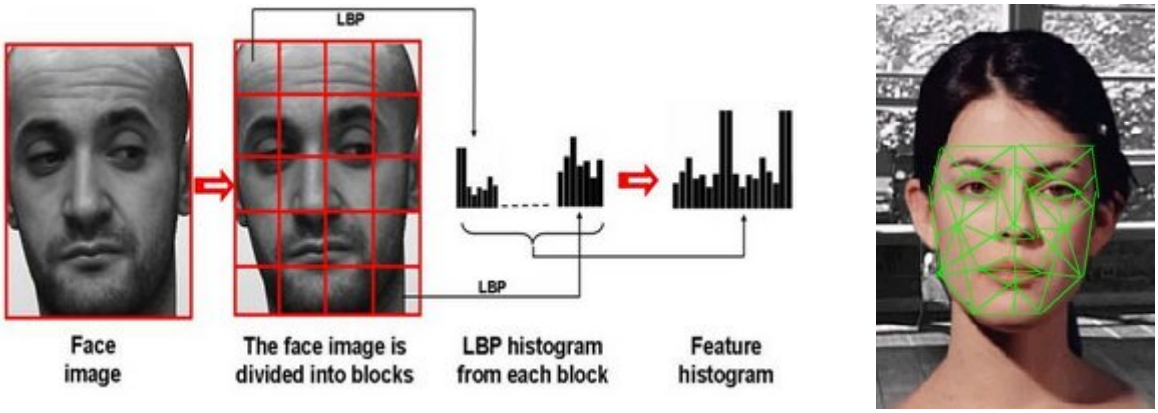


Figure 17. Dividing the images in blocks, extracting the features and identifying the face parts

Human body language recognition is realized using two stages (Figure 18):

(1) Training – a software application that will be done to obtain the image feature database using the psychological annotated image database.

(2) Recognition – another software application that with the aid of the video cameras (visual and infrared) and the image feature database will offer in real time the human body language interpretation. Due to the large amount of available video data, supervised machine learning algorithms can automatically learn complex action models from annotated training examples.

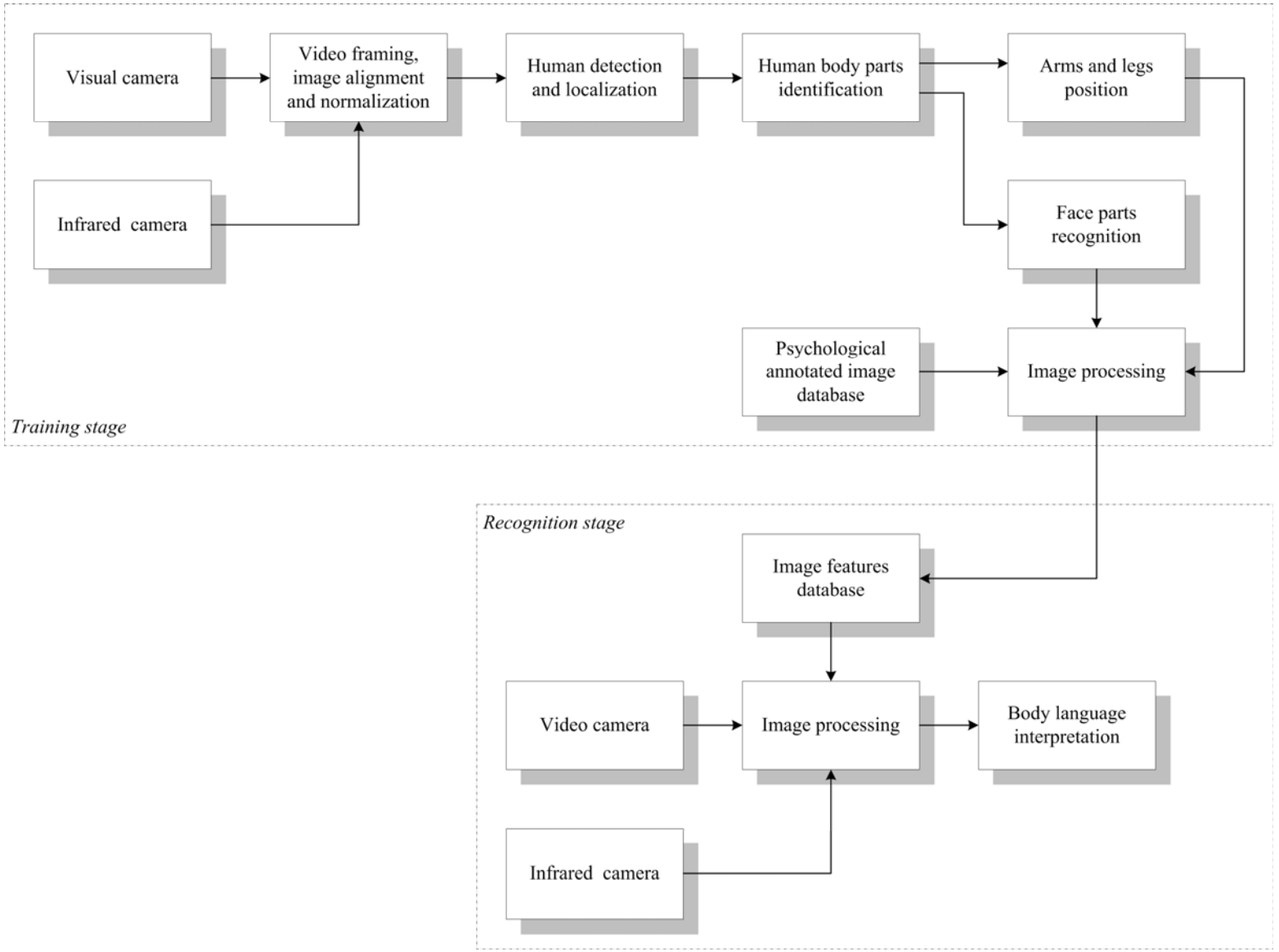


Figure 18. Computer recognition of human body language (training and recognition stages)

PROJECT SCOPE

The tracking of human body parts from video has received a great deal of attention over the years [8], with the majority of work being conducted using static cameras in controlled environments. Realization of an automatic identification of human body language is very necessary to prevent dangerous situation in the airports. The project proposes a modality to use psychological annotated images data in machine learning and to do an automatic recognition of some particular situation.

The scope of the project is interpreting the main position of the human body to identify human emotions, danger signals, fight or flight indicators, hostility, in order to help other people to interact with them or to prevent dangerous situations.

The ***main objectives*** of the project are:

O1. Indentifying the significance of the facial expressions

The facial expressions include emotions and expressions, like happiness, sadness, anger, surprise, disgust, fear, confusion, excitement, desire, and contempt, according to the expression of the eyes, lips, and chins. One example is presented in Figure 12.

O2. Indentifying the significance of the human body positions and gestures

Gestures can be some of the most direct and obvious body language signals (Figure 12, Figure 13, Figure 14). Waving, pointing, and using the fingers to indicate numerical amounts are some very common and easy to understand gestures. Some gestures may be cultural and other gestures are most difficult to understand.

Product acceptance criteria are presented in table 1.

Table 1. Product acceptance criteria

Category	Acceptance criteria
Functionality	System testing report shows that the user requirements are implemented, evaluated, and functional in the operating environment. User acceptance testing report is approved and signed. The functionality is documented.
Performance	The product works in real time in operational environment
Interface quality	The interface is user friendly. The interface is documented.

Project boundaries are:

- The customer is only Obelisk Company which will deal with marketing and look for potential clients.
- The limits of the project budget are 360,000 and 470,000 lei.
- The software application timeline is 30.12.2014 and it must be functional in the airport starting with 01.01.2015.
- The software application will be used only for human body language identification. All other uses are out of scope.

Project constraints

The project management triangle is used by managers to analyze or understand the difficulties that may arise due to implementing and executing a project. All projects irrespective of their size will have many constraints. Although there are many such project constraints, these should not be barriers for successful project execution and for the effective decision making.

The main three constraints in a project management triangle are time, cost and scope:

The *time constraint* is the short period o project completeness: 12.19.2013.

The *cost constraint* of the project budget is 470,000 lei.

The *project deliverables (scope constraint)* are:

D1. Software requirements specification
D2. Database acquisition specification
D3. Algorithm architecture design specification
D4. Preliminary software specification
D5. Software design specification
D6. Functional specification
D7. User documentation
D8. Software unit test plans

D9. Software integration test plan

D10. Software testing procedures

D11. User acceptance testing

D12. User feedback quizzes

There are other constraints too. One of them is the big amount of image data that is necessary for this application to work. To realize an automatic body language interpretation there are necessary a lot of psychological annotated data with different body position and their interpretation.

Another identify constraint is the large computational cost due to the big amount of image data. Because of this, the computers need to be very efficient and the software application needs to be optimized.

The rapid movements of human body imply the possibility to extract the image features from the video frames and to recognize them more quickly. In that case it may be some delays if the software application optimization isn't optimal.

The large number of face feature models is another constraint. The face has a lot of details that must be considered to identify its expressions and emotions.

In some cases there are large crowds of people the human body or face identification could be difficult.

On the other part, the ***project assumptions*** are:

- Activities: 7 main activities with 35 sub-activities need for project completion.
- Human resources involved: project manager, software development manager, 2 senior software developers, 10 junior software developers, 3 computer scientists, 2 software testers, and a technical writer.
- Psychological annotated image database will be bought from Y Company.

In that case, the project has 35 activities grouped in 7 stages (phases): requirement analysis, algorithm and software design, software development, software testing, deployment and project closing. There are 6 ***milestones*** planned in order to establish the checkpoints of the critical path of the project enumerated bellow.

Table 2. The project milestones and their completion date

Milestones	Completion date
Decision point - Algorithm design complete	04.11.2014
Decision point - Software design complete	09.15.2014
Decision point - Software development complete	11.12.2014
Decision point - Unit test complete	12.05.2014
Decision point - Integration test complete	12.10.2014
Decision point – Project complete	12.19.2014

The detailed ***work breakdown structure*** is presented below.

Table 3. Work breakdown structure and dependencies

Main activity	Sub-activity	Dependencies
1.1. Requirements establishing	1.1.1. Define the user requirements and establish work teams	All other tasks cannot start before 1.1.1 finishes.
	1.1.2. Analyze the requirements	It starts after 1.1.1 finished. After 1.1.2 finishes, 1.1.3 may begin.
	1.1.3. Elaborate the software requirements specification	It starts after 1.1.2 finished. After 1.1.3 finishes, 1.1.4 may begin.
	1.1.4. Elaborate the database acquisition specification	It starts after 1.1.4 finished. After 1.1.4 finishes, 1.1.5 may begin.
	1.1.5. Initiate the acquisition of the annotated databases	It starts after 1.1.4 finished. After 1.1.5 finishes, 1.4.1 may begin.
1.2. Algorithm architecture design	1.2.1. Develop the requirements	It starts after 1.1.4 finished. After 1.2.1 finishes, 1.2.2 may begin.
	1.2.2. Elaborate the algorithm architecture design specification	It starts after 1.2.1 finished. After 1.2.2 finishes, 1.2.3 may begin.
	1.2.3. Elaborate the preliminary software specification	It starts after 1.2.2 finished. After 1.2.3 started, 1.2.4 may begin.
	1.2.4. Review the preliminary software specification and budget with software development team	It starts after 1.2.3 finished. After 1.2.4 finishes, 1.2.5 may begin.

Main activity	Sub-activity	Dependencies
	1.2.5. Decision point - Algorithm design complete	It starts after 1.2.4 finished. After 1.2.5 finishes, 1.3.1 may begin.
1.3. Software architecture design	1.3.1. Review preliminary software specification	It starts after 1.2.5 finished. After 1.3.1 finishes, 1.3.2 may begin.
	1.3.2. Design the system architecture	It starts after 1.3.1 finished. After 1.3.2 finishes, 1.3.3 may begin.
	1.3.3. Develop functional specifications	It starts after 1.3.2 finished. After 1.3.3 finishes, 1.3.4 may begin.
	1.3.4. Decision point - Software design complete	It starts after 1.3.3 finished. After 1.3.4 finishes, 1.4.1 may begin.
1.4. Software development	1.4.1. Review functional specifications	It starts after 1.3.4 and 1.1.5 finished. After 1.4.1 finishes, 1.4.2 may begin.
	1.4.2. Develop software code	It starts after 1.4.1 finished. After 1.4.2 finishes, 1.4.3 may begin.
	1.4.3. Developer testing (primary debugging)	It starts after 1.4.2 finished. After 1.4.3 finishes, 1.4.4 may begin.
	1.4.4. Realize the software integration	It starts after 1.4.3 finished. After 1.4.4 finishes, 1.4.5 may begin.
	1.4.5. Decision point - Software development complete	It starts after 1.4.4 finished. After 1.4.5 finishes, 1.4.6 may begin.
	1.4.6. Elaborate the user documentation	It starts after 1.4.5 finished. After 1.4.6 finishes, 1.5.1 may begin.
1.5. Software testing	1.5.1. Develop unit test plans using product specifications	It starts after 1.4.6 finished. After 1.5.1 finishes, 1.5.2 may begin.
	1.5.2. Develop integration test plans using product specifications	It starts after 1.5.1 finished. After 1.5.2 finishes, 1.5.3 may begin.
	1.5.3. Realize the testing procedure	It starts after 1.5.2 finished. After 1.5.3 finishes, 1.5.4 may begin.
	1.5.4. Unit testing	It starts after 1.5.3 finished. After 1.5.4 finishes, 1.5.5 may begin.
	1.5.5. Modified module code and retesting	It starts after 1.5.4 finished. After 1.5.5 finishes, 1.5.6 may begin.
	1.5.6. Decision point - Unit test complete	It starts after 1.5.5 finished. After 1.5.6 finishes, 1.5.7 may begin.
	1.5.7. Integration testing	It starts after 1.5.6 finished. After 1.5.7 finishes, 1.5.8 may begin.

Main activity	Sub-activity	Dependencies
	1.5.8. Modified code and retesting	It starts after 1.5.7 finished. After 1.5.8 finishes, 1.5.9 may begin.
	1.5.9. Decision point - Integration test complete	It starts after 1.5.8 finished. After 1.5.9 finishes, 1.5.10 may begin.
	1.5.10. Realize the testing report	It starts after 1.5.9 finished. After 1.5.10 finishes, 1.6.1 may begin.
1.6. Deployment	1.6.1. Realize the software installation kit	It starts after 1.5.10 finished. After RSIK finishes, IS may begin.
	1.6.2. Install the software	It starts after 1.6.1 finished. After 1.6.2 finishes, 1.6.3 may begin.
	1.6.3. User acceptance testing and evaluate the software	It starts after 1.6.2, 1.5.9, 1.4.6 finished. After 1.6.3 finishes, 1.6.4 may begin.
	1.6.4. Invoice paid	It starts after 1.6.3 finished. After 1.6.4 finishes, 1.7 may begin.
1.7. Decision point – Project complete		It starts after 1.6.3, 1.6.4 finished.

TIME MANAGEMENT

The project will be start on 01.20.2014 and finish on 12.19.2014 with a total project duration of 221 days (11 months). The project management plan sets 3 lags for the activity 1.2.1, 1.3.2, and 1.4.2 (with a total of 6 days) for eventually unforeseen delays and 3 weeks for annual leaves in June, July and August (one week each).

The work breakdown dictionary of the project with dependencies and durations is illustrated in the table below, Appendix 1 and 2.

Table 4. Time management matrix

Activity	Total work (hours)	Duration (days)	Start date	Finish date
1. Computer recognition of human body language	11,242.08	221	01/20/2014	12/19/2014
1.1. Requirements establishing	229.83	80	01/20/2014	05/13/2014
1.1.1. Define the user requirements and establish work teams	35.2	2	01/20/2014	01/21/2014
1.1.2. Analyze the requirements	57.6	20	01/22/2014	02/18/2014
1.1.3. Elaborate the software requirements specification	86.4	5	02/19/2014	02/25/2014
1.1.4. Elaborate the database acquisition specification	50.63	3	02/26/2014	02/28/2014
1.1.5. Initiate the acquisition of the annotated databases	0	50	03/03/2014	05/13/2014
1.2. Algorithm architecture design	1,074	31	02/28/2014	04/11/2014
1.2.1. Develop the requirements	538.93	20	02/28/2014	03/27/2014
1.2.2. Elaborate the algorithm architecture design specification	229.82	10	03/28/2014	04/10/2014
1.2.3. Elaborate the preliminary software specification	295.47	8	04/01/2014	04/10/2014
1.2.4. Review the preliminary software specification and budget with software development team	9.78	1	04/11/2014	04/11/2014
1.2.5. Decision point - Algorithm design complete	0	0	04/11/2014	04/11/2014
1.3. Software architecture design	2,911.2	93	04/14/2014	09/15/2014
1.3.1. Review preliminary software specification	24	1	04/14/2014	04/14/2014

Activity	Total work (hours)	Duration (days)	Start date	Finish date
1.3.2. Design the system architecture	1,924.8	60	04/16/2014	07/18/2014
1.3.3. Develop functional specifications	962.4	30	07/18/2014	9/15/2014
1.3.4. Decision point - Software design complete	0	0	09/15/2014	9/15/2014
1.4. Software development	6,472.25	63	09/15/2014	12/12/2014
1.4.1. Review functional specifications	10.52	1	09/15/2014	09/16/2014
1.4.2. Develop software code	5,280	36	09/18/2014	11/07/2014
1.4.3. Developer testing (primary debugging)	864	27	10/01/2014	11/07/2014
1.4.4. Realize the software integration	96	3	11/07/2014	11/12/2014
1.4.5. Decision point - Software development complete	0	0	11/12/2014	11/12/2014
1.4.6. Elaborate the user documentation	221.73	21	11/12/2014	12/12/2014
1.5. Software testing	518	22	11/12/2014	12/15/2014
1.5.1. Develop unit test plans using product specifications	65.6	4	11/12/2014	11/18/2014
1.5.2. Develop integration test plans using product specifications	97.2	3	11/18/2014	11/21/2014
1.5.3. Realize the testing procedure	82	5	11/21/2014	11/28/2014
1.5.4. Unit testing	64	2	11/28/2014	12/03/2014
1.5.5. Modified module code and retesting	64	2	12/03/2014	12/05/2014
1.5.6. Decision point - Unit test complete	0	0	12/05/2014	12/05/2014
1.5.7. Integration testing	64	2	12/05/2014	12/09/2014

Activity	Total work (hours)	Duration (days)	Start date	Finish date
1.5.8. Modified code and retesting	32	1	12/09/2014	12/10/2014
1.5.9. Decision point - Integration test complete	0	0	12/10/2014	12/10/2014
1.5.10. Realize the testing report	49.2	3	12/10/2014	12/15/2014
1.6. Deployment	36.8	4	12/15/2014	12/19/2014
1.6.1. Realize the software installation kit	16	1	12/15/2014	12/16/2014
1.6.2. Install the software	8.8	1	12/16/2014	12/17/2014
1.6.3. User acceptance testing and evaluate the software	8	1	12/17/2014	12/18/2014
1.6.4. Invoice paid	4	1	12/18/2014	12/19/2014
1.7. Decision point - Project complete	0	0	12/19/2014	12/19/2014

COST MANAGEMENT

Cost management uses technology to measure cost and productivity through the full life cycle of the project. It includes estimating tools and materials to be used during the project, human resource control, scheduling, and their cost.

The resource costs are presented in table 5, 6 and Appendix 1.

Table 5. The total project cost of resources

Resource name	No. of persons / work	Cost (lei/hour)	Total cost (lei)
Human resources			
Project manager	1	100.00	4,520.00
Software development manager	1	90.00	10,293.61
Software tester	2	80.00	23,040.00
Senior software developer	2	70.00	57,370.29
Junior software developer	10	60.00	144,481.97
Computer scientist	3	70.00	129,262.05
Technical writer	1	50.00	6,533.33
Tools			
Computer for development	12	1.00	5,128.25
Computer	3	0.50	212.13
Printer	13% of usage	1.00	37.12
Materials			
Papers	26 x 100 sheets	3.00	78.00
Toner	23% of usage	15.00	345.00
Writing tools	24 pieces	5.00	120.00
DVD	2 pieces	5.00	10.00
Psychological annotated databases	1 piece	20,000.00	20,000.00
Microsoft Visual Studio Ultimate 2013	-	-	-
Microsoft Windows 7 Ultimate	-	-	-
Microsoft Office 2010	-	-	-

Table 6. The total project cost per activity

Activity/resource	Cost per activity (lei)	Hours/work per activity
1. Computer recognition of human body language	**401,431.75**	**11,242.08 hrs**
1.1. Requirements establishing	34,766.24	229.83 hrs
1.1.1. Define the user requirements and establish work teams	3,060.40	35.2 hrs
Project manager	1,600.00	16 hrs
Software development manager	1,440.00	16 hrs
Computer	0.80	1.6 hrs
Printer	1.60	1.6 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
1.1.2. Analyze the requirements	3,827.60	57.6 hrs
Project manager	2,000.00	20 hrs
Software development manager	1,800.00	20 hrs
Computer	8.00	16 hrs
Printer	1.60	1.6 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
1.1.3. Elaborate the software requirements specification	6,447.00	86.4 hrs
Project manager	40.00	0.4 hrs
Software development manager	3,600.00	40 hrs
Senior software developer	2,800.00	40 hrs
Computer	2.00	4 hrs
Printer	2.00	2 hrs
Papers	3.00	1 x 100 sheets
1.1.4. Elaborate the database acquisition specification	1,431.24	50.63 hrs
Software development manager	216.00	2.4 hrs
Technical writer	1,200.00	24 hrs
Computer	12.00	24 hrs
Printer	0.24	0.23 hrs
Papers	3.00	1 x 100 sheets

Activity/resource	Cost per activity (lei)	Hours/work per activity
1.1.5. Initiate the acquisition of the annotated databases	20,000.00	0 hrs
Psychological annotated databases	20,000.00	1 piece
1.2. Algorithm architecture design	52,719.28	1,074 hrs
1.2.1. Develop the requirements	29,697.56	538.93 hrs
Software development manager	1,440.00	16 hrs
Senior software developer	11,200.00	160 hrs
Computer scientist	16,936.59	241.95 hrs
Computer for development	120.98	120.98 hrs
1.2.2. Elaborate the algorithm architecture design specification	10,635.70	229.82 hrs
Senior software developer	560.00	8 hrs
Computer scientist	9,978.43	142.55 hrs
Computer for development	71.27	71.27 hrs
Printer	8.00	8 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
1.2.3. Elaborate the preliminary software specification	12,220.39	295.47 hrs
Software development manager	576.00	6.4 hrs
Software tester	2,560.00	32 hrs
Senior software developer	8,512.00	121.6 hrs
Computer scientist	388.47	5.55 hrs
Computer for development	128.00	128 hrs
Printer	1.92	1.92 hrs
Papers	9.00	3 x 100 sheets
Toner	45.00	3 % of usage
1.2.4. Review the preliminary software specification and budget with software development team	165.63	9.78 hrs
Project manager	80.00	0.8 hrs
Software development manager	72.00	0.8 hrs
Senior software developer	2.29	0.03 hrs
Junior software developer	1.97	0.03 hrs

Activity/resource	Cost per activity (lei)	Hours/work per activity
Computer scientist	2.29	0.03 hrs
Computer	4.00	8 hrs
Printer	0.08	0.08 hrs
Papers	3.00	1 x 100 sheets
1.2.5. Decision point - Algorithm design complete	0.00	0 hrs
1.3. Software architecture design	104,173.17	2,911.2 hrs
1.3.1. Review preliminary software specification	1,851.97	24 hrs
Software development manager	717.61	7.97 hrs
Computer scientist	1,116.28	15.95 hrs
Printer	0.08	0.08 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
1.3.2. Design the system architecture	68,192.80	1,924.8 hrs
Computer scientist	67,200.00	960 hrs
Computer for development	960.00	960 hrs
Printer	4.80	4.8 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
Writing tools	10.00	2 piece
1.3.3. Develop functional specifications	34,128.40	962.4 hrs
Computer scientist	33,600.00	480 hrs
Computer for development	480.00	480 hrs
Printer	2.40	2.4 hrs
Papers	6.00	2 x 100 sheets
Toner	30.00	2 % of usage
Writing tools	10.00	2 piece
1.3.4. Decision point - Software design complete	0.00	0 hrs

Activity/resource	Cost per activity (lei)	Hours/work per activity
1.4. Software development	186,723.07	6,472.25 hrs
1.4.1. Review functional specifications	196.00	10.52 hrs
Software development manager	72.00	0.8 hrs
Senior software developer	80.00	1.15 hrs
Computer scientist	40.00	0.57 hrs
Computer	4.00	8 hrs
1.4.2. Develop software code	146,998.00	5,280 hrs
Junior software developer	144,000.00	2,400 hrs
Computer for development	2,880.00	2,880 hrs
Papers	3.00	1 x 100 sheets
Toner	15.00	1 % of usage
Writing tools	100.00	20 piece
1.4.3. Developer testing (primary debugging)	30,672.00	864 hrs
Senior software developer	30,240.00	432 hrs
Computer for development	432.00	432 hrs
1.4.4. Realize the software integration	3,408.00	96 hrs
Senior software developer	3,360.00	48 hrs
Computer for development	48.00	48 hrs
1.4.5. Decision point - Software development complete	0.00	0 hrs
1.4.6. Elaborate the user documentation	5,449.07	221.73 hrs
Technical writer	5,333.33	106.67 hrs
Computer	53.33	106.67 hrs
Printer	8.40	8.4 hrs
Papers	9.00	3 x 100 sheets
Toner	45.00	3 % of usage
1.5. Software testing	20,776.00	518 hrs
1.5.1. Develop unit test plans using product specifications	2,631.60	65.6 hrs
Software tester	2,560.00	32 hrs
Computer	16.00	32 hrs
Printer	1.60	1.6 hrs

Activity/resource	Cost per activity (lei)	Hours/work per activity
Papers	9.00	3 x 100 sheets
Toner	45.00	3 % of usage
1.5.2. Develop integration test plans using product specifications	3,901.20	97.2 hrs
Software tester	3,840.00	48 hrs
Computer	24.00	48 hrs
Printer	1.20	1.2 hrs
Papers	6.00	2 x 100 sheets
Toner	30.00	2 % of usage
1.5.3. Realize the testing procedure	3,258.00	82 hrs
Software tester	3,200.00	40 hrs
Computer	20.00	40 hrs
Printer	2.00	2 hrs
Papers	6.00	2 x 100 sheets
Toner	30.00	2 % of usage
1.5.4. Unit testing	2,576.00	64 hrs
Software tester	2,560.00	32 hrs
Computer	16.00	32 hrs
1.5.5. Modified module code and retesting	2,576.00	64 hrs
Software tester	2,560.00	32 hrs
Computer	16.00	32 hrs
1.5.6. Decision point - Unit test complete	0.00	0 hrs
1.5.7. Integration testing	2,576.00	64 hrs
Software tester	2,560.00	32 hrs
Computer	16.00	32 hrs
1.5.8. Modified code and retesting	1,288.00	32 hrs
Software tester	1,280.00	16 hrs
Computer	8.00	16 hrs
1.5.9. Decision point - Integration test complete	0.00	0 hrs
1.5.10. Realize the testing report	1,969.20	49.2 hrs
Software tester	1,920.00	24 hrs
Computer	12.00	24 hrs

Activity/resource	Cost per activity (lei)	Hours/work per activity
Printer	1.20	1.2 hrs
Papers	6.00	2 x 100 sheets
Toner	30.00	2 % of usage
1.6. Deployment	2,274.00	36.8 hrs
1.6.1. Realize the software installation kit	578.00	16 hrs
Senior software developer	560.00	8 hrs
Computer for development	8.00	8 hrs
DVD	10.00	2 piece
1.6.2. Install the software	536.00	8.8 hrs
Senior software developer	56.00	0.8 hrs
Junior software developer	480.00	8 hrs
1.6.3. User acceptance testing and evaluate the software	760.00	8 hrs
Project manager	400.00	4 hrs
Software development manager	360.00	4 hrs
1.6.4. Invoice paid	400.00	4 hrs
Project manager	400.00	4 hrs
1.7. Decision point - Project complete	0.00	0 hrs

QUALITY MANAGEMENT

Omega Company has developed and implemented a quality management system according to "ISO 9001:2008 Quality Management Systems" in order to document the company's best business practices, better satisfy the requirements and expectations of its customers and to improve the overall management of the company.

All project management documents are realized using the Omega Company templates to assure them that the integrity of our quality management system is maintained and focused on customer satisfaction and continuous improvement.

Quality management within this project is a continuous activity, which involves quality planning, quality assurance and quality control. It encompasses the entire software development process, which includes processes such as requirements definition, software design, coding, source code control, code reviews, change management, configuration

management, testing, release management, and product integration. Quality management is organized into goals, commitments, abilities, activities, measurements, and verifications.

The quality management documents will use the templates of the Omega Company.

The main standards used are:

- ISO/IEC 12207 Systems and software engineering - Software life cycle processes
- ISO/IEC 15288:2008 Systems and Software Engineering - Life Cycle Processes - Risk Management
- IEEE Std 1028-1997 Standard for Software Reviews
- ISO/IEC 9126 Software engineering - Product quality

Quality planning is performed during each activity start and encompasses the statement of specific quality requirements or elaboration of test acceptance procedures.

Quality assurance

Quality assurance is a set of activities for ensuring quality in the processes by which products are developed and aims to prevent defects with a focus on the process used to make the product. It is a proactive quality process.

The following table defines the sequence of activities that must be performed in support of the acceptance process and who is responsible for those activities.

Table 7. List of deliverables and acceptance criteria

Deliverables	Quality acceptance criteria	Quality assurance responsibility	Activity
Software requirements specification	The *Software requirements specification* describes what capabilities the application should have and includes: product requirements, business case, functional requirements, and data requirements. The software development team has reviewed the specification to ensure its sufficiency for beginning application design and to determine which requirements can be met within the constraints of the current project phase. The software test team has reviewed the specification to ensure that all requirements are testable. The project manager has reviewed the specification to ensure that all requirements are traceable to the scope, goals, and objectives established.	Project manager	1.1.3

Deliverables	Quality acceptance criteria	Quality assurance responsibility	Activity
Database acquisition specification	The *Database acquisition specification* includes the data requirements and describes what capabilities the database should have to be used in product development and implementation. The project manager has reviewed the specification to ensure that all requirements are traceable to the scope, goals, and objectives established.	Technical writer	1.1.4
Algorithm architecture design specification	The *Algorithm architecture design specification* describes the algorithms and its implementation mode to provide the capabilities defined in the *Software requirements specification*. The software development team has reviewed the specification to ensure that all algorithms are implementable. The software test team has reviewed the specification to ensure that all algorithms are testable.	Computer scientists	1.2.2
Preliminary software specification	The *Preliminary software specification* describes the preliminary software development characteristics according to the *Algorithm architecture design specification* and the *Software requirements specification*. The software development team has reviewed the specification to ensure that all algorithms are implementable. The software test team has reviewed the specification to ensure that all algorithms are testable.	Software development manager	1.2.3, 1.2.4, 1.3.1

Deliverables	Quality acceptance criteria	Quality assurance responsibility	Activity
Software design specification	The *Software design specification* describes how the software application should function and be constructed to provide the capabilities defined in the *Software requirements specification*. The design team has reviewed the specification for correctness, completeness, and consistency with respect to the prioritized requirements established in the *Software requirements specification*. The software development manager and software development team have reviewed the specification to ensure its sufficiency for beginning application development and to validate the feasibility of implementing the design within the constraints of the current project phase. The software test team has reviewed the specification to ensure that the design is testable.	Software development manager	1.3.2
Functional specification	The *Functional specification* describes what is needed by the system user as well as requested properties of inputs and outputs. It provides the capabilities defined in the *Software design specification* and *Software requirements specification*.	Software development manager	1.3.3, 1.4.1
User documentation	The user documentation describes in detail the procedures for using all of the functionality provided in the software application to be understandable for the user.	Technical writer	1.4.6
Software unit test plans	The software application was delivered into the test environment with functionality as specified in the *Software requirements specification*, and *Software design specification*.	Software testers	1.5.1
Software integration test plan		Software testers	1.5.2
Software testing procedures	The *Software testing procedures* describes in detail the procedures for testing all the functionality of the software application.	Software testers	1.5.3

Deliverables	Quality acceptance criteria	Quality assurance responsibility	Activity
User acceptance testing and user feedback quiz	For user acceptance testing, the integrated software application was delivered to meet the system test acceptance criteria. The integrated software application must pass through all acceptance testing scenarios with no critical/major/minor severity errors in any functional module. The software application is user friendly and is easy to work with. The user tests the software and provides feedback, including bug reports and usability issues. This feedback lets the software company know if the product is meeting user expectations.	Project manager	1.6.3

Quality control

Quality control is a set of activities for ensuring quality in products. The activities focus on identifying defects in the actual products produced. Quality control, therefore, is a reactive process.

The acceptance criteria in the table below define the conditions under which the user (Obelisk Company) and the project manager of Omega Company agree that they will accept completion of the milestones and deliverables subject to these acceptance criteria.

Measurement enables the Omega Company to improve the software process; assist in planning, tracking and controlling the software project and assess the quality of the software thus produced. It is the measure of such specific attributes of the process, project and product that are used to compute the software metrics. Metrics are analyzed and they provide a dashboard to the management on the overall health of the process, project and product. Generally, the validation of the metrics is a continuous process spanning multiple projects. The kind of metrics employed generally account for whether the quality requirements have been achieved or are likely to be achieved during the software development process. As a quality assurance process, a metric is needed to be revalidated every time it is used.

Defect removal efficiency is the chosen key quality measure. The defect removal efficiency gives a measure of the development team ability to remove defects prior to release and represents the percentage of bugs eliminated by software reviews, inspections and tests. It is calculated as a ratio of defects resolved to total number of defects found. It is typically measured prior and at the moment of release and is presented in table 8.

The calculation formula is:

Defect removal efficiency = Number of defects resolved by the development team / Total number of defects at the moment of measurement

Table 8. Defect removal efficiency on product stages

Stage	Defect removal efficiency (minimum)
Requirements review	30%
Top-level design reviews	40%
Detailed functional design reviews	45%
Detailed logic design reviews	55%
Code inspections	60%
Unit tests	25%
New Function tests	35%
Integration tests	45%
System test	50%
External tests	40%
Cumulative efficiency	**97%**

Other product quality factors are:

- Low defect potentials: maximum 2.5 per function point;
- High defect removal efficiency: minimum 95%;
- Unambiguous, stable requirements: maximum 2.5% change;
- Explicit requirements achieved: minimum 97.5%;
- High user satisfaction ratings: minimum 90%;

HUMAN RESOURCE MANAGEMENT

The roles and responsibilities are essential to project success. All human resources implied are from Omega Company and they must clearly understand their roles and responsibilities in order to successfully perform their portion of the project.

The Figure 19 represents the hierarchical-type project chart and the table 9 defines the roles and responsibilities for the project.

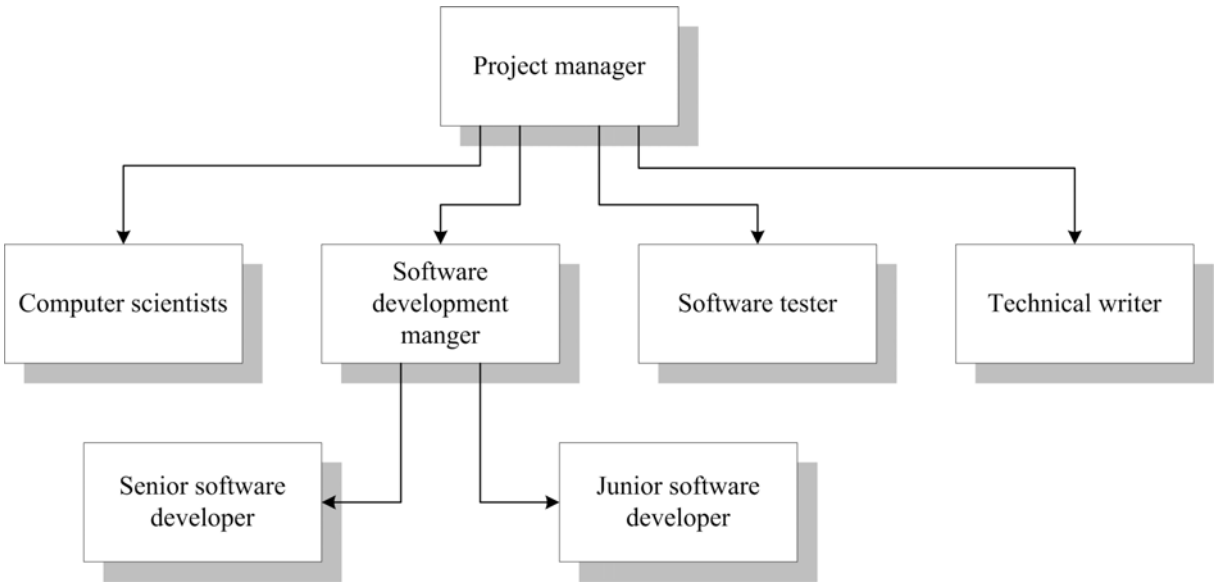


Figure 19. Hierarchical-type project chart

Table 9. Responsibility assignment matrix

Activity	PM	SDM	CS	SSD	JSD	ST	TW	FD
Define the user requirements necessary to implement and establish work teams	S	R	P	P		P		
Analyze the requirements	S	R	P	P		P		
Elaborate the software requirements specification	S	R	P	P		P		
Elaborate the database acquisition specification		S					R, P	
Initiate the acquisition of the annotated databases	S							R, P
Develop the requirements	S	R	P					
Elaborate the algorithm architecture design specification	S		R, P					
Elaborate preliminary software specifications	S	R, P	P	P		P		
Review the software specifications and budget with software development team	S	R, P	P	P	P			
Decision point - Algorithm design complete	S		R					
Review preliminary software specifications		R		P				
Design the system architecture		R		P				
Develop functional specifications		R		P				

Activity	PM	SDM	CS	SSD	JSD	ST	TW	FD
Decision point - Software design complete	S	R		P				
Review functional specifications		R		P	P			
Develop software code		S			R, P			
Developer testing (primary debugging)		S		R, P				
Realize the software integration		S		R, P				
Decision point – Software development complete	S	R						
Elaborate the user documentation		S					R, P	
Develop unit test plans using product specifications	S					R, P		
Develop integration test plans using product specifications	S					R, P		
Realize the testing procedure	S					R, P		
Unit testing	S					R, P		
Modified module code and retesting	S					R, P		
Decision point – Unit test complete	S, R							
Integration testing						R, P		
Modified code and retesting						R, P		
Decision point – Integration test complete	S, R							
Realize the testing report	S					R, P		
Realize the software installation kit	S					R, P		
Install the software	S	R		P				
Evaluate the software and invoice paid	S							R, P
Decision point – Project complete	S, R							

Legend:

PM – Project manager
SDM – Software development manager
CS – Computer scientist
SSD – Senior software developer
JSD – Junior software developer
ST – Software tester
TW – Technical writer
FD – Financial department

R – Responsibility
S – Supervision
P – Performer

COMMUNICATIONS MANAGEMENT

The project communications management processes provide the critical links among people and information that are necessary for successful communications. Everyone involved in the project should understand how the communications affect the project.

The communication during the project will be performed using templates based on the following communication matrix.

Table 10. The communications management matrix

Target audience	Person(s) to convey the audience	Data of the message	Format of the message	Content of the message
Project teams Customer	Project manager	Start project (1/20/2014)	Meeting	Project requirements
Project teams	Project manager	Weekly in activities 1.1.2, 1.1.3, 1.1.4	Meeting	Project requirements Software requirements Psychological annotated database requirements
Financial department	Project manager	2/28/2014	Email Phone	Psychological annotated database acquisition
Senior software developers	Computer scientists	When required in activities 1.2.1, 1.2.2	Meeting	Algorithm design Optimization methods
Project manager	Senior software developer	4/11/2014	Meeting	Decision to start/not to start the software development
Computer scientists Software developer team Software testers	Software development manager	When required in activities 1.3.1, 1.3.2, 1.3.3	Email Phone Meeting Discussion	Software requirements Software development Optimization methods Software coding errors

Target audience	Person(s) to convey the audience	Data of the message	Format of the message	Content of the message
Computer scientists Software development team members Software testers	Software development team members	When required in activities 1.3.1, 1.3.2, 1.3.3	Email Phone Meeting Discussion	Software requirements Functional specification Software development Optimization methods Software coding errors
Project manager Software development team Software testers	Software development manager	9/15/2014	Meeting	Decision to start/not to start the software testing
Software development manager Software development team Computers scientists	Software testers	When required in activities 1.5.1 ÷ 1.5.8	Email Phone Meeting Discussion	Software requirements Functional specification Software development Optimization methods Software coding errors Testing plans Testing procedures
Customer Software development manager Software testers	Project manager	In activity 1.5.7	Meeting	Software requirements Testing plans Testing procedures
Project manager Software development manager	Software testers	12/10/2014	Meeting	Decision to start/not to start the deployment
Customer	Project manager	12/16/2014 ÷ 12/19/2014	Meeting	Software application installation User acceptance testing Evaluation of the software
Financial department	Project manager	12/19/2014	Email Phone	Paying the invoice

RISK MANAGEMENT

The following table provides the information regarding the identification risks, their ranking and correspondent approach strategy for the risks.

Table 11. Project risks assessment matrix

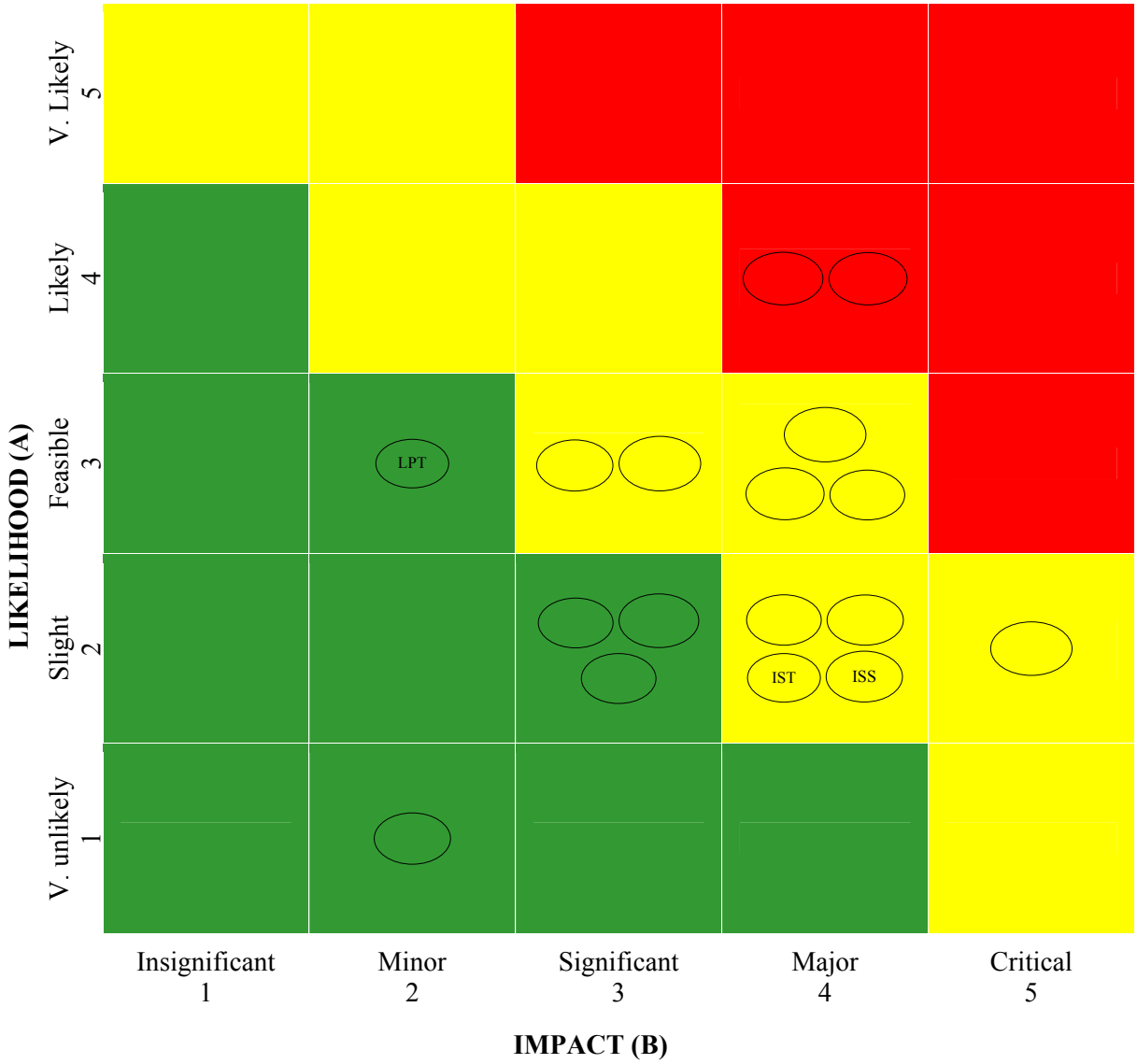
Possible risks	Likelihood of occurrence	Impact	Risk rate (likelihood x impact)	Required action	Risk manager
User risks					
Failure to manage end-user expectations (FM)	2	4	8	Involvement of the user in the project requirements establishing	Project manager
Lack of adequate user involvement (LAU)	2	3	6	Applying different strategies for user involvement	Project manager
Complicated/wrong user interface (WUI)	1	2	2	Establishing the interface requirements from the project start	Project manager
Requirements risks					
System requirement not adequately indentified Misunderstanding of the requirements (MR)	2	4	8	Implication of both the user and the project teams in requirements establishing phase	Project manager
Continually changing requirements (CCR)	3	4	12	Establishing all the requirements from the project start	Project manager
Requirements conflict during the initial phases of integration and coding (RC)	2	3	6	Software developers must find that even the specification is unclear or incomplete	Project manager
Project complexity risks					

Possible risks	Likelihood of occurrence	Impact	Risk rate (likelihood x impact)	Required action	Risk manager
Real-time performance shortfalls (RTP)	4	4	16	Designing the best optimization algorithms for models used	Project manager
Project involves the use of new technology (NT)	4	4	16	Using the most appropriate algorithms for project implementation and optimization	Project manager
Planning and control risks					
Incorrect image database (IID)	2	5	10	Well founded database acquisition requirements	Project manager
Delays of the software development/testing activities (DSD)	3	4	12	Reallocation of the resource at disposal	Project manager
No or insufficient software testing (IST)	2	4	8	Clearly founded of software testing criteria	Project manager
Incorrect software specifications (ISS)	2	4	8	Implying the project teams to identify all the requirements	Project manager
Project progress not monitored closely enough (PPN)	2	3	6	Establishing milestones in key points and verifying the processes and deliverables	Project manager

Possible risks	Likelihood of occurrence	Impact	Risk rate (likelihood x impact)	Action required	Risk manager
Team risks					
Project team fluctuation during the life of the project (PTF)	3	4	12	Establish a reserve team	Project manager
Lack of qualified human resources (LQH)	3	3	9	Hire other specialists with similar experience and knowledge	Project manager
Week communication/ cohesion between team members (WCC)	3	3	9	Establish a communication form inside the team Socialization	Project manager
Lack of project team members involvement (LPT)	3	2	6	Establish a reward system	Project manager

The risk management provides a general description for the approach taken to identify and manage the risks associated with the project. The project team identifies scores and ranks the various risks in order for the assigned risk managers to take the necessary steps to implement the mitigation response at the appropriate time during the schedule. Risk managers will provide status updates on their risk's planned timeframe.

The effective risk management begins with an understanding of risk and involves ensuring that uncertainties leading to risk and opportunity are factored into all project decisions, regardless of who makes them.



Legend:

Green - Low risk
Yellow - Moderate Risk
Red - Extremely High risk

Figure 20. Risk assessment matrix

PROCUREMENT MANAGEMENT

The objective of a Procurement Management Plan is to describe the end-to-end procurement process that the project will use to acquire its goods and services. In this case the acquisition of the psychological annotated image database is out of the project and is made by the financial department.

PROJECT CLOSING

After the project finalizes all the activities, the invoice is paid, all the documents are archived and the project is close.

REFERENCES

[1] Kendon, A. - *Gesture: Visible Action as Utterance*, Cambridge: Cambridge University Press, 2004

[2] Collins, A. - *Gestures, body language and behavior*, New York: DKC, 2003.

[3] Hall, E. T. - *A system for the notation of proxemic behavior*, American Anthropologist, no. 65, pp. 1003–1026, 1963.

[4] Hall, E. T. - *The Hidden Dimension*, Anchor Books, 1966.

[5] Remland, M.S. & Jones, T.S. - *Interpersonal distance, body orientation, and touch: The effect of culture, gender and age*, Journal of Social Psychology, no. 135, pp. 281-297, 2005

[6] Straker, D. (n.d.). - *Mouth body language. Changing Minds* (http://changingminds.org/techniques/body/parts_body_language/mouth_body_language.htm)

[7] Straker, D. (n.d.). - *Leg body language. Changing Minds* (http://changingminds.org/techniques/body/parts_body_language/leg_body_language.htm)

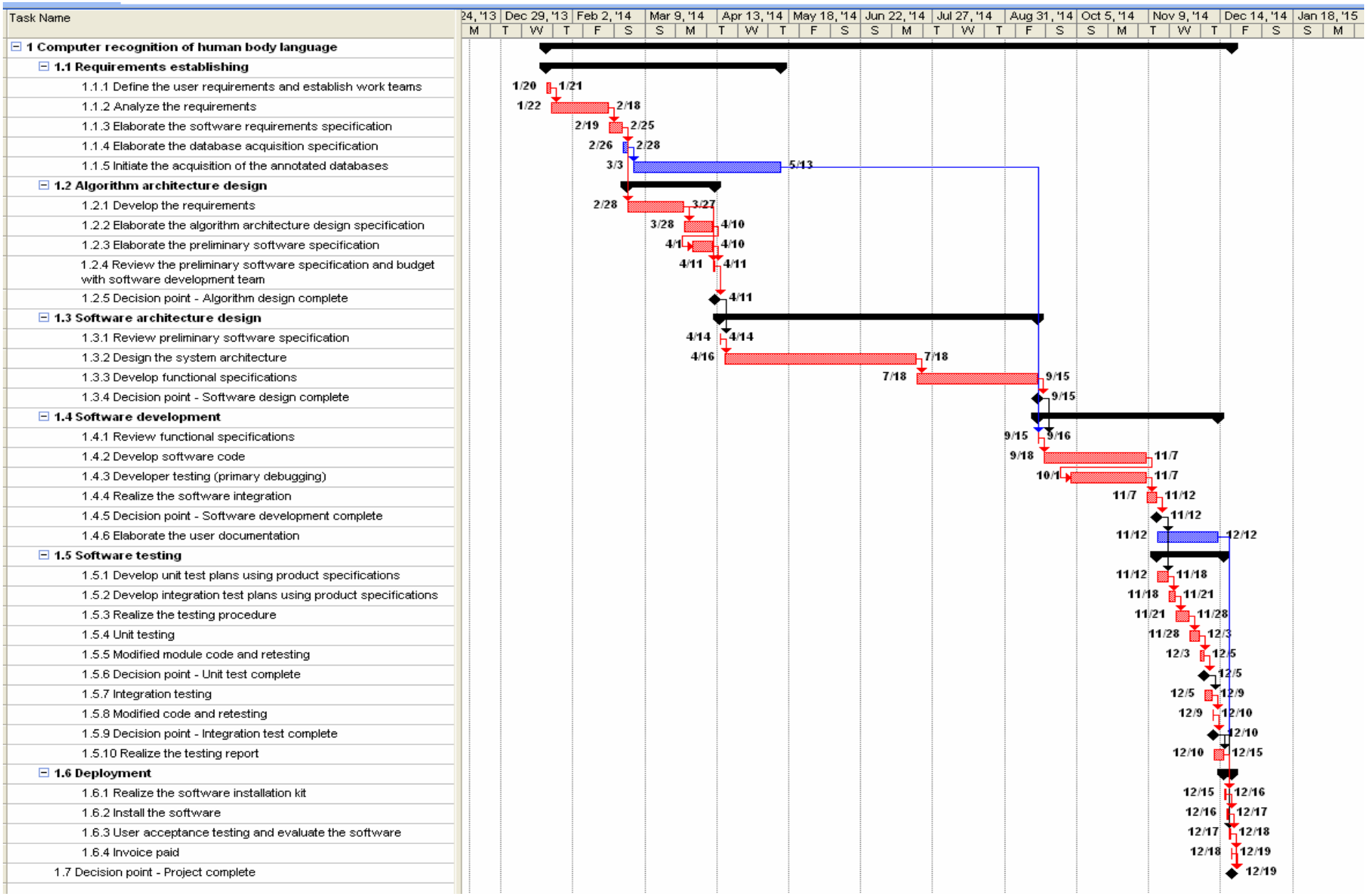
[8] Aggarwal, J., Cai, Q.- *Human Motion Analysis: A Review*, Computer Vision and Image Understanding, 73 (3), pp. 428-440, 1999

[9] Weinland, D., Ronfard, R., Boyer, E. - *A survey of vision-based methods for action representation, segmentation and recognition*, Research Report 7212, INRIA, 2010

[10] Wang, J.G., Sung, E. - *Facial feature extraction in an infrared image by proxy with a visible face image*, IEEE Transactions on Instrumentation and Measurement, (Vol. 56 , Issue 5), pp. 2057-2066, 2007

Appendix 1. The project duration and costs

	Task Name	Duration	Start	Finish	Cost	Work
1	**1 Computer recognition of human body language**	**221 days**	**Mon 1/20/14**	**Fri 12/19/14**	**Lei401,431.75**	**11,242.08 hrs**
2	**1.1 Requirements establishing**	**80 days**	**Mon 1/20/14**	**Tue 5/13/14**	**Lei34,766.24**	**229.83 hrs**
3	1.1.1 Define the user requirements and establish work teams	2 days	Mon 1/20/14	Tue 1/21/14	Lei3,060.40	35.2 hrs
4	1.1.2 Analyze the requirements	20 days	Wed 1/22/14	Tue 2/18/14	Lei3,827.60	57.6 hrs
5	1.1.3 Elaborate the software requirements specification	5 days	Wed 2/19/14	Tue 2/25/14	Lei6,447.00	86.4 hrs
6	1.1.4 Elaborate the database acquisition specification	3 days	Wed 2/26/14	Fri 2/28/14	Lei1,431.24	50.63 hrs
7	1.1.5 Initiate the acquisition of the annotated databases	50 days	Mon 3/3/14	Tue 5/13/14	Lei20,000.00	0 hrs
8	**1.2 Algorithm architecture design**	**31 days**	**Fri 2/28/14**	**Fri 4/11/14**	**Lei52,719.28**	**1,074 hrs**
9	1.2.1 Develop the requirements	20 days	Fri 2/28/14	Thu 3/27/14	Lei29,697.56	538.93 hrs
10	1.2.2 Elaborate the algorithm architecture design specification	10 days	Fri 3/28/14	Thu 4/10/14	Lei10,635.70	229.82 hrs
11	1.2.3 Elaborate the preliminary software specification	8 days	Tue 4/1/14	Thu 4/10/14	Lei12,220.39	295.47 hrs
12	1.2.4 Review the preliminary software specification and budget with software development team	1 day	Fri 4/11/14	Fri 4/11/14	Lei165.63	9.78 hrs
13	1.2.5 Decision point - Algorithm design complete	0 days	Fri 4/11/14	Fri 4/11/14	Lei0.00	0 hrs
14	**1.3 Software architecture design**	**93 days**	**Mon 4/14/14**	**Mon 9/15/14**	**Lei104,173.17**	**2,911.2 hrs**
15	1.3.1 Review preliminary software specification	1 day	Mon 4/14/14	Mon 4/14/14	Lei1,851.97	24 hrs
16	1.3.2 Design the system architecture	60 days	Wed 4/16/14	Fri 7/18/14	Lei68,192.80	1,924.8 hrs
17	1.3.3 Develop functional specifications	30 days	Fri 7/18/14	Mon 9/15/14	Lei34,128.40	962.4 hrs
18	1.3.4 Decision point - Software design complete	0 days	Mon 9/15/14	Mon 9/15/14	Lei0.00	0 hrs
19	**1.4 Software development**	**63 days**	**Mon 9/15/14**	**Fri 12/12/14**	**Lei186,723.07**	**6,472.25 hrs**
20	1.4.1 Review functional specifications	1 day	Mon 9/15/14	Tue 9/16/14	Lei196.00	10.52 hrs
21	1.4.2 Develop software code	36 days	Thu 9/18/14	Fri 11/7/14	Lei146,998.00	5,280 hrs
22	1.4.3 Developer testing (primary debugging)	27 days	Wed 10/1/14	Fri 11/7/14	Lei30,672.00	864 hrs
23	1.4.4 Realize the software integration	3 days	Fri 11/7/14	Wed 11/12/14	Lei3,408.00	96 hrs
24	1.4.5 Decision point - Software development complete	0 days	Wed 11/12/14	Wed 11/12/14	Lei0.00	0 hrs
25	1.4.6 Elaborate the user documentation	21 days	Wed 11/12/14	Fri 12/12/14	Lei5,449.07	221.73 hrs
26	**1.5 Software testing**	**22 days**	**Wed 11/12/14**	**Mon 12/15/14**	**Lei20,776.00**	**518 hrs**
27	1.5.1 Develop unit test plans using product specifications	4 days	Wed 11/12/14	Tue 11/18/14	Lei2,631.60	65.6 hrs
28	1.5.2 Develop integration test plans using product specifications	3 days	Tue 11/18/14	Fri 11/21/14	Lei3,901.20	97.2 hrs
29	1.5.3 Realize the testing procedure	5 days	Fri 11/21/14	Fri 11/28/14	Lei3,258.00	82 hrs
30	1.5.4 Unit testing	2 days	Fri 11/28/14	Wed 12/3/14	Lei2,576.00	64 hrs
31	1.5.5 Modified module code and retesting	2 days	Wed 12/3/14	Fri 12/5/14	Lei2,576.00	64 hrs
32	1.5.6 Decision point - Unit test complete	0 days	Fri 12/5/14	Fri 12/5/14	Lei0.00	0 hrs
33	1.5.7 Integration testing	2 days	Fri 12/5/14	Tue 12/9/14	Lei2,576.00	64 hrs
34	1.5.8 Modified code and retesting	1 day	Tue 12/9/14	Wed 12/10/14	Lei1,288.00	32 hrs
35	1.5.9 Decision point - Integration test complete	0 days	Wed 12/10/14	Wed 12/10/14	Lei0.00	0 hrs
36	1.5.10 Realize the testing report	3 days	Wed 12/10/14	Mon 12/15/14	Lei1,969.20	49.2 hrs
37	**1.6 Deployment**	**4 days**	**Mon 12/15/14**	**Fri 12/19/14**	**Lei2,274.00**	**36.8 hrs**
38	1.6.1 Realize the software installation kit	1 day	Mon 12/15/14	Tue 12/16/14	Lei578.00	16 hrs
39	1.6.2 Install the software	1 day	Tue 12/16/14	Wed 12/17/14	Lei536.00	8.8 hrs
40	1.6.3 User acceptance testing and evaluate the software	1 day	Wed 12/17/14	Thu 12/18/14	Lei760.00	8 hrs
41	1.6.4 Invoice paid	1 day	Thu 12/18/14	Fri 12/19/14	Lei400.00	4 hrs
42	1.7 Decision point - Project complete	0 days	Fri 12/19/14	Fri 12/19/14	Lei0.00	0 hrs


Task Name
1 Computer recognition of human body language
1.1 Requirements establishing
1.1.1 Define the user requirements and establish work teams
1.1.2 Analyze the requirements
1.1.3 Elaborate the software requirements specification
1.1.4 Elaborate the database acquisition specification
1.1.5 Initiate the acquisition of the annotated databases
1.2 Algorithm architecture design
1.2.1 Develop the requirements
1.2.2 Elaborate the algorithm architecture design specification
1.2.3 Elaborate the preliminary software specification
1.2.4 Review the preliminary software specification and budget with software development team
1.2.5 Decision point - Algorithm design complete
1.3 Software architecture design
1.3.1 Review preliminary software specification
1.3.2 Design the system architecture
1.3.3 Develop functional specifications
1.3.4 Decision point - Software design complete
1.4 Software development
1.4.1 Review functional specifications
1.4.2 Develop software code
1.4.3 Developer testing (primary debugging)
1.4.4 Realize the software integration
1.4.5 Decision point - Software development complete
1.4.6 Elaborate the user documentation
1.5 Software testing
1.5.1 Develop unit test plans using product specifications
1.5.2 Develop integration test plans using product specifications
1.5.3 Realize the testing procedure
1.5.4 Unit testing
1.5.5 Modified module code and retesting
1.5.6 Decision point - Unit test complete
1.5.7 Integration testing
1.5.8 Modified code and retesting
1.5.9 Decision point - Integration test complete
1.5.10 Realize the testing report
1.6 Deployment
1.6.1 Realize the software installation kit
1.6.2 Install the software
1.6.3 User acceptance testing and evaluate the software
1.6.4 Invoice paid
1.7 Decision point - Project complete
24, '13
Dec 29, '13
Feb 2, '14
Mar 9, '14
Apr 13, '14
May 18, '14
Jun 22, '14
Jul 27, '14
Aug 31, '14
Oct 5, '14
Nov 9, '14
Dec 14, '14
Jan 18, '15
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M

THE IMPLEMENTATION OF A COMPUTER NETWORK FOR A LAWYERS' FIRM

Paula Cornelia NEAGU

CONTENTS

INTRODUCTION

Telecommunications and computer networking have vastly increased our options on how and what we communicate. A well-run network is staged like a smooth running car where the users only notice they can manoeuvre the car comfortably; they do not notice the thorough project management, the design, planning and implementation work which the car has undergone to be what it is today.

As Hutchinson & Sawyer brought out in Computers, Communications, & Information, the advantages of computer networks are: "sharing peripheral devices, sharing of programs and data, better communications, security of information, and access to databases.[13]"

Sharing Peripheral Devices Print Sharing (where multiple users share the same printer) can cut operational costs. For example, large and expensive laser printers are used by multiple users within company networks. Providing a business has a network, large in-house printers can affordably be leased or purchased.

Sharing of Programs and Data File Sharing in the business environment is important, because it saves space, time, and paper. Digital files on a share drive are not only cost effective and convenient, but a company's database is accessible to only authorized personnel and inaccessible to unauthorized personnel. Network-linked employees can share groupware and work together on shared projects. Purchasing network versions of software is yet another advantage of having a company network.

Better Communications Schedules and task assignments can be easily shared and organized in a network. When emailing within a network, group settings and contact lists are easily kept up-to-date. Attaching scanned documents and emailing business communication is cheaper and easier than faxing information to another department at a different location.

Security of Information When information is shared on a network and accidental data loss occurs, data recovery is much more likely to occur when working on a network. When shared information is stored on multiple computers and databases, it stands to reason that if a hard drive fails, others will have the shared information residing in another repository. Firewall appliances that are built for networks go far beyond what a consumer grade firewall can do.

Access to Databases Typically, extensive databases (whether public or private) are shared on a network. Sophisticated databases have built-in parameters to protect the data from accidental overwrites or misuse by disgruntled employees.

[13] S. Hutchinson, S. Sawyer - *Computers, communications, and information : a user's introduction,* 7th ed., Irwin/McGraw-Hill, Boston, 2000

PROJECT SCOPE

A proper network **planning** is vitally essential for the successful implementation of a network system. In the case of a law firm, where a significant amount of confidential information is handled, the network **security** is vital. *Therefore, the purpose is to implement a network able to offer better* ***performance*** *both from the user's viewpoint (**easy access, fast transfer of document, data file sharing**, **better communications schedules, sharing peripheral devices**) and from the network security administrator (**security of information, effective management of servers and users**).*

The law firm is based in a three storey building and its work surface totals 600 square meters. The offices are located as follows:

- Downstairs: reception desk, conference room, server room;
- First floor: Financial and accounting office and Administrative, secretary 5 offices lawyers, a notary office;
- Second floor: the manager, assistant manager, secretary II, 5 offices lawyers, a notary office.

GOAL: Implementing a network at X company's site in order to meet information security and flow documents requirements.

Project Boundaries:

- Network licenses and all needed software are to be purchased by the beneficiary upon project stages A1.1 ER or A1.2. DCN
- It is beneficiary's responsibility to sign a contract with an internet provider and to acquire public IP addresses no later than A2.2. ID
- All peripheral devices are to be acquired by the beneficiary no later than A2.2. ID.

Constraints

Money resources are limited: no more 150,000 RON

The time to implement the project is limited: maximum 30 work days

Objective 1: Network configuration		
A1.1.	Establish requirements (**ER**)	• security vs. mobility • tolerance limits of the budget • time tolerance limits • knowing the building's materials (architecture) • determining the number of workstations
A1.2.	Design the computers network (**DCN**)	• conceptual configuration • determining material needs • market research

		• network physical diagram • network logical diagram • final offer draw-up
A1.3.	Obtaining client approval (**OCA**)	• Presentation of the offer • Obtain written approval of the customer
Objective 2: Implementation		
A2.1.	Purchase needed materials (**PNM**)	• approved by the client
A2.2.	Infrastructure development (**ID**)	• structured cabling • installation and configuration of network components • interconnection network components
A2.3.	Testing network functionality (**TNF**)	• check client-server communication • verification of shared equipment and shared files
A2.4.	Handover (**HO**)	• invoice • handover document
Objective 3: Train the users		
A3.1.	Training handbook (**TH**)	• handbook
A3.2.	Training (**T**)	• trainee's knowledge and skills
A3.3.	Training evaluation (**TE**)	• evaluation instrument • evaluation results information
A3.4.	Training follow up (**TFU**)	• training report
Objective 4: Result dissemination		
A4.1.	Request client's written recommendation (**CWR**)	• Recommendation letter
A4.2.	Upload client recommendation on company site (**UCR**)	• electronic form of recommendation letter
A4.3.	Update advertising documents (**UAD**)	• documents updated

TIME MANAGEMENT

Name	Explanation	Dependencies	Duration
ER	Meeting with the client for a better understanding of the network requirements and architecture, establishing the budget and time limits.	All other tasks cannot start before ER ends.	1 day
DCN	Technical leader and IT experts create a conceptual configuration to know which materials they need (physical schema and logical schema network). Contact suppliers in order to obtain prices for equipment and materials.	It starts after ER finished. After DCN finishes, OCA may begin.	4 days
OCA	Meeting with the client in order to present the proposed equipment and prices. Obtain written approval of the customer.	DCN finished Once OCA ends, PNM can start.	1 day
PNM	Materials and equipment acquisition, in accordance with customer approval	OCA finished PNM needs to start before all the other tasks start.	4 days
ID	Building cabling, active and passive components installing and configuring, equipment interconnected.	PNM started ID needs to end so that TNF starts.	10 days
TNF	Testing network for meeting performance criteria (authentication criteria, data transfer, sharing peripheral devices print sharing, data file sharing)	ID finished TNF needs to end so that HO starts.	2 days
HO	Documents acknowledging users' signoff as acceptance of product handover and compliance with contract provisions	TNF finished	1 day
TH	Developing user's guide	TNF started TH needs to end so that T starts.	4 days
T	Training network administrator/s (theoretical and practical)	TH finished T needs to end so that TE starts	2 days
TE	Evaluating trainees' understanding and capacity to use the network.	T finished TE needs to end so that TFU starts	½ day
TFU	Drawing up a report with the conclusions of evaluation that is to be submitted to company management board.	TE finished TFU needs to start so that CWR may begin.	½ day
CWR	Requiring and obtaining a letter recommendation on behalf of the customer.	TFU started CWR needs to end	1 day

		so that UCR starts	
UCR	Scanning the letter of recommendation and uploading it on the service provider's site	CWR finished	4 hours
UAD	Updating advertising materials	CWR finished UCR si UAD finalizate	4 hours

COST MANAGEMENT

The output of the resource planning process is a description of what types of resources are required and in what quantities for each element of the work breakdown structure.

In most application areas, additional work during a design phase is widely held to have the potential for reducing the cost of the production phase. The cost estimating process must consider whether the cost of the additional design work will offset the expected savings.

Costs must be estimated for all resources that will be charged to the project. This includes, but is not limited to, labor, materials, supplies, and special categories such as an inflation allowance or cost reserve.

The cost evaluation technique is analogous estimating. Also called top-down estimating this means using the actual cost of a previous, similar project as the basis for estimating the cost of the current project.

Activity	Human Resources	Cost per hour	Tools	Cost	Materials	Cost per unit
ER	1 PM 1 technical leader	100 lei 90 lei				
DCN	1 technical leader 1 acquisition specialist	90 lei 55 lei	2 PC 1 printer			
OCA	1 PM 1 technical leader	100 lei 90 lei				
PNM	1 acquisition specialist	55 lei				
ID	1 technical leader 2 IT experts 4 unskilled workers	90 lei 75 lei 25 lei	2 drilling machines, 1 network tester, 2 electrical wire detector		Gutter 1500 ml Screws 6000 Plastic dowels 6000 Drills 6 STP Cat 5 e cable 2000 ml Router 1 wireless router 1 switches 4 servers 3 laptops 15	10.00 lei 0.02 lei 0.02 lei 5.00 lei 0.70 lei 1200.00 lei 1400.00 lei 500.00 lei 3900.00 lei 2500.00 lei
TNF	1 technical leader	90 lei	1 network tester			

	2 IT experts	75 lei				
HO	1 PM	100 lei				
TH	1 technical leader 1 IT experts	90 lei 75 lei	1 PC 1 printer			
T	1 IT experts	75 lei				
TE	1 IT expert	75 lei				
TFU	1 IT expert	75 lei				
CWR	1 PM	100 lei				
UCR	1 IT expert	75 lei				
UAD	1 IT expert	75 lei				

PROJECT QUALITY

Information security is the main requirement when implementing a computer network for a lawyers' firm. For this reason this project will aim to align itself to the international standards ISO/IEC 27033 "Information technology — Security techniques — Network security" and ISO/IEC 27001:2013 "Information technology — Security techniques — Information security management systems — Requirements".

The main issues that have to be fulfilled during the implementation of the network and the configuration of its active and passive elements are as follows:

- **User Registration**
  - All users shall have a unique user ID based on a standard naming convention
  - A formal authorization process shall be defined and followed for provisioning of user IDs.
  - Employee shall sign a privilege form acknowledging their access rights
  - Privileges shall be allocated to individuals on a 'need-to-have' basis.
  - A record of all privilege accounts shall be maintained and updated on regular basis
- **Password Management** Weak password management means that the most sensitive passwords are often the least well defended. The need to coordinate password updates among multiple people and programs makes changing the most sensitive passwords technically difficult. Inability to secure sensitive passwords exposes organizations to a variety of security exploits. Strong, manual controls over access to privileged accounts may sometimes create unanticipated risks, such as impaired service in IT operations and escalation of physical disasters from one site to an entire organization. Inability to associate administrative actions with the people who initiated them may violate internal control requirements. Typical organizational password management policies include:
  - Users shall be forced to change their passwords at the time of first use

- Passwords shall have a minimum length of eight characters
- Passwords for all users shall expire in 30/60 days
- A record of five previous passwords shall be maintained to prevent re-use of these passwords
- A maximum of three successive login failures shall result in a user's account being locked out
- Passwords shall not be displayed in clear text when they are being keyed in
- Passwords must include at least one small character (a-z), one capital character (A-Z) and one numeric character (0 – 9) / one special character (@ # $ & / +)
- All password entry tries shall be logged along with date, time, IP address, machine name, application and user ID for successful, unsuccessful login attempts

- **Operating System & Application Control** Management of configurable security controls that are built into the operating system or application. In the scope of the ISMS framework, the objective is to ensure system / application security settings are restrictive enough to protect the system (information) whilst not adversely impacting availability to the business (end user). If an attacker can easily view someone's username and password, he can impersonate that user, and do massive damage by modifying critical information, read corporate emails, damage corporate websites etc. The procedure to log into an operating system or application control should minimize the risk of unauthorized access. The procedure shall therefore follow a strict set of rules to govern what information is displayed to the potential user during the process of log-in. Sample operating system and application control policies include:
  - All users in the organization shall have a unique ID
  - No systems or application details shall be displayed before log-in
  - In the condition of log-in failure, the error message shall not indicate which part of the credential is incorrect
  - The number of unsuccessful log-in attempts shall be limited to 3/5/6 attempts
  - During log-in process, all password entries shall be hidden by a symbol
  - The use of system utility program shall be restricted e.g. password utility
  - All operating systems and application shall time out due to inactivity in 5/10/15/30 minutes
  - All applications shall have dedicated administrative menus to control access rights of users

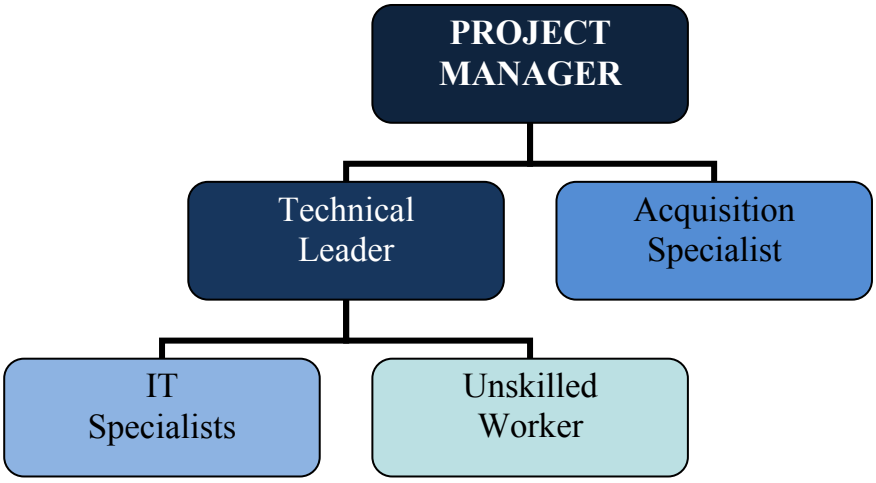
- **Network Security** Network security assumes importance to the organization when viewed in light that networks change frequently as new users and devices are added and newer data communication technologies are introduced, usage of various networking, communications, and computing technologies to effectively meet the expanding need, sensitive data is increasingly transmitted over networks, proliferation of internet access has increased the vulnerability as employees use internet more for information and knowledge. The primary objectives of a network security policy should be to ensure that access to company's network is only provided to authorized users, that adequate controls are in place to manage remote users, that all equipment can be recognized uniquely, that networks should be segregated based on needs, and that appropriate network routing protocols are enabled. Typical policy statements for Network Security include:
    - Appropriate authentication mechanisms shall be used to control the access by remote users.
    - Allocation of network access rights shall be provided as per the business and security requirements
    - Two-factor authentication shall be used for authenticating users using mobile/remote systems

Quality control is to rely on the ***inspection technique*** and ***check-lists.*** Inspection will include activities such as measuring, examining, and testing undertaken to determine whether results conform to requirements. The check-lists are the result of the best practices emerged from previous projects.

PROJECT HRM

- **Project Organizational Chart**

The Project Organizational Chart below provides a graphical representation of the project's hierarchical reporting relationships.



- **RAM**

The following table contains the project's staffing requirements and allocation per activities.

	ER	DCN	OCA	PNM	ID	TNF	HO	TH	T	TE	TFU	CWR	UCR	UAD
Project Manager	R P		R P				R P					R P		
Technical Leader	C	R P	C		R P	R P		C						
IT specialists					P	P		R P	R P	R P	R P		R P	R P
Acquisition Specialist		P		R P										
Unskilled Worker					P									

RAM Key:
R: Responsible organizational unit
P: Performing organizational unit
C: Consulting specialist

- **Staff acquisition**

The HR necessary for this project already exists and it is to be assigned to project activities in accordance with their competences. Obviously, the project manager is fully aware of his team's knowledge and skills. Consequently, the HR assignment is to take place on a "need-to-do" basis. Given the team's experience with previous projects the risk of major conflicts is minimal as a result of existing homogeneity.

The technical leader is in charge with the creation of conceptual configuration of the network, thus, establishing the amount of materials and tools which are necessary. Also, he coordinates and audits (inspections and check-lists) the subordinated team. He is also responsible for the final testing of the network functionality.

The IT specialists are responsible for the training handbook development, and the technical leader is only a consulting specialist.

The technologies or methods used to transfer information back and forth among project elements can vary significantly: from brief conversations to extended meetings, from simple written documents to immediately accessible on-line schedules and databases.

The stakeholder groups involved within this project include the following: the manager of the lawyers' firm (sponsor) and as a result its employees, the project team, the suppliers and the IT company's prospective customers.

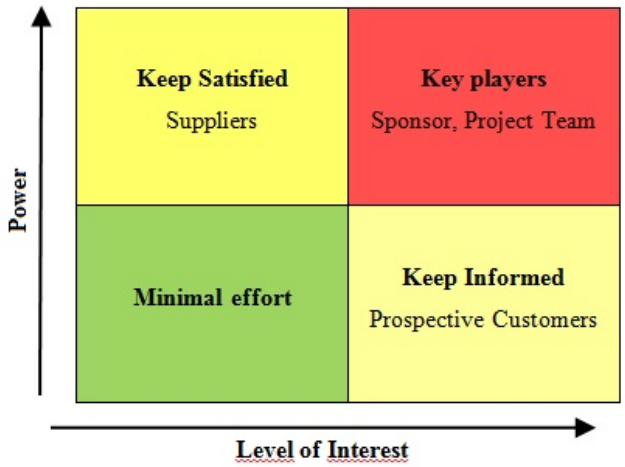


Figure 1: Mendelow's power / interest matrix

Key Players		
Stakeholders	**Communication**	
	when	**how**
Sponsor, project manager, technical leader	A1.1. ER	win-win negotiation
Technical leader, acquisition specialist	A1.2. DCN	Formal: Meeting
Sponsor, project manager, technical leader	A1.3. OCA	Formal: Meeting
Sponsor, project manager	A2.4 HO	Formal: Meeting, network documentation
IT specialists	Objective 3: Train the users	Meeting, pre-training activities, training report
Sponsor, project manager	A4.1. CWR	Formal: Meeting
Team members	When needed	Formal: Meeting Informal: ad hoc conversations

Keep Satisfied		
Stakeholders	**Communication**	
	when	**how**
Acquisition specialist, Suppliers	A1.2. DCN A2.1. PNM	E-mail, phone, fax Meeting to sign contracts

Keep Informed		
Stakeholders	**Communication**	
	when	**how**
Prospective customers	A4.2. UCR, A4.3. UAD	Template

Every phase of the project, after either achieving its objectives or being terminated for other reasons, requires closure. Administrative closure consists of verifying and documenting project results to formalize acceptance of the product of the project by the sponsor / client. It includes collection of project records, ensuring that they reflect final specifications, analysis of project success and effectiveness, and archiving such information for future use.

Administrative closure activities should not be delayed until project completion. Each phase of the project should be properly closed to ensure that important and useful information is not lost.

RISK MANAGEMENT

- **Risks identification and qualitative analyses (table)**

Code	Risk	Description	Probability	Impact	Rating (PxI)
R1	Testing stage	Insufficient testing	3	5	15
R2	Access rights	Wrong allocation of access rights	2	4	8
R3	Documentation	Lack of documentation	3	5	15
R4	Password	Poor management password	2	5	10
R5	Cabling	Poor or incorrectly installed network cabling can cause numerous problems with the computer network.	4	4	16
R6	Network architecture	Insecure network architecture	2	5	10
R7	Compatibility	No equipment / software compatibility	1	5	5
R8	Scalability	No network scalability	1	5	5
R9	Currency	Currency fluctuations	5	1	5

Risk no 1:

Network insufficient testing can lead to the following technical failures: equipment failure or malfunction, saturation of the information system, software malfunction. Therefore, a stage by stage testing is needed as far as the establishment of the network is concerned.

Risk no 2:

A misconfigured network is a primary entry point for unauthorized users. User administration, especially in a heterogeneous environment where each user has multiple login accounts and appears in multiple directories, has many inherent security problems. Along with setting login credentials and procedures, network access control also usually involves setting rights and privileges associated with each user. Privileges are usually determined based on the perimeters of the job or position held by each user. However, administrators can grant users additional rights and privileges if the need arises. Risk focused strategy: Enforcing policy regarding segregation of duties and identifying users who are already in violation and reducing the number and scope of administrator-level accounts needed to manage user access to systems and applications.

Risk no 3:

When the network implementation has been completed and the network is in operation, the project work is not finished until you have the proper documents in your hands. If you have followed the outlined recommendations above during the network construction, you would have maintained the up-to-date documents below:

- Visual diagram of the network layout including IP addresses
- Hardware and software inventory,
- Server (s) configuration,
- Cable mapping and patch panel diagram,
- Policies and Procedures (i.e. backup)
- Vendor contact information.

Risk no 4:

To protect the network from intrusion it is a good idea for system administrators to verify that the passwords used within an organization are strong ones.

Password aging is another technique used by system administrators to defend against bad passwords within an organization. Password aging means that after a set amount of time (usually 90 days) the user is prompted to create a new password. The downside to password aging, however, is that users are more likely to write their passwords down.

Risk no 5:

Poor or incorrectly installed network cabling can cause numerous problems with the computer network. There are two wiring standards for network cabling, T568a and T568b. It is essential that you DO NOT MIX T568a and T568b on the same network. Each cable should be no longer than 90 Mtr and should be a single piece of cable (there should be no joins or joints). Cabling should NOT be run next to electrical mains cabling (because of the potential for interference);

Risk no 6:

Insecure network architecture can lead to increased hacker attack surface, uncontrolled spread of malware, and expensive audit scope. A well architected network can help an organization prevent and contain security incidents.

In this project, the design uses both wired and wireless networks and separates the traffic of various departments using VLANs. In order to maintain a minimum level of practicality and security, the computers in the network obtain their IP addresses from a DHCP server while inter-VLAN routing is disabled. VLANs are propagated between devices using VTP while the security zones are enforced using access lists.

Risk no 7:

Usually, the running of any software or operation system needs the hardware to meet a set of minimum requirements. Hardware and software compatibility is mandatory. Regardless the complexity of a system in terms of its hardware, the former cannot be efficient as long as the software it runs is not managed appropriately. Moreover, there are certain programs that can only run efficiently with specific operation systems. Therefore, the software and hardware procurement are tightly linked.

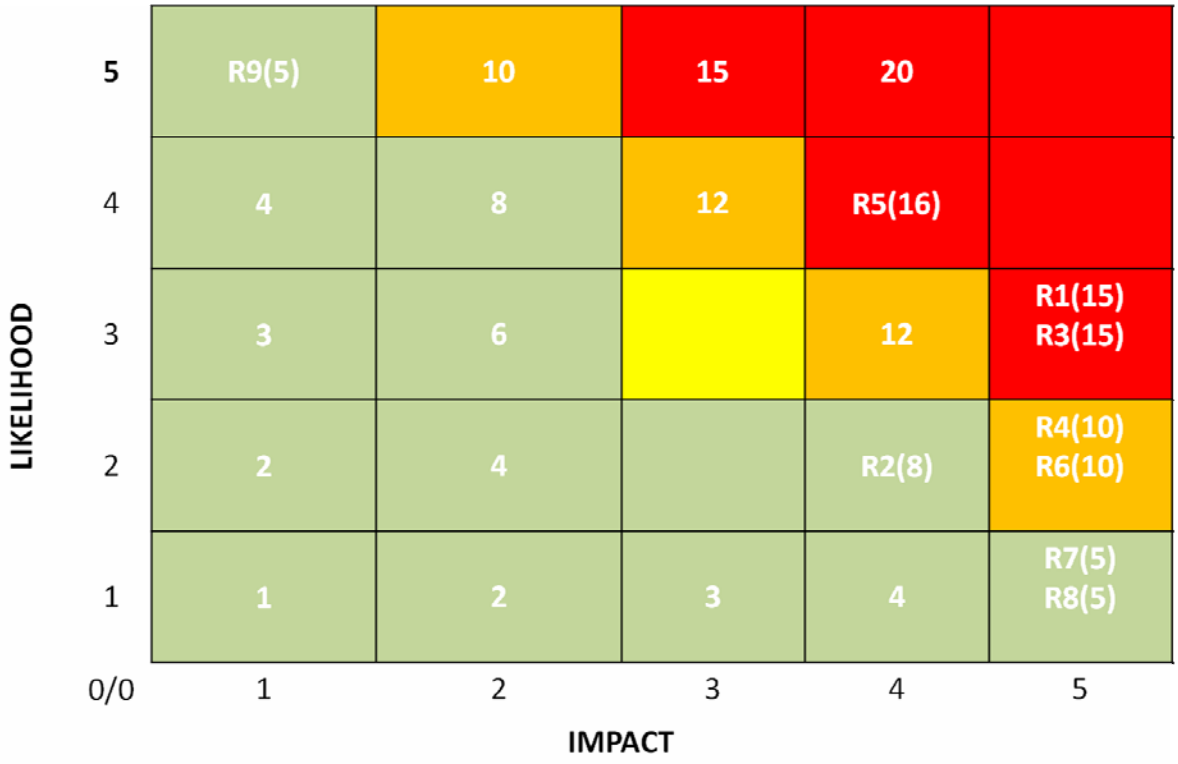
Risk no 8:

When a business is just starting out, the temptation is to keep expenses low in order to get through the critical first few years. However, when setting up a computer network for a growing business, you should also take into consideration scalability. Network scalability is the ability of the computer network to grow with the business needs to change, not taking into account that scalability can mean spending more money on infrastructure down the road. That must be a guiding principle from the very moment the physical and logical network conceptual configuration is done.

Risk no 9:

Currency fluctuation is a risk for the company because in the period between the sale and the receipt of funds, the value of the foreign payment when it is exchanged for home currency terms could result in a loss for the company. The reduced home currency value would arise because the exchange rate has moved against the company during the period of credit granted.

- **Risks Matrix**

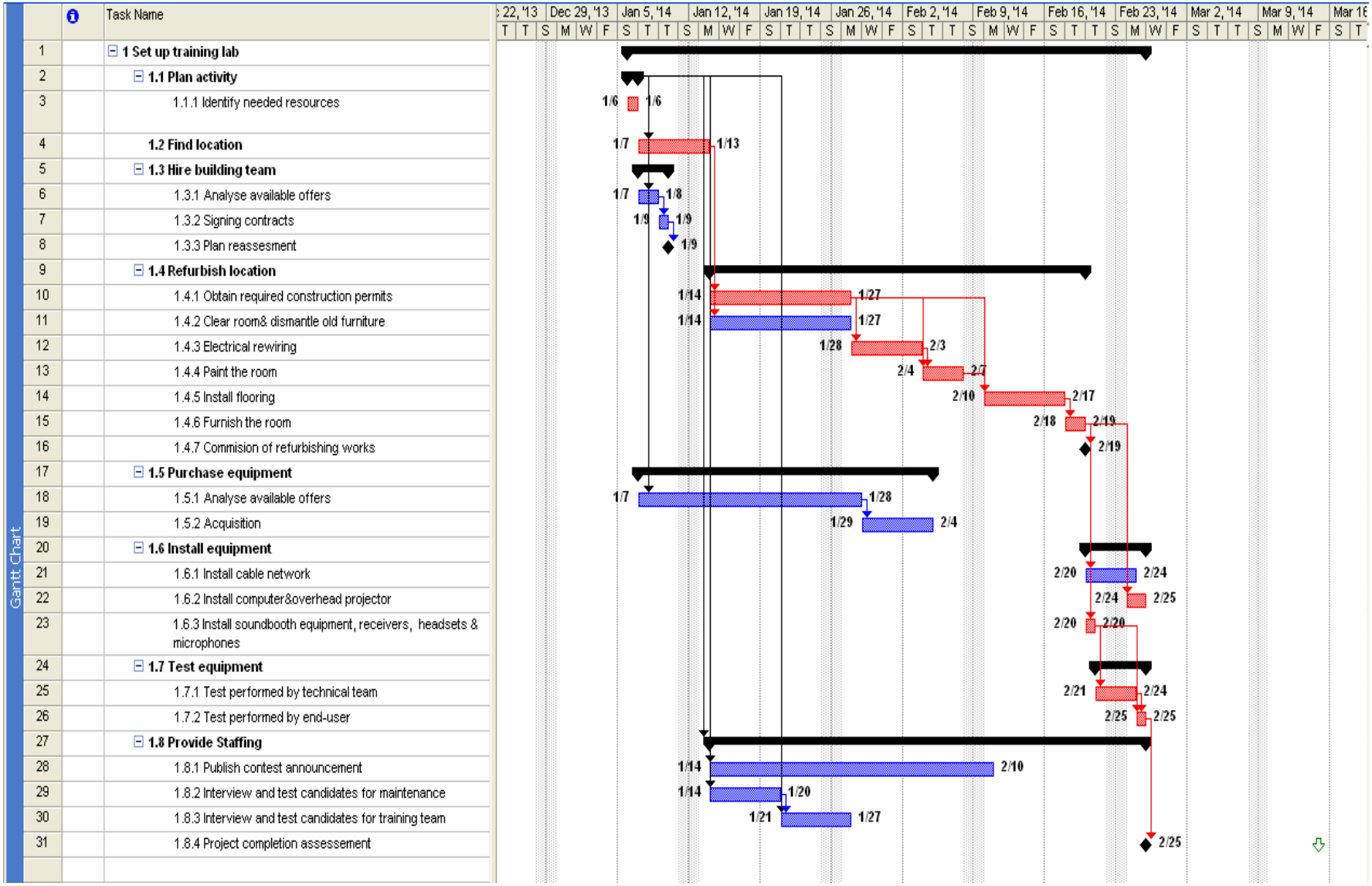


PROCUREMENT

- All the tools needed are already owned by the company running this project. Hence, they do not incur any additional costs and are not to be included in the resource pool table presented in the costs management plan.
- The type of contract resorted to is the fixed price one. That allows the company to buy the items it needs for the project and, if case may be, bargain for the price of some of these should they need to be acquired as bulk.

PROJECT CLOSING & CONCLUSIONS

The project success depends on meeting the triple constraint: cost-time-scope. In addition, the adequate management of risks and meeting the quality standards greatly contribute to delivering the final product and accomplishing project goal.


Gantt Chart
Task Name
1 Set up training lab
1.1 Plan activity
1.1.1 Identify needed resources
1.2 Find location
1.3 Hire building team
1.3.1 Analyse available offers
1.3.2 Signing contracts
1.3.3 Plan reassesment
1.4 Refurbish location
1.4.1 Obtain required construction permits
1.4.2 Clear room& dismantle old furniture
1.4.3 Electrical rewiring
1.4.4 Paint the room
1.4.5 Install flooring
1.4.6 Furnish the room
1.4.7 Commision of refurbishing works
1.5 Purchase equipment
1.5.1 Analyse available offers
1.5.2 Acquisition
1.6 Install equipment
1.6.1 Install cable network
1.6.2 Install computer&overhead projector
1.6.3 Install soundbooth equipment, receivers, headsets & microphones
1.7 Test equipment
1.7.1 Test performed by technical team
1.7.2 Test performed by end-user
1.8 Provide Staffing
1.8.1 Publish contest announcement
1.8.2 Interview and test candidates for maintenance
1.8.3 Interview and test candidates for training team
1.8.4 Project completion assessement
Dec 22, '13
Dec 29, '13
Jan 5, '14
Jan 12, '14
Jan 19, '14
Jan 26, '14
Feb 2, '14
Feb 9, '14
Feb 16, '14
Feb 23, '14
Mar 2, '14
Mar 9, '14
Mar 16

	Task Name	Duration	Start	Finish	Predeces	Resource Names
1	**1 Set up training lab**	**37 days**	**Mon 1/6/14**	**Tue 2/25/14**		
2	**1.1 Plan activity**	**1 day**	**Mon 1/6/14**	**Mon 1/6/14**		
3	1.1.1 Identify needed resources	1 day	Mon 1/6/14	Mon 1/6/14		CFO[10%],Cons 1[10%],Tech 1[10%],Cons 2[10%],Project Manager [10%],Tech 2[10%]
4	**1.2 Find location**	**5 days**	**Tue 1/7/14**	**Mon 1/13/14**	2	Cons 1,Project Manager
5	**1.3 Hire building team**	**3 days**	**Tue 1/7/14**	**Thu 1/9/14**		
6	1.3.1 Analyse available offers	2 days	Tue 1/7/14	Wed 1/8/14	2	L.adv.[50%],CFO[50%]
7	1.3.2 Signing contracts	1 day	Thu 1/9/14	Thu 1/9/14	6	CFO[30%],L.adv.[30%]
8	1.3.3 Plan reassesment	0 days	Thu 1/9/14	Thu 1/9/14	7	
9	**1.4 Refurbish location**	**27 days**	**Tue 1/14/14**	**Wed 2/19/14**		
10	1.4.1 Obtain required construction permits	10 days	Tue 1/14/14	Mon 1/27/14	4	Cons 2[33%],stationary[0.3],permit fees [1]
11	1.4.2 Clear room& dismantle old furniture	10 days	Tue 1/14/14	Mon 1/27/14	4	building team
12	1.4.3 Electrical rewiring	5 days	Tue 1/28/14	Mon 2/3/14	10	rewiring services[1 contract]
13	1.4.4 Paint the room	4 days	Tue 2/4/14	Fri 2/7/14	10,12	painting services[1 contract]
14	1.4.5 Install flooring	6 days	Mon 2/10/14	Mon 2/17/14	10,13	flooring[20 sq m],flooring services[1 contract]
15	1.4.6 Furnish the room	2 days	Tue 2/18/14	Wed 2/19/14	14	building team,chairs[15 pc(s)],desks[14 pc(s)]
16	1.4.7 Commision of refurbishing works	0 days	Wed 2/19/14	Wed 2/19/14	15	
17	**1.5 Purchase equipment**	**21 days**	**Tue 1/7/14**	**Tue 2/4/14**		
18	1.5.1 Analyse available offers	16 days	Tue 1/7/14	Tue 1/28/14	2	CFO[50%],L.adv.[50%]
19	1.5.2 Acquisition	5 days	Wed 1/29/14	Tue 2/4/14	18	CFO,L.adv.
20	**1.6 Install equipment**	**4 days**	**Thu 2/20/14**	**Tue 2/25/14**		
21	1.6.1 Install cable network	3 days	Thu 2/20/14	Mon 2/24/14	15	Tech 1[50%],Tech 2[50%],cable[50 meter]
22	1.6.2 Install computer&overhead projector	2 days	Mon 2/24/14	Tue 2/25/14	15	Tech 2[50%],PC[1 pc(s)],overhead projector[1 pc(s)]
23	1.6.3 Install soundbooth equipment, receivers, headsets & microphones	1 day	Thu 2/20/14	Thu 2/20/14	15	Tech 1,interpreter console[1 pc(s)],microphones[12 pc(s)],receivers+headsets[14 pc(s)]
24	**1.7 Test equipment**	**3 days**	**Fri 2/21/14**	**Tue 2/25/14**		
25	1.7.1 Test performed by technical team	2 days	Fri 2/21/14	Mon 2/24/14	23	Tech 1[50%],Tech 2[50%]
26	1.7.2 Test performed by end-user	1 day	Tue 2/25/14	Tue 2/25/14	23,25	Cons 1,Cons 2,Project Manager
27	**1.8 Provide Staffing**	**31 days**	**Tue 1/14/14**	**Tue 2/25/14**	**2**	
28	1.8.1 Publish contest announcement	20 days	Tue 1/14/14	Mon 2/10/14	2	Cons 1[50%],stationary[0.2]
29	1.8.2 Interview and test candidates for maintenance	5 days	Tue 1/14/14	Mon 1/20/14	2	Project Manager
30	1.8.3 Interview and test candidates for training team	5 days	Tue 1/21/14	Mon 1/27/14	2,29	Project Manager
31	1.8.4 Project completion assessement	0 days	Tue 2/25/14	Tue 2/25/14	26	

Appendix 1 – Gantt Chart, activities and resources

Legend:
Tech – Technical expert
Cons – Consultant
CFO – chief financial officer
L.adv. – legal advisor
pc(s) – piece(s)
sq m – square meters
PC – personal computer

Budget Report as of Thu 12/12/13
MicProject

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
23	Install soundbooth equipment, receive	0.00 RON	Prorated	14,560.00 RON	0.00 RON	14,560.00 RON	0.00 RON	14,560.00 RON
22	Install computer&overhead projector	0.00 RON	Prorated	4,660.00 RON	0.00 RON	4,660.00 RON	0.00 RON	4,660.00 RON
18	Analyse available offers	0.00 RON	Prorated	3,200.00 RON	0.00 RON	3,200.00 RON	0.00 RON	3,200.00 RON
15	Furnish the room	0.00 RON	Prorated	2,330.00 RON	0.00 RON	2,330.00 RON	0.00 RON	2,330.00 RON
4	Find location	0.00 RON	Prorated	2,200.00 RON	0.00 RON	2,200.00 RON	0.00 RON	2,200.00 RON
19	Acquisition	0.00 RON	Prorated	2,000.00 RON	0.00 RON	2,000.00 RON	0.00 RON	2,000.00 RON
10	Obtain required construction permits	0.00 RON	Prorated	1,941.00 RON	0.00 RON	1,941.00 RON	0.00 RON	1,941.00 RON
11	Clear room& dismantle old furniture	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
29	Interview and test candidates for main	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
30	Interview and test candidates for traini	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
28	Publish contest announcement	0.00 RON	Prorated	1,230.00 RON	0.00 RON	1,230.00 RON	0.00 RON	1,230.00 RON
14	Install flooring	0.00 RON	Prorated	800.00 RON	0.00 RON	800.00 RON	0.00 RON	800.00 RON
21	Install cable network	0.00 RON	Prorated	570.00 RON	0.00 RON	570.00 RON	0.00 RON	570.00 RON
26	Test performed by end-user	0.00 RON	Prorated	560.00 RON	0.00 RON	560.00 RON	0.00 RON	560.00 RON
6	Analyse available offers	0.00 RON	Prorated	400.00 RON	0.00 RON	400.00 RON	0.00 RON	400.00 RON
25	Test performed by technical team	0.00 RON	Prorated	320.00 RON	0.00 RON	320.00 RON	0.00 RON	320.00 RON
12	Electrical rewiring	0.00 RON	Prorated	300.00 RON	0.00 RON	300.00 RON	0.00 RON	300.00 RON
13	Paint the room	0.00 RON	Prorated	300.00 RON	0.00 RON	300.00 RON	0.00 RON	300.00 RON
7	Signing contracts	0.00 RON	Prorated	120.00 RON	0.00 RON	120.00 RON	0.00 RON	120.00 RON
3	Identify needed resources	0.00 RON	Prorated	112.00 RON	0.00 RON	112.00 RON	0.00 RON	112.00 RON
8	Plan reassesment	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
16	Commision of refurbishing works	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
		0.00 RON		**40,403.00 RON**	**0.00 RON**	**40,403.00 RON**	**0.00 RON**	**40,403.00 RON**

IMPROVING FOREIGN LANGUAGE PROFICIENCY AMONG EMPLOYEES

Maria Adelina NEGOITA

CONTENTS

INTRODUCTION

1. Project Charter

The **Project's Beneficiary** is **ZET Company**.

The Company ZET will train 200 employees within a 200000 euro EU financed project meant to improve its employees' proficiency in foreign languages, as part of the company's business development policy. Its training project answers the overall market's approach to attaining highly qualified labour force, having the capacity to respond to the changing needs of markets in a competitive and dynamic economy, in line with the National Development Plan 2007 – 2013.

The project is co-financed by the European Social Fund of the European Union, in the framework of the "Human Resources Development" Operational Programme 2007 – 2013.

The project is to be developed for 1 year, starting from December 2nd, 2013 and it consists of in-house language training courses, held by professional language trainers.

Partners in the Project:

Bucharest University, the Faculty of Foreign Languages - English, French, German, Czech Departments.

Company profile:

ZET Company specializes in developing and manufacturing personal computing devices, servers, related storage devices, networking products, software and printers for households and small- to medium-sized businesses, also offering customer-support services and consultancy for its whole range of products.

2.Constraints and assumptions:

The main constraint in the project would be that training courses should be held without interfering with the company's activity - that is without impacting on its operational performance in a negative way. Therefore, trainees are to attend courses in turns and still perform their daily tasks. This is the reason why the main stakeholder has also preferred to go with in-house training and therefore, to invest in setting up two language training labs at the premises of the company.

On the other hand, the project manager starts from the assumption that the company's top management is fully supportive of the project and it has delivered the necessary resources in order to implement it.

The beneficiary of the project being an IT company, it will provide for the IT equipment – PCs, laptops, etc. - needed to set up the training labs which are to serve to the same purpose in the future, as the company's approach to continuing professional development goes in with its overall business development policy.

II. PROJECT SCOPE

- **Scope Planning**

The Company has already obtained a financing contract for the training project.

Therefore, the Company has planned to ensure professional training of 200 employees who are involved in daily client-support operations for internal and external customers. The trainees are to get a language certificate for the languages spoken in countries relevant for the company's development, such as - English, French, German, and Czech.

The company's target within the project is to help its employees get a higher proficiency in one international language and other official language in the European Union, accordingly with the Company's development needs. Employees are encouraged to take part in the project, as a means to enhance their professional life and to motivate them work harder for their personal achievement, as well as to the benefit of the company.

The project's specific objectives aim at improving the employees' foreign language skills - both written and communication – and support them improve and update their qualifications as a means to increase their level of adaptability and flexibility to specific day-to-day tasks and, in the end, to increase work quality and operational performance of the company.

The Company's top level management has designated a project manager to coordinate the training project. There are two teams involved in the process – the project management team, whose role is to initiate, monitor and control activities, and a project implementation team, which is taking care that training develops as scheduled.

The Project management team consists of:

– 1 Project Manager
– 1 Legal Advisor
– 1 Financial Expert

Project Implementation Team:

– 2 HR Experts
– 1 Training Coordinator
– 2 Purchasing Experts
– 3 IT experts
– 8 Language Trainers
– 4 Unskilled Workers

- **Scope Statement**

WBS Dictionary

- **Kick-off meeting**

1.1. Determine specific needs in the project

1.2. Project opening press release

1.3. Task assignment

1.4. Project promotion within company

1.5. Draft list of participants

- **Provide location**

2.1. Identify suitable rooms

2.2. Purchase desks

2.3. Purchase chairs

2.4. Furnish classrooms

3. Procure support materials

3.1. Purchase PCs

3.2. Purchase laptops

3.3. Purchase video projectors

3.4. Purchase smart whiteboards

3.5. Purchase course support materials/ stationary, etc.

4. Install equipment

4.1. Install PCs, video projectors and whiteboards in the training labs

4.2. Set up internet connection

5. Hire foreign language lecturers

5.1. Hire 2 English trainers

5.2. Hire 2 French trainers

5.3. Hire 2 German trainers

5.4. Hire 2 Czech trainers

5.5. Curricula approval

5.6. Purchase courses materials

6. Language Training

6.1. Language courses

6.2. Periodical evaluation tests – every 4 months

6.3. Periodical assessment reports – every 4 months

6.4. Final evaluation tests

6.5. Language certificates award ceremony

7. Final Project assessment

7.1. Project closure meeting

7.2. Project closure press release

7.3. Project results dissemination within the company

7.4. Establish simple tools to measure project effectiveness

7.5.

III. PROJECT TIME MANAGEMENT

ACTIV. ID	ACTIVITY TITLE	ACTIVITY DESCRIPTION/ EXPLANATIONS	DEPENDENCIES	DURATION/ working days
A.1	**Kick-off meeting**	Holding a first meeting in order to organize project teams and activities		7
A.2	Specific needs	Determine personnel to be hired, equipment, course materials to be purchased, purchasing schedule etc.		6
A.3	Project opening press release	Press release to announce the company's training project		1
A.4	Task assignment	Members of the project management team and project implementation team are given specific task to perform		1
A.5	Project promotion within company	The project is promoted among the employees via email, as well as through a link added to the company's website		5
A.6	Draft list of participants	Drafting a list of employees who are willing to take part in project	The list of participants is drafted when project promotion within the company is over	2
A.7	**Provide location**			10
A.8	Identify suitable rooms	The teams identify two rooms at the premises of the company which are suitable in terms of space and location		2
A.9	Purchase desks	Issuing a procurement notice, followed by public tender		10
A.10	Purchase chairs	Issuing a procurement notice, followed by public tender		10
A.11	Furnish training labs	Once furniture purchased, the training labs are prepared and furnished	A11 depends on A.8	5
A.12	**Procure support materials**			16
A.13	Purchase PCs	Direct procurement	A.13 depends on A.11	3
A.14	Purchase laptops	Direct procurement	A.14 depends on A.11	3
A.15	Purchase video projectors	Issuing a procurement notice, followed by public tender	A.15 depends on A.14	10
A.16	Purchase smart	Issuing a procurement notice, followed by public tender	A.16 depends on A.11	10

	whiteboards			
A.17	Purchase course support materials/ stationary, etc.	Direct procurement / procurement notice, followed by public tender	A.17 depends A.11	7
A.18	**Install equipment**			14
A.19	Install PCs, video projectors and whiteboards in the training labs	All equipment is installed and ready to use	A.19 depends on A.11	14
A.20	Set up internet connection	All PCs and laptops are connected to internet and ready to use	A.20 depends on A.11	2
A.21	**Hire foreign language lecturers**	The project team contacts the university in order to select and hire lecturers for each module of the training project. Lecturers are hired on temporary employment contracts.	A.21 depends on A.6	5
A.22	Hire 2 English trainers	There are two lecturers hired for each language module as a precautionary measure to avoid training gaps and also due to the high number of employees involved in the training project.		5
A.23	Hire 2 French trainers	idem		5
A.24	Hire 2 German trainers	idem		5
A.25	Hire 2 Czech trainers	idem		5
A.26	Curricula approval	Trainers present curricula and adjust them to the requirements and expectations of the company	A.26 depends on A.2	1
A.27	Purchase courses materials	Books, other course support materials needed for training are bought as advised by the trainers through direct procurement procedure	A.27 depends on A.2	
A.28	**Language Training**	The training lasts the whole year, except for holidays. Employees are divided on groups of 15 and they are attending classes in turn, in the morning or in the evening, as agreed.		240
A.29	Language courses	Language courses are scheduled on 4 modules	A.29 depends on A.21	240
A.30	Periodical evaluation tests	Trainees undergo evaluation tests every 4 months.		8
A.31	Periodical assessment reports	Following evaluation tests, the training coordinator drafts a report on the language training development to be presented to the project manager and company top management.		2
A.32	Final evaluation tests	At the end of the training, employees have to pass final evaluation tests.		2

A.33	Language certificates award ceremony	Employees receive language certificates according to their level of proficiency.		1
A.34	**Final Project assessment**			
A.35	Closing project meeting	Teams discuss closing procedures, contracts to be terminated etc.		1
A.36	Project closure press release	A press release is issued to announce the project results. This is meant as a marketing tool used as to promote the company as a competitive working environment, where employees' professional development is highly valued. This strategy also makes the company more appealing to potential customers, clients or valuable experts who may be therefore convinced to join in.		1
A.37	Project results dissemination within the company	The results of the project are disseminated within the company as to motivate employees to attend similar future projects and also to enhance competitiveness among employees etc.		1
A.38	Assessment tools	The project manager and the company management establish simple assessment tools in order to measure project effectiveness. They evaluate if the goals assumed in the project have been attained and therefore, if business performance has increased – e.g. a higher number of contracts signed etc.		1

IV. COST MANAGEMENT

ID	Activity	Human Resources	Cost/unit/ron	Tools	Cost/unit/ron
A.1	**Kick-off meeting**				
A.1.1	Specific needs	Project manager	250		
A.1.2	Project opening press release	Project manager	250		
A.1.3	Task assignment	Project manager	250		
A.1.4	Project promotion within company	Training coordinator	100		
A.1.5	Draft list of participants	2 HR Experts	150		
A.2	**Provide location**	2 Purchasing Experts	150		
A.2.1	Identify suitable rooms	2 Purchasing Experts	150		
A.2.2	Purchase desks	2 Purchasing Experts	150	30 desks	90
A.2.3	Purchase chairs	2 Purchasing Experts	150	30 chairs	50

A.2.4	Furnish training labs	4 Unskilled workers	20		
A.3	**Procure support materials**	2 Purchasing Experts	150		
A.3.1	Purchase PCs	2 Purchasing Experts	150	30 PCs	3500
A.3.2	Purchase laptops	2 Purchasing Experts	150	2 laptops	4000
A.3.3	Purchase video projectors	2 Purchasing Experts	150	2 video projectors	2000
A.3.4	Purchase smart whiteboards	2 Purchasing Experts	150	2 whiteboards	4500
A.3.5	Purchase course support materials/ stationary, etc.	2 Purchasing Experts	150	206 Course materials	40
A.4	**Install equipment**	3 IT Experts	100		
A.4.1	Install PCs, video projectors and whiteboards in the training labs	3 IT Experts	100		
A.4.2	Set up internet connection	3 IT Experts	100		
A.5	**Hire foreign language lecturers**	2 HR Experts, Legal Advisor	150 , 200		
A.5.1	Hire 2 English trainers		40		
A.5.2	Hire 2 French trainers		40		
A.5.3	Hire 2 German trainers		45		
A.5.4	Hire 2 Czech trainers		50		
A.5.5	Curricula approval	Project Manager	250		
A.5.6	Purchase courses materials	2 Purchasing Experts	150		
A.6	**Language Training**	Language Trainers			
A.6.1	Periodical evaluation tests	Language Trainers			
A.6.2	Periodical assessment reports	Training coordinator	100		

A.6.3	Final evaluation tests	Training coordinator	100		
A.6.4	Language certificates award ceremony	Training coordinator	100		
A.7	**Final Project assessment**	Project manager Training coordinator	250, 100		
A.7.1	Closing project meeting	Project manager Training coordinator	250, 100		
A.7.2	Project closure press release	Project manager	250		
A.7.3	Project results dissemination within the company	Training coordinator	100		
A.7.4	Assessment tools	Project Team Training Coordinator	250, 100		

V. PROJECT QUALITY

The Project Management Team will make sure the trainees have the necessary learning resources – in terms of technology and course materials- as well as qualified teachers in order to improve their communication skills in the foreign languages they use in their jobs on a regular basis.

When training is over, the trainees will undergo final evaluation tests to attest their level of knowledge related to understanding, writing, reading and speaking. Trainees will also receive language certificates at the end of the training.

The project manager, together with the company's management, will establish some simple tools to assess the effectiveness of the project in terms of: a higher number of contracts signed; increased activity performance; the company has met its development goals in certain countries where the languages the employees have been trained in are the main communication languages etc.

VI. PROJECT HUMAN RESOURCE MANAGEMENT

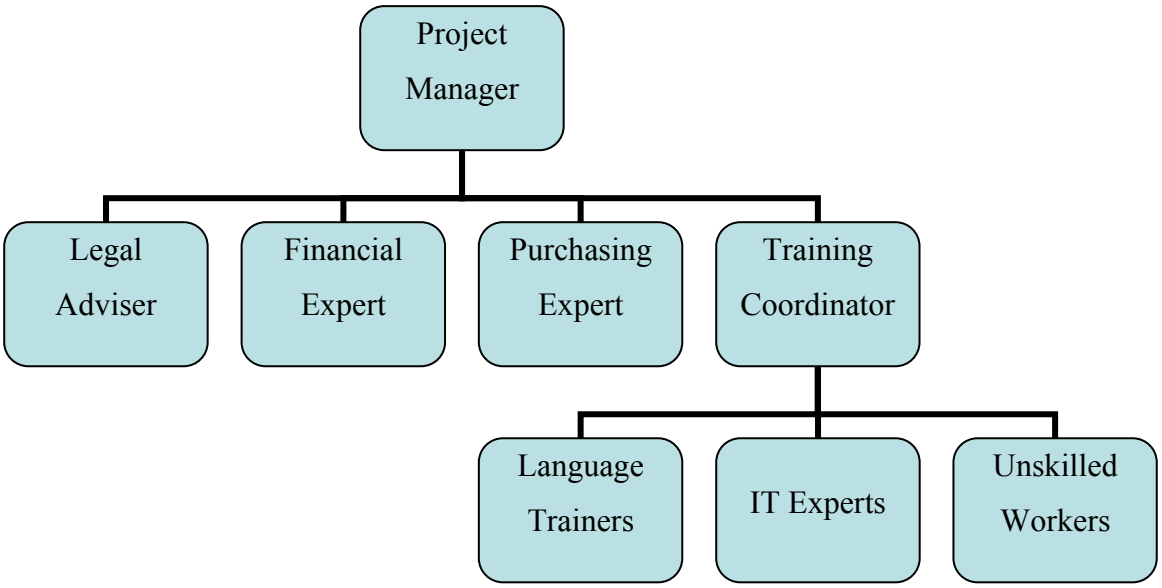
1. Organizational planning

There are two teams involved in the process: the project management team, whose role is to initiate, monitor and control activities, and the project implementation team, which is taking care that training develops as scheduled. Each member of the two teams is assigned clear and specific project tasks and responsibilities within the project.

The Project management team consists of 1 project manager, 1 legal advisor, 1 financial expert, while the project implementation team has 2 HR experts, 1 training coordinator, 2 purchasing experts, 3 IT experts, 4 unskilled workers.

2. Project organizational chart

The two project teams subordinate as following:



3. Responsibility Assignment Matrix (RAM)

WBS Activities ⟶

	A1	A2	A3	A4	A5	A6	A7
Project Manager	R	R	R	R	R	R	R
Legal Adviser	P	P	P		P	P	P
Financial Expert	P	P	P		P		P
HR Experts	P				P		P
Training Coordinator	P				P	R	P
Purchasing Experts		P	P		P		
IT experts		P	P	P			
Language Trainers						P	
Unskilled Workers	P	P	P	P	P	P	P

R= Responsible organizational unit

P= Performing organizational unit

4 Staff acquisition

The language trainers are university lecturers who are to be temporarily employed on collaboration agreements, as drafted by the Project Legal Adviser. Contractual provisions follow the overall project plan in terms of cost management and training schedule.

The members of the project management team, as well as the members of the project implementation team, except for the language trainers, are employees of the project's main stakeholder.

VII. PROJECT COMMUNICATIONS MANAGEMENT

In order to bring on an effective communication environment, the project management team will ask an IT expert to create a link on the company's website where the training coordinator will post all information related to courses: schedule, modifications, training progress reports, test results, information regarding language certificates awarding etc. This simple communication tool will also facilitate communication among trainees and trainers and will prevent any misunderstandings related to schedule or last minute changes etc.

Every four months, the training coordinator will periodically conduct a stakeholder analysis as to inform on the progress of the training, on possible resources reallocation or unpredictable events that could hinder the development of the project. The training coordinator will use a template for progress report.

VIII. RISK MANAGEMENT

Having Czech trainers on the project may be a high risk the management team decides to treat by paying them better than the other trainers. Otherwise, the Czech language module could be off and having no Czech speakers as employees may create a problem to the company's development policy on the Czech market.

It is also important to have curricula adjusted to the specific needs of their jobs. When training is over, trainees should be able to communicate and also have good IT terminology knowledge.

Promoting the project at the beginning and also at the end of the project is also a key point in inducing a strong perception on the IT market.

In order to have the main activities performed on time, the project team allocates enough resources and gives them clear tasks and deadlines.

Possible equipment malfunctions are managed with priority by a team of three IT experts, while a credit line is available to prevent any payment delays.

	Risk	*Description*	*Probability*	*Impact*	*Risk Value*
1	No Czech language trainer can be convinced to join the project	There is no training expert willing to conduct the Czech language module	2	5	10
2	Curricula are not adjusted to the specific needs expressed by the beneficiary	Trainees won't assimilate useful knowledge as to accomplish their job tasks	2	4	8
3	Level of proficiency at the end is below expectations	Trainees aren't be able to use the language they have been trained in as to perform current job tasks	1	4	4
4	The results of the training project are not well promoted	As a result, all future attempts by employees to take part in such a training project will not be encouraged	1	3	3
5	The Company has not had the cash flow to assist project activities	All project activities lack financing and therefore they can be delayed, trainers are not paid as agreed etc.	3	4	12
6	Main project activities are not	As the overall	4	2	8

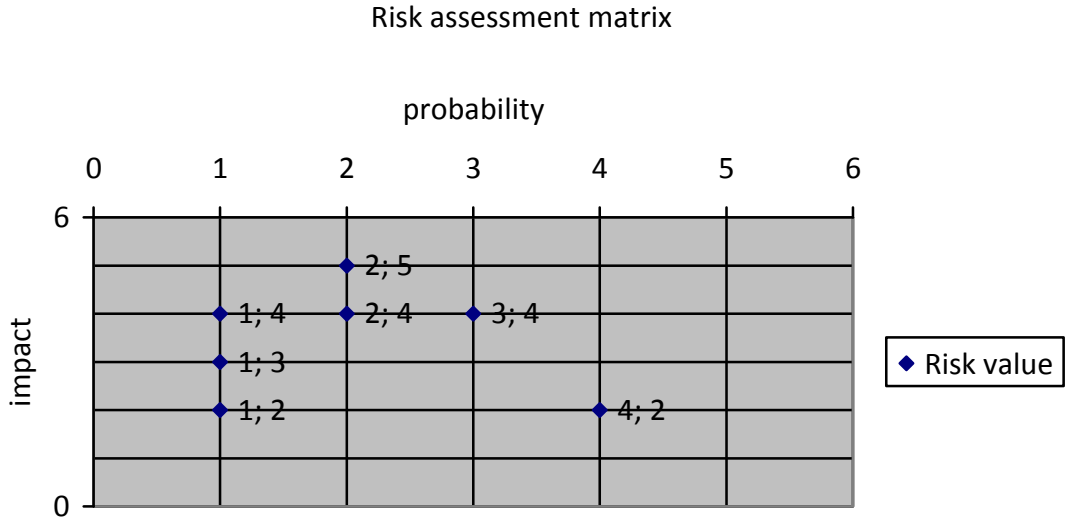
	performed on time	training schedule is put off to a later time, EU reimbursement could not be granted			
7	Equipment does not function properly	Training labs are not totally functional	1	2	2

Very likely	***5***	***10***	***15***	***20***	***25***
likely	***4***	***8***	***12***	***16***	***20***
feasible	***3***	***6***	***9***	***12***	***15***
slight	***2***	***4***	***6***	***8***	***10***
Very unlikely	***1***	***2***	***3***	***4***	***5***
	Insignificant	***Minor***	***Significant***	***Major***	***Critical***

Legend:

Low risk: no. 7 (2), no. 6 (8), 2, 3 and 4

High risks: no. 5 and no. 1



IX. PROCUREMENT

The main resources needed to set up the language training lab – PCs and laptops – will be procured by direct procurement from the project's beneficiary, while whiteboards and video projectors are to be provided for by public tender, after a procurement notice has been issued .

The furniture will also be procured by public tender. Course materials, stationary etc. are also to be acquired by public tender.

All procurement procedures within the project comply with the provisions in Government Emergency Ordinance No. 34/2006.

Language trainers are hired on temporary employment contracts drafted by the legal advisor of the company assigned to the project management team.

X. PROJECT CLOSING

At the end of the project, the teams meet to discuss closing procedures, e.g. termination of the temporary employment contracts signed with the language trainers.

The project manager drafts a press release to announce the results of the project. This strategy is meant to promote the company as a competitive working environment, where employees' professional development is highly valued. The training coordinator also disseminates results among the employees of the company, as a means to enhance competitiveness and motivate other employees to take part in similar future projects.

CONCLUSIONS

The project manager and the company management establish some simple assessment tools to measure project effectiveness. They conclude that the goals assumed in the project have been attained and, as a consequence, the company's development strategy in the targeted countries has resulted in enhanced business performance and a motivating and competitive working environment. The employees have managed to get a higher number of contracts signed off and therefore, the management has approved to be given incentives according to their performance.

The project has proved to be effective both in terms of business development policy and working environment.

Due to the success of the project, the company has been perceived as a valuable competitor on the IT market, and also a serious employer and business partner. The company intends to develop similar training courses in the near future.

SETTING UP A TRAINING LABORATORY FOR CONFERENCE INTERPRETERS

Ioana PANAITESCU

CONTENTS

1. INTRODUCTION

Since gaining a strategic position as a member of both NATO and the EU, Romania has become more and more involved in the organizing of events, conferences and summits meant to enhance cooperation between partner states. At the level of each institution cooperation is deemed necessary, both on a bilateral and multilateral level. Whenever such events are organized by our institution, among other objectives, it is within our responsibility to also ensure that all technical conditions are met, for the event to unfold in an appropriate manner. This is why the translation team has a very important role, and a professional group of people have been organized in a separate department in order to ensure translation services for the most common languages. For these professionals to always be prepared and to keep up with the evolutions in this field there is a need for a training base, where they can practice in real life conditions and improve their skills.

For that reason, a team was appointed in order to prepare a laboratory with the necessary equipment and to identify the staff needed to run the establishment and organize the training sessions.

The goal is to set up a training lab for conference interpreters, needed for improving the work in this field, and which could benefit the activity of the institution. The project manager must identify the location, address the purchase of the necessary equipment, and identify the staff necessary to manage the respective location and to start implementing courses for interpreters.

The laboratory should be large enough to house up to 12 attendants to the course, and should provide the necessary conditions in order for the attendants to be able to simulate the conditions in a conference with participants from various countries, and try to prepare for both consecutive and simultaneous translation.

Both the translators and the institution shall benefit from the training room. The main end user shall be the translation department, but the room will also be used by other departments for conferences or meetings, according to a schedule mutually agreed with the translation department.

2. PROJECT SCOPE

2.1. Scope planning

In the past years, due to the increasing number of multicultural events organized by our institution, the necessity was identified for a professional team of conference interpreters, for various languages, and the management approved the setting up of a department in which interpreters can be trained and can practice in an organized environment, so that they keep up with the innovations in the field and constantly brush up on their skills.

The management has approved the setting up of such a laboratory, and has appointed a project manager, who has selected a team made up of two technical experts, a person responsible for acquisitions (the CFO), a legal advisor, and two members from the translation team as consultants. The project team is directly subordinated to the management of the institution (also the Project Sponsor), and any changes brought to the project shall be submitted for approval to the top management.

To this respect, the team will follow the pattern used in several similar laboratories from the universities in Bucharest. A visit to one of the universities was organized and the project manager has discussed with the staff that runs the laboratory in order to identify what equipment is necessary and what are the minimum conditions that need to be provided.

2.2. Scope statement

The main objective of the project is to set up a laboratory large enough for 12 attendants, equipped with a soundproof translation booth, microphones, receivers and headsets. Also, a computer and projector shall be needed. Depending on the conditions available in the location identified, the soundproof booth can be an adjacent room, but it must provide visual contact with the main room through a glass panel. The furniture in the room shall be custom made with individual desks, offering multiple possibilities of arrangement (multiple rows, U shape, etc.). In terms of furbishing (wall covering, flooring, etc.), the details shall be established in a separate contract signed with the building team which shall restore the location. The equipment to be purchased must ensure a good audio quality, without interruptions in the flow of speech. Second hand equipment is acceptable, provided that it passes the quality checks from the technical team.

In mid-September 2014 our institution will host an important seminar with participants from 15 European countries, where interpreters for at least 4 languages shall be needed. The top management considers that at least 6 interpreters must be prepared for the respective event, and they will need at least 6 months of training, and therefore requested that the laboratory become operational by March 15th 2014.

The following assumptions apply to the project at this stage, and as more assumptions are identified, they will be added accordingly.

- Funding is available for purchasing the necessary equipment
- Enough time is available for the completion of the project
- All department heads will provide necessary support, and will avoid over allocation of the persons involved in the project management team, for the successful completion of the project

The following constraints apply to the project at this stage, and as more constraints are identified, they will be added accordingly.

- There are limited resources available to support the Project. Second hand equipment might have to be purchased.
- As implementation will be done internally and not by the product developers or vendors, there will be limited support from the equipment providers.

The Work Breakdown Structure is detailed in Table 1:

	Activity	Explanation	Dependencies
1.	Plan activity	A team meeting in which the needed resources are identified	-
2.	Find location	Identifying a location with the characteristics necessary to host the laboratory	Activity 1
3.	Hire building team	Analyzing available offers and selecting a team to perform quality works, for a convenient rate.	Activity 1
4.	Refurbish location	Bringing in a construction team to do any repairs necessary, to do the rewiring, to paint the room, install flooring, and furnish the room.	Activity 2
5.	Purchase equipment	Establishing the conditions for the acquisition, identifying the best equipment to be bought, based on the price-quality ratio.	Activity 1
6.	Install equipment	Installing all necessary cables and plugs for the equipment to be installed and then installing the equipment.	Activity 5
7.	Test equipment	Performing all necessary tests in order to ensure that the equipment is functional.	Activity 6
8.	Provide staffing	Selecting personnel for the equipment maintenance once the laboratory becomes operational, and lecturers who will implement training courses.	Activity 1

Table 1: WBS

3. TIME MANAGEMENT

When establishing criteria for developing and controlling the project schedule, duration estimates were made, based on previous experiences, and on the assumptions of the team members.

A more detailed list of activities and milestones, as well as their sequence and dependencies is available in Appendix 1, the Gantt Chart.

The deadline for the laboratory to become functional is March 15th, and all activities have been planned until February 25th, which leaves us with about 20 spare days, which can be used in case of any delays.

Any proposed changes to the project schedule shall be reviewed by the Project Manager and approved by the Project Sponsor. Appropriate stakeholders will be notified of any significant modifications as they occur.

The table below presents the duration of each activity and sub-activity:

Code	Activity	Duration/ hours	Duration/ days	Start date	End date
1.	Set up training lab	668 hrs	37 days	1/6/2014 8:00	2/25/2014 17:00
1.1.	Plan activity	4.8 hrs	1 day	1/6/2014 8:00	1/6/2014 17:00
1.1.1.	Identify needed resources	4.8 hrs	1 day	1/6/2014 8:00	1/6/2014 17:00
1.2.	Find location	80 hrs	5 days	1/7/2014 8:00	1/13/2014 17:00
1.3.	Hire building team	20.8 hrs	3 days	1/7/2014 8:00	1/9/2014 17:00
1.3.1.	Analyze available offers	16 hrs	2 days	1/7/2014 8:00	1/8/2014 17:00
1.3.2	Signing contracts	4.8 hrs	1 day	1/9/2014 8:00	1/9/2014 17:00
1.3.3.	Plan reassessment	0 hrs	0 days	1/9/2014 17:00	1/9/2014 17:00
1.4.	Refurbish location	122.4 hrs	27 days	1/14/2014 8:00	2/19/2014 17:00
1.4.1.	Obtain required construction permits	26.4 hrs	10 days	1/14/2014 8:00	1/27/2014 17:00
1.4.2.	Clear room& dismantle old furniture	80 hrs	10 days	1/14/2014 8:00	1/27/2014 17:00
1.4.3.	Electrical rewiring	0 hrs	5 days	1/28/2014 8:00	2/3/2014 17:00
1.4.4.	Paint the room	0 hrs	4 days	2/4/2014 8:00	2/7/2014 17:00
1.4.5.	Install flooring	0 hrs	6 days	2/10/2014 8:00	2/17/2014 17:00
1.4	Furnish the room	16 hrs	2 days	2/18/2014	2/19/2014

Code	Activity	Duration/ hours	Duration/ days	Start date	End date
.6.				8:00	17:00
1.4.7.	Commission of refurbishing works	0 hrs	0 days	2/19/2014 7:00	2/19/2014 17:00
1.5.	Purchase equipment	208 hrs	21 days	1/7/2014 8:00	2/4/2014 17:00
1.5.1.	Analyze available offers	128 hrs	16 days	1/7/2014 8:00	1/28/2014 17:00
1.5.2.	Acquisition	80 hrs	5 days	1/29/2014 8:00	2/4/2014 17:00
1.6.	Install equipment	32 hrs	4 days	2/20/2014 8:00	2/25/2014 17:00
1.6.1	Install cable network	16 hrs	3 days	2/20/2014 8:00	2/24/2014 17:00
1.6.2.	Install computer &overhead projector	8 hrs	2 days	2/24/2014 8:00	2/25/2014 17:00
1.6.3.	Install sound booth equipment, receivers, headsets & microphones	8 hrs	1 day	2/20/2014 8:00	2/20/2014 17:00
1.7.	Test equipment	40 hrs	3 days	2/21/2014 8:00	2/25/2014 17:00
1.7.1.	Test performed by technical team	16 hrs	2 days	2/21/2014 8:00	2/24/2014 17:00
1.7.2.	Test performed by end-user	24 hrs	1 day	2/25/2014 8:00	2/25/2014 17:00
1.8.	Provide Staffing	160 hrs	20 days	1/14/2014 8:00	2/10/2014 17:00
1.8.1.	Publish contest announcement	80 hrs	20 days	1/14/2014 8:00	2/10/2014 17:00
1.8.2.	Interview and test candidates for maintenance	40 hrs	5 days	1/14/2014 8:00	1/20/2014 17:00
1.8.3.	Interview and test candidates for training team	40 hrs	5 days	1/21/2014 8:00	1/27/2014 17:00

Table 2: Activity duration

4. COST MANAGEMENT

The budget for the entire project is of 40,403 RON.

A detailed budget report is presented in Appendix 2.

5. PROJECT QUALITY

5.1. Quality Assurance

As mentioned in the introduction, the objective of the present project is to obtain a training laboratory with performing audio equipment, to replicate real-life conference conditions. All the activities involved in the project (see the WBS) are planned to provide the achievement of the quality factors.

All activities shall be supervised by the project management team. The progress of refurbishing and installing of cables shall be supervised by one of the technical experts and verifications shall be performed on a weekly basis.

The success of the project will be based on how well the following conditions were met:

· Milestones completed on schedule;

· Project on budget;

· Project on time;

· Works have passed acceptance testing.

5.2. Quality control

The Project Manager shall verify periodically the progress of the works and shall submit a weekly report to the top management. Inspections shall be performed in order to evaluate the location and decide how to de-clutter, as well as to verify how the refurbishing was performed. Final tests shall be performed to check proper functioning of the equipment.

The table below provides a description of the deliverables and the acceptance criteria:

Deliverables	Acceptance criteria
Location	Within premises; large enough for 12 attendants; away from any continuous source of noise; soundproof booth for 2 translators +visual;
Refurbishing	Any unnecessary items will be removed from the room; walls painted in a neutral relaxing color; flooring – carpeting; 12 individual desks +chairs;
Equipment	1 overhead projector; 1 PC; infrared light transmission technology with 1 interpreter console +headsets, 12 wireless receivers +headsets, and 12 microphones;
Installing equipment	Cables installed through cable channels, in order to prevent tripping; all equipment functioning;
Maintenance team	2 technical experts selected and trained in order to ensure equipment maintenance, during working hours, in turns;
Training team	2 trainers with a master's degree in interpreting and at least 3 years of experience in conference interpreting, who will design the courses and prepare the materials.
Documents	According to the institution templates

Table 3: Quality control

6. PROJECT HUMAN RESOURCE MANAGEMENT

6.1. Organizational Planning

The roles and responsibilities for the Project are essential for the success of the project. All human resources involved must clearly understand their roles and responsibilities in order to successfully perform their portion of the project. As such, for the main activities the following roles and responsibilities have been assigned (Table 4):

Activity	PM	Tech	Cons	L.adv.	CFO	Bld
Plan activity	**2**	**1**	**1**	**1**	**1**	**-**
Find location	**3**	**-**	**1**	**-**	**-**	**-**
Hire building team	**4**	**-**	**-**	**1**	**1**	**-**
Refurbish location	**3**	**-**	**-**	**-**	**-**	**1**

Purchase equipment	**3**	**-**	**-**	**1**	**1**	**-**
Install equipment	**-**	**1**	**-**	**-**	**-**	**-**
Test equipment	**2**	**1**	**1**	**-**	**-**	**-**

Table 4: Roles and responsibilities

Legend:

1 – actual responsibility;
2 – general supervision;
3 – must be consulted;
4 – approval authority.

PM – project manager
Tech – technical expert
Cons – consultant
L.adv. – legal advisor
CFO – chief financial officer
Bld. – building team

6.2. Staff acquisition

According to the main HR management principles, the process will start with the selection of the best internal specialists, who also prove flexibility and availability for team work. Responsibilities will be clearly defined during the kick off meeting, and will be mentioned in the meeting minute.

In order to enhance team cohesion, informal meetings will be encouraged, and the project manager will discuss periodically with the team members, in an attempt to address their issues linked to the involvement in the project.

Most of the personnel involved in the project team will also be involved in the actual activity after the laboratory becomes functional. The two consultants and the project manager were selected from the interpreting team who will actually use the training lab, while the technical experts might be selected to ensure maintenance for the laboratory, and this makes them all the more interested in the success of the project and in the timely delivery of the product.

7. COMMUNICATIONS MANAGEMENT

7.1. Stakeholders

The main stakeholders for this project are the top management of the institution (also the project sponsor), the project manager, and the members of the team, who, as it was already mentioned, will also be the main beneficiaries of the project. Also, the building team, and the equipment supplier will have some influence in the development of the project.

7.2. Stakeholders Communication Needs

The following plan sets the communication framework for this project, will serve as a guide for communications throughout the development of the project, and will be updated as other communication needs are identified.

The Project Manager will take a proactive role in ensuring effective communication during the development of the project. The communications requirements are documented in the Communications Matrix presented in the following table (Table 4). The Communications Matrix will be used as a guide, stating the information to be communicated, who is to do the communication, when the communication will take place, and to whom the information will be communicated:

Project stage	Person to convey message	Target audience	When the message is conveyed	Communi-cation type/channel	Deliverables	Message content
1.1	Project Manager	- Project team - Project sponsor	Mon 1/6/14	Kickoff meeting	- Agenda - Meeting minutes	Introduce the project team and the project. Review project objectives and management approach.
1.2.	Project Manager	Project sponsor	Mon 1/13/14	E-mail	Official letter	Report on identifying location
1.3	CFO, Legal advisor	Building Team	Thu 1/9/14	Meeting	Contract	Signing contract with building team
1.3	CFO	Project managemen t	Thu 1/9/14	E-mail	Official letter	Report progress of hiring building team
1.3.3	CFO, Legal advisor	Project Manager	Thu 1/9/14	Meeting	Agenda	Reassess activity plan and costs, after identifying location and hiring building team
1.4.1	Town hall	Consultant	Tue	Mail	Official letter	Apply for

Project stage	Person to convey message	Target audience	When the message is conveyed	Communi-cation type/channel	Deliverables	Message content
	authorities		1/14/14			construction permits
1.4.7	Building team	Project Manager	Wed 2/19/14	Meeting	-	Commission of refurbishing works
1.4.7	Project Manager	Project Sponsor	Wed 2/19/14	Meeting	-	Periodical report on the progress of the project
1.5	CFO Legal advisors	Equipment vendors	Tue 1/7/14	E-mail	Official letter	Offer request
1.6.	Technical expert	Project manager	Thu 2/20/14	E-mail	Official letter	Report on equipment installation
1.8.1.	Consultant	Interviewees	Tue 1/14/14	Intranet	Announcement	Publish contest announcement
1.8.4.	Project manager	Project sponsor	Tue 2/25/14	Meeting	Meeting minute	Project delivery assessment

Table 5: STAKEHOLDERS COMMUNICATION MATRIX

8. RISK MANAGEMENT

8.1. Planning

This chapter regards the evaluation of potential factors that could have a negative impact on the project development, prioritized according to the impact level.

During the kickoff meeting, the team will brainstorm in order to identify the main risks, based on historical information and knowledge that has been accumulated from previous similar projects and from other sources of information and assumptions analysis. Certain measures will be identified, in order to minimize risk impact and implement mitigation response.

The Risk Assessment will be continuously monitored and updated during the project development, with weekly assessments included in the status report and open to amendment by the Project Manager.

8.2. Risk identification & qualitative analysis

	Risk Description	Probability	Impact	Risk Value	Corrective Actions
A	Location with the specified characteristics not available on premises	1	3	3	Try to obtain location in another unit of the institution
B	Not enough candidates in the personnel pool to select training personnel	1	3	3	Extend period of time for selection
C	Construction permits not obtained on time	2	2	4	Extend deadline for refurbishing works
D	The equipment available off the shelf is over the budget	3	2	6	Purchase second hand equipment
E	Refurbishing works not delivered on time	4	2	8	Extend deadline for refurbishing and installing equipment
F	Poor quality refurbishing works	4	2	8	The contract with the building team will clearly state the deliverables and the obligation of the builder to re-do the works if standards were not attained
G	Technical team not able to install equipment	2	5	10	Outsource installing to vendor – may involve additional costs
H	Not all team members are available as planned (sick leave, or involvement in other urgent activities)	4	4	16	Involve the remaining team members (and allocate days off for overtime) and be prepared to reschedule activities

Green = Low risk, Amber = Medium risk, Red = High risk

Likelihood of Occurrence (A)		Severity of Impact (B)	
1- Very unlikely	(hasn't occurred before)	1 - Insignificant	(has no effect)
2 - Slight	(rarely occurs)	2 - Minor	(little effect)
3 - Feasible	(possible, but not common)	3 - Significant	(may pose a problem)
4 - Likely(has occurred before, will again)		4 - Major	(will pose a problem)
5 - Very Likely	(occurs frequently)	5 - Critical	(immediate action required)

Table 6: Risk management

9. PROCUREMENT

In terms of procurement, two acquisitions contracts will be signed, one for the refurbishing works, and another one linked to the equipment acquisition.

First, a building team will be hired to do all the dismantling, rewiring, painting and refurbishing. Several offers will be analyzed, from various companies, with the support of the logistical department, and a contract will be signed with the one company that offers the best price-quality ratio.

Then, the equipment will be purchased, by analyzing several offers available on the internet from various suppliers, and taking into consideration the budget available. If the quotations for off-the-shelf products are too high, second hand equipment offers might be identified, and the equipment will be accepted, provided it passes quality checks from technical experts.

The analysis of available offers and all other activities linked to acquisitions will start right after the kickoff meeting, so that there is enough time to identify the best offers.

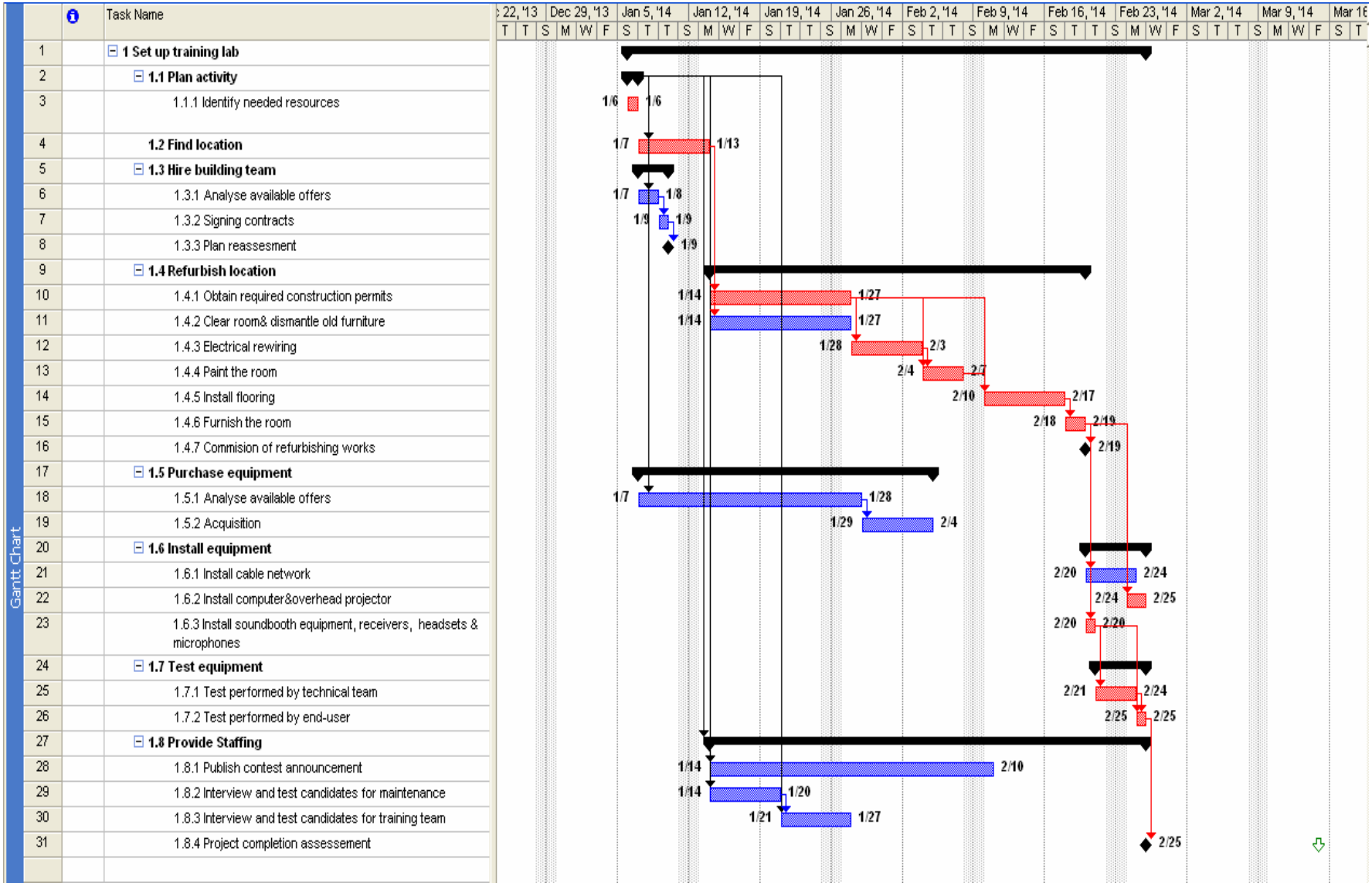
10. PROJECT CLOSING AND CONCLUSIONS

The project will finish no later than March 15th 2014, when the laboratory must become operational. In order for the project to be declared closed, all acceptance tests must be passed, all equipment must be functional and it must meet the requirements of both the technical experts and the translation team.

After the works are finished, all contracts with the building team and the equipment supplier will have to be closed, and commission reports will be signed with each party.

The responsibility for managing the laboratory will fall to one of the technical experts who will ensure the maintenance and one of the trainers selected. The latter will have to sign a handover report, taking over responsibility that the equipment will be used properly and committing to cover all expenses if the equipment is damaged by the users.

Appendix 1 – Gantt Chart, activities and resources


Gantt Chart
Task Name
1 Set up training lab
1.1 Plan activity
1.1.1 Identify needed resources
1.2 Find location
1.3 Hire building team
1.3.1 Analyse available offers
1.3.2 Signing contracts
1.3.3 Plan reassesment
1.4 Refurbish location
1.4.1 Obtain required construction permits
1.4.2 Clear room& dismantle old furniture
1.4.3 Electrical rewiring
1.4.4 Paint the room
1.4.5 Install flooring
1.4.6 Furnish the room
1.4.7 Commision of refurbishing works
1.5 Purchase equipment
1.5.1 Analyse available offers
1.5.2 Acquisition
1.6 Install equipment
1.6.1 Install cable network
1.6.2 Install computer&overhead projector
1.6.3 Install soundbooth equipment, receivers, headsets & microphones
1.7 Test equipment
1.7.1 Test performed by technical team
1.7.2 Test performed by end-user
1.8 Provide Staffing
1.8.1 Publish contest announcement
1.8.2 Interview and test candidates for maintenance
1.8.3 Interview and test candidates for training team
1.8.4 Project completion assessement
Dec 22, '13
Dec 29, '13
Jan 5, '14
Jan 12, '14
Jan 19, '14
Jan 26, '14
Feb 2, '14
Feb 9, '14
Feb 16, '14
Feb 23, '14
Mar 2, '14
Mar 9, '14
Mar 16

	Task Name	Duration	Start	Finish	Predeces	Resource Names
1	**1 Set up training lab**	**37 days**	**Mon 1/6/14**	**Tue 2/25/14**		
2	**1.1 Plan activity**	**1 day**	**Mon 1/6/14**	**Mon 1/6/14**		
3	1.1.1 Identify needed resources	1 day	Mon 1/6/14	Mon 1/6/14		CFO[10%],Cons 1[10%],Tech 1[10%],Cons 2[10%],Project Manager [10%],Tech 2[10%]
4	**1.2 Find location**	**5 days**	**Tue 1/7/14**	**Mon 1/13/14**	2	Cons 1,Project Manager
5	**1.3 Hire building team**	**3 days**	**Tue 1/7/14**	**Thu 1/9/14**		
6	1.3.1 Analyse available offers	2 days	Tue 1/7/14	Wed 1/8/14	2	L.adv.[50%],CFO[50%]
7	1.3.2 Signing contracts	1 day	Thu 1/9/14	Thu 1/9/14	6	CFO[30%],L.adv.[30%]
8	1.3.3 Plan reassesment	0 days	Thu 1/9/14	Thu 1/9/14	7	
9	**1.4 Refurbish location**	**27 days**	**Tue 1/14/14**	**Wed 2/19/14**		
10	1.4.1 Obtain required construction permits	10 days	Tue 1/14/14	Mon 1/27/14	4	Cons 2[33%],stationary[0.3],permit fees [1]
11	1.4.2 Clear room& dismantle old furniture	10 days	Tue 1/14/14	Mon 1/27/14	4	building team
12	1.4.3 Electrical rewiring	5 days	Tue 1/28/14	Mon 2/3/14	10	rewiring services[1 contract]
13	1.4.4 Paint the room	4 days	Tue 2/4/14	Fri 2/7/14	10,12	painting services[1 contract]
14	1.4.5 Install flooring	6 days	Mon 2/10/14	Mon 2/17/14	10,13	flooring[20 sq m],flooring services[1 contract]
15	1.4.6 Furnish the room	2 days	Tue 2/18/14	Wed 2/19/14	14	building team,chairs[15 pc(s)],desks[14 pc(s)]
16	1.4.7 Commision of refurbishing works	0 days	Wed 2/19/14	Wed 2/19/14	15	
17	**1.5 Purchase equipment**	**21 days**	**Tue 1/7/14**	**Tue 2/4/14**		
18	1.5.1 Analyse available offers	16 days	Tue 1/7/14	Tue 1/28/14	2	CFO[50%],L.adv.[50%]
19	1.5.2 Acquisition	5 days	Wed 1/29/14	Tue 2/4/14	18	CFO,L.adv.
20	**1.6 Install equipment**	**4 days**	**Thu 2/20/14**	**Tue 2/25/14**		
21	1.6.1 Install cable network	3 days	Thu 2/20/14	Mon 2/24/14	15	Tech 1[50%],Tech 2[50%],cable[50 meter]
22	1.6.2 Install computer&overhead projector	2 days	Mon 2/24/14	Tue 2/25/14	15	Tech 2[50%],PC[1 pc(s)],overhead projector[1 pc(s)]
23	1.6.3 Install soundbooth equipment, receivers, headsets & microphones	1 day	Thu 2/20/14	Thu 2/20/14	15	Tech 1,interpreter console[1 pc(s)],microphones[12 pc(s)],receivers+headsets[14 pc(s)]
24	**1.7 Test equipment**	**3 days**	**Fri 2/21/14**	**Tue 2/25/14**		
25	1.7.1 Test performed by technical team	2 days	Fri 2/21/14	Mon 2/24/14	23	Tech 1[50%],Tech 2[50%]
26	1.7.2 Test performed by end-user	1 day	Tue 2/25/14	Tue 2/25/14	23,25	Cons 1,Cons 2,Project Manager
27	**1.8 Provide Staffing**	**31 days**	**Tue 1/14/14**	**Tue 2/25/14**	**2**	
28	1.8.1 Publish contest announcement	20 days	Tue 1/14/14	Mon 2/10/14	2	Cons 1[50%],stationary[0.2]
29	1.8.2 Interview and test candidates for maintenance	5 days	Tue 1/14/14	Mon 1/20/14	2	Project Manager
30	1.8.3 Interview and test candidates for training team	5 days	Tue 1/21/14	Mon 1/27/14	2,29	Project Manager
31	1.8.4 Project completion assessement	0 days	Tue 2/25/14	Tue 2/25/14	26	

Legend:
Tech – Technical expert
Cons – Consultant
CFO – chief financial officer
L.adv. – legal advisor
pc(s) – piece(s)
sq m – square meters
PC – personal computer

Budget Report as of Thu 12/12/13
MicProject

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
23	Install soundbooth equipment, receive	0.00 RON	Prorated	14,560.00 RON	0.00 RON	14,560.00 RON	0.00 RON	14,560.00 RON
22	Install computer&overhead projector	0.00 RON	Prorated	4,660.00 RON	0.00 RON	4,660.00 RON	0.00 RON	4,660.00 RON
18	Analyse available offers	0.00 RON	Prorated	3,200.00 RON	0.00 RON	3,200.00 RON	0.00 RON	3,200.00 RON
15	Furnish the room	0.00 RON	Prorated	2,330.00 RON	0.00 RON	2,330.00 RON	0.00 RON	2,330.00 RON
4	Find location	0.00 RON	Prorated	2,200.00 RON	0.00 RON	2,200.00 RON	0.00 RON	2,200.00 RON
19	Acquisition	0.00 RON	Prorated	2,000.00 RON	0.00 RON	2,000.00 RON	0.00 RON	2,000.00 RON
10	Obtain required construction permits	0.00 RON	Prorated	1,941.00 RON	0.00 RON	1,941.00 RON	0.00 RON	1,941.00 RON
11	Clear room& dismantle old furniture	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
29	Interview and test candidates for main	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
30	Interview and test candidates for traini	0.00 RON	Prorated	1,600.00 RON	0.00 RON	1,600.00 RON	0.00 RON	1,600.00 RON
28	Publish contest announcement	0.00 RON	Prorated	1,230.00 RON	0.00 RON	1,230.00 RON	0.00 RON	1,230.00 RON
14	Install flooring	0.00 RON	Prorated	800.00 RON	0.00 RON	800.00 RON	0.00 RON	800.00 RON
21	Install cable network	0.00 RON	Prorated	570.00 RON	0.00 RON	570.00 RON	0.00 RON	570.00 RON
26	Test performed by end-user	0.00 RON	Prorated	560.00 RON	0.00 RON	560.00 RON	0.00 RON	560.00 RON
6	Analyse available offers	0.00 RON	Prorated	400.00 RON	0.00 RON	400.00 RON	0.00 RON	400.00 RON
25	Test performed by technical team	0.00 RON	Prorated	320.00 RON	0.00 RON	320.00 RON	0.00 RON	320.00 RON
12	Electrical rewiring	0.00 RON	Prorated	300.00 RON	0.00 RON	300.00 RON	0.00 RON	300.00 RON
13	Paint the room	0.00 RON	Prorated	300.00 RON	0.00 RON	300.00 RON	0.00 RON	300.00 RON
7	Signing contracts	0.00 RON	Prorated	120.00 RON	0.00 RON	120.00 RON	0.00 RON	120.00 RON
3	Identify needed resources	0.00 RON	Prorated	112.00 RON	0.00 RON	112.00 RON	0.00 RON	112.00 RON
8	Plan reassesment	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
16	Commision of refurbishing works	0.00 RON	Prorated	0.00 RON	0.00 RON	0.00 RON	0.00 RON	0.00 RON
		0.00 RON		**40,403.00 RON**	**0.00 RON**	**40,403.00 RON**	**0.00 RON**	**40,403.00 RON**

IMPLEMENTATION OF A CBT SYSTEM IN SECURITY SCREENERS TRAINING CENTRE – ABILITY ORGANIZATION IN TRAINING FOR ROMANIAN AIR COMPANIES

Mariana POLEAC

CONTENTS

ABSTRACT

In the last decades, the environment of the companies which operate in the air transport industry has known **profound changes**, its essential characteristics being the complexity and **discontinuity of changes**. The Romanian air companies must adapt themselves to the globalization tendency of the air transport services, focus on the movement of the strategic orientation towards the security and quality of the services offered to customers.

Security has been a matter of concern for civil aviation for several decades, but in particular since the bombing of a flight above Lockerbie in 1988. However, **aviation security** has, up until more recently, been addressed on essentially a national level. At the international level, though for some time Standards and Recommended Practices have been laid down by the International Civil Aviation Organisation (ICAO) for States to implement, these are not regulated by a binding mechanism **to guarantee their full and proper application**[14].

Following the terrorist attacks in the United States on 11 September 2001 when commercial aircraft were used as weapons of mass destruction, **the Commission made a legislative proposal to bring aviation security under the EU's regulatory umbrella**. This initiative led to the adoption of framework Regulation (EC) No 2320/2002 of the European Parliament and of the Council of 16 December 2002 establishing **common rules** in the field of civil aviation security and thus provided the basis for allowing harmonization of **aviation security rules** across the European Union with binding effect.

That regulatory framework has since been overhauled by a new framework, in full effect from 29 April 2010, as laid down by Regulation (EC) No 300/2008 of the **European Parliament** and of the Council of 11 March 2008 on **common rules in the field of civil aviation security** and repealing Regulation (EC) No 2320/2002.

The International Civil Aviation Organization (ICAO) was established on the grounds of the Convention on Civil Aviation, signed in Chicago, on December 7, 1944, and became a UN specialised agency in 1947. Romania joined the Convention of Chicago in 1965. Romania is a member of the Central European Rotation Group to the ICAO Council, together with Slovakia, Slovenia, the Czech Republic, Bulgaria, Poland and Hungary

Each Member State must adopt a national civil aviation security program in order to ensure that common standards are applied. They must also designate a competent authority to be responsible for coordinating and monitoring the **implementation of its**

[14] http://www.euractiv.com/transport/aviation-security/article

national quality control program. That authority may also adopt national security measures applicable to small airports (in our case – the Ministry of Transportations).

The increasing threat of terrorism has forced Governing bodies around the world to set up stringent regulations on the way **security personnel should be trained and tested.** These new regulations have meant many organizations no longer have the capabilities to provide in house training to their employees and require specialist help from security training companies.

While many security trainers have sufficient security knowledge to provide the training, many lack the technologies and marketing prowess required to take advantage of these extra requirements.

Because **Security Screeners Training Centre** is authorized and responsible - by Ministry of Transportations - **for all training program and certification for all security screeners** from international airports in Romania, also for implemented security standards with all the rules on the notification, preparation, performance and conclusion of inspections of competent authorities.

As an SSTC we have given access to the **security x-ray simulator** through which we will be able to provide high quality training to our screeners and ***CBT system is a operational request and*** **is** ***the absolute best way to keep our finances down****, and also* ***the ultimate tool*** to offer the training in the most operative, efficiency and best possible way.

I. Scope Management Plan – *business plan*

The e-Learning industry has undergone radical changes over the past five years (2008 - 2013), It s considered now as the black horse for training and learning solutions, especially inside companies that combine **large number of employees and extend through a huge geographical distribution**. The need of e-Learning solution **is a must** for companies that are undergo **rapid technological; processes and organizational changes**[15].

Many airlines included ours, pay too much money on education in general. With **CBT system we** have the chance to lower our costs substantially and can adapt courses to suit our taste.

Security Screeners Training Centre **is authorized and responsible for:**

- all training program and certification for all security screeners from international airports in Romania

[15] Sharyn D. Gardner, David P. Lepak, Kathryn M. Bartol, (2003) Virtual HR: The impact of information technology on the human resource professional http://www.sciencedirect.com

- implemented security standards with all the rules on the notification, preparation, performance and conclusion of inspections of competent authorities

CBT system is

- *a operational request*
- *the ultimate tool* to offer the training developed within the into the e-learning platform
- *the absolute best way to keep our finances down* in *the most operative, efficiency and best* possibilits.

The available assessments of suitable systems support our organizations ground training programs, and the **CBT system provides training to airlines and individual users. Over 250 security operators will use online crew training platform and over 2000+ individual users will have used the courses.**

I.1. Advantages and benefits[16]:

Cost-effective

Using CBT platform we can easily save money, and instead of taking a number of crew out of production they can be scheduled individually with a 'short trip'.

Is-Tireless

A CBT never needs a break because the training is online and always there. And with this you can train great numbers of students in a given time frame compared to other methods. CBT meets the need for round the clock (continuous).

Self-paced, Flexible, and Individualized

Trainees works at their own pace, and CBT can sequence the training to match the trainees needs. The computer can always match the trainees schedule and provides immediate feedback to trainees on their progress. CBT does not have to be delivered to all employees simultaneously, and allows the company to maintain coverage of critical positions.

Works with Flight Crew

The trainee feels in control and the computer is non-judgmental and non-threatening. It provides a privacy factor that reduces trainees' embarrassment about taking 'remedial' classes, or making mistakes while answering questions in the training materials.

Can Reduce Resource Requirements

We can have a higher trainee to trainer ratio; this is where the instructor serves as a facilitator, assisting trainees as needed. And there is less need for a centralized training facility. Facilitators can serve more than one structure with a CBT program, lessening the investment each company would have to make.

[16] http://scandlearn.com/courses/crm-and-airborne-emergency

Gives Trannies Increased Control Over Training Activities

Provides management systems for tracking trainees progress and location. And it also provides on line testing to match a trainee with needed training and it provides consistency of training in terms of quality and information presented. It also provides standardization of training when training occurs in several work locations simultaneously.

I.2. Project Assumptions

The following assumptions were made in preparing the Project Plan:

- All employees are willing to change classics courses to take advantage of the functionality offered by the new CBT technology.
- Management will ensure that project team members are available as needed to complete project tasks and objectives.
- The Steering Committee will participate in the timely execution of the Project Plan (timely approval cycles and meeting when required).
- Failure to identify changes to draft deliverables within the time specified in the project timeline will result in project delays.
- Project team members will adhere to the Communications Plan.
- Mid and upper management will foster support and “buy-in” of project goals and objectives.
- The Training Centre will ensure the existence of a technological infrastructure that can support the new technology.
- All project participants will abide by the guidelines identified within this plan.
- The Project Plan may change as new information and issues are revealed.

I.3. Project Constraints

The following represent known project constraints:

- Project funding sources are limited, with no contingency.
- Due to the nature of law enforcement, resource availability is inconsistent.

I.4. Project sponsor

Ministry of Transportation by Romanian Air Companies – the competent authority designate to be responsible for coordinating and monitoring the implementation of national quality

control program **will assure total costs for all resources** (tools and materials) used in project include the cost with consultant from Scandlearn Company.

Human resources are providing by Security Screeners Training Centre (members of team project).

II. Project Goal

GOAL: To implement all the programs developed within the **Security Screeners Training Centre** into the e-learning platform **using the CBT system,** in order to train the screeners employed of the Romania International Airports.
(meets the requirements of Regulation (EU) 185/2010, Section 11 b) third paragraph).

II.1. Project Objectives

Objective 1: using available assessments of suitable systems and internal elearning platform, to adapt specific course for obtaining **initial certification**, usually delivered in the presence of the instructor in specially equipped classroom.
The instructor will can:

- freely choose how many contexts of images of luggage to prepare for the training
- decide the level of difficulty of the contexts in the session (3 levels of difficulty)

Objective 2: to adapt specific courses for obtaining the **continuing education** (6h/6m), under the new legislation. Characteristics:

- 10 sessions of 15 contexts of images per month (equivalent to 1 hour per month of training)
- cycles of sessions of 6 months (6-course events), up to three years set by the 185/2010 of the European Commission for the certification of frequency sweeps

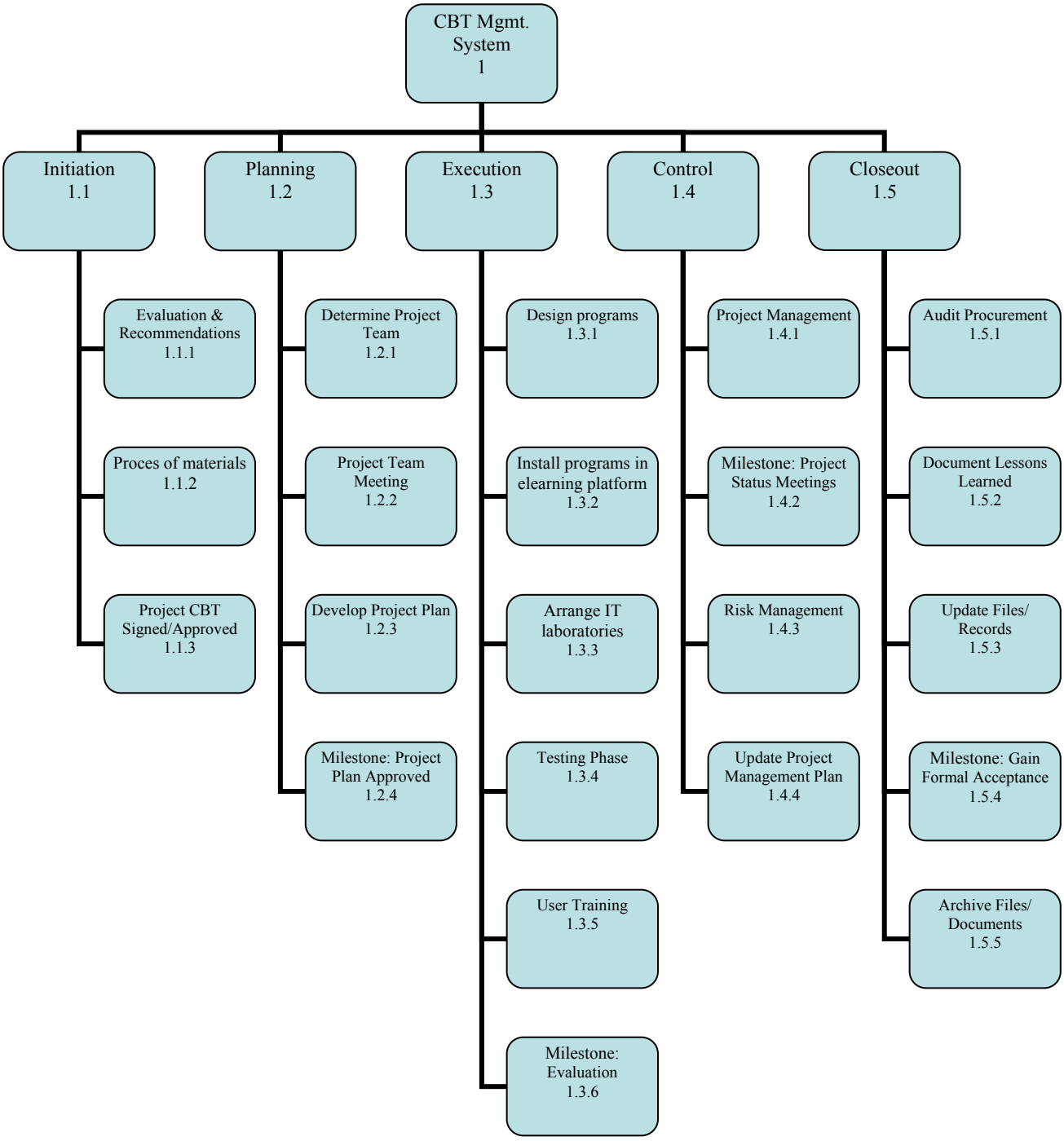
Objective 3: to use the CBT platform also as an environment of **free training**, suitable for all the screeners who can prove they need to refine their ability to recognize a particular threat in the luggage presented.
The instructor will by able to:

- freely choose how many contexts of images of luggage to prepare for the training
- decide the level of difficulty of the contexts in the session (3 levels of difficulty)
- also decide to select the contexts of luggage having a specific threat to them (8 families of threats), in order to put the screener in a position to improve their ability to interpret

Objective 4: In addition to platform are available online courses delivered through its platform designed to be a very easy to use and very powerful in the **management of interactive and multimedia courses** and also of the classroom, allowing the institution to training or instructor to have a tool characterized by flexibility and storage capacity of the performance of users in line with **other e-learning systems** (LMS) on the market today.

II.2. Work Breakdown Structure (WBS) – in appendix 1

- **Scheme of WBS:**



III. Time Management Plan (Gantt Chart)

The starting date, duration of each activity, and the end date are presented in the Gantt Chart appendix 1.

The implementation period of the project is 01.04.14 - 01.07.14

IV. Project Cost Management

- ***Human resources:***

- Project Manager (PM) - 1 position

- Consultant from Scandlearn company Implementation Manager (IM) - 1 position

- Design Engineer (DE) - 2 positions

- Instructor in security screeners (IS) - 4 position

- Experts in e-learning training program (EE) - 4 positions

- ***Materials:***

- 200 units - CBT Software

- 54 workstations

- 200 Users for testing programs

- 1000 meters cable

- 2 cars

Total costs: 213,154.80 $

These costs respect the constraints regarding the budget categories imposed by the sponsor.

Total costs/activities - Gantt Chart – appendix 2

Total costs/resources - Gantt Chart – appendix 3

IV.1 WBS Dictionary

1	WBS Code	Element Name	Definition	Dependence	Time
2	1	**CBT Management System**	**All work to implement a CBT management system.**		63.08 d
3	1.1	Initiation	The work to initiate the project.		6d
4	1.1.1	Evaluation & Recommendations	Working group to evaluate solution sets and make recommendations for using available assessments of suitable systems		3d
5	1.1.2	Process of material	Process of requests resources: 200 unit of CBT software, 54 unit workstations, 2 special cars and 1000 m cable	3	1d
6	1.1.3	Milestone: Project CBTSigned/Approved	The responsible signs the Project CBT which authorizes the Project Manager to move to the Planning Process.	4FS+2 d	0d
7	1.2	**Planning**	**The work for the planning process for the project.**		6d
8	1.2.1	Determine Project Team	The Project Manager determines the project teams – 4 equips, and planning the resources.	5	1d
9	1.2.2	Project Team CBT Meeting	The planning process is officially started with a project meeting which includes the Project Manager with options for implementation ***in-house*** there is sufficient expertise to undertake the project within a reasonable timeframe. It would be possible to ***release the experts from regular duties to work full-time on the project.***	7	1d

10	1.2.3	Develop Project Plan	Under the direction of the Project Manager the team develops the project plan. Engage a consultant from *Scandlearn company* who could undertake key elements of the project to deliver tools which could then be implemented by in-house staff. This would provide timely delivery of a useable system at a reasonable cost..	8	2d
11	1.2.4	Milestone: Project Plan Approval	The project plan is approved by Ministry of Transportation and the Project Manager has permission to proceed to execute the project according to the project plan.	9FS+2 d	0d
12	1.3	**Execution**	**Work involved executing the project.**		45d
13	1.3.1	Design System and courses	The curricula and the supports of 5 courses are design and adapted for the new CBT system.	10	10d
14	1.3.2	Install Development System	Installation and configuration Team install a development system for testing and customizations of user interfaces.	12	10d
15	1.3.3	Arrange IT laboratories	50 workstations across the 5 location by the actual system is installed and configured to support/rule CBT program.	13	5d
16	1.3.4	Testing Phase	The system is tested with a select set of 20 users.	14	5d
17	1.3.5	User Training	All users are provided with a four hours training class. Additionally, managers are provided with an additional two hours class to cover advanced reporting.	15	15d
18	1.3.6	Evaluation CBT system	System goes live with all users.	15	10d
19	1.4	**Control**	**The work involved for the control process of the project.**		45d
20	1.4.1	Project Management	Overall project management for the project.	10	1d
21	1.4.2	Project Status Meetings	Weekly team status meetings.	16	0d
22	1.4.3	Risk Management	Risk management efforts as defined in the Risk Management Plan.	15FF+ 2d	1d
23	1.4.4	Update Project Management Plan	Project Manager updates the Project Management Plan as the project progresses.	21	3d
24	1.5	**Closeout**	**The work to close-out the project.**		41.08 d
25	1.5.1	Audit Procurement	An audit of all hardware and software procured for the project, ensures that all procured products are accounted for and in the asset management system.	12	5d
26	1.5.2	Document Lessons Learned	Project Manager along with the project team performs a lessons learned meeting and documents the lessons learned for the project.	17	5d
27	1.5.3	Update Files/Records	All files and records are updated to reflect the widget management system.	25	0d
28	1.5.4	Milestone: Gain Formal Acceptance	The Project initiating formally accepts the project by signing the acceptance document included in the project plan.	25	3d
29	1.5.5	Archive Files/Documents	All project related files and documents are formally archived.	27FS+ 2d	1d

V. Project quality management Process

Objectives	Indicators
Initial certification	• freely choose how many contexts of images of luggage to prepare for the training • decide the level of difficulty of the contexts in the session (3 levels of difficulty) choose the level of difficulty of interpretation of the piece of baggage • choice of the presence of a particular threat in the luggage (only for type courses Training) • evaluation of performance with a first score (ability to identify prohibited articles) and a second score (total capacity to assess the contexts shown taking into account the skill in applying the correct procedures) • detailed reporting and advanced always accessible to the instructor that stores the performance of each session (partial) and aggregates the results of 6 cycles (total 3 years) • dynamic creation of the certificate in PDF format, complete with all data concerning the user experience (times, average votes) and ready for the signature of the instructor

Continuing education (6h/6m)	• 10 sessions of 15 contexts of images per month (equivalent to 1 hour per month of training) • cycles of sessions of 6 months (6-course events), up to three years set by the 185/2010 of the European Commission for the certification of frequency sweeps
Free training	• freely choose how many contexts of images of luggage to prepare for the training • decide the level of difficulty of the contexts in the session (3 levels of difficulty) • also decide to select the contexts of luggage having a specific threat to them (8 families of threats), in order to put the screener in a position to improve their ability to interpret
Management of interactive and multimedia courses	In addition to platform are available online courses delivered through its platform designed to be a very easy to use and very powerful in the **management of interactive and multimedia** courses and also of the classroom, allowing the institution to training or instructor to have a tool characterized by flexibility and storage capacity of the performance of users in line with **other e-learning systems** (LMS) on the market today

VI. Human Resource Management Plan

VI.1. Project Roles and Responsibilities

The roles and responsibilities for the CBT system are essential to project success. All team members must clearly understand their roles and responsibilities in order to successfully perform their portion of the project. For the CBT system the following project team roles and responsibilities have been established:

Project Manager (PM), (1 position): responsible for the overall success of the Software Upgrade Project. The PM must authorize and approve all project expenditures. The PM is also responsible for approving that work activities meet established acceptability criteria and fall within acceptable variances. The PM will be responsible for reporting project status in accordance with the communications management plan. The PM will evaluate the performance of all project team members and communicate their performance to functional managers. The PM is also responsible for acquiring human resources for the project through coordination with functional managers. The PM must possess the following skills: leadership/management, budgeting, scheduling, and effective communication.

Implementation Manager - consultant from Scandlearn company (IM), (1 position): The IM is responsible for the distribution, implementation, and monitoring of the new software upgrade. The IM is responsible for working with the DEs, ISs and EEs to ensure all coding

on new software conforms with organizational security regulations. The IM is responsible for coordination outage windows with each department to facilitate the rollout of the software upgrades with minimal/no disturbance to operations. The IM will report status to the PM in accordance with the project's communications management plan. The IM's performance will be evaluated by the PM and communicated to the IM's functional manager (Network Manager). The IM must be proficient in managing network architecture.

Design Engineer (DE), (2 positions): responsible for gathering coding requirements for the Software Upgrade Project. The DEs are responsible for all upgrade design, coding, and testing of the upgraded software. The DEs will assist the implementation lead in the distribution and monitoring of the software upgrades throughout the network infrastructure. The DEs will be responsible for timely status reporting to the PM as required by the communications management plan. The DEs may not authorize any project expenditures nor allocate any resources without PM approval. DE's performance will be managed by the PM and communicated to the Design Technology Group Manager (DE's Functional Manager). DEs must be proficient in programming html, C++, and Java programming languages.

Instructor in security screeners (IS), (4 position): The ISs is responsible for training all network users on the features provided by the upgrades to the existing software. The ISs will coordinate training times/locations with each department's training advocate. The ISs will provide training status to the PM in accordance with the project communications management plan.

Experts in elearning training program (EE), (4 positions): While not part of the project team, functional managers are responsible for providing resources for the project in accordance with the project staffing plan. Functional managers are responsible for working with the PM to determine skill sets required and approving resource assignments. Functional managers are also responsible for conducting performance appraisals of assigned resources based, in part, on the PM's feedback regarding project performance.

VI. 2 PROJECT ORGANIZATIONAL CHARTS

Role	Responsibilities	Participant(s)
Project Sponsor	▪ Ultimate decision-maker and tie-breaker ▪ Provide project oversight and guidance ▪ Review/approve some project elements	Top management of Ministry of Transportation **Balan Constantin**
Steering Committee	▪ Commits department resources ▪ Approves major funding and resource allocation strategies, and significant changes to funding/resource allocation ▪ Resolves conflicts and issues ▪ Provides direction to the Project Manager ▪ Review project deliverables	**Sandulescu Ion** – adjunct director of project sponsor **Ionescu Maria** – acquisitions expert **Moraru Andeeas** – jurist expert
Project Manager	▪ Manages project in accordance to the project plan ▪ Serves as liaison to the Steering Committee ▪ Receive guidance from Steering Committee ▪ Supervises consultants ▪ Supervise vendor(s) ▪ Provide overall project direction ▪ Direct/lead team members toward project objectives ▪ Handle problem resolution ▪ Manages the project budget	**Poleac Mariana**
Project Participants	▪ Understand the user needs and business processes of their area ▪ Act as consumer advocate in representing their area ▪ Communicate project goals, status and progress throughout the project to personnel in their area ▪ Review and approve project deliverables ▪ Creates or helps create work products ▪ Coordinates participation of work groups, individuals and stakeholders ▪ Provide knowledge and recommendations ▪ Helps identify and remove project barriers ▪ Assure quality of products that will meet the project goals and objectives ▪ Identify risks and issues and help in resolutions	**Calinescu Mihai** Design Engineer **Coptuna Mihai** Design Engineer **Popescu Mihai** experts in elearning training program **Popa Corneliu** experts in elearning training program **Preda George** experts in elearning training program **Pop Calin** expertsexperts in elearning training program **Ionescu George** Instructor in security screeners **Ion Alin** Instructor Instructor in security screeners **Iliescu Mihai** Instructor in security screeners **Ilinca Lucian** Instructor in security screeners
Subject Matter Experts	▪ Lend expertise and guidance as needed	**George Clooney** Implementation Manager consultant from Scandlearn company

	Project Manager (PM) 1 position	Design Engineers(DE) 2 positions	Implementation Manager (IM) 1 position	Instructor in security screeners (IS) 4 positions	Experts in elearning training program (EE) 4 positions
Requirements Gathering	**A**	**R**	**R**	**I**	**C**
Coding Design	**A**	**R**	**C**	**I**	**R**
Coding Input	**A**	**R**	**R**	**I**	**C**
Software Testing	**A**	**R**	**C**	**C**	**R**
Network Preparation	**A**	**C**	**I**	**I**	**R**
Implementation	**A**	**C**	**I**	**R**	**R**
Conduct Training	**A**	**I**	**I**	**R**	**A**

Key:
R – Responsible for completing the work
A – Accountable for ensuring task completion/sign off
C – Consulted before any decisions are made
I – Informed of when an action/decision has been made

VII. Project communication management processes

Disseminating knowledge about the project is essential to the project's success. Project participants desire knowledge of what the status of the project is and how they are affected. Furthermore, they are anxious to participate. The more that people are educated about the progress of the project and how it will help them in the future, the more they are likely to participate and benefit.

This plan provides a framework for informing, involving, and obtaining buy-in from all participants throughout the duration of the project.

This communication plan is for the following audiences:

- Project Sponsor
- Steering Committee
- Project Manager
- Project Participants
- User Group Participants
- Subject Matter Experts

Communications Methodology The communications methodology utilizes three directions for effective communication:

Top-Down It is absolutely crucial that all participants in this project sense the executive support and guidance for this effort. The executive leadership of the organization needs to speak with a unified, enthusiastic voice about the project and what it holds for everyone involved. This will be 'hands-on' change management, if it is to be successful. Not only will the executives need to speak directly to all levels of the organization, they will also need to listen directly to all levels of the organization, as well.

The transition from the project management practices of today to the practices envisioned for tomorrow will be driven by a sure and convinced leadership focused on a vision and guided by clearly defined, strategic, measurable goals.

Bottom-Up To ensure the buy-in and confidence of the personnel involved in bringing the proposed changes to reality, it will be important to communicate the way in which the solutions were created. If the perception in the organization is that only the Steering Committee created the proposed changes, resistance is likely to occur. However, if it is understood that all participants were consulted, acceptance seems more promising.

Middle-Out Full support at all levels, where the changes will have to be implemented, is important to sustainable improvement. At this level (as with all levels), there must be an effort to find and communicate the specific benefits of the changes. People need a personal stake in the success of the project management practices.

Communications Outreach The following is a list of communication events that are established for this project:

Monthly Status Reports *The Project Manager shall provide monthly written status reports to the Steering Committee. The reports shall include the following information tracked against the Project Plan:*

- *Summary of tasks completed in previous month*
- *Summary of tasks scheduled for completion in the next month*
- *Summary of issue status and resolutions*

Monthly Steering Committee Meeting *These status meetings are held at least once per month and are coordinated by the Project Manager. Every member of the Steering Committee participates in the meeting. The Project Manager sends the status*

report to each member of the team prior to the meeting time so everyone can review it in advance.

Bi-Monthly Project Team Status Meeting *These status meetings are held every other month. Every member of the Project Team will be invited to participate in the meeting. Project Manager sends the status report to each member of the team prior to the meeting so everyone can review it in advance.*

Website Use *User Group Participants and Subject Matter Experts may be updated monthly at the discretion of the Project Manager. Information will be posted to the project's website.*

VIII. Risk management

VIII. 1. Risk Assessment

The **Risk Assessment** will be continuously monitored and updated throughout the life of the project, with monthly assessments included in the status report and open to amendment by the Project Manager.

Because mitigation approaches must be agreed upon by project leadership (based on the assessed impact of the risk, the project's ability to accept the risk, and the feasibility of mitigating the risk), it is necessary to allocate time into each Steering Committee meeting, dedicated to identifying new risks and discussing mitigation strategies.

The Project Manager will convey amendments and recommended contingencies to the Steering Committee monthly, or more frequently, as conditions may warrant.

VIII. 2. Critical Project Barriers

Unlike risks, critical project barriers are insurmountable issues that can be destructive to a project's initiative. In this project, the following are possible critical barriers:

- Removal of project funding
- Natural disasters or acts of war
- Should any of these events occur, the Project Plan would become invalid

VIII. 3. Initial Project Risk Assessment

Risk	IMPACT	LIKELIHOOD	Risk Level	Mitigation Strategy
Project Size				
Person Hours	**Minor:** Over 40 /Week	**Likely**	**8**	Assigned Project Manager, engaged consultant, comprehensive project management approach and

Risk	IMPACT	LIKELIHOOD	Risk Level	Mitigation Strategy
				communications plan
Estimated Project Schedule	**Significant:** Over 3 months	**Slight**	6	Created comprehensive project timeline with frequent baseline reviews
Team Size at Peak	**Minor:** Over 12 members	**Likely**	8	Comprehensive communications plan, frequent meetings, tight project management oversight
Number of Interfaces to Existing Systems Affected	**Significant:** Over 2	**Likely**	12	Develop interface control document immediately
Project Definition				
Narrow Knowledge Level of Users	**Significant:** Knowledgeable of user area only	**Likely**	12	Assigned Project Manager(s) to assess global implications
Available documentation clouds establishment of baseline	**Minor:** More than 75% complete/current	**Likely**	8	Balance of information to be gathered by consultant
Project Scope Creep	**Insignificant:** Scope generally defined, subject to revision	**Slight**	2	Scope intially defined in project plan, reviewed monthly by Project Manager and Steering Committee to prevent undetected scope creep
Consultant Project Deliverables unclear	**Insignificant:** Well defined	**Slight**	2	Included in project plan, subject to amendment
Vendor Project Deliverables	**Significant:** Estimated, not clearly defined	**Feasible**	9	Included in project plan, subject to amendment
Cost Estimates Unrealistic	**Insignificant**: Thoroughly predicted by industry experts using proven practices to 15% margin of error	**Slight**	2	Included in project plan, subject to amendment as new details regarding project scope are revealed
Timeline Estimates Unrealistic	**Minor:** Timeline assumes no derailment	**Feasible**	6	Timeline reviewed monthly by three groups (Project Manager and Steering Committee) to prevent undetected timeline departures
Number of Team Members Unknowledgeable of Business	**Insignificant**: Team well versed in business operations impacted by technology	**Slight**	2	Project Manager and consultant to identify knowledge gaps and provide training, as necessary
Project Leadership				
Steering Committee existence	**Minor:** Identified and enthusiastic	**Slight**	4	Frequently seek feedback to ensure continued support
Absence of Commitment Level/Attitude of Management	**Minor:** Understands value & supports project	**Slight**	4	Frequently seek feedback to ensure continued support
Absence of Commitment Level/Attitude of Users	**Minor:** Understands value & supports project	**Slight**	4	Frequently seek feedback to ensure continued support
Absence of Mid-Management Commitment	**Minor:** Most understand value & support project	**Slight**	4	Frequently seek feedback to ensure continued support
Project Staffing				
Project Team Availability	**Minor:** Distributed team makes availability questionable	**Feasible**	6	Continuous review of project momentum by all levels. Consultant to identify any impacts caused by unavailability. If necessary, increase committtmment by participants to full time status
Physical Location of Team prevents effective management	**Minor:** Team is dispersed among several sites	**Slight**	4	Use of Intranet project website, comprehensive Communications Plan
Project Team's Shared Work Experience creates poor working relationship	**Minor:** Some have worked together before	**Feasible**	6	Comprehensive Communications Plan
Weak User Participation on Project Team	**Minor:** Users are part-time team members	**Slight**	4	User Group Participants coordinated by full time employee

Risk	IMPACT	LIKELIHOOD	Risk Level	Mitigation Strategy
Project Management				
Procurement Methodology Used foreign to team	**Insignificant:** Procurement Methodology familiar to team	**Slight**	2	Project Manager and consultant to identify knowledge gaps and provide training, as necessary
Change Management Procedures undefined	**Insignificant::** Well-defined	**Slight**	2	- // -
Quality Management Procedures unclear	**Insignificant:** Well-defined and accepted	**Slight**	2	- // -
Software Vendor				
Number of Times Team Has Done Prior Work with Vendor Creates Foreign Relationship	**Insignificant:** Never	**Likely**	4	A comprehensive vendor evaluation and selection process (incorporated into Project Plan) will be employed to predict and define the relationship between the department and the vendor
Team's Lack of Knowledge of Package	**Minor:** Conceptual understanding	**Feasible**	6	Comprehensive vendor evaluation and selection process incorporated into Project Plan will assist the team in better understanding the package offering(s)
Poor Functional Match of Package to Initial System Requirements	**Minor:** Minimal customization required	**Slight**	4	Although a package has not yet been selected, the Consultant has compared the initial requirements with available functionality and determined that a functional match to the initial requirements is very likely. Vendor selection will be based, in part, on how well the proposed application matches defined functional specifications.
Team's Involvement in Package Selection Impacts Success of Implementation	**Minor:** High involvement in selection	**Slight**	4	Comprehensive vendor evaluation and selection process incorporated into Project Plan

VIII.4. Risk Assessment Matrix.

Very Likely 5	5	10	15	20	25
Likely 4	4	8	12	16	20
Feasible 3	3	6	9	12	15
Slight 2	2	4	6	8	10
Very unlikely 1	1	2	3	4	5
	Insignificant 1	**Minor** 2	**Significant** 3	**Major** 4	**Critical** 5

Green = Low risk, Amber 9 = Medium risk, Amber 10 –12 high risk, Red = High risk

IX. Project closing and conclusions

Performance Reviews:

The project manager will review each team member's assigned work activities at the onset of the project and communicate all expectations of work to be performed. The project manager will then evaluate each team member throughout the project to evaluate their performance and how effectively they are completing their assigned work. Prior to releasing project resources, the project manager will meet with the appropriate functional manager and provide feedback on employee project performance. The functional managers will then perform a formal performance review on each team member.

Recognition and Rewards:

Although the scope of this project does not allow for ample time to provide cross-training or potential for monetary rewards there are several planned recognition and reward items for project team members.

- Upon successful completion of the CBT project, a party will be held to celebrate the success of each team member with the team members' families present.
- Upon successful completion of the project, any team member who satisfactorily completed all assigned work packages on time will receive a certificate of thanks from the Security Screeners Training Centre.
- Team members who successfully complete all of their assigned tasks will have their photo taken for inclusion in the Romanian Air Company newsletter.
- The company will provide free family tickets for the top two performers on each project.

CONCLUSIONS:

- Using CBT platform we can easily save money, and instead of taking a number of crew out of production they can be scheduled individually with a 'short trip'.
- A CBT never needs a break because the training is online and always there. And with this you can train great numbers of students in a given time frame compared to other methods. CBT meets the need for round the clock (continuous).
- Trainees works at their own pace, and CBT can sequence the training to match the trainees needs. The computer can always match the trainees schedule and provides immediate feedback to trainees on their progress. CBT does not have to be delivered

to all employees simultaneously, and allows the company to maintain coverage of critical positions.

- The trainee feels in control and the computer is non-judgmental and non-threatening. It provides a privacy factor that reduces trainees' embarrassment about taking 'remedial' classes, or making mistakes while answering questions in the training materials.
- We can have a higher trainee to trainer ratio; this is where the instructor serves as a facilitator, assisting trainees as needed. And there is less need for a centralized training facility. Facilitators can serve more than one structure with a CBT program, lessening the investment each company would have to make.
- Provides management systems for tracking trainees progress and location. And it also provides on line testing to match a trainee with needed training and it provides consistency of training in terms of quality and information presented. It also provides standardization of training when training occurs in several work locations simultaneously.

APPROVALS

Sign-off Sheet

I have read the above Project Plan and will abide by its terms and conditions and pledge my full commitment and support for the CBT Project Plan.

Project Sponsor: Balan Constantin

_____

Project Manager: Poleac Mariana

_____

Steering Committee: Sandulescu Ion

_____

Steering Committee: Ionescu Maria

_____

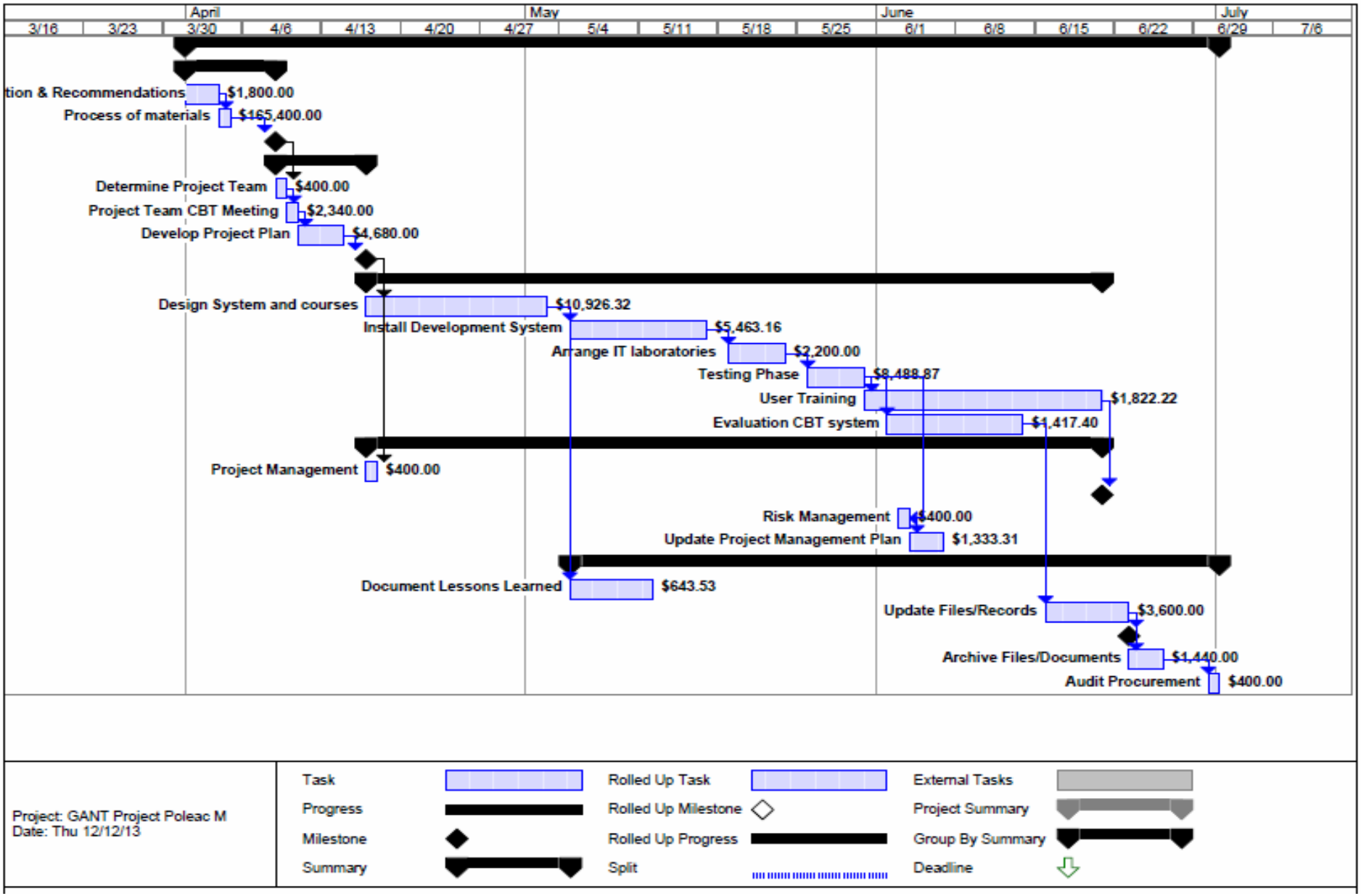
Steering Committee: Moraru Andeeas

_____

REFERENCES :

1. Predescu I., Ionescu A. - *Tematica pentru întocmirea lucrarii*, Ed. Teora, Bucureşti, 1998.
2. www.ProjectManagementDocs.com
3. http://scandlearn.com/courses/crm-and-airborne-emergency
4. http://www.euractiv.com/transport/aviation-security/article
5. Fredric William, Shrestha Pritam K, 2003, Information technology and productivity: a comparison of Japanese and Asia-Pacific banks http://www.sciencedirect.com.
6. William B. Rouse, 2000, Software tools for strategic management, Information Knowledge System Management, 13891995, 2000, Vol. 2, Issue 1, search in EBSCO Academic Search Premier.
7. Sharyn D. Gardner, David P. Lepak, Kathryn M. Bartol, (2003) Virtual HR: The impact of information technology on the human resource professional http://www.sciencedirect.com.

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining	3/9
1	**1 CBT Management System**	**$0.00**	**Prorated**	**$213,154.80**	**$0.00**	**$213,154.80**	**$0.00**	**$213,154.80**	
2	**1.1 Initiation**	**$0.00**	**Prorated**	**$167,200.00**	**$0.00**	**$167,200.00**	**$0.00**	**$167,200.00**	
3	1.1.1 Evaluation & Recommendations	$0.00	Prorated	$1,800.00	$0.00	$1,800.00	$0.00	$1,800.00	
4	1.1.2 Process of materials	$0.00	Prorated	$165,400.00	$0.00	$165,400.00	$0.00	$165,400.00	
5	1.1.3 Milestone: Project CBT Signed/Approved	$0.00	Prorated	$0.00	$0.00	$0.00	$0.00	$0.00	
6	**1.2 Planning**	**$0.00**	**Prorated**	**$7,420.00**	**$0.00**	**$7,420.00**	**$0.00**	**$7,420.00**	
7	1.2.1 Determine Project Team	$0.00	Prorated	$400.00	$0.00	$400.00	$0.00	$400.00	
8	1.2.2 Project Team CBT Meeting	$0.00	Prorated	$2,340.00	$0.00	$2,340.00	$0.00	$2,340.00	
9	1.2.3 Develop Project Plan	$0.00	Prorated	$4,680.00	$0.00	$4,680.00	$0.00	$4,680.00	
10	1.2.4 Milestone: Project Plan Approval	$0.00	Prorated	$0.00	$0.00	$0.00	$0.00	$0.00	
11	**1.3 Execution**	**$0.00**	**Prorated**	**$30,317.97**	**$0.00**	**$30,317.97**	**$0.00**	**$30,317.97**	
12	1.3.1 Design System and courses	$0.00	Prorated	$10,926.32	$0.00	$10,926.32	$0.00	$10,926.32	
13	1.3.2 Install Development System	$0.00	Prorated	$5,463.16	$0.00	$5,463.16	$0.00	$5,463.16	
14	1.3.3 Arrange IT laboratories	$0.00	Prorated	$2,200.00	$0.00	$2,200.00	$0.00	$2,200.00	
15	1.3.4 Testing Phase	$0.00	Prorated	$8,488.87	$0.00	$8,488.87	$0.00	$8,488.87	
16	1.3.5 User Training	$0.00	Prorated	$1,822.22	$0.00	$1,822.22	$0.00	$1,822.22	
17	1.3.6 Evaluation CBT system	$0.00	Prorated	$1,417.40	$0.00	$1,417.40	$0.00	$1,417.40	
18	**1.4 Control**	**$0.00**	**Prorated**	**$2,133.31**	**$0.00**	**$2,133.31**	**$0.00**	**$2,133.31**	
19	1.4.1 Project Management	$0.00	Prorated	$400.00	$0.00	$400.00	$0.00	$400.00	
20	1.4.2 Milestone: Project Status Meetings	$0.00	Prorated	$0.00	$0.00	$0.00	$0.00	$0.00	
21	1.4.3 Risk Management	$0.00	Prorated	$400.00	$0.00	$400.00	$0.00	$400.00	
22	1.4.4 Update Project Management Plan	$0.00	Prorated	$1,333.31	$0.00	$1,333.31	$0.00	$1,333.31	
23	**1.5 Closeout**	**$0.00**	**Prorated**	**$6,083.53**	**$0.00**	**$6,083.53**	**$0.00**	**$6,083.53**	
24	1.5.1 Document Lessons Learned	$0.00	Prorated	$643.53	$0.00	$643.53	$0.00	$643.53	
25	1.5.2 Update Files/Records	$0.00	Prorated	$3,600.00	$0.00	$3,600.00	$0.00	$3,600.00	
26	1.5.3 Milestone: Gain Formal Acceptance	$0.00	Prorated	$0.00	$0.00	$0.00	$0.00	$0.00	
27	1.5.4 Archive Files/Documents	$0.00	Prorated	$1,440.00	$0.00	$1,440.00	$0.00	$1,440.00	
28	1.5.5 Audit Procurement	$0.00	Prorated	$400.00	$0.00	$400.00	$0.00	$400.00	


April
May
June
July
3/16
3/23
3/30
4/6
4/13
4/20
4/27
5/4
5/11
5/18
5/25
6/1
6/8
6/15
6/22
6/29
7/6
tion & Recommendations
$1,800.00
Process of materials
$165,400.00
Determine Project Team
$400.00
Project Team CBT Meeting
$2,340.00
Develop Project Plan
$4,680.00
Design System and courses
$10,926.32
Install Development System
$5,463.16
Arrange IT laboratories
$2,200.00
Testing Phase
$8,488.87
User Training
$1,822.22
Evaluation CBT system
$1,417.40
Project Management
$400.00
Risk Management
$400.00
Update Project Management Plan
$1,333.31
Document Lessons Learned
$643.53
Update Files/Records
$3,600.00
Archive Files/Documents
$1,440.00
Audit Procurement
$400.00
Project: GANT Project Poleac M
Date: Thu 12/12/13
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline

GANT Project Poleac M							
ID	Resource Name	Group	Max. Units	Peak	Std. Rate	Cost	Work
4	Calinescu Mihai Design Engineer	DE	100%	100%	$15.00/hr	$3,512.51	234.17 hrs
14	Coptuna Mihai Design Engineer	DE	100%	100%	$15.00/hr	$3,512.29	234.15 hrs
2	Popescu Mihai experts in elearning tr	EE	100%	100%	$15.00/hr	$1,954.85	130.32 hrs
8	Popa Corneliu experts in elearning tra	EE	100%	100%	$15.00/hr	$3,557.68	237.18 hrs
9	Preda George experts in elearning tra	EE	100%	100%	$15.00/hr	$4,270.14	284.68 hrs
10	Pop Calin expertsexperts in elearning	EE	100%	100%	$15.00/hr	$3,463.84	230.92 hrs
15	Users	HR	2,000%	800%	$5.00/hr	$1,122.44	224.48 hrs
1	George Clooney Implementation Man	IM	100%	100%	$100.00/hr	$6,202.93	62.03 hrs
3	Ionescu George Instructor in security	IS	100%	100%	$15.00/hr	$3,603.46	240.23 hrs
11	Ion Alin Instructor Instructor in securit	IS	100%	100%	$15.00/hr	$3,591.73	239.45 hrs
12	Iliescu Mihai Instructor in security scr	IS	100%	100%	$15.00/hr	$3,005.15	200.35 hrs
13	Ilinca Lucian Instructor in security scr	IS	100%	100%	$15.00/hr	$3,008.08	200.53 hrs
7	cable	Mater		eter/day	$1.00	$2,000.00	2,000 meter
16	Poleac Mariana	PM	100%	100%	$50.00/hr	$6,189.72	123.8 hrs
5	car	Tools		unit/day	$5,000.00	$10,100.00	2 unit
6	wokstation	Tools		unit/day	$1,000.00	$54,050.00	54 unit
17	software	Tools		unit/day	$500.00	$100,010.00	200 unit

PRIVATE CLOUD COMPUTING PROJECT

TIGĂNUS Ionel

CONTENTS

I. INTRODUCTION

I.1 Executive Summary

IT&C COMPUTING Company's purchased a building that will expand business.

The proposed number of people working there is about 85 divided into the subdivisions.

A building facility is in its final stage of construction.

Taking into account that the objectives of the company, and the stage of the construction, the opportunity is to design the IT&C installation according to the nowadays and foreseen objectives of ***IT&C COMPUTING Company*** and the newest technology on the today's IT&C market. By installing it properly it will give the ***IT&C COMPUTING team*** the opportunity to design and install new technology based on privat cloud computing. Moreover, the new design will meet the standards to be interoperable with the IT&C installations the old location and those of collaborators.

I.2 Business Opportunity

I.2.1 Functional Aspects of Cloud Computing

From a conceptual standpoint, users using computational platforms and IT infrastructure in the Cloud and its applications running inside it. Thus, the Cloud gives users access to hardware, software, data resources which means an integrated computing platform as a service, in a transparent, so:

- HaaS - Hardware as a Service

Rapidly growing virtualization hardware, IT automation and the possibility to measure the time and cost of services used led to the possibility to users to use IT hardware, or even entire data centers as "pay-as-you-go ". Haas is a flexible, scalable and easily managed, able to satisfy user requests.

- SaaS – Software as a Service

In this concept a software or an application is hosted as a service and provided to users via the Internet. In this way there is no need for the user to install on your own computer programs, to handle their maintenance and cleared most of the costs related to this issue. An example of this is the Google Chrome browser which is able to provide a new desktop user, through which applications are offered (local or remote).

- DaaS – Data as a Service

Information from multiple sources and in multiple formats can be accessed through Internet services. Users can operate the remote database.

Based on support Haas, Daas, SaaS, Cloud Computing software can also provide a platform - PaaS (Platform as a Service). Users can access hardware configurations, software, and information they need.

I.2.2 Benefits

Unified communications (UC) is the integration of real-time communication services such as:

- instant messaging (chat),
- presence information,
- telephony (including IP telephony),

- video conferencing,
- data sharing (including web connected electronic whiteboards aka IWB's or Interactive White Boards), call control and speech recognition with non-real-time communication services such as unified messaging (integrated voicemail, e-mail, SMS and fax), as in figure 1:

Figure 1

UC is not a single product, but a set of products that provides a consistent unified user interface and user experience across multiple devices and media types, as in figure 2:

I.3 Assumptions

- private cloud computing project was approved;
- The needs in terms of communication are similar to other divisions that houses around 85 people;
- There will be no changes in the ***IT&C COMPUTING Company's*** objectives in the next year;
- General scheme of the installation is similar to that in Figure 2, following the team involved in the development and progress of the project to determine project details:

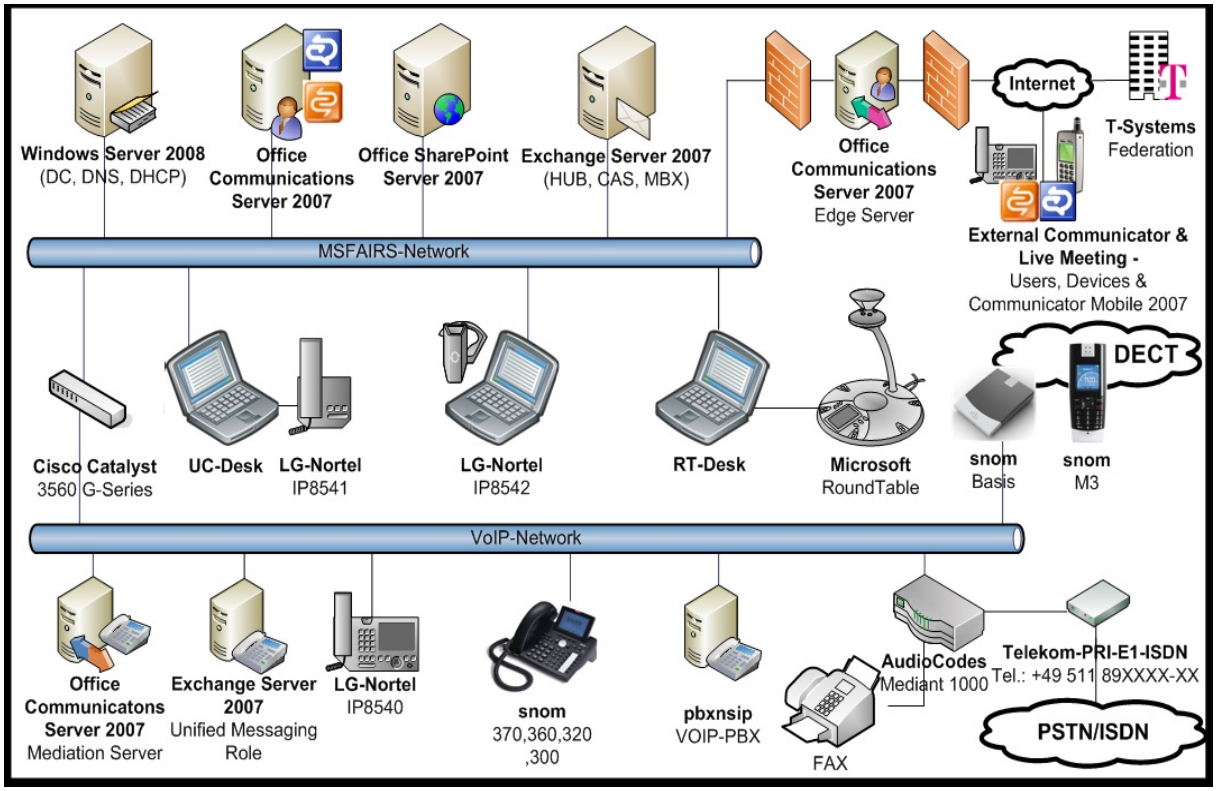


Figure 2

II. SCOPE STATEMENT

I.1 Main goal

IT&C Computing Company is going to installation the new built facility to cover the telecommunication related facilities in a secure and interoperable manner.

II.2 Objectives

- For about 8 months time, my company installs the network so that as all the division will have all needed services to reach its full working capacity;
- In 2 months time, all cables will be installed in a structured cabling according to division needs;
- In 4 months time, all networking equipment is going to be installed and configured;
- In 5 months time all terminals composing the network will be installed and given the initial configuration;
- In 7 months time, the server room will be equipped according to the needed services and all servers will be configured and integrated in the network; Final test of the local network.
- in 8 months the new design will be installed and connected to all facilities;

Final test of the Privat Cloud Computing project integrated in the IT&C Computing Company network have to take place.

- The installation and configuration staff will give on site training for the appointed administrators so that as they have to be able to deal with what was installed there.

III. RESOURCES MANAGEMENT

III.1 Resource description

The team that works for this project is composed of 17 people.

The equipment planned to be installed during the project is presented in the next table:

Equipment	Type	Quantity
Cabling	FTP	1000 m
	optical fiber	800 m
Routing equipment	Router	4 u.
	Switch	8 u.
Workstation	Hardware	60 u.
	Software	60 u.
Servers	Hardware	3 u.
	Software	4 u.
Storage	Hardware	2 u.
	Software	2 u.
Voice	VoIP phone	20 u
	phone	40 u
VTC	Equipment	2 u.
Leased line	Data	100 Mbps
	Voice	PBX

ID	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/ use
1	Project manager	Work		P		100%	4500 lei/mon	50lei/h	0.00 lei
2	Project engineer	Work		P		100%	4,000lei/mo	50lei/h	0.00 lei
3	Acquisition manager	Work		A		100%	3,500lei/mo	40lei/h	0.00 lei
4	Acquisition expert	Work		A		100%	3,000lei/mo	35lei/h	0.00 lei
5	Acquisition specialist	Work		A		100%	2,800 lei/mo	30lei/h	0.00 lei
6	Head installation team	Work		H		100%	3,500lei/mo	35lei/h	0.00 lei
7	Installation member 1	Work		I		100%	2,800lei/mo	30lei/h	0.00 lei
8	Installation member 2	Work		I		100%	2,800lei/mo	30lei/h	0.00 lei
9	Installation member 3	Work		I		100%	2,800lei/mo	30lei/h	0.00 lei
10	Installation member 4	Work		I		100%	2,800lei/mo	30lei/h	0.00 lei
11	Head configuration team	Work		H		100%	3,500lei/mo	35lei/h	0.00 lei
12	Configuration member 1	Work		C		100%	2,800lei/mo	30lei/h	0.00 lei
13	Configuration member 2	Work		C		100%	2,800lei/mo	30lei/h	0.00 lei
14	Configuration member 3	Work		C		100%	2,800lei/mo	30lei/h	0.00 lei
15	Configuration member 4	Work		C		100%	2,800lei/mo	30lei/h	0.00 lei
16	Account manager	Work		A		100%	3,500lei/mo	40lei/h	0.00 lei
17	Legal adviser	Work		L		100%	100lei/hr	40lei/h	0.00 lei

More information about human resources

III.2 Work Breakdown Structure (WBS)

The WBS consist of 13 activities, starting with:

- assembling the team,
- defining the needs,
- acquisition of the equipment and materials,
- installation of cables and equipment,
- configuration of all equipment,
- testing the network locally,
- testing network with other Surrounding servers,
- training for the administrative staff
- finally, the handover of the entire network to the IT&C Computing Company.

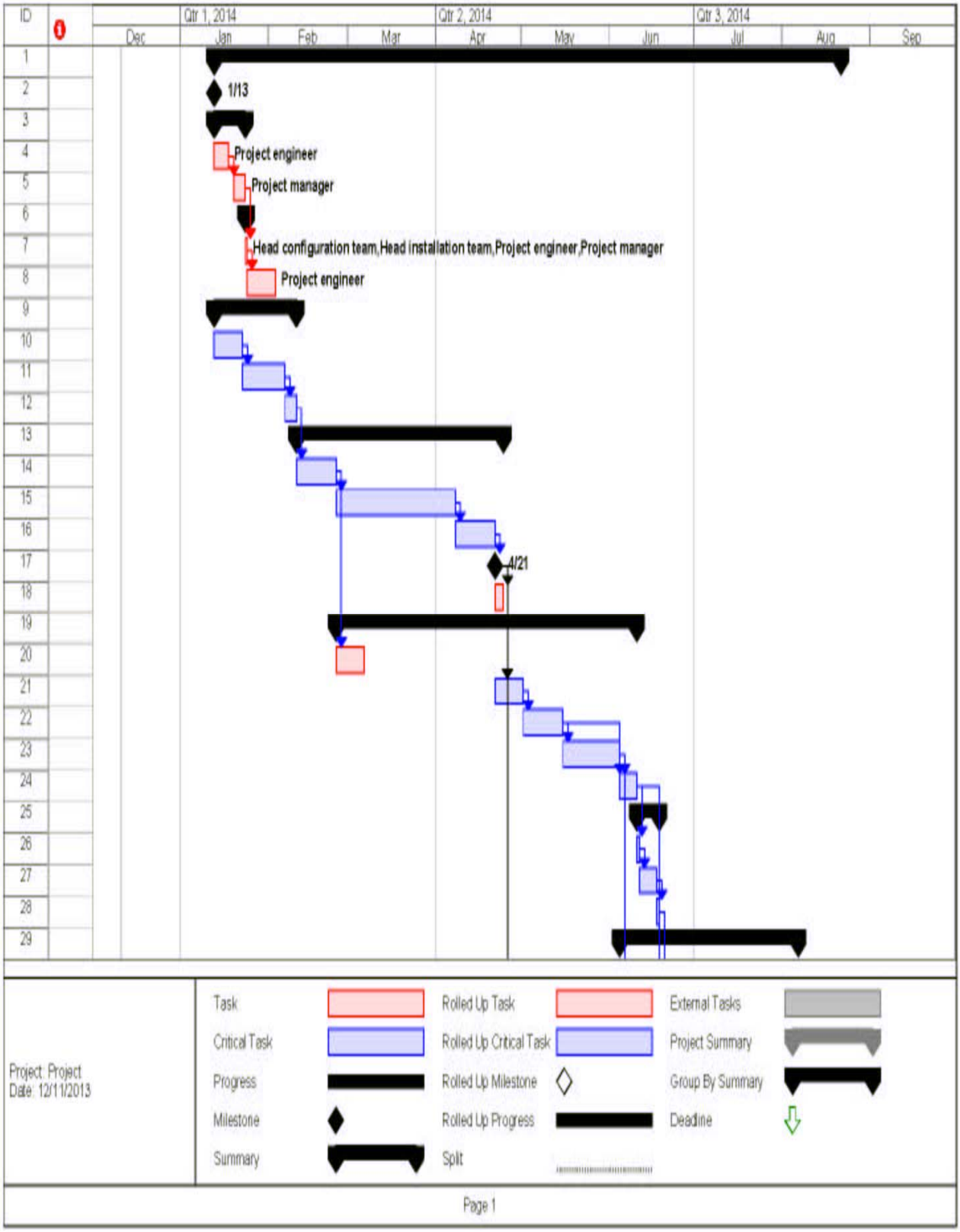
More details about WBS

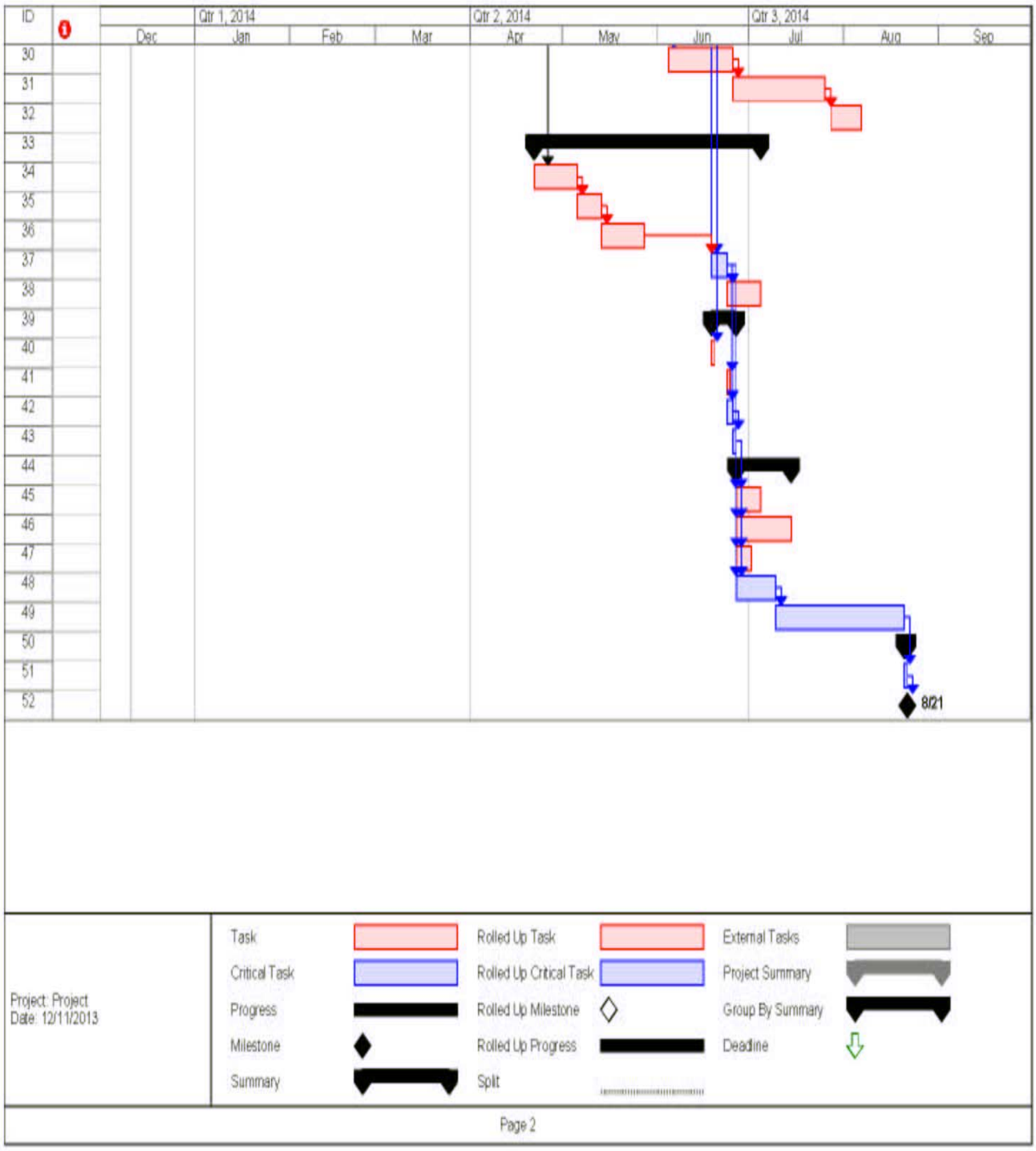
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	**PRIVAT CLOUD COMPUTING**	**159 days**	**1/13/2014**	**8/21/2014**		
2	Getting knowledge of the signed contract	0 days	1/13/2014	1/13/2014		Project manager,Legal adviser
3	**Assembling the team**	**9 days**	**1/13/2014**	**1/23/2014**		
4	Identify the members	5 days	1/13/2014	1/17/2014		Project engineer
5	Appoint the identified members	4 days	1/20/2014	1/23/2014	4	Project manager
6	**Defining the company needs**	**1 day**	**1/24/2014**	**1/24/2014**		
7	Site survey at the building	1 day	1/24/2014	1/24/2014	5	Head configuration team,Head installation team,Project engineer,Project manager
8	Design (draw) the network plan	6 days	1/27/2014	2/3/2014	7	Project engineer
9	**Determinate the type and the quantity of the material to be purchased**	**21 days**	**1/13/2014**	**2/10/2014**		
10	Determinate the type and the quantity of the equipment for the plan	8 days	1/13/2014	1/22/2014		
11	Market research	11 days	1/23/2014	2/6/2014	10	
12	Develop a list of the material to be purchased with an estimated cost	2 days	2/7/2014	2/10/2014	11	
13	**Acquisition of material according to the designed plan**	**53 days**	**2/11/2014**	**4/24/2014**		
14	Develop the specifications	10 days	2/11/2014	2/24/2014	12	
15	Binding	30 days	2/25/2014	4/7/2014	14	
16	Providers selection	10 days	4/8/2014	4/21/2014	15	
17	Materials reception completed	0 days	4/21/2014	4/21/2014	16	
18	Paying the purchased material	3 days	4/22/2014	4/24/2014	17	
19	**Cabling and FO instalation**	**76 days**	**2/25/2014**	**6/10/2014**		
20	Drilling the walls	8 days	2/25/2014	3/6/2014	14	
21	Installing the cable and the fiber conduit	8 days	4/22/2014	5/1/2014	17	
22	Installing the cables and the fiber	10 days	5/2/2014	5/15/2014	21	
23	Installing the sockets and the patch panels	14 days	5/16/2014	6/4/2014	22	
24	Test of the installed cabling	4 days	6/5/2014	6/10/2014	23,22	
25	**Install networking equipment**	**6 days**	**6/11/2014**	**6/18/2014**		
26	Physical installation of the networking equipment	1 day	6/11/2014	6/11/2014	24	
27	Configuration of the networking equipment	4 days	6/12/2014	6/17/2014	26	
28	Test the networking equipment installed in the network	1 day	6/18/2014	6/18/2014	27	
29	**Install terminals**	**45 days**	**6/5/2014**	**8/5/2014**		
30	Physical installation of terminals	15 days	6/5/2014	6/25/2014	23	
31	Initial configuration of terminals	22 days	6/26/2014	7/25/2014	30	
32	Test of terminals connectivity to the network equipment	8 days	7/28/2014	8/6/2014	31	
33	**Install server room, configuration all servers and the conectionof the server room to the LAN**	**54 days**	**4/22/2014**	**7/4/2014**		
34	Physical installation of the racks and the power supply for the server room	10 days	4/22/2014	5/5/2014	17	
35	Physical installation of the servers and the storage devices	6 days	5/6/2014	5/13/2014	34	

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
37	The interconnection of the server with the LAN	3 days	6/19/2014	6/23/2014	36,24,28	
38	Test the LAN interms of services	9 days	6/24/2014	7/4/2014	37	
39	**Connection the LAN to old location of company and the internet**	**6 days**	**6/19/2014**	**6/26/2014**		
40	Leased line reception	1 day	6/19/2014	6/19/2014	28	
41	Installation of the equipment	1 day	6/24/2014	6/24/2014	37	
42	Interconnection	2 days	6/24/2014	6/25/2014	37	
43	Test the connection	1 day	6/26/2014	6/26/2014	42	
44	**Final test the network**	**12 days**	**6/27/2014**	**7/14/2014**		
45	Test the connectivity	6 days	6/27/2014	7/4/2014	37,43	
46	Test the services (email, collaborative tools, etc)	12 days	6/27/2014	7/14/2014	37,43	
47	Test the VTC services	3 days	6/27/2014	7/1/2014	37,43	
48	Test the VOIP	9 days	6/27/2014	7/9/2014	37,43	
49	On site tainning	30 days	7/10/2014	8/20/2014	48	
50	**Handover the system**	**1 day**	**8/21/2014**	**8/21/2014**		
51	Prepare the handover documents	1 day	8/21/2014	8/21/2014	49	
52	Sign the handover documents	0 days	8/21/2014	8/21/2014	51	

IV. TIME MANAGEMENT PLAN

The Privat Cloud Computing project will span on 159 days.
Detailed activitie's duration is presented in the **Gantt chart**.




ID
Qtr 1, 2014
Qtr 2, 2014
Qtr 3, 2014
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
8/21
Project: Project
Date: 12/11/2013
Task
Critical Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Deadline
Page 2

V. COST MANAGEMENT PLAN

Total cost of the project is: 381.242,25 lei as follows:

- Total cost of equipment and material that will be used for the project is 161.475.08 lei;
- Total cost of human resources is 170.040,17;
- Total additional costs is 49.727 lei.

The cost estimate methods used for this project are: **order of magnitude** (the IT&C Computing Company is dealing with such projects) and **budget estimate** (defined during the cost management process)

A more detailed view is presented in **Budget report**.

Budget Report as of 12/5/2013
cheltuieli

ID	Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance
30	Physical installation of terminals	0.00 lei	Prorated	92,834.00 lei	0.00 lei	92,834.00 lei
26	Physical installation of the networking	0.00 lei	Prorated	81,479.00 lei	0.00 lei	81,479.00 lei
15	Binding	0.00 lei	Prorated	37,950.00 lei	0.00 lei	37,950.00 lei
22	Installing the cables and the fiber	0.00 lei	Prorated	30,600.00 lei	0.00 lei	30,600.00 lei
16	Providers selection	0.00 lei	Prorated	14,650.00 lei	0.00 lei	14,650.00 lei
14	Develop the specifications	0.00 lei	Prorated	13,250.00 lei	0.00 lei	13,250.00 lei
49	On site training	0.00 lei	Prorated	11,250.00 lei	0.00 lei	11,250.00 lei
21	Installing the cable and the fiber condu	0.00 lei	Prorated	7,060.00 lei	0.00 lei	7,060.00 lei
23	Installing the sockets and the patch pa	0.00 lei	Prorated	5,980.00 lei	0.00 lei	5,980.00 lei
34	Physical installation of the racks and th	0.00 lei	Prorated	4,540.00 lei	0.00 lei	4,540.00 lei
11	Market research	0.00 lei	Prorated	3,870.00 lei	0.00 lei	3,870.00 lei
12	Develop a list of the material to be pur	0.00 lei	Prorated	3,680.00 lei	0.00 lei	3,680.00 lei
40	Leased line reception	0.00 lei	Prorated	2,481.00 lei	0.00 lei	2,481.00 lei
35	Physical installation of the servers and	0.00 lei	Prorated	2,467.50 lei	0.00 lei	2,467.50 lei
20	Drilling the walls	0.00 lei	Prorated	2,240.00 lei	0.00 lei	2,240.00 lei
27	Configuration of the networking equipm	0.00 lei	Prorated	2,100.00 lei	0.00 lei	2,100.00 lei
31	Initial configuration of terminals	0.00 lei	Prorated	1,960.00 lei	0.00 lei	1,960.00 lei
10	Determinate the type and the quantity	0.00 lei	Prorated	1,600.00 lei	0.00 lei	1,600.00 lei
36	Configuration of servers and storages	0.00 lei	Prorated	1,575.00 lei	0.00 lei	1,575.00 lei
8	Design (draw) the network plan	0.00 lei	Prorated	1,200.00 lei	0.00 lei	1,200.00 lei
4	Identify the members	0.00 lei	Prorated	1,000.00 lei	0.00 lei	1,000.00 lei
5	Appoint the identified members	0.00 lei	Prorated	900.00 lei	0.00 lei	900.00 lei
51	Prepare the handover documents	0.00 lei	Prorated	850.00 lei	0.00 lei	850.00 lei
38	Test the LAN interms of services	0.00 lei	Prorated	840.00 lei	0.00 lei	840.00 lei
32	Test of terminals connectivity to the ne	0.00 lei	Prorated	647.50 lei	0.00 lei	647.50 lei
7	Site survey at the building	0.00 lei	Prorated	575.00 lei	0.00 lei	575.00 lei
28	Test the networking equipment installe	0.00 lei	Prorated	560.00 lei	0.00 lei	560.00 lei
46	Test the services (email, collaborative	0.00 lei	Prorated	551.25 lei	0.00 lei	551.25 lei
24	Test of the installed cabling	0.00 lei	Prorated	525.00 lei	0.00 lei	525.00 lei
37	The interconnection of the server with	0.00 lei	Prorated	455.00 lei	0.00 lei	455.00 lei
47	Test the VTC services	0.00 lei	Prorated	420.00 lei	0.00 lei	420.00 lei
43	Test the connection	0.00 lei	Prorated	375.00 lei	0.00 lei	375.00 lei
18	Paying the purchased material	0.00 lei	Prorated	350.00 lei	0.00 lei	350.00 lei
42	Interconnection	0.00 lei	Prorated	280.00 lei	0.00 lei	280.00 lei
48	Test the VOIP	0.00 lei	Prorated	280.00 lei	0.00 lei	280.00 lei
41	Installation of the equipment	0.00 lei	Prorated	140.00 lei	0.00 lei	140.00 lei
2	Getting knowledge of the signed contr	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei
17	Materials reception completed	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei
45	Test the connectivity	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei
52	Sign the handover documents	0.00 lei	Prorated	0.00 lei	0.00 lei	0.00 lei
		0.00 lei		331,515.25 lei	0.00 lei	331,515.25 lei

VI. QUALITY MANAGEMENT PLAN

Activity 1 - Briefing about the signed contract. Responsible: **General Manager**, **legal advisor.**

Activity 2 - All team members are gathered. Responsible: **General Manager**, **project manager.**

a. Identify the team members according to the project needs;

b. All members are given a specific role.

Activity 3 - Have identified the IT&C needs of the division in a **Site survey report**. Responsible: **Project manager, Project engineer**.

a. Identification of the connection method in place at the building;

b. Identification of the type of the used equipment;

c. Identification of the type of software the company uses;

d. Identification of the server room;

e. Identification of the rooms allocated to each subdivision;

f. Identification of the needs of the equipment/materials for each room.

Activity 4 - Proposal plan design by the **project manager** and the **project engineer** to be submitted for formal approval to the **General Manager** at IT&C Computing.

a. Design of a diagram based of the site surveys that have to consist of:

I. Division's plan;

II. The path of the cable to be run;

III. The equipment's position;

IV. The power supply's position.

Activity 5 - The list of type, quantity and estimated cost of the quipment/materials to be purchased. Responsible: **Project engineer and project manager**.

a. Write down a list of equipment to be installed to meet the requirements in the approved plan;

b. Count how much cable and how many servers, workstations, routers, switches are needed to install according to approved plan;

c. Determine the type of equipment to be installed in order to meet the requirements in the approved plan:

d. Write down a list that consists of type, number and foreseen cost for the needed materials/equipment.

Activity 6 - Purchasing all **equipment/materials** needed. **Head acquisition and project engineer.**

a. Write down the technical specification that each type of equipment/material have to meet;

b. Hold the biding;

c. Select the provider that meet the requirements from specification in a most cost effective manner;

d. Receive the equipment/materials from the selected provider;

e. Pay the agreed amount of money for the delivered equipment/materials.

Activity 7 - Have **installed all the cable conduit, FO, sockets and patch panels** according to the approved diagram. Responsible: **Project engineer**, **installation team leader.**

a. Drill the walls according to the network diagram;

b. All cable conduit should be installed according to the plan;

c. All cables and FO have to be installed inside the cable conduit;

d. All the needed sockets are installed for each room;

e. All patch panels are installed according to the approved plan;

f. The connectivity between sockets and patch panels has to be insured, the attenuation should be less than 0.1 dB on fibre optical and 0.2 dB on FTP cable.

Activity 8 - Have **installed and configured all the networking equipment** in order to permit connectivity among terminals and to the server room. Responsible: **Project engineer, configuration team leader.**

a. Install all routing equipment in the designed places;

b. Configure the routing equipment to meet the requirements in the approved plan;

c. All the routing equipment has to be connected.

Activity 9- Have **installed and configured all the terminals** in order to have connectivity among terminals and to the server room. Responsible: **Project engineer, Installation and configuration team leaders.**

a. The terminal equipment has to be installed in each room according to the approved plan;

b. Each equipment must have installed the operating system as a basic configuration;

c. All terminal equipment has to be reached from the networking equipment.

Activity 10 - Have **installed and configured all the servers** in order to insure all designed services for the company network. Responsible: **Project engineer, Installation and configuration team leaders.**

a. The 3 racks are to be installed in the server room:

I. One for the interconnection equipment;

II. One for the operational equipment;

III. One for the back-up solution;

b. The servers and storages are to be installed and connected so that as to meet the approved plan:

I. Three servers and storage are to be installed in the operational rack;

II. The other set of two servers and a storage are to be installed in a the backup rack;

c. Configuration of the installed equipment:

I. Install the virtualization software;

II. Install the operating system on servers;

III. Install the operating system on storages;

IV. Install the applications as needed.

d. The installed and configured servers are to be connected to the server switch;

e. Check the installed services from each terminal; the available services have to be accessed from each terminal.

Activity 11 - Have the **IT&C connectivity** between the new location and the old location. Responsible: **Project engineer, Installation and configuration team leaders**.

a. Receive and check the leased line, The speed have to be 100Mbps;

b. Configure the installed routing equipment in order to insure the connection to the old location.

c. Connect the leased line to the routing equipment;

d. Test results:

Activity 12 - Every **service has to work reliable and without delay** inside the local network and over the WAN. Responsible: **Project manager, project engineer, head of configuration team.**

a. The average response for a ping in the connectivity test;

b. Check the services from new location's servers to old locations';

c. Check the services between the new location's terminals and old locations' terminals;

d. The VTC system have to work without any discrepancy between the image and sound;

e. The VoIP system have to work properly:

f. The onsite course have to be comprehensible so that as:

I. The administrators have to be able to reinstall al equipment and applications installed in the division;

II. The administrators have all data to work with the telecom provider in order to fix the connectivity to the company.

Activity 13 - The **handover of the network** have to meet the agreed contract.

Responsible; **Project manager, legal adviser.**

a. The handover documents are prepared by the project manager and the project engineer and endorsed by legal adviser;

b. The handover documents are signed by the project manager and the general manager.

VII. RISK MANAGEMENT PLAN

Risk identification methodology

Documentation reviews, assumptions analysis, and brainstorming.

Risks:

A. Delay in having in time the necessary equipment and materials - The acquisition manager is going to take this risk in order not to delay the beginning of the installation.

B. Risk of employees injuries - All employees are insured by an insurance company.

C. Technology experience of project team - The team working for the project has the knowledge and all necesary skills to deal with the technology for the new network

D. Disaster recovery - In the planning phase, the project manager and the project engineer plan to install one set of equipment as hot reserve to increase the availability of data in case of equipment failure. Moreover, the training at the final of installation will give the administrators all needed skills to deal with all installed equipment in all imagined conditions.

Code	Risk	Percentage	Impact	Rating score
A	**Delay in having in time the necessary equipment and materials**	1	4	4
B	**Risk of employees injuries**	4	4	16
C	**Technology experience of project team**	2	3	6
D	**Disaster recovery**	2	4	8

LIKELIHOOD						
	Very Likely 5	5	10	15	20	25
	Likely 4	4	8	12	16	20
	Feasible 3	3	6	9	12	15
	Slight 2	2	4	6	8	10
	Very unlikely 1	1	2	3	4	5
		Insignificant	Minor	Significant	Major	Critical
		1	2	3	4	5
IMPACT (B)						

				B	
			C	D	
				A	
Insign.	Minor	Significant	Major	Critical	
1	2	3	4		
IMPACT (B)					

Risk conditions

Code	**Risk**	**Risk conditions**

Code	Risk	Risk conditions
	Extremely High Risk	
B	**Risk of employees injuries**	All employees are insured by an insurance company.
	High Risk	
D	**Disaster recovery**	In the planning phase, the project manager and the project engineer plan to install one set of equipment as hot reserve to increase the availability of data in case of equipment failure. Moreover, the training at the final of installation will give the administrators all needed skills to deal with all installed equipment in all imagined conditions.
	Moderate Risk	
C	**Technology experience of project team**	The team working for the project has the knowledge and all necesary skills to deal with the technology for the new network
	Low Risk	
A	**Delay in having in time the necessary equipment and materials**	The acquisition manager is going to take this risk in order not to delay the beginning of the installation.

VIII. COMMUNICATIONS MANAGEMENT PLAN

No	Stakeholders	Type	When (Phase)					Expectation/concerns		
			planning	execution	controlling	closing	operating	cost	quality	schedule
1	**The Company owners**	D	X					h	m	m
2	**The Company management**	D	X	X	X			h	h	h
3	**Director of the new location**	I	X	X	X			m	h	h
4	**Director of the old location**	D		X	X			m	h	h
5	**Company employees**	I					X	l	m	m
6	**Company costumers**	N					X			l
7	**General manager**	D	X	X	X	X		h	h	h
8	**Project manager**	D	X	X	X	X		h	h	h
9	**Project engineer**	I	X	X	X	X		h	h	h
10	**Team leaders**	P		X	X	X		l	h	h
11	**Workers**	N					X	l	m	m

LEGEND:

Type Rating P= performer E= expert h= higH I= influencer N= nonessential m= mediuM

D= decision maker l= low

VIII. Project Closing and Conclusions

Taking into account the above company has approved the project and decided to implement it immediately.

Cloud computing offers obvious advantages, such as co-location data and computing the scale economy in hosting services. Currently these platforms are used mostly in search engine implementing flexible hosting or commercial web sites. Their role in scientific computation is constantly changing and constantly evolving. In some scenarios, scientific analysis, data must be stored closer to the experiment. In others, it is preferred as a wide band.

The tendency to move scientific data in the cloud has become increasingly evident. It is expected this trend to continue and accelerate in the future. As more and more systems operating in the cloud, the matters set forth in the previous chapter are becoming increasingly important, becoming a thriving research area.

Bibliography

David S. Linthicum 2003, 'Next Generation Application Integration: From Simple Information to Web Services',*Addison-Wesley Pub Co*; 1st edition, ISBN 0-201-84456-7.

Linthicum David S. 2009, 'Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide',*Addison-Wesley Information Technology Series*, ISBN 0136009220.

Ion Lungu, Davian Popescu, Anda Velicanu 2008, 'Multi Channel Architecture Model Based On Service OrientedIntegration', *Revista Informatică economică*, pg. 82-86, nr. 3/2008, ISSN 1453-1305

Brenda M. Michelson 2006, 'Event-Driven Architecture Overview - Event-Driven SOA Is Just Part of the EDA Story',*Patricia Seybold Group*, 2 Februarie 2006, http://www.psgroup.com

K. Keahey, I. Foster, T. Freeman, and X. Zhang. "Virtual workspaces: achieving quality of service and quality of life in the Grid. *Scientific Programming"*

Amy Schurr, "Keep an eye on the Cloud Computing", Network World