REGIONAL DEPARTMENT OF DEFENSE RESOURCES MANAGEMENT STUDIES

THE 11th EXPLORATORY WORKHOP

"DEFENSE RESOURCES MANAGEMENT - TRENDS AND OPORTUNITIES"

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CONTENTS

HUMAN RESOURCES DEVELOPMENT IN GEORGIA

LTC. Shalva BAKRADZE

Georgia as an independent country has a very old history. Georgia had always been a leader country in the Caucasus region. During all its history we always had challenges on many directions. Some wanted from us to change religion or not to be an independent country and for that purpose we had always had many wars. Finally in 1784 we signed an agreement with Russia called "Treaty of Georgievsk" by which we had to be supported from Russia. However, after signing this treaty they did not help us much. So, I must say that at that point we lost our independence. At the beginning of the 20th century in 1917 communists came to the power in Russia and they step by step occupied countries around Russia. After communists came to the power in Russia, they did not have time for us and on 26th of May of 1918 we declared independence and became free country. This lasted only for three years and in 1921 red army with war came to Georgia and occupied it. So, we lost our independence again. At that time happened the first big migration of intellectual people from Georgia. Mainly they went to France. These people were really big loses for Georgia, but at that period communists would simply killed them if they stayed in their country. We had been part of Soviet Union for many years, until the 1990. On 26th of May of 1990 we declared independence and became independence country again. This was very crucial moment for us.

GEORGIA FROM 1990 TO 2000

From 1990 to 2000, in my opinion, was the worst period for intellectual and open minded people in Georgia. Economy fell so low that we did not have any real salary. I remember that the salary in the public sector was so low that you even could not pay for minimum needs and also you would get your salary with delay of maybe 6 months or you could never get it. There was no hot water, electricity was only for few hours and for bread you had to stay in a queue for 7-8

hours… Some people in capital city of Tbilisi where preparing food in the yards in front of their houses.

From the beginning of 1991 big civil war was happening in Georgia, mainly in Tbilisi. This was war for power and many people, especially young people died during this war. Until that period I do not remember that we ever had such big civil war where Georgian was fighting each other for power… These times were horrible. The country became embroiled in a bitter civil war, which lasted until nearly 1995. Eduard Shevardnadze (Soviet Minister of Foreign Affairs from 1985 to 1991) returned to Georgia in 1992 and joined the leaders of that period. The other leaders after some time were killed or later on went to Russia. We also had war with Russia in Abkhazia and Ossetia in which many people, died and became refugees. From Abkhazia about 300000 people became refugees. These people to survive from enemy went through high mountains of Georgia for more than 200 km and many of them could not make it. I have to say that many of them were high talented and educated people. Some of them were professors, scientists, mathematicians etc…

So, they were left without jobs and it must be mentioned that Government could not help these people at all. They have to find the ways to survive. Because of the situations at that time and low level of economy, actually this was the case for almost all people in Georgia.

From that period citizens of Georgia started to immigrate in other countries. I have to say that many of these people were intellectuals and for better future they went to other countries.

During the decade, from 1990 to 2000, more than million people left Georgia. Many of them became very famous, but most of them were not Georgians anymore. Who wanted better future they had to change their citizenship. Among them who left Georgia also were great sportsmen who did not have support in Georgia. So, they decided to leave Georgia and many of them changed citizenship and family names. As an example I can say that in 1996 in Olympic games Kakhiashilis won his 2nd Olympic gold in weightlifting, but first gold medal he won in 1992 when he was Kakhiashili and won Olympic games as a Georgian but following medals he got as a Greek. This is just one example just to show that Georgia at that period could not keep such talented people. Not only sportsmen left Georgia. It must be said that the main reason for these great immigrations from Georgia was to get more finance and to survive. They actually helped their families and friends from abroad. This was the best thing for keeping Georgia's economy just to survive. At that period nobody cared about human resources. Georgia had

always been an agricultural country. However, because of the lack of money, people could not care about their lands and about 70 percent of people went to the capital city of Georgia, Tbilisi. They came to Tbilisi, but there were not any jobs for them. No work place was created. Economy was not growing. There was not planned human resource development at that period at all.

In the mid of that decade some signs of good movements were made but not at government level. Families try to send their children to study abroad. First students went abroad to study in foreign universities. I have to mention that I also was sent to London to study English in 1993 and then continued study in the university. There I met some refugees from Abkhazia also. At that period English government made easy to get visa for Georgians who were leaving for study. Actually this was big help from them. This people who went to study abroad could get new knowledge and after some time when they got back home they could use what they had learned there. This was the only bright sign in that period which later on helped our country's development greatly.

I also have to mention that many different religion's people in Georgia through its history has lived peacefully and there never was any big war because of this case within the Georgian population. Today 83.9 percent of the population practices Eastern Orthodoxy, with majority of these adhering to the national Georgian Orthodox Church. Religious minorities include Muslims (9.9 percent), Armenian Apostolic (3.9 percent), and Roman Catholic (0.8 percent). Around 1 percent declared no religion at all

Number of Georgian citizens immigrated since 1990

Country	Since 1990
Russia	1 000 000
Ukraine	150 000
USA	140 000
Europe	50 000
Others	160 000

These situations continued till the end of 20th century. By then some signs of Georgian economy's growth could be seen. Situation became more stabilized. There was no 9 month delay in salaries, but situation still was corrupted and still had big problems. Some jobs were creating,

however, there was no planned human resources and mainly you could get a job only if you knew head of that organization or you head good relationship with politicians. However, many European countries and USA were starting to get involved in development of Georgia's economy. We became members of many European and non-European unions. Number of students studying abroad was increasing. Ministries where getting new qualified persons for jobs. But till the mid of 21st century still was some corruption, which in my point of view is the main reason for not developing in any directions so fast as other countries have done since 1990.

GEORGIA FROM 2000

In 2003, Shevardnadze (who won re-election in 2000) was deposed by the Rose Revolution, after Georgian opposition and international monitors asserted that the November 2 parliamentary elections were marred by fraud. Following the Rose Revolution, a series of reforms were launched to strengthen the country's military and economic capabilities. These people had support from USA and most European countries. In Georgia's economy many famous companies started to invest lots of money. For this reason they needed qualified people to work, so who was studying abroad they were asked in many cases to come back to Georgia and take these kea positions, because they new USA and European countries' experience and had knowledge how to develop. At that time started the developing of human resources market. To apply for a job you have to have some specific knowledge. Also Ministries and just companies try to foresee their needs which they did not do in the past. So accordingly to their needs people were hired for jobs. Of course there was still some level of corruption but not at low levels. Many nongovernmental organizations were created during that period and they also created many jobs. These organizations got their plans from their donor organizations so that they knew exactly what kind of people they wanted and what their goal was. In many cases good graduated students were sent abroad for specific jobs for 6 month or more and they were trained for working in that particular company or organization.

But times had changed. Tensions with Russia began escalating in April 2008. Once again, war took place in Georgia and Russia was involved again.

On 7th of August, Georgian President, ordered a unilateral ceasefire at about 7 p.m. However, Ossetian separatists intensified their attacks on Georgian villages. Georgia

launched a large-scale military operation against South Ossetia during the night of 7–8 August 2008. According to the EU fact-finding mission, 10,000–11,000 soldiers took part in the general Georgian offensive in South Ossetia. The official reason given for this was to "restore constitutional order" in the region. According to Russian military commander, over 10 Russian peacekeepers were killed on 8 August. That day Russia officially sent troops across the Georgian border into South Ossetia, claiming to be defending both peacekeepers and South Ossetian civilians. Russia accused Georgia of committing "genocide".

In five days of fighting, the Russian forces captured Tskhinvali, pushed back Georgian troops, and largely destroyed Georgia's military infrastructure using airstrikes deep inside Georgia proper. Russian and Abkhaz forces opened a second front by attacking the Kodori Gorge, held by Georgia. After the retreat of the Georgian forces, the Russians temporarily occupied the cities of Poti, Gori, Senaki, and Zugdidi. Both during and after the war, South Ossetian authorities and irregular militia conducted a campaign of ethnic cleansing against Georgians in South Ossetia, with Georgian villages around Tskhinvali being destroyed after the war had ended. The war displaced 192,000 people,https://en.wikipedia.org/wiki/Georgia_(country) - cite_note-80 and while many were able to return to their homes after the war, a year later around 30,000 ethnic Georgians remained displaced. Russia recognised Abkhazia and South Ossetia on 26 August 2008. In response, the Georgian government cut diplomatic relations with Russia. Since the war, Georgia has maintained that Abkhazia and South Ossetia are under Russian occupation and remain, legally, part of Georgia. So, as you can see, once again war has interrapted our development.

After 2008, despite of the world economy crysies, more money came into Georgia's economy. Invetmnets were made mainly in infrustructure developments, tourism, in exporting Georgian products to different countries, manly vine and mineral water so that we replace Russian market with others.

At that point almost every key job was occupied by young people and the government in my opinion was not totally right, because they said that they would not hire for any public sector people over age of 40. I must say that at that period we had some parliamentars of age 21 and ministers of age 25 and many times during the public speeches they were put in very funny situations, because they did not have any experiance. They were only active members of president's party. That was not right.

In 2012 the Georgian Government was changed and situation in Georgia has become more free. New Prime Minister is very active and despite of still having many problems most of Georgian people feel better than before. People who wants to work novadays have to go through some examinations which is step forward.

CONCLUSION

As a solution and conclusion I have to say that Georgia has very openminded human resources which if trained could be used not only in Georgia. In my point of view for developing human resources in Georgia we have many options. Most important thing is to have like this trainings in DRESMARA more often and also should include more Georgian people. This will make us to gain and share experiance and ways of development in which you and other countries already went through. Also we have to keep sending good students abroad to get modern knowledge and also learn more and more about chalenges most european countries and USA had and how to overcome those problems. In Georgia for good students there are some grants but not many people can apply for that. We have to increase scolarship programs, because beleive me we have potencial to become very developed country in close future. In my opinion we need to take all good experiance from you and developed countries but we must avoid just copying them. We have to adopt them according to Georgian reality and culture, so that we do not lose our authentity which most tourists like in Georgia. I hope that very soon we will have the opportunity to go to European Countries and USA without visa, which is also very important. I also hope very much that soon we will become member of EU and NATO and take all advantages from it. All these steps with others will make Georgian human resources ready for any chalanges we might have in 21st century.

MAINTENANCE RESOURCES AND ITS ROLE DURING LIFE-CYCLE OF EQUIPMENTS

Commander Viorel BOLD

Maintenance costs are a big part of total cost of operation of the equipment. The term of industrial system refers to a machine, machining center, industrial robot, production line, the workshop, warehouse, etc., in the light of the specific characteristics of each industry; maintenance costs may represent 15 to 60 % of the costs finished products.

Operation under optimum conditions and high-performance of the equipment is closely linked to the prevention of faults arising by maneuvers misuse, and due to inadvertent overload operator or by accident, through excessive wear and premature of components, etc.

Development of techniques for the monitoring and diagnostics and their implementation on industrial systems ensure safe operation and performance, with positive effects on the reliability and productivity.

Addressing issues of appearance and the management of the situation of a fault in a system requires, as a first stage, the definition of terms usual.

Damage to or capacity cut-off a system to ensure a function required under the operating conditions specified defines a situation of fault (failure). A failure is due to an outbreak of one or more faults.

Not always a fault result in failure, the system can continue to operate, but with loss of performance. Detection and insulation of faults is therefore a necessity in any system.

- Faults detection shall be defined as the presence of a fault in the system;
- Faults insulation refer to determining the type of damage, to the place of production of the fault and also the time of detection;
- Faults identification refers to determining size and behavior in time of the fault, i.e. the cause that generated damage noted.

These three functions are performed by the blocks/equipment for detection and diagnosis of faults in industrial systems.

Diagnosis includes, therefore, the steps for the isolation and identification of the faults, establishing a link cause and effect between symptoms noticed and failure that follow, their causes and its consequences, using specific algorithms and leading to early detection of abnormal situations, thus preventing damage.

The process of detection and diagnosis of faults involves access to certain sizes / significant parameters of the system, giving at any time information on the status of it. The sum of all equipment to ensure the acquisition and analysis of the system signals, detection, and fault diagnostic trouble bears the name of the *mode of monitoring the condition of the system*, a term encountered in the English language as well as *condition monitoring*. Monitoring the status of a system can be achieved using equipment/sophisticated algorithms, or, for simpler systems, is based on experience and training system operator respectively.

CONCEPTS OF MAINTENANCE

The development of units activities, the need to meet more complex missions and longer duration is at best quality and cost as small, have determined the orientation of the logistics management units and experts in machinery and equipment to develop organizational measures and technologies to reduce accidental stops for the movement of machinery and reduce waiting time by in repair, thus the cost of maintenance.

Maintenance may be considered to be a group of activities correspond to the technical and organizational aspects which are aimed at maintaining operating, maintenance and repair equipment.

The first maintenance policy developed consists of the operation of the plant that operated up to their stop erratic (breakdown) due to wear provided or due to the appearance of any faults. Intervention shall be considered satisfactory as long as machine/system operate at a minimum acceptable (reactive maintenance).

Development and increase in complexity has led to the modernization and updating techniques and maintenance policies. Depending on the costs related to the spare parts and materials, i.e. the losses due to the parking time in repair, can be distinguished one from another three types of policy for maintenance.

•Corrective maintenance allows a means of production, on a provisional basis, carrying out a full function, by the assistance at the time when a problem occurs. The action is well-planned, however, should not only at the level of symptoms, but reaching for it and solving the fault's cause.

For the situation in the implements function safely until you install a certain level of wear or a fault, talk to you about the preventive maintenance and predictive maintenance. In such systems, machinery will be turned off at once, and the repair will be made only where the need arises.

•Preventive Maintenance allows detection of the time, location and identification of fault or the part worn, as well as the calculation time for safe operation of the machine. Type activity preventive and predictive planning makes it possible to stop, the preparation of the intervention team, ensuring the necessary spare parts, i.e. minimize duration of parking for repair.

•Predictive Maintenance represents a qualitative leap upper in a modern system of maintenance, regardless of industry or of the specific nature of the production, since it provides all the information necessary for the purpose of:

1. Early detection of the appearance of faults;
2. Location;
3. Faults diagnosing;
4. The calculation of timeline for safe operation of the machine.

REACTIVE MAINTENANCE

This type of maintenance is characterized by two components, namely planning low and repair incomplete.

1. Repairs are often badly planned due to constraints of time imposed by mission / funds / spare parts supply / material and system management. More commonly, reactive maintenance costs three / four times more than the problem would be solved in a planned manner.

2. A second problem related to the reactive maintenance is that the work is focused on repairing symptom fault, without looking for cause. For example*, failure of a rotor shaft can cause malfunctions in a piece of equipment, causing equipment off / fulfill its mission. It is changed as soon as possible and the machine/system is put back into service, without trying to*

determine the underlying cause of fault on the rotor shaft and/or without trying to prevent recurrence of fault. As a result, reliability machine/system is reduced drastically, which causes an increase in frequency of the appearance of the fault and, of course, the maintenance costs.

CORRECTIVE MAINTENANCE

In the event CORRECTIVE MAINTENANCE, unlike the reactive maintenance, activity focuses on tasks planned at regular intervals to ensure that the operation of tweaking machinery/mission critical systems. Effectiveness of the maintenance program shall be judged according to the life-cycle cost of machinery/mission critical systems and not as fast is put back into service.

Thus, the main objective of corrective maintenance is to eliminate interruptions in operation, deviations from optimal operating conditions and the operations without unnecessary duplication. This requires accurate and complete repair of problems since incipient phase, on the basis of a program of work well-established, implemented by trained people for this purpose, repairs being checked before the machine/system will be put again in operation. Incipient problems are not reducing only to electronic problems / electrical / mechanical. All deviations from optimal operating conditions, e.g. yield, capacity for the production or quality of the products, are corrected as soon as they are detected.

PREVENTIVE MAINTENANCE

Preventive maintenance concept has a multitude of meanings. A literal interpretation of this term defines a maintenance program which is intended to eliminate or prevent corrective maintenance and/or the reactive maintenance. A preventive maintenance program more comprehensive will appeal to periodic assessment of equipment/machinery/mission critical systems to detect potential problems and to program operations required immediately to prevent any damage to the operating conditions. The activities of routine maintenance are managed in the course of time.

Below figure shows rate of occurrence of a fault according to the time of operation.

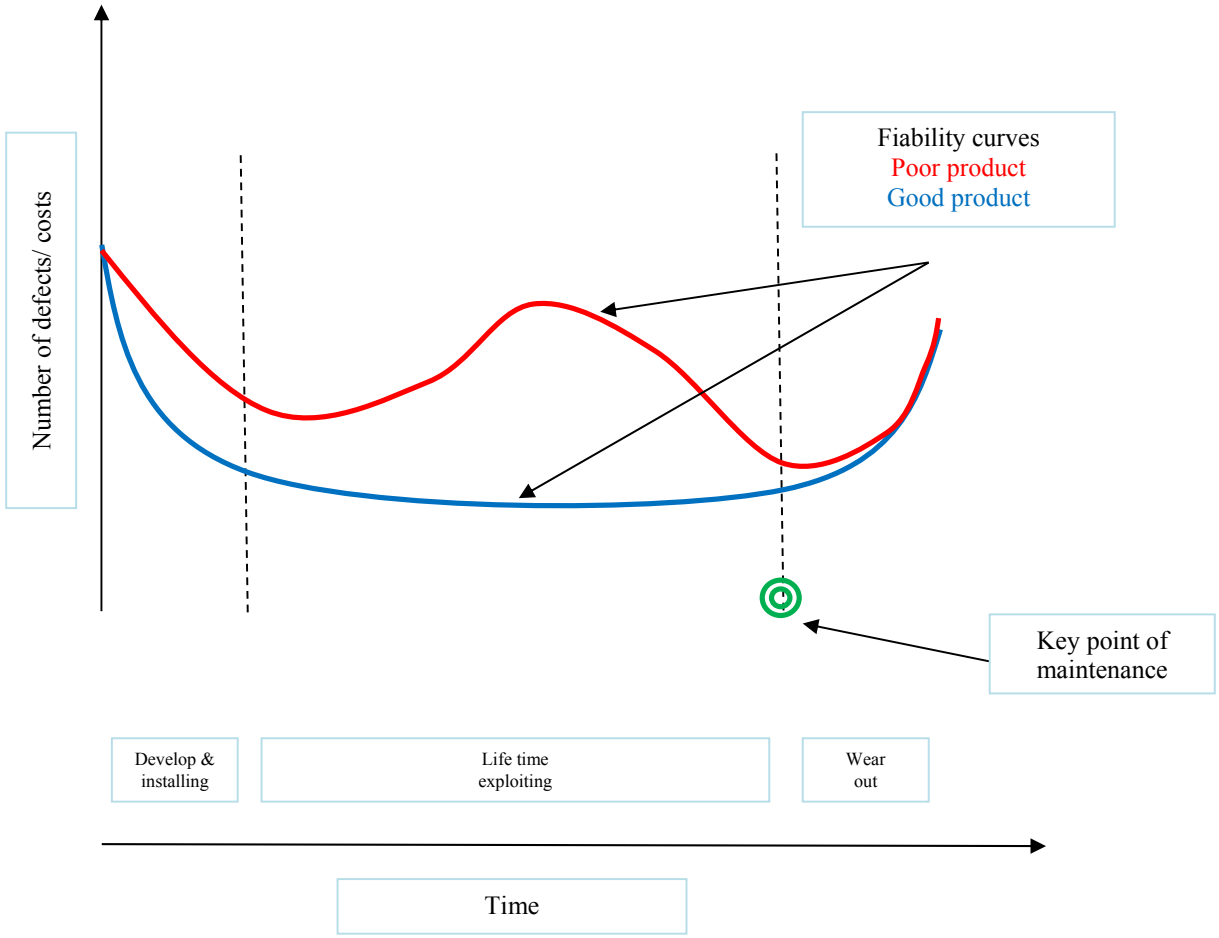

Fig. 1. Statistic representation of defects occurred on a machine / system / equipment

Thus, a new machine is likely to be damaged during the first week of the putting into service due to problems relating to the installation. After this period possibility of occurrence of a fault is relatively low for a long period of time. After the period of operation tweaking for a long time, called the life-cycle, the probability of a failure mode is growing rapidly with the elapsed time. Preventive maintenance management takes, or should take, into account this statistic in planning repairs and maintenance work.

Implementing preventive maintenance at the present time varies in a wide range. Some of the programs are extremely limited and shall consist only in lubrication and some minor adjustments. A real program and effective preventive maintenance involves planning repairs, lubrication, adjustments, renovation for all equipment/machines/ subsystems within an

equipment / facilities. Common denominator of these operations is correct programming in time depending on the statistics presented above.

All of the maintenance programs reference assumes that each machine/equipment has a specific time of life. *For example, the conditions of use and therefore appearances statistical faults for a water pump are not the same as a fuel transfer pump or a lube pump*.

PREDICTIVE MAINTENANCE

As preventive maintenance, the predictive has a lot of definitions. For a part of the human operators this is reduced at rotating machinery vibration monitoring with a view to detecting incipient faults and in the prevention of a quench. For others, it refers to the monitoring with thermal camera equipment of engines or other machines mechanical/electrical, in order to detect any problems that may arise.

Common premise from which predictive maintenance starts is that periodic or continuous monitoring of mechanical / electrical/ electronic or other indicators of system operation or processes can provide the data necessary to ensure maximum interval between repair and maintenance work, in order to minimize the cost of completion of missions due to possible faults.

However, predictive maintenance is a lot more than that. It is actually the means to improve and increase productivity, product's quality and yield of total system of manufacture and production efficiency, as well as reducing operating costs.

Predictive maintenance is, in fact, a philosophy or an attitude which, on the basis of the operating conditions, allow optimization of industrial system. Comprehensive management of predictive maintenance uses the most effective methods (monitoring vibrations, Thermography, tribology, etc.) in order to obtain the operating parameters of subsystems components of an industrial system, on the basis of which will schedule with maintenance and repair.

Predictive maintenance inclusion in the general program of maintenance optimizes availability machinery and equipment and reduces maintenance costs very much.

Unlike *preventive maintenance*, which has as a basis for programming the elapsed time since the commissioning/major overhaul/intervention activities for the organization of the maintenance activities, *predictive maintenance* programming is based on the parameters/indicators of effective operation of equipment/machine / system.

The use predictive maintenance as important element of the policy of the maintenance of a company provide real-time data on the status of current of each mechanical drive system and the efficiency of operation of each process. These data are an important basis for the organization of the maintenance activity. They will be able to avoid such unscheduled downtime of the production process, by identifying problems before they become serious. Most of the problems can be minimized by their detection at the earliest stage.

THE APPROACH AND IMPLEMENTATION OF THE PROGRAMS OF PREDICTIVE MAINTENANCE

In many cases, preventive maintenance programs have not given expected results; this being generated not so much of technical limits but the approach and implementation of maintenance techniques at the level of the workplace. With a view to making the maintenance policy more efficient should be taken into account a few factors, namely:

- The way of approach, from the highest level to the place of work, on the one hand, but also the difference between policy developments of maintenance for each company;
- Correct use of maintenance techniques.

THE APPROACH OF THE MAINTENANCE POLICY

As regards the policy approach of the predictive maintenance should be taken into account two important elements:

- Understanding place and role of predictive maintenance,
- Unit size to which it applies the maintenance policy.

PREDICTIVE MAINTENANCE PERCEPTION

Consider matters related to the effectiveness of the types of equipment for over 30 years, it has been demonstrated that the maintenance policy is responsible for approximately 17% of user downtime production or quality issues. Other 83 percent is due to most of the times the operating practices inadequate, design faulty, etc.

In the development of an effective policy of predictive maintenance it is necessary to involve factors of the governing board, of managerial team that should be able to understand the

need of its implementing, with additional costs, but which in time will prove its effectiveness. Thus, in order to optimize processes and the operation of units, as a general rule, it is necessary to implement the specific predictive maintenance, for the detection, isolation and resolution in a timely manner and with reduced costs of all deviations from performance laid down. The use of these techniques maintenance must, however, be supported at all levels, which is difficult to be carried out. This is why it is essential for formation of categories of staff to have the main purpose development and implementation of that policy of maintenance.

The choice of staff and the organization is not an easy process. Team members must possess complete knowledge about designing machinery, equipment and processes, and to be able to implement the best practices for operating as well as for the maintenance all machines/equipment critical equipment. Also, the team must have a good knowledge and use of maintenance techniques correctly, in accordance with machine/equipment features. This problem may be solved in two ways:

- First approach refers to personnel selection from among the best specialists, who possess thorough knowledge in their respective fields of their own specialty.
- The second approach refers to the commitment of specialized engineers to ensure the quality of maintenance. Most of the times, specialists in this category offer their services in an advisory capacity, usually in the short term, after which the unit will be forced to appeal to their own employees to continue this activity.

THE MAINTENANCE POLICY VS COMPANY SIZE

Before analyzing the approach of the maintenance policy according the size of the establishment, it should be borne in mind that increased productivity, low cost, the quality of the products and services, represents requirements both at the level of large companies, as well as at the level of the smallest.

First element which must be taken into account is linked to the assurance of an environment encouraging labor, involving all employees, for in matters of management, to the productive. All the services of the unit should be involved in ensuring an efficient technology flow, supply, production, maintenance, enforcement goals.

Proper planning depends on a number of factors, as follows:

- good knowledge of production capacity,

- materials control
- High reliability of the equipment.
- Permanent contact with the services of supply, human resources, i.e. with the maintenance.

There should not be lost sight of human-factor. Unit personnel must be properly trained, evaluated at regular intervals and, if need be, entered in the training programs.

The supply department has a particularly important role, both in its relationship with the production, as well as with the maintenance, because it ensures that demand for materials and supplies in agreement with rhythms of production, as well as spare parts and equipment required any repairs or maintenance.

The maintenance service should maintain in perfect working order and operation the company equipment. The objective of the maintenance activity is to prevent problems and resolve emerging ones without a negative impact to accomplish the goals. Consideration must be given to corrective maintenance, as well as the preventive maintenance with efficient use of infrastructure and the production capacity of the unit.

Implementations of some predictive maintenance programs are perfectly justifiable, on the understanding that these programs should be integrated into a uniform policy, in order to avoid dissipate efforts and the emergence of additional costs. This is why it is so important the existence of a computerized system of management, which shall include all items to compete to the performance of an activity to carry out the tasks assigned in optimum conditions. Implemented correctly, such a system will provide a means of communication and for the integration of the services of supply, production, maintenance, enforcement missions.

TECHNIQUES USED BY THE POLICIES OF THE MAINTENANCE

Components of a system, such as pumps, electric motors or hydraulic, transmission systems, etc. as integrated parts of this must operate at nominal parameters to ensure that expected performances of the system as a whole are achieved. Dealing with problems in maintenance, set up the procedures and strategy of the maintenance of a system should take into account both monitoring and diagnostic purposes at the level of each component, but also the influence of system variables.

Most of the times cause of a fault is located in the variations of the process parameters and a non-integrative monitoring and diagnostics approach of the system may lead to ineffective actions.

The main technologies for monitoring and diagnosis of the status of a system are:

- Vibration analysis is one of the most used methods of detection and diagnosis of faults in electromechanical systems. By this method shall be measured vibration system, usually with an accelerometer, after which it shall examine the frequency spectrum generated with a view to identifying frequencies significant from the point of view of the machine status.
- Temperature is another parameter key that can provide information on the status of a piece of equipment/system. This is an important indication of the conditions mechanical, electrical or load applied to a certain components.
- Thermography is to use an infrared camera to view and measure thermal energy emitted by an object.
- The lubricating fluid analysis can be used to determine the conditions of mechanical wear, the lubrication or condition the fluid. Presence of metal particles in the lubricating fluid suggests that there is a wear, their analysis by providing information on the part subject to wear. Fluid acidity show oxidation due to high temperatures, either particle contamination of water or extended use. The viscosity is also an important parameter and must be in accordance with that specified in manufacturer's data. Alkalinity or loss of it proves that the fluid is in contact with inorganic acids such as sulfuric acid or nitric acid.
- Spectrometry means measuring the quantity and type metal elements in a sample of fluid.
- Ultrasonic noise detection can be used to determine leakage of liquid or gas. When a fluid passes from a high pressure area to a low pressure produces noise ultrasonic flow due to turbulence. The detector converts ultrasonic noise in the audible range.

FINANCIAL IMPLICATIONS

In normal conditions of analysis of new investments shall be placed in the balance initial costs and benefits expected, in terms of cost savings achieved and the growth of profit. To consider the project as being a good investment should be recovered costs incurred within a reasonable time-frame.

If for the purchase and installation of the new equipment these calculations are relatively easy to do, the benefits investments in maintenance are very difficult to estimate, since this process involves many more variables.

In evaluating the need for development and implementation of last resort to a policy of maintenance at the level of a company should be taken into account a few factors, namely:

- interruptions and their distribution over time,
- frequent need for repairs,
- number of products with the fault manufactured,
- Possible performance degradation, etc.

This is why it is important to know previous performance of the machine/ equipment/ system, which will work through the program for maintenance, but also possibility to improve their analysis.

To justify support for a policy of maintenance in a company it is necessary that it will be to a certain extent quantifiable from the point of view of costs and benefits involved. Their calculation includes both costs and benefits that can be determined with accuracy, as well as some hard to quantify.

For example, for the first category can be calculated costs of interruption of production. In a cut-off of "X" hours of the production process results in a number of parts not produced and another number of faulty parts, whose financial correspondent can be determined. But it is difficult to quantify consequences of not fulfilling the overall task, if the provision of products delayed or equipment maintenance cannot be performed.

Another category of expenditure measurable results are represented by direct cost and installation of the equipment to be procured for the implementation of the maintenance policy. Must be taken into consideration when it is installed in such a way as to eliminate interruptions of production / carry out the tasks assigned and, in addition, must be prepared staff to be able to exploit it. Once equipment has been installed and put into service, costs relate mainly to personnel dedicated to its exploitation. But if existing staff is well prepared and if new equipment installed take over part of tasks or improves the efficiency of operators, then the operation costs are represented in the greater part of its fuel energy required, consumables, etc.

In conclusion, it can be said that the justification for the financial implementation of the maintenance policy should be based on a business plan firmly, in which investment costs to be covered by benefits from a financial point of view.

CHOOSING THE MAINTENANCE STRATEGY

In choosing of a strategy in order to implement a particular type of maintenance, it should be borne in mind, firstly, that it does not require maintenance repair work is carried out in the shortest possible time, but it is primarily a means of preventing damage caused by machinery/equipment problems. Thus, the role of the maintenance strategy is to obtain and maintain:

- optimal availability of equipment/production systems and to those aids for maintaining production capacity / comply with specific tasks to the level of performance;
- optimal operating conditions for the equipment/production systems or auxiliary;
- efficient use and maximum capacities of the resources for the maintenance;
- extended life of equipment/systems;
- rapid response in the event of a fault;

Developing a strategy for maintenance at the level of a company shall not be reduced to a single type of maintenance. There is always a mixture of reactive maintenance, corrective and preventive predictive. Also, an important factor in choosing a type of maintenance is represented by the consequences of the possible statuses of a fault on the machine/equipment/system. Appearance of a fault could pose problems of safety or production, or can lead to environmental problems. There are faults which cause substantial costs related to the loss of production, or defects which may be irrecoverable a piece of equipment. Most of the times, for each piece of equipment/process there are known consequences of a possible fault. Otherwise it may call upon the operator equipment in question or in the documentation relating thereto.

In the maintenance documentary, maintenance strategies mentioned above are to be found and under other names. It is possible methods/strategies for maintenance:

- DOM - design out maintenance
- maintenance based on continuous assessment of machine parameters/ equipment/ process (CBM - condition based maintenance);
- operation at fixed intervals of time (FTM - fixed time maintenance);

• operation until the ignition capacity (OTB - operated to breakdown);

DOM is a special category of maintenance, which shall take into account the problems related to the *maintenance of the design phase*. For instance, they provide for automatic lubrication systems, mechanical seals or bearings watertight, for the prevention of possible faults.

CBM, being a method based on continuous assessment of the machine status/ equipment, falls into the category predictive maintenance. Continuous monitoring of the machine status/system still allows detection of incipient phase of the faults, so that corrective action can be planned and organized in time. To the development of a system of monitoring and diagnostic purposes must be taken into account two factors.

In the first place, the method or technique of monitoring must be in place during the operation of machine/equipment/process being monitored. In addition to this, the method chosen must be objective, based on data supplied by performance systems of measurement, data acquisition and processing.

Secondly, for an effective maintenance it is necessary to prepare a specific documentation, which will be within the reach of maintenance personnel on the sites. This documentation must contain:

- advice on monitoring and lubrication during operation;
- monitoring procedures and lubrication on stop period and procedures for FTM;
- standards of monitoring for various parts;
- Specific standards.

FTM is almost preventive maintenance, in which case operations are established and organized in time, at fixed intervals of time, most of the times as a function of the life cycle of the machine/equipment and various assemblies.

OTB is reactive maintenance department, intervention at the machine / equipment/process will be absent only after the fault has led to a halt ability to operate. For such situations, the best solution is that of the development of corrective procedures which allow intervention at the fault, the examination of the case, and not just the symptomatic and repair check before attempting to restart the equipment.

FIABILITY

All the elements of the maintenance must be met in order to maintain reliability of equipment, for the purpose of carrying out its tasks in good conditions at minimum cost.

Reliability (Reliability, symbol R(t)) is the "characteristic of a product expressed by the possibility of carrying out function required for the purpose, in given conditions, for a period of time specified".

This definition contains the five fundamental concepts:

1. *Concept of feature*. Reliability is therefore a feature of a product, which can be determined and characterized, in the same way as the other technical characteristics (power, engine speed, etc.) and expressed quantitatively. Reliability must have the same status as other technical characteristics: to be considered as from the scheme-design, to be monitored properly in production and to be attested by tests or by other methods of estimation.

2. *The concept of probability*. Reliability is expressed as a probability and has a value between 0 and 1. Being a probability cannot be measured directly as is the case other physical parameters, but shall be determined on the basis of the methods of mathematical and statistics for theory. This constitutes a major obstacle to this feature in an appropriate manner of measurement. In particular, for design and engineering reliability has to be regarded as a basic feature which may be used as a guide and to optimize constructive solution.

3. *The concept of a function*. Reliability involves satisfying a required function. This implies correct definitions of the function that you need to carry it out. In the case of a simple element function means what he should do, in the assembly of which it is part. For products or equipment complex there may be multiple functions, dependent on different states and operating modes considered or implied. Reliability refers to all of these functions.

4. *Concept of Operation conditions* (usage and environmental) means all conditions for which the product was designed. It is noted that in many cases the notion of reliability is not interpreted correctly, especially when the value of reliability is estimated through the prism of laboratory experiments in which requests are not correlated with those of normal use. Operating conditions directly influence reliability. An ideal product has reliability corresponding to working conditions. Not knowing certain working conditions makes reliability may not have desired value. Here arising out a series of conditions which concern on the one hand use, and on the other hand the scheme and design.

5. *Concept of the operating time*. Reliability implies an operating time expressed in units of time (hours, days, years, etc.) or a number of cycles, connections, maneuvers, etc. In other cases, materials and equipment for road, the duration can be expressed in kilometers. In conclusion, the duration symbolized by "t" shall be expressed in the unit's characteristic of the product.

Correct expression of reliability requires information concerning the five concepts listed. Neglecting of one element in the definition generates confusion and cannot have technical utility. This applies both to a single item, component or product, as well as for a system or equipment technical unit.

Correct interpretation of the reliability definition is particularly important for both design and engineering, as well as for use. For now it is found that reliability raises more problems than it will solve, but improving methods of investigation will lead to safety at the time of the processing concept of reliability in the main feature of a product.

CONCLUSIONS

Based on graphics in Figure 1, the main points on which the new system of maintenance must have in view would be:

- Purchase of the equipment to be carried out from the leading manufacturers in the business, specialized in areas, which may present guarantees on the quality of the products and services of the maintenance during the life cycle of equipment.
- Purchasing equipment whose reliability during the period of design / construction / test has been proven over a period of time sufficiently large so that the design faults to be rectified;
- Personnel training in the operation of equipment, with a view to preventing the occurrence or causes faults due to exploitation by human operator;
- Perhaps the most important part of routine maintenance, provision of equipment to monitor the performance of the equipment and automation control on the operation / off equipment. The apparatus of monitoring the performance of the equipment is the main component for the prevention of damage. At the time when the monitoring equipment detects the appearance of variations in the parameters of operation outside nominal values (vibration, temperature, noise, odors gaseous, etc.) they must inform these things to operator (human or electronic), which will act accordingly. Detection of defects in early development can provide

immediate correction, and prevents damage other components / damage to equipment. For example, for the emergence of a noise on a piston of an engine can intervene quickly, it is replaced and the engine can continue to work. If the noise is ignored, the piston may shatter, con rod may break, breaks engine block and it is damaged permanently, without the possibility of repair / reconditioning.

- Providing, during the period of his life, of the elements of the operating at nominal parameters (lubricants, filters, anti-freeze, cooling/heating, etc.), in accordance with manufacturer's specifications;
- Providing preventive maintenance, as specified by the constructor, which is intended to eliminate or prevent corrective maintenance and/or the reactive maintenance.
- Providing kits of tools / service elements necessary for assistance during the period of his life, for its operation (removal covers visit, top up with liquid lubrication, cooling or lubricating equipment, etc.)
- Providing corrective maintenance, where appropriate, if possible through intervention of specialized personnel on the part of the manufacturer;
- Equipment's behavior monitoring through the collection of statistics data - number hours of operation, the operating parameters, number of operations to maintenance, the costs of maintenance, etc.
- By end-of-life a complex study must be imposed that should include several components:
  - Importance of equipment with respect to the influence of its company operability / influence on fulfillment of its goals;
  - the value of equipment
  - age of the equipment
  - reliability of the equipment during the lifetime
  - maintenance costs during the life cycle
  - repair costs during the lifetime
  - degree of physical wear of the equipment
  - DEGREE OF MORAL WARE OF THE EQUIPMENT
  - possibility of up-grade or replacing it
  - staff training for the operation of the a new equipment

All of these elements have only one end - IDENTIFICATION OF THE LEVEL COSTS FOR USE OF THE EQUIPMENT.

It is possible to identify where are you incurring additional costs of operation or if they are reduced to up-grading / replacing equipment. It is clear that toward the end of the service life of operating costs/maintenance on any equipment increase, due to wear and physical aging of materials.

Complex economic study which requires must determine:

- old equipment maintenance costs;
- The existence on the market of the spare parts and maintenance specialists in old equipment.
- Time to ensure the replacement parts (sometimes arrive at periods of 16 to 18 months to ensure that parts that make equipment in efficiency and there is only a single supplier).
- If repairs are required to existing equipment, having regard to its importance in the framework of the system/plant/unit or it may be excluded from the component (for example, repairing a telephone central unit produced in the 1970s which is still in service, under the circumstances in which communications equipment have evolved very much over the last 45 years);
- the value of a new piece of equipment, to replace old equipment
- complexity of the works for installing the new equipment
- Maintenance costs of the new equipment
- MORAL UP-GRADING of system / equipment with next-generation, which can help to ensure that its operation under the optimum conditions for a further 10 - 20 years
- Compatibility with systems/units which are identical with that work together (standardization of equipment / systems / s) for INTEGRATION into groups of identical companies.
- Work more effectively in the unit.
- Ensure capabilities for achieving the tasks in a safe manner.

Concluding, in accordance with the conditions to ensure present financial, the new concept of maintenance should aim at reducing the costs of maintenance by replacing equipment outdated (whose maintenance is more expensive than their replacement) with new equipment, which have cost very low maintenance front of old ones.

THE ROLE OF THE EDA IN THE EU DEFENSE COOPERATION

LTC. Catalin GRADINARIU

The European Defence Agency (EDA) is an intergovernmental Agency of the European Council. Currently, 27 countries – all EU Member States except Denmark – participate in EDA. Following the mission of the Agency, "to support the Member States and the Council in their effort to improve European defence capabilities (…)"[1] cooperation with the Member States is very close; be it on the top-level through the Steering Board which sets EDA's priorities or at the working level in expert teams. Indeed, EDA currently connects around 4,000 national based-experts in cooperative defence projects. On a monthly basis, the Agency receives around 1,000 visitors in its premises in Brussels ensuring that projects are tightly knit to Member States' needs.

Member States contribute to the Agency's annual budget according to a GNP-based formula and approve its work plan. Through the Agency's "à la carte" approach, Member States can decide whether or not to participate in Agency projects according to national needs. Likewise, the results achieved by the Agency are for the benefit of its Member States.

The European Defence Agency is the place to go for European defence cooperation. The Agency supports the European Council and the Member States in their effort to improve the European Union's defence capabilities through cooperative projects and programmes.

It works on the basis of a new approach that draws together the whole defence spectrum, tailoring its work to the military needs of tomorrow, providing different and often innovative solutions.

Since its foundation in 2004, the EDA and its participating Member States have launched important projects, boosting Pooling & Sharing of capabilities in areas such as Counter-IED, maritime surveillance, cyber defence, Air-to-Air Refuelling or helicopter availability, to name but a few. At the same time, the Agency concentrates on advancing enablers for cooperation like

[1] *http://www.eda.europa.eu/Aboutus/Whatwedo/Missionandfunctions*

standardisation and certification; it also conducts research & technology projects, works on initiatives in support of the European defence industry, and advances an innovative dual-use approach.

EDA is pragmatic, cost effective and results oriented. It offers multinational solutions in a time where capability gaps can often not be closed by single Member States alone.

EDA is the only EU Agency whose Steering Board meets at ministerial level. At the meetings of this governing body, Defence Ministers decide on the annual budget, the three year work programme and the annual work plan as well as on projects, programmes and new initiatives.

Federica Mogherini is the Head of the European Defence Agency, in her role as High Representative of the Union for Foreign Affairs & Security Policy/Vice-President of the European Commission. Appointed in November 2014, she leads the Agency's Steering Board.

The Head of Agency, who is the High Representative of the Union for Foreign Affairs and Security Policy, is also Vice-President of the European Commission. The EDA Chief Executive is appointed by decision of the Steering Board. In addition to ministerial meetings at least twice a year, the Steering Board also meets at the level of National Armaments Directors, R&T Directors and Capability Directors.

In addition to heading the Agency and leading its Steering Board, Federica Mogherini will lead the European External Action Service (EEAS) and chair meetings of EU foreign ministers.

1. EDA'S ORGANISATION AND MISSION

The European Defence Agency has a unique structure that brings together each aspect of the defence process, from cooperation planning, through capabilities, research & technology, armaments cooperation, to industry and market, as well as wider European policies. This structure allows the Agency to anticipate and react rapidly to developments; maintain its operational output; facilitate the prioritisation of tasks; and serve the needs, expectations and interests of Member States effectively and efficiently. EDA currently has some 130 staff.

Led by Jorge Domecq, EDA's Chief Executive, the Agency's organisational structure comprises since 1 January 2014 *three operational directorates* :

- Cooperation Planning & Support

- Capability, Armament & Technology
- European Synergies & Innovation

The Cooperation Planning & Support directorate is instrumental in assisting each step of defence cooperation. The directorate focuses on the early identification of requirements at European level as well as the through-life aspect of capabilities including harmonisation of standards and certification, joint procurement and training. The directorate also deals with the military dimension of the *Single European Sky*[2].

It is responsible for capability planning through the Capability Development Plan[3] and the Cooperative Programme Database; the Pooling & Sharing[4] initiative to foster defence cooperation including the promotion and monitoring of the Code of Conduct.

The directorate is also responsible for key enablers to support defence cooperation and enhance interoperability: *standardisation* and certification including *military airworthiness, the defence test and evaluation base, ammunition safety*, as well as education and training. Harmonisation of standards and common certification procedures for defence equipment reduces costs, facilitates pooling of demand and enhances interoperability. Through the Military Airworthiness Forum, the Agency has developed and published a series of harmonised airworthiness standards that are currently being implemented into national regulations. Through the European Network of National Safety Authorities on Ammunition, EDA provided the platform where Member States harmonise national T&E and qualification procedures, for instance on *ammunition qualification.*

The Agency's multinational training exercises such as the *Helicopter Exercise Programme5, the European Air Transport Training, European Air Refuelling Training* and

[2] The project aims to organise airspace into functional blocks, based on traffic flows rather than national borders. In these areas and others it is important to ensure that the viewpoints and needs of EU Member States' militaries are considered: after all military pilots share the same sky as their civilian counterparts. In order to ensure that the effects on military aviation are understood and taken into account, Member States have set the European Defence Agency a series of different tasks relating to the project.

[3] The CDP is a comprehensive planning method providing a picture of European military capabilities over time. It can be used by Member States' defence planners when identifying priorities and opportunities for cooperation. The European Defence Agency is coordinating this work with Member States and other stakeholders such as the EU Military Committee. The CDP benefits from several inputs such as the Headline Goal Process, studies on long-term trends, lessons from operations and information on current plans and programmes.

[4] The concept refers to initiatives and projects to pool and share more military capabilities among EU Member States

different trainings in the field of *Counter IED* have concrete operational value for European armed forces. The directorate also coordinates armament cooperation and joint procurement courses.

The directorate supports the Member States in identifying operational and financial consequences as well as opportunities that *SESAR (Single European Sky ATM Research programme),* may bring to European air forces. It ensures continuous coordination with the SESAR Joint Undertaking and other involved bodies. It facilitates Member States' military forces related activities in SESAR deployment.

In addition, the directorate provides support to CSDP military and civilian operations and missions and EU Battlegroups, at the request of their Member States. Building on previous experience from the *Contractor Support to Operations platform,* the EU Satcom Market and the *Effective Procurement Methods,* EDA is offering its support at all stages for joint procurement.

The Capability, Armaments & Technology directorate prepares the programmes of tomorrow by maximising synergies between capabilities, armaments and Research & Technology. The Agency's main programmes, endorsed by the European Council in December 2013 are under the responsibility of this directorate, Remotely Piloted Aircraft Systems, Air-to-Air Refuelling, Satelite Communications and Cyber Defence.

The Capability, Armaments & Technology Directorate brings together the Agency's work in the areas of:

- *Information Superiority* (Communication & Information Systems, Surveillance & Reconnaissance, Space, Cyber Defence);
- *Air* (Remotely Piloted Aircraft Systems, Air-to-Air Refuelling, airlift and aerial systems technologies);
- *Land* (Counter-IED, armoured systems, camp protection and land systems technologies);
- *Maritime* (Maritime Surveillance, Mine Counter Measures and naval systems technologies);
- *Joint domain* (mobility, transport, medical and Ammunition).

Particular attention will be given to identifying future Critical Defence Technologies needed to support military capabilities.

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[5] *The overall concept was approved at the Ministerial Steering Board in November 2009. Its aim is to provide Member States with a framework to develop, consolidate and share best practices in order to meet the challenges of flying helicopters in a modern operational environment.*

Through its integrated approach – by combining capability, armament and research experts – the directorate ensures an holistic approach to each of the above mentioned working areas. For example in the maritime domain, the directorate among other things contributes to the elaboration of an EU Maritime Security Strategy, works on safety and regulatory aspects of Unmanned Maritime Systems, coordinates the maritime surveillance networking (MARSUR) project with currently 17 Member States and Norway, and deals with research into naval systems.

Member States entrusted EDA with the preparation of key programmes in areas where critical capability gaps have been identified during recent years which cannot be closed by one Member State alone: Remotely Piloted Aircraft Systems, Air-to-Air Refuelling, Satellite Communications and Cyber Defence.

Regarding *Remotely Piloted Aircraft Systems*, the aim is to prepare the ground for a European solution for the next-generation medium altitude long endurance (MALE) platform in the 2020-2025 timeframe. At the same time, regulatory and technological aspects for the safe integration of military unmanned air vehicles in general air traffic are being worked on.

On *Air-to-Air Refuelling,* a unique force multiplier needed for air combat operations, the Agency is working on short-, mid- and long-term solutions to optimise the use of existing capabilities but also to pool and share new strategic tankers for Europe by 2020.

The objective of EDA's proposal for *Governmental Satellite Communications* (GOVSATCOM) is to prepare the next generation in the 2025 timeframe.

In the area of *Cyber Defence*, the Agency concentrates on training, improving cyber situational awareness, improving civil/military cooperation, the protection of EU assets during missions and operations and technological aspects.

The European Synergies & Innovation Directorate acts as an interface between defence ministries and wider EU policies that have implications for defence. It also promotes and supports innovative research, and, as requested by its Member States works in support of them and the European Commission on the setting up of the Preparatory Action for CSDP-related research. The directorate is also responsible for market & industry policy as well as defence analysis and outlook. The directorate also deals with the Agency's energy and environmental activities.

EDA has an important task in supporting Ministries of Defence in their interactions with other European institutions whilst ensuring that the specificities of defence are fully reflected in the related work of the European Commission. The European Synergies & Innovation Directorate (ESI) acts as the focal point and the coordinating interface with the European Commission and its various DGs; the directorate is in charge of developing synergies and greater complementarity with existing EU programmes and instruments. EDA for example supports access to *European Structural and Investment Funds*[6] for defence industry, with special focus on SMEs, engaged in dual-use research to ensure that key technology and industrial priorities – as identified by Member States in the framework of EDA – are maintained or developed in Europe.
Performing defence analysis and providing an outlook on major developments affecting the defence sector is yet another essential task of the ESI Directorate. In this regard, the directorate, among others, provides an input to the capabilities development process by delivering analysis on industrial capabilities in relation to EDA programmes and Capabilities Development Plan (CDP) priorities. It identifies and analyses the main trends and other aspects (such as innovative financial instruments, defence related critical skills, defence industry statistics or the development of balanced EDTIB) affecting the *European Defence Technological and Industrial Base (EDTIB)* and *European Defence Equipment Market (EDEM).* In addition, the directorate releases *defence statistics*[7] which reveals the main trends of the defence sector on the European and national level.

Through these two areas of work the ESI directorate promotes the efficiency and competitiveness of the EDEM and helps government and industrial stakeholders in adapting into the EU regulatory environment. It also proposes solutions to mitigate and reverse the negative trends and develops measures to strengthen the EDTIB.
Finally, the directorate is in charge of *EDA's energy & environment programme*. As energy and environmental issues are rapidly growing areas of interest within the defence sector, EDA has developed a comprehensive approach to support Member States's effort for carbon reduction and sustainability goals within the Armed Forces. The Programme addresses activities relating to energy efficiency, renewables, knowledge and cultural aspects and overall sustainability and resilience of defence capabilities. Recent activity has seen the conclusion of a 20-year contract to

[6] *http://www.eda.europa.eu/info-hub/publications/publication-details/pub/factsheet-european-structural-funds-for-dual-use-research*
[7] *http://www.eda.europa.eu/info-hub/defence-data-portal*

build and operate a solar facility on the military airbase at Paphos in Cyprus under the *European Armed Forces GO GREEN Project*[8].

In order to maximise the effectiveness of work, the Agency works closely together with a number of EU institutions, international organisations and third States. Several Administrative Arrangements with international organisations and third States (Norway, Serbia and Switzerland) have been concluded[9].

European Space Agency

On 20 June 2011, EDA signed an Administrative Arrangement with the European Space Agency. The cooperation aims at exploring the added value and contribution of space assets to the development of European capabilities in the area of crisis management and the Common Security and Defence Policy. Building on their specific complementary roles and activities, ESA and EDA are already cooperating on a variety of subjects, including Intelligence, Surveillance and Reconnaissance, Satellite Communication in support of Unmanned Aerial Systems, and Space Situational Awareness, as well as critical space technologies.

OCCAR

The European Defence Agency and the Organisation for Joint Armament Cooperation (OCCAR) signed an Administrative Arrangement on 27 July 2012. On the occasion of the signature, the OCCAR-EA Director Patrick Bellouard expressed his conviction that: "From now on, integration into OCCAR of programmes originating from EDA's work on capabilities and harmonisation of requirements, will run smoother, delivering maximum efficiency for our customers."[10] Under the arrangement, EDA and OCCAR share information on projects and programmes throughout their lifecycle, helping to guarantee a seamless handover of projects, with both parties remaining involved and informed at every stage. EDA and OCCAR have already cooperated effectively on an ad hoc basis on several major projects. This arrangement incorporates the lessons learned from these projects.

European Aviation Safety Agency

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[8] *The European Defence Agency has signed a contract with a European energy consortium to install and operate a solar facility at Paphos Airbase, in Cyprus. It will provide clean energy to this military site for the next 20 years.*

[9] *The Agency signed Administrative Arrangements with Norway (2006), Switzerland (2012) and the Republic of Serbia (2013) enabling them to participate in EDA's projects and programmes.*

[10] *http://www.occar.int/238*

EDA and the European Aviation Safety Agency signed a Cooperation Arrangement on 18 June 2013, covering the harmonisation of military aviation safety requirements with a primary focus on airworthiness. Both agencies expect to achieve considerable benefits from this increased cooperation, especially in areas of 'dual use' aircraft. One such example will be the A400M certified by EASA in its civil aircraft configuration. This civil certification can serve as a baseline for the subsequent military certification by the respective national Military Airworthiness Authorities. In the field of Remotely Piloted Aircraft Systems (RPAS) close cooperation and harmonisation of civil and military rules and regulations to enable safe operations in Europe will be essential. EDA projects on air traffic insertion (DeSIRE) and mid-air collision avoidance (MIDCAS) can be preliminary enablers towards joint civil and military certification.

The European Defence Agency was established under a Joint Action of the Council of Ministers on 12 July, 2004, "to support the Member States and the Council in their effort to improve European defence capabilities in the field of crisis management and to sustain the European Security and Defence Policy as it stands now and develops in the future"[11]. On 12 July 2011, the Council adopted a Decision defining the statute, seat and operational rules of the European Defence Agency. This Council decision replaced the Council Joint Action.

The European Defence Agency, within the overall mission set out in the Joint Action, is ascribed four functions, covering:

- developing defence capabilities;
- promoting Defence Research and Technology (R&T);
- promoting armaments co-operation;
- creating a competitive European Defence Equipment Market and strengthening the European Defence Technological and Industrial Base.

These *four main tasks* form the chain for capability development, from defining requirements via research and armaments cooperation to industrial supply. This integrated approach contributes to coherent capability development, where demand and supply are optimally connected in order to save time and costs for Member States. More collaboration will, in turn, provide opportunities for the European defence industry. The Agency also supports

[11] *https://www.eda.europa.eu/aboutus/whatwedo*

Ministries of Defence in their interactions with other European institutions and keeps them up-to-date regarding wider EU policies that have implications for defence.

EDA acts as a catalyst, promotes collaborations, launches new initiatives and introduces solutions to improve defence capabilities. It is the place where Member States willing to develop capabilities in cooperation do so. It is also a key facilitator in developing the capabilities necessary to underpin the Common Security and Defence Policy of the Union.

EUROPEAN DEFENCE COOPERATION

The idea of a collective European defence is as old as the story of European integration itself. From thet ashes of World War 2, it wouldn't take long to see an incredible idea emerge : what if European countries, busy stitching their wounds after half a decade of devastating conflict, could start cooperating on defence issues and promote peace together ?

In March 1947, a Treaty of *"Alliance and Mutual Assistance"* was signed in Dunkirk by France and the United Kingdom. The two countries vowed to *"cooperate closely with one another as well as with the other United Nations in preserving peace and resisting aggression"*[12], in a move that was primarily aimed to prevent any possible future German aggression in Europe.

The following year, in March 1948, the signature of the Treaty of Brussels saw the extension of this initial effort to three additional countries : Belgium, Luxembourg, and the Netherlands. The signatories made their intent even clearer. Stating that this Treaty was meant to *"afford assistance to each other [...] in maintaining international peace and security and in resisting any policy of aggression"*[13], they summarised their alliance as one for *"collaboration in economic, social and cultural matters, and for collective self-defence"*[14].

The political push for Europe to fulfil its role on the global stage, including defence and security issues, gained extra momentum with the joint UK-French declaration of Saint-Malo in December 1998, only a few weeks after the first informal meeting of EU Ministers of Defence in Pörtschach, Austria.

In Saint-Malo, the French President and UK Prime Minister jointly called for a European foreign policy that would allow Europe to play its full role on the international stage. To achieve

[12] *https://www.eda.europa.eu/aboutus/our-history/inception*
[13] *idem*
[14] *ibidem*

this, they argued that the EU must have the capacity for autonomous action, backed by credible military forces, to respond to international crises. This view was endorsed by the other Member States at the European Council in Cologne, 1999, which declared that the EU needed to be given the means and capabilities to assume its responsibilities for a common European policy on security and defence.

This initiative was to be pushed by Javier Solana, who became the first Secretary General of the Council and High Representative for Common Foreign and Security Policy of the European Union in 1999. While in the same year, Member States agreed to a set of military capability targets to be completed by 2003, known as the *Helsinki Headline Goal*. The following year brought further progress in the establishment of an effective EU foreign and security policy, with the agreement to permanently establish the *Political and Security Committee (PSC), EU Military Committee (EUMC),* and *EU Military Staff (EUMS).*

The *Common Security and Defence Policy (CSDP)*, formerly known as the *European Security and Defence Policy (ESDP)*, is a major element of the Common Foreign and Security Policy of the European Union (EU) and is the domain of EU policy covering defence and military aspects, as well as civilian crisis management. The ESDP was the successor of the European Security and Defence Identity under NATO, but differs in that it falls under the jurisdiction of the European Union itself, including countries with no ties to NATO.

Formally, the Common Security and Defence Policy is the domain of the European Council, which is an EU institution, whereby the heads of member states meet. Nonetheless, the High Representative of the Union for Foreign Affairs and Security Policy, currently Federica Mogherini, also plays a significant role. As Chairperson of the external relations configuration of the Council, the High Representative prepares and examines decisions to be made before they are brought to the Council.

EDA in support of Common Security and Defence Policy

Recent operations have demonstrated critical gaps in European military capabilities. But while defence budgets are under pressure and investment is in decline, costs of major defence systems are rising. For European Member States cooperation in defence is the solution to acquire and maintain critical capabilities.

Among other things, Heads of State and Government supported during the European Council meeting of December 2013 a more systematic and long-term approach to cooperation through increased transparency and information-sharing in defence planning.

Pooling & Sharing

Based on a German-Swedish food for thought paper on intensifying European military cooperation in 2010 (the "Ghent Initiative"), EDA together with its Member States developed the Pooling & Sharing initiative. The concept refers to initiatives and projects to pool and share more military capabilities among EU Member States. In November 2011 EDA proposed and Defence Ministers adopted an initial list of eleven Pooling & Sharing priorities. Among these projects are Air-to-Air Refuelling, the Helicopter Training Programme, maritime surveillance, or the European Satellite Communications Procurement Cell .

In its efforts to promote a systematic approach towards Pooling & Sharing, EDA proposed and Ministers adopted on 19 November 2012 the "Code of Conduct on Pooling & Sharing". The Code comprises a series of actions to support cooperative efforts of EU Member States to develop defence capabilities. The actions herein are aimed at mainstreaming Pooling & Sharing in Member States' planning and decision-making processes. They are to be implemented on a national and voluntary basis, in line with defence policies of Member States.

In December 2013 the European Council made a clear case for increased defence cooperation and welcomed the progress achieved by the Agency's Code of Conduct on Pooling & Sharing. Additionally, Heads of State and Government asked for a policy framework to foster more systematic and long term cooperation by the end of 2014.

Capability Development Plan

EDA is capability-driven and its programmes, projects and other activities have to contribute to improving the military capabilities needed for Common Security and Defence Policy operations in the future. The Capability Development Plan (CDP) is the 'driver' for the work of the Agency. It describes national and European future capability needs from the short to longer term.

The CDP is not a 'Plan' in the traditional sense, describing the number of units or the amount of equipment Member States should have at their disposal. Rather it provides a view of future capability needs, taking into account the impact of future security challenges, technological development and other trends. It assists the Member States in their national

defence planning and programmes. The CDP is an important element in a comprehensive capability development process, and it provides the basis of the Agency's capability-driven approach.

There are some operational conclusions which are highlighted in the CDP:

- *Concepts and doctrine*: Appropriate concepts and doctrine need to be developed to underpin other developments, and need to be fundamentally joint, multinational and inter-agency in nature.
- *Persistent intelligence and knowledge-based operations*: The exploitation of knowledge is fundamental in operations, and need to be based on wide-area surveillance, full spectrum intelligence and robust early warning capacity.
- *Comprehensive and co-ordinated actions*: Operational challenges need to be addressed by using a multi-agency concept based on seamless civilian-military structures and procedures.
- *Maintaining the initiative*: EU forces need constantly to maintain the initiative and the ability to manoeuvre in all operational dimensions when facing adversaries who are unconstrained in their actions.
- *Achieving agility and adaptability*: There is a need for greater flexibility, agility, responsiveness, tactical manoeuvre and a discriminate force usage.
- *The human factor*: People remain the most critical requirement. Future operational demands of deployed forces will require even higher-quality personnel and training.

Future Capability Profile

Within the CSDP framework, the EDA offers the promise for institutionalising a common defense dimension, as a response to the afore-mentioned increased expectations established by CSDP missions. Several steps have been made in the formation of a European joint capabilities base, stringently needed to improve the EU's operational capacity and its *long-term vision for an integrated European defense identity*[15].

The Future Capability Profile[16] is presented within the 6 capability development areas associated with the EU's Integrated Development Teams.

COMMAND

[15] *https://isiseurope.wordpress.com/2014/03/20/european-defense-eda/#_edn4*
[16] *https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/esdp/91136.pdf*

a. Command and Control capabilities form the decisive element in the battle for information superiority and decision superiority. It is aimed at employing EU MS forces, assets and facilities commensurate with the mission and its demands, so that the desired effects can be achieved.

b. During the preparation and conduct of an EU led operation, command and control must be continuously ensured in near-real time and between all levels of command and bodies of the EU. This will need to be based upon a streamlined C2 organisation, clear and standardised C2 procedures and a secure and efficient command support. The command capability must support rapid decision-making. The EU MS need to generate joint and combined headquarters that are easily deployable and sustainable, with the capability to plan, conduct and assess multinational operations. The availability of planning, decision support and command instruments will be necessary for global multifunctional crisis management.

c. There will be a requirement to conduct operations, supported by network enabling capabilities as well as to establish, maintain and share real-time situational awareness. This command capability must be secure and flexible, and must minimize the constraints of distance, terrain and weather.

d. The Operation Commander will need the ability to exercise command and control authority over relevant EU instruments in a defined area and/or during a defined time period. The ability to communicate seamlessly with partners at all levels, as well as the ability to plug in to joint and combined headquarters will become priorities.

INFORM

a. Future operations undertaken by the EU will rely on the capability to collect, process, select, share, disseminate, retrieve and store information. Information management systems should optimise this process, tailoring the desired output to the specific mission. The information needs to be inter-departmental, inter-agency and readily accessible.

b. The intelligence and findings gained through collection and reconnaissance efforts are both an indispensable contribution to ensuring an independent capacity to make judgements, take proper decisions and appropriate action, as well as representing common interests within an increasingly complex environment. This requires EU MS to have available a broad spectrum of recognition and surveillance capabilities, including analysis of cyberspace with regard to military relevant information. It should be the aim to achieve a greater coverage than now, focussing on the areas of strategic interest for the EU.

c. Developing reliable strategic communication and intelligence capabilities and protecting them against physical and non-physical threats as well as having access to reliable navigation and geographic positioning data will be critical. Merging these capabilities, may provide the EU MS with the basis for common information dissemination and reliable and secure communications.

d. The result of this capability for obtaining and securely managing information might become apparent in a noticeable increase in the responsiveness of the decision making process of the chain of command, and making the manoeuvre of military forces progressively more effective.

ENGAGE

a. To be effective forces may have to deny, or possibly control, limited in both time and space, the sea, land, air and information domains, to impair opponents' capabilities, both on contact and remotely, while simultaneously achieving the desired effects on targets. This requires the ability to rapidly engage on the ground, in the air, and at sea. Precision, high speed, engagement capability is needed.

b. Within a joint environment the military capability as a whole takes priority over the capabilities of the single services. Therefore standoff engagement has to become an option for all services. All military capabilities should reflect the growing likelihood and relevance of fighting within complex terrain, such as urban and littoral areas. Forces need a range of capabilities from physical destruction to non-lethal. Future operations will necessitate capabilities for precise and selective targeting and engagement thereby optimising commit-toeffect times and minimising collateral damage especially in urban areas.

c. The preparation and conduct of future EU led operations will require continued consideration of space related aspects, such as communication, and the detection and identification of potential threats in advance of an appropriate response.

d. Combat identification capabilities in order to reduce casualties amongst friendly forces, partners, civilians and local population are increasingly important in the complex operational environment.

e. Where feasible, the EU MS must also aim to reduce the impact of military operations on the natural environment.

PROTECT

a. Good prior knowledge of the overall situation is a prerequisite for effective ESDP operations. Hence, it could be advantageous for MS to have access to appropriate surveillance and advanced alarm capabilities.

b. It is critical to have the ability to detect, and then counter, those weapons which, for legal, moral or ethical reasons, are not available to EU MS forces (such as biological weapons) but which may be freely employed by an adversary. Thus it is important to protect our forces against the bio-hazards that they may face. High standards of casualty handling and the ability to recover stranded personnel become priorities, even in geographically remote areas.

c. Recognising the expanded nature of the future battlespace, EU MS may need increasingly to safeguard networks and the area of operations against both physical and cyber attack.

d. The consequences of Weapons of Mass Destruction attacks will be particularly difficult to manage. Preventing proliferation will be important as well as the ability to counter their subsequent employment. CBRN defence and protection capabilities may be essential for some ESDP missions.

DEPLOY

a. Deployability is the precondition for ESDP operations, including the reinforcement and sustainment of forces. EU MS should have at their disposal viable means for strategic deployability over long distances. Responsive Reception Staging Onwards movement and Integration is required to maintain tempo during operations. This requires adequate, timely and securely available air, sea and land transport capacities and procedures.

b. Strategic deployment is planned and should be coordinated on a joint and multinational basis, using all modes of transport and available civilian resources. An ensured deployability forms the basis for a rapid, credible expeditionary capability, which should be one of the main efforts of the EU to manage crises and prevent conflicts. It will need to be based upon strategic air transport, on in-flight refuelling capabilities, and on strategic sea transport capabilities, as well as overland force projection assets.

c. For intra-theatre movements, capabilities of mobility and land mobility support, tactical air transport and air mobility is a requirement.

SUSTAIN

a. The success of operations will also depend on the sustainability of deployed forces. Sustainability will encompass the provision, replacement and rotation of forces with the

necessary means and facilities, according to operational demands. Even if the operational area is a long way from EU MS territories, sustainability must be ensured for the duration of the deployment, irrespective of the threat situation or availability of infrastructure and other factors in the operational area.

b. The joint/combined support arrangements should be capable of ensuring the required quality and quantity of support over long distances and protracted timeframes. This capability may be enhanced through the provision of accurate asset visibility and tracking. Beneath that, a multinational logistic component may allow the reduction of the overall logistic footprint. Any unit has to be capable of ensuring sustainability for a limited period of time by utilising organic assets. Harmonisation, and in the longer-term standardisation, of logistic requirements and procedures may ease multinational joint/combined logistics.

CONCLUSION

European defence faces challenges today and even more tomorrow, challenges that will require capabilities that address diverse threats and maintain Europe's technological edge within constrained budgets. One approach to these challenges is by giving a priority to defence and increased collaboration between Europeans. The European Defence Agency was created ten years ago to support and enhance this cooperation. EDA is proving an important catalyst to Pooling & Sharing defence and security capabilities.

The EDA has a privileged position at the hub of national defense industries and private defense firms agendas to accomplish the above objectives and to generate possible synergies to surpass the current defense challenges at a European level[17]. This singular positioning permits EDA to extend particularly cogent know-how and analytical input and streamline development across a range of issue areas. Its special location should allow it to develop persuasive analyses and proposals across the range of its activities and it enables the EDA to become an interface between three camps, the political, the economic, and the military, being responsible with both the rationalization of member states' defense budgets and the streamlining of the emerging European defense industry and market. The strategies induced by the EDA's institutional setting may ossify over time into a "common" European strategy on defense, which will ultimately shape the EU's international identity.

[17] *http://isis-europe.eu/wp-content/uploads/2014/08/ESR_72.pdf*

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SWOT ANALYSIS - STRATEGIC MANAGEMENT TOOL

LTC. Cristian MACAVEIU

Strategic Management is all about description and identification of the strategies that managers can carry so as to achieve better a competitive advantage and performance for their organization. An organization is said to have competitive advantage if its profitability is higher than the average profitability for all companies in its industry.

Strategic management can also be defined as acts and a bundle of decisions which a manager undertakes and which decides the result of the organization's performance. The manager must have a thorough knowledge and analysis of the general and competitive organizational environment so as to take right decisions. They should make best possible utilization of strengths, minimize the organizational weaknesses, make use of arising opportunities from the business environment and shouldn't ignore the threats. Strategic management is nothing but planning for both predictable as well as unfeasible contingencies. It is applicable to both small as well as large organizations as even the smallest organization face competition and, by formulating and implementing appropriate strategies, they can attain sustainable competitive advantage.

It is a way in which strategists set the objectives and proceed about attaining them. It deals with making and implementing decisions about future direction of an organization. It helps us to identify the direction in which an organization is moving.

Strategic management is a continuous process that controls and evaluates the industries and the business in which an organization is involved; evaluates its competitors and sets goals and strategies to meet all existing and potential competitors; and then reevaluates strategies on a regular basis to determine how it has been implemented and whether it was successful or does it needs replacement.

Strategic Management gives a broader perspective to the employees of an organization and they can better understand how their job fits into the entire organizational plan and how it is co-related to other organizational members. It is nothing but the art of managing employees in a

manner which maximizes the ability of achieving business objectives. The employees become more trustworthy, more committed and more satisfied as they can co-relate themselves very well with each organizational task. They can understand the reaction of environmental changes on the organization and the probable response of the organization with the help of strategic management. Thus the employees can judge the impact of such changes on their own job and can effectively face the changes. The managers and employees must do appropriate things in appropriate manner. They need to be both effective as well as efficient.

One of the major role of strategic management is to incorporate various functional areas of the organization completely, as well as, to ensure these functional areas harmonize and get together well. Another role of strategic management is to keep a continuous eye on the goals and objectives of the organization.

STRATEGIC MANAGEMENT AND ITS TOOLS AND TECHNIQUES

Now organizations find themselves operating in an environment that is changing faster than ever before. The process of analyzing the implications of these changes and adjust the way that the organization reply to them is known as business strategy.

"*Strategy is the direction and scope of an organization over the long term, which achieves advantage in a changing environment through its configuration of resources and competences" Johnson et al. (2009).*

While your role as a manager is unlikely to require you to make decisions at the strategic level, you may be asked to contribute your expertise to meetings where strategic concerns are being discussed. You may also be asked to comment on presentations, reports, pilot schemes or statistics that will affect future strategy.

Fig.1 Factors that influence decision-making process(www.free-management-ebooks.com)

Whether you work in a large multinational corporation or a small organization, a good understanding of the appropriate business analysis techniques and terminology will help you to contribute to the strategic decision-making processes.

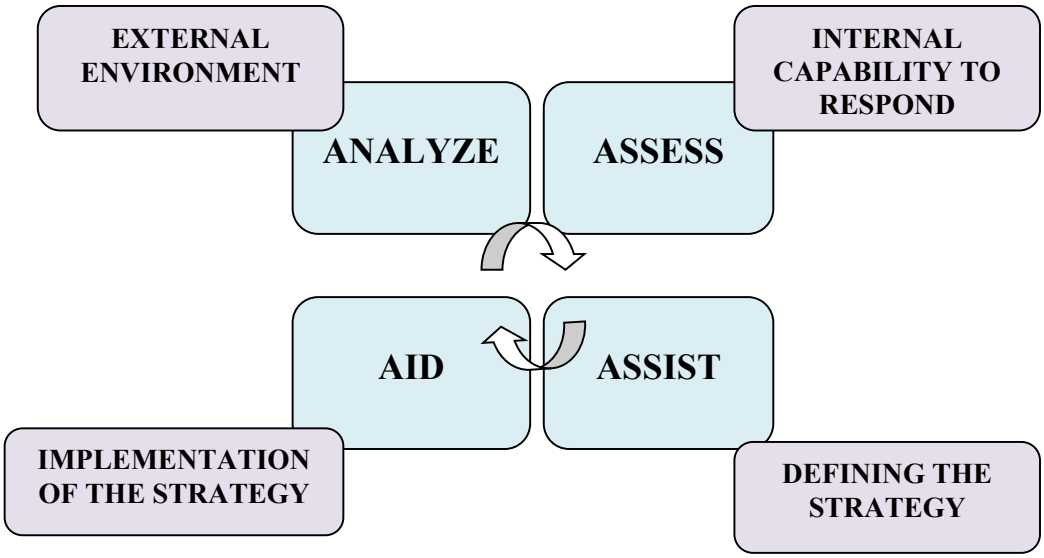


Fig.2 Decision-making process(www.free-management-ebooks.com)

Typical scenarios where you could be asked to provide informations and data for our organization's strategic decision making include:

- Analysing the organization's external environment.
- Assessing the organization's internal capabilities and how well it can respond to external forces.
- Assisting with the definition of the organization's strategy.
- Aiding in the implementation of the organization's strategy.

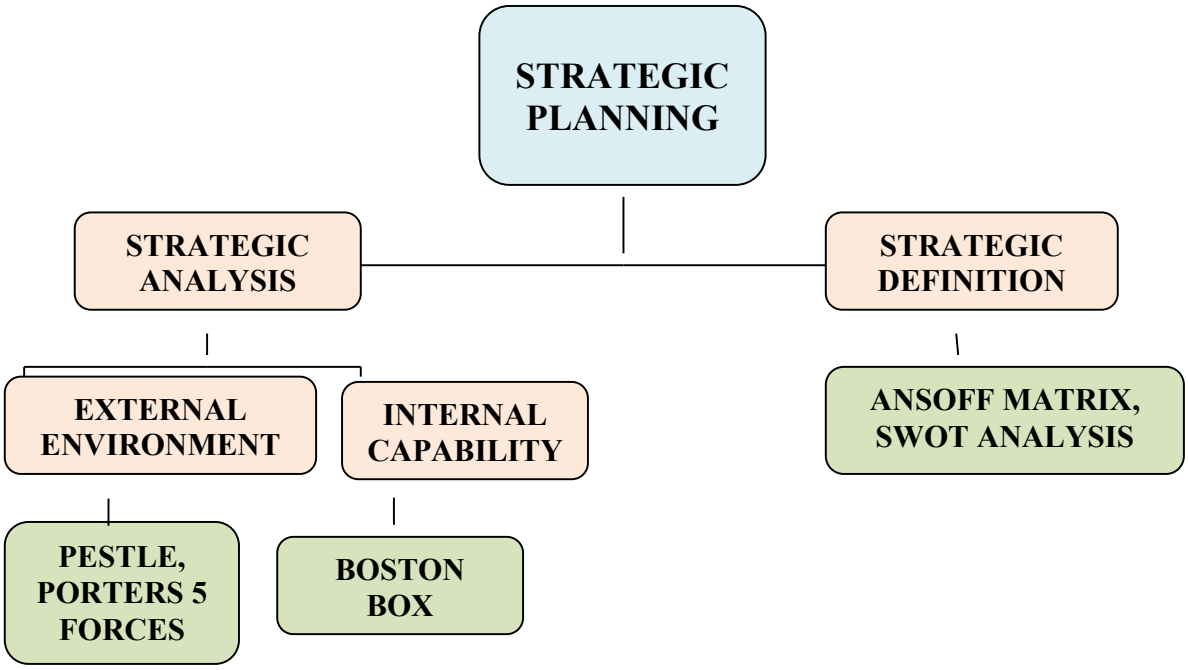


Fig.3 Business analysis tools (www.free-management-ebooks.com)

The diagram above shows where five widely used business analysis tools fit into the strategic planning process.

A popular tool for identifying these external factors is the *PESTLE Analysis*, which can be used to help you consider Political, Economic, Social, Technological, Legal, and Environmental issues.

Porter's Five Forces model is regarded as a credible and practical alternative to the widely used SWOT Analysis. The five key factors the model uses to identify and evaluate potential

opportunities and risks are: competitive rivalry, threat of new entrants, threat of substitutes, bargaining power of suppliers, and bargaining power of customers.

The Boston Matrix is used to allocate resources depending on how a product or service is positioned in the market. It can be used to analyse business units, product lines, and services.

The Ansoff Matrix, or *Ansoff Box*, is a business analysis technique that provides a framework enabling growth opportunities to be identified. It can help you consider the implications of growing the business through existing or new products and in existing or new markets. Each of these growth options draws on both internal and external influences, investigations, and analysis that are then worked into alternative strategies.

The SWOT Analysis is a business analysis technique that your organization can perform for each of its products, services, and markets when deciding on the best way to achieve future growth. The process involves identifying the strengths and weaknesses of the organization, and opportunities and threats present in the market that it operates in.

SWOT ANALYSIS BACKGROUND

SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. SWOT analysis, a subset of the broader situation analysis commonly done for planning purposes, is used to assess the fit between an organization's strategy, its internal capabilities (its strengths and weaknesses) and external possibilities (its opportunities and threats). The version I present here is designed to go substantially beyond traditional SWOT analysis. Instead of just providing four groups of lists, it uses prioritization and systematic matching to provide decision makers with insights that can be acted upon.

Harvard Business School professor Kenneth R. Andrews is generally regarded as the pioneer of SWOT analysis. In 1971, he was one of the first strategy theorists to formally articulate the concept of strategic fit between the organization's resources and capabilities to the external environment. He argued that this methodology was a sound approach to determine a niche strategy-the best way for a organization to use its strengths to exploit opportunities and to defend both the organization's weaknesses and strengths against threats. Figure 4 is a depiction of Andrews' strategy model that was the precursor to SWOT analysis. The essential thrust of the model asks four questions (Andrews, 1971):

A. What can we do (strengths and weaknesses)?

B. What do we want to do (organizational and individual values)?

C. What might we do (external opportunities and threats)?

D. What do others expect us to do (stakeholder expectancies)?

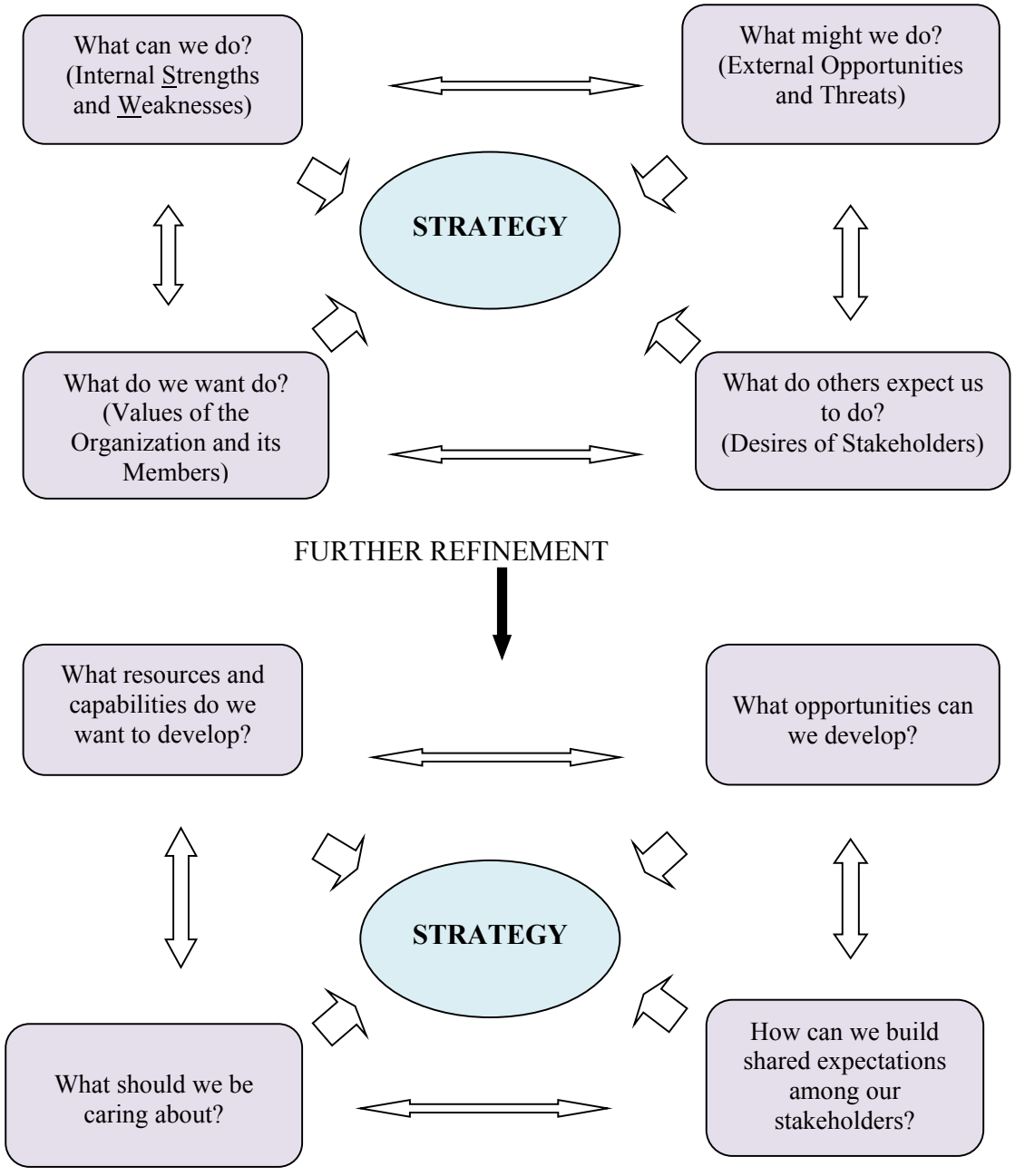


Fig.4 Generic SWOT analysis: Key questions that guide strategic choice

The answers to these strategic choices are the raw material of strategic management (see Figure 4, Adapted from: Clawson, James G., *Strategic Thinking*, University of Virginia Graduate School of Management, UVA-BP-0391, 1998.). As the figure also shows, Andrews' initial SWOT model was often supplemented with four additional corresponding questions that further refined the strategic analysis of his first SWOT model:

A. 1. What new capabilities and resources do we want to develop?

B. 2. What do we need to learn to care about?

C. 3. How do we create new possibilities?

D. 4. How do we partner among stakeholders to build shared expectancies?

Today, many of the SWOT analysis models are diagrammed as shown in Figure 5,a. It has been significantly simplified from Andrews' original partly to make it a cleaner conceptual tool for rough first-cut environmental analysis. Additionally, some of the areas of the original model, less relevant to pure SWOT analysis, have been relegated to more advanced management techniques and tools developed since. Nonetheless, Andrews' model provided the bedrock foundation of modern environmental analysis (see Figure 5,b).

Internal Strengths	Internal Weaknesses
1. …… 2. …… 3. ……	1. …… 2. …… 3. ……
External Opportunities	**External Threats**
1. …… 2. …… 3. ……	1. …… 2. …… 3. ……

a. First Draft : Identification, Analysis and Ranking of Strategic Issues

		Internal Factors	
External Factors	Opportunities	Strengths	Weaknesses
		1. Internal Strengths Matched with External Opportunities	2. Internal Weaknesses Matched with External Opportunities
	Threats	3. Internal Strengths Matched with External Threats	4. Internal Weaknesses Matched with External Threats

b. Second Draft: Specification of SWOT variables and Development of Strategy to improve Matches

Fig. 5 The common SWOT model

A SWOT analysis is conceptually simple and comprehensive: It can be applied to many facets of an organization. These factors have made it the most popular strategy model, particularly for determining an organization's ability to deal with its environment. As well, it has been taught in undergraduate business administration and MBA strategy courses for decades and remains frequently used by consultants and companies.

STRATEGIC RATIONALE AND IMPLICATIONS

SWOT is part of the larger analysis of an organization's situation. Situation analysis is viewed as one of the fundamental elements of strategy formulation. Situation analysis is undertaken to provide an organization with an overview of the best possible data, information and understanding of the forces, trends and root causes of a defined context in which it intends to intervene in the competitive marketplace. These insights are then used to make informed choices

about broad action areas that utilize the organization's comparative advantage and increase its likelihood of fulfilling its mission and achieving its goals and objectives.

Situation analysis typically consists of both an external and an internal component. Environmental analysis is the process of monitoring the environment to identify both present and future strengths, weaknesses, opportunities, and threats that may influence the organization's ability to reach its goals.

For purposes of analysis, a organization's macro-environment can be divided into two main segments or levels:

- The operating or task environment that generally constitute an industry such as its supplier, competition, customer, labor, and international components
- The general environment that entails the social, technological, economic, environmental, political/legal, (STEEP) components within which the industry and organization is subjected.
- Environmental analysis helps the decision maker answer critical questions like the following:
- What are the industry's main economic traits?
- What are the competitive forces and how powerfully will they affect the organization?
- What factors are creating changes in the dynamics affecting competition?
- What are our competitors' assumptions about the changing environment?
- What are the key environmental factors to the organization's competitive success?
- Is the industry's environment attractive or unattractive both now and in the future?

The organization's microenvironment is an equally important facet of situation analysis. The analyst assesses the microenvironment to better understand the company's situation. As such, the analyst reviews the company's current situation by studying its costs, resources, capabilities, and internal organizational issues. One particularly powerful way of studying the organization is to do so through the application of the McKinsey 7S framework we share in Chapter 20, "McKinsey 7S Analysis," which suggests studying the organization's strategy, structure, skills, systems, shared values, style, and staff.

Analysts also must thoroughly understand and meet the critical needs of senior decision makers. Analysts must recognize that executives' information needs often change over time and must adjust their environmental analysis to reflect such changes. Top managers will continuously support effective environmental analysis because it will regularly assist them to make better decisions.

Environmental analysts should focus on identifying existing and potential strengths, weaknesses, opportunities, and threats suggested by components of the organization's environment. Strategists must interpret the results of environmental analysis in light of their in-depth understanding of company operations. The analyst must share the strategist's skill to contribute to an effective strategy.

SWOT analysis applies a general framework for understanding and managing the environment in which an organization operates. The model seeks to help the analyst isolate the major issues facing an organization through careful analysis of the four individual SWOT elements. Managers can then formulate strategies to address key issues. Although these questions may help direct a SWOT analysis, much insightful work is required to answer them properly and to place them in perspective. For example, the analyst must assess the relative importance of each issue and the issue's potential impact on the organization and its strategy. Furthermore, the priority or relative importance of each issue may vary for strategies formulated at the different corporate, business, or functional levels.

SWOT analysis forces managers to better understand and respond to those factors that have the greatest importance for the organization's performance. These factors are called the organization's strategic issues. A strategic issue is a factor that exists either inside or outside the organization that is likely to have a prominent and longer-term impact on the ability of the enterprise to meet its strategic and competitive objectives. Strategic issues, unlike their tactical or operational counterparts, occur less frequently and may actually never arise again, typically impact activities across the entire organization, and require greater allocations of organizational resources to effectively address.

We should emphasize that strategic issues do not just arrive on top of a decision maker's desk neatly labeled as such. Instead, information derived from SWOT analysis assists in the identification of new technologies, market trends, new competitors, and customer satisfaction trends. They require interpretation and translation—that is, analysis—before they are labeled as strategic issues. Often, managers draw upon their experience to categorize issues as controllable or uncontrollable, as threats or opportunities. The categories then determine how an issue appears to an individual manager, how well it can be sold to other managers, and what action the organization subsequently takes.

The value of SWOT analysis is that it is an intuitively appealing method of organizing huge amounts of information and data. After the initial analysis is conducted and the relevant strategic issues have been identified, the analyst places the issues onto the four-quadrant grid shown earlier in Figure 2. This grid is the intermediate analytical output of the SWOT analysis and provides a concise visual depiction of the prior analysis. Some analysts prefer to emphasize the internal strengths and weaknesses of the company by putting the company at the top of the matrix. Other analysts prefer to place the opportunities and threats on the top of the matrix in order to underscore the environmental aspect of SWOT analysis (refer to Figure 5).

SWOT ANALYSIS UTILITY

Before looking at how the SWOT analysis can be applied to your organization, it is important to be clear about what exactly we mean by the terms Strengths, Weaknesses, Opportunities, and Threats.

Strengths – Internal factors that are favorable for achieving your organization's objective.

Weaknesses – Internal factors that are unfavorable for achieving your organization's objective.

Opportunities – External factors that are favorable for achieving your organization's objective.

Threats – External factors that are unfavorable for achieving your organization's objective.

These definitions are open to interpretation and a weakness of the SWOT technique is that it can be highly subjective. For example, if your organization was dependent on one single large distributor then this could be seen as a strength, as you would be able to get your products into the market quickly and efficiently. However, it could also be seen as a weakness because you are totally dependent on them to do so.

Some factors will always be easy to categorize. For example, it is difficult to imagine huge financial resources, a broad product line, no debt, and committed employees being anything other than strengths, whatever the objective of the organization may be.

However, some factors can be either strengths or weaknesses depending upon the business objective. For example, a large number of distributors could be a strength if your

objective is to place your products in as many outlets as possible. But if could be a weakness if your objective was to control your retail prices and prevent discounting.

The strength of the SWOT analysis comes from the fact that it can be applied to many different organizational scenarios, but its weakness is that it requires clear thinking and good judgment to obtain any real value from using it. You will often see SWOT analysis for an organization in which no specific business objective has been stated (see the example SWOT for Audi). These top-level SWOTs can have value in guiding strategy at the very highest level, but when a potential strategy has been identified and is being considered as a business objective then additional SWOTs will be required at this lower level.

Remember, when you are using the SWOT analysis technique, the processes of clearly identifying the business objective and categorizing the SWOT factors are equally important because they are interdependent.

This interdependence means that the SWOT analysis is often an iterative process in which the findings cause the objective to be reset and another analysis made. The output of any particular analysis is not necessarily definitive.

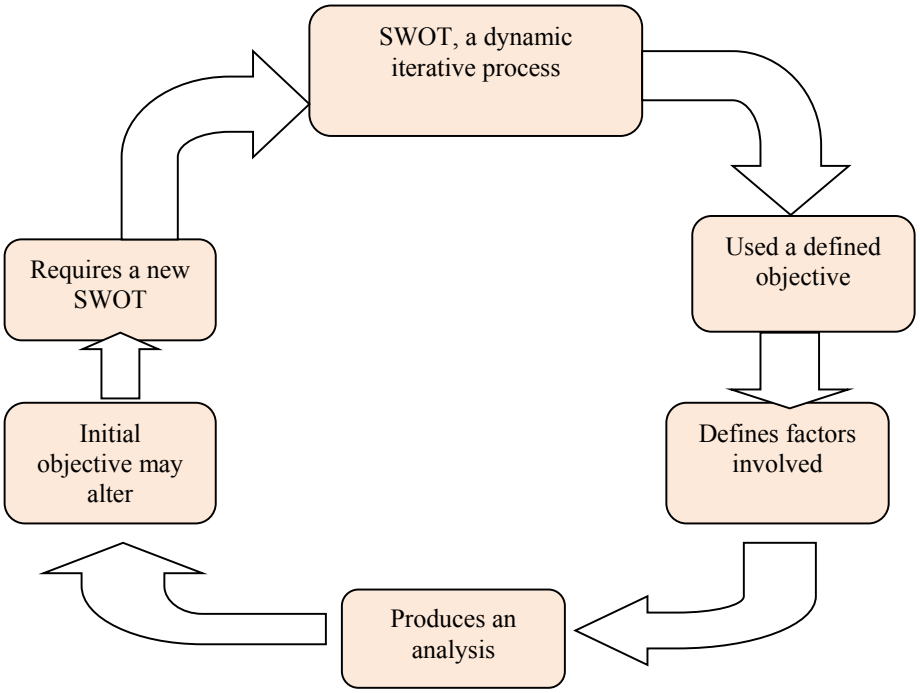


Fig. 6 SWOT analysis-an iterative process

The analysis is normally performed at a meeting involving representatives from the necessary stakeholders groups that have specialist knowledge and supporting data. Each of these individuals brings their own particular perspectives and expertise to the discussion.

The end result of such a meeting or series of meetings is a completed SWOT report. The success of this type of meeting relies on a strong and effective Chair who is familiar with the SWOT process and can successfully manage discussions, drawing out key points to gain consensus.

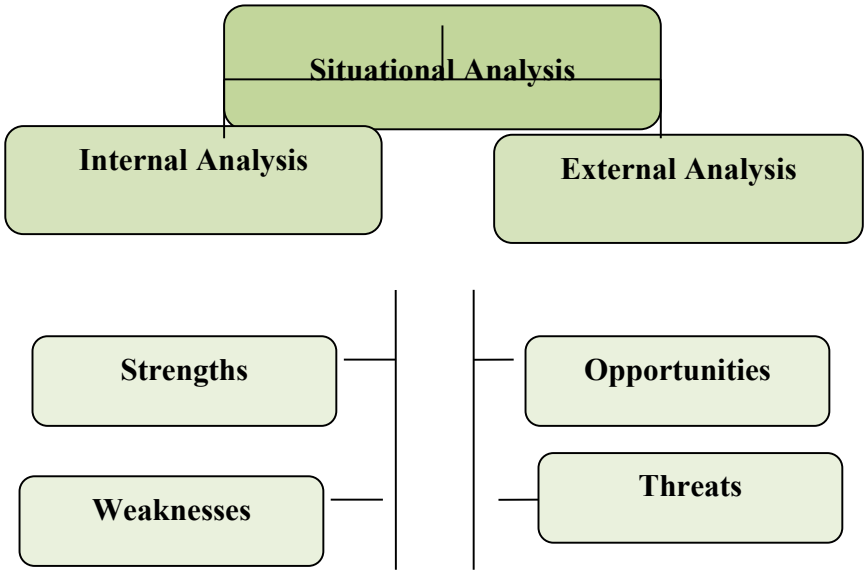
The Chair needs to take an active role in encouraging attendees to contribute to such discussions and brainstorm through the SWOTs in order to identify as many factors as possible. This is important when opportunities and threats are being considered, as these are often things that people within the organization have certain preconceptions about, or may be actively hostile to admitting the existence of.

For example, *The rapid uptake by music lovers of the MP3 format seemed to take many established record companies by surprise. Whilst the record companies must have been aware of the existence of this new format, it is not difficult to imagine a scenario where people in strategy meetings would be reluctant to point out just how much of a threat (or opportunity) this new way of consuming music could be.*

As the implications would have threatened the established organizational structure, as well as rendering obsolete a business model that had remained unchanged for over 50 years, it must have been a difficult subject to discuss objectively!

The difficulty of admitting the existence of internal weaknesses in the organization is even more problematic and in some organizations it is impossible to talk about weaknesses objectively because senior management are in a state of denial about them.

It is extremely important that those involved in such strategy meetings are encouraged by the Chair to think of and generate ideas for deliberation, no matter how far-fetched they may appear. By suspending criticism and judgment till the final stages of the process, participants will feel free to generate unusual ideas that could prove to be valuable.



One of the most effective ways to achieve this is to focus on internal factors to begin with and then on external factors later. Once all of these have been cataloged, then discussions on each point's relevance and likelihood can take place

SWOT ANALYSIS EXAMPLE

Founded in 1909 and headquartered in Bethesda, Maryland, Lockheed Martin Corporation is one of the largest defense contractors in the world. The company is engaged primarily in advanced technology systems and products such as fighter aircraft, missile defense systems, unmanned vehicles, space transportation systems, global communications and satellites, information systems, aircraft carriers, and logistics support. Its intricate and diverse product offerings have defense, civil, and commercial applications, but they are sold primarily to agencies of the U.S. government such as the Army, Navy, and NASA. Even though the company benefits from its century-long track record, Lockheed Martin faces an intense and dynamic environment within the defense industry due to significant reductions in defense spending.

The SWOT analysis, shown in the following table, presents an integrative view of how Lockheed Martin's internal resources and capabilities (its strengths and weaknesses) combine with its external possibilities (its opportunities and threats) to provide actionable strategies for maintaining a competitive advantage within the defense industry.

Internal Factors / External Factors	Strengths	Weaknesses
	1. Defense industry leader with a strong brand 2. Strong R&D; produces innovative new products giving first-mover advantage 3. Diversified product portfolio 4. Wide-ranging revenue streams 5. Long-standing supplier relations 6. Aggressive organizational restructuring and cost-cutting initiatives	1. Heavy reliance on the U.S. government as a primary source of revenue 2. Increased operating expenses 3. Legal proceedings (contract misconduct) 4. Crowing pension liability 5. High debt-to-equity ratio
Opportunities 1. The market demands technological innovations 2. Strategic acquisitions 3. Share costs through strategic outsourcing and subcontracting 4. Investing in commercial applications of defense products 5. Proliferations of security threats	Actionable SO Strategies Priority 1. Maintain market leadership by focusing innovation on future customer needs (Information technologies, F-35 fighter planes, unmanned aircraft, and missiles) O1, O4,O5, S1, S2, S3, S5 2. It is a buyer's market to acquire defense companies that will add knowledge,	Actionable WO Strategies Priority 1. Identify and cultivate new customer segments(commercial and international) O1, O4, O5, W1 2. Increase investment and focus in better networked and innovative government and legal affairs staff O1, O5, W1, W3 3. Revisit choices in pension

	product diversification and revenue O2, S3, S4, S5 3. Improve productivity within and across the management of the supply chain and through organizational realignment O2, O3, S5, S6 4. Using corporate reputation to transfer existing technologies into commercial product offerings(radar, GPS, fingerprinting, satellite tracking, data security) O4, S1, S3	investment fund managers to identify ones with long-term track records of higher returns O3, W4, W5 4. Work with government policy-makers to develop subsidized veterans' skills retraining and placement programs in high-demand product areas O2, W1 5. Develop greater contractual flexibility with labor force and suppliers thereby converting fixed costs to variable O3, W2
Threats 1. Defense spending cuts 2. New or expanded export controls, market-limiting regulations(U.S. International Traffic in Arms Regulations) 3. Strong competition increases margin pressure 4. Disruptive technologies increase R&D	Actionable ST Strategies Priority 1. Develop quantitative return on investment models to demonstrate costs and outcome advantages of the U.S. government awarding Lockheed contracts T1, T3, T5, S1, S5, S6 2. Identify, select and invest in university research in	Actionable WT Strategies Priority 1. Expand continuous-improvement and quality-management processes(Six Sigma) to all operations to ensure that product deliveries are made on time and within budget T1, T3, T5, W1, W2 2. Create a high-risk issues-management solutions

investment risk 5. Slowdown and/or recession of the global economy	selected fields of emerging technologies T4, S2, S3, S5 3. Develop more rigorous processes and systems for monitoring supplier compliance with contractual terms T2, S1, S5	team focused on retiree concerns and export regulatory concerns T2, W4, W5

CONCLUSIONS AND RECOMMENDATIONS

The popularity of SWOT analysis is down to its flexibility and simplicity. It is easy for everyone to understand and its implementation does not require any technical knowledge or specialist training.

The SWOT methodology can condense a large number of situational factors into a manageable number but it does encourage a tendency to oversimplify the situation and it can be unduly influenced by vested interests within the organization. This is particularly apparent when conducting a high-level organizational SWOT.

For example, it is a subjective decision as to whether or not a particular organizational culture should be classified as a strength or a weakness. Those responsible for the prevailing culture will see it as a strength no matter what, whereas those who have less invested may be more objective and see it as a weakness in certain circumstances.

A technological change may be considered a threat or an opportunity depending on perspective. Those who owe their jobs and status to an existing technology are likely to view any change as a threat to their position and therefore to be avoided. Others who have no vested interest may consider it is as an opportunity.

Those responsible for developing strategy need to be aware of these issues of oversimplification and vested interests, and try to take them into account. This is always going to be difficult, however, if senior management has a reputation for being unwilling to consider options that may threaten the current situation.

Another problem with SWOT is that there are no obvious limits as to what is and is not relevant. The Chair managing the SWOT discussions needs to keep everyone involved focused on what is important in achieving the objectives, rather than just creating lists of issues and classifying them arbitrarily without any external reference.

It is also necessary to add an element of priority to the list of factors in each of the four categories. Otherwise you may decide that opportunities and threats balance each other out, when in fact the threats pose a greater risk to your organization than the weaker opportunities it could take advantage of.

Anyone using the SWOT technique must also be mindful that its simplicity does not provide a mechanism for solving any disagreements that arise from the discussion. Because this technique is often used in a brainstorming or blue-sky thinking environment there is usually little opportunity to verify statements with hard data or assess the practicalities of implementation.

Although this business analysis technique has its limitations it does play a valuable role in enabling unusual and non-conformist issues to be raised and discussed. It also has a role to play in developing a strategy objective when it is used as part of the process, but its limitations must be acknowledged.

A SWOT analysis can be useful for many kind of strategic planning. It's a relatively quick way to look at organizational strengths, weaknesses, opportunities, and threats. The overall purpose of a SWOT analysis is to examine the internal and external factors that help or hinder you in achieving each of your objectives. It can be used as a brainstorming tool or to help focus your attention on key areas.

You can use your SWOT analysis as a means of gathering information from a range of perspectives or you may be able to use your results to strategic advantage by either matching your strengths to opportunities or converting threats or weaknesses into strengths or opportunities.

SWOT analysis can play a valuable role in enabling unusual and non-conformist issues to be raised and discussed. It also has a role to play in developing a strategy objective when it is used as part of the process, but its limitations must be acknowledged.

The most obvious limitations are: the risks of oversimplification; the fact that vested interests can prevent weaknesses and threats from being acknowledged; and the danger of information overload as there are no obvious limits as to what is and is not relevant.

When you are conducting a SWOT analysis, you should keep in mind that it is only one stage of the business planning process. For complex issues, you will usually need to conduct more in-depth research and analysis to make decisions.

Keep in mind that a SWOT analysis only covers issues that can definitely be considered a strength, weakness, opportunity or threat. Because of this, it's difficult to address uncertain or two-sided factors, such as factors that could either be a strength or a weakness or both, with a SWOT.

A SWOT analysis may be limited because it:

1. doesn't prioritise issues
2. doesn't provide solutions or offer alternative decisions
3. can generate too many ideas but not help you choose which one is best
4. can produce a lot of information, but not all of it is useful.

SWOT analysis as a method of strategic planning involves specifying project objectives and identify key aspects of internal and external favorable or unfavorable to achieving objectives.

First, managers must determine whether the target will be achieved by selecting a different objective that the analysis will be respected. The decision-maker becomes a key component, complexity and accuracy of analysis depends entirely on the level of knowledge, experience, involvement and cooperation of these factors.

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SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEM – DESIGN IDEAS FOR THE ROMANIAN MILITARY ENVIRONMENT

LTC Laurențiu NEMEȘ

Over time, the profession of supply chain management has evolved to meet the changing needs of the global supply chain. According to the Council of Supply Chain Management Professionals (CSCMP)[18]: *"Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement...and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies."*

The CSCMP also defines logistics management as the activity "that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirement. Logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing, sales manufacturing, finance, and information technology." (CSCMP 2011) Logistics activities include, but are not limited to quantification, procurement, inventory management, transportation and fleet management, and data collection and reporting.

This paper focuses on specific concepts and requirements for an information system designed to support an integrated supply chain model in the military environment. This model promotes

[18] The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities. Arlington, Va., USAID | DELIVER PROJECT, Task Order 1, Second edition, 2011 (First edition 1998), pp. 15-16

collaboration and seamless linkages between the activities, levels and people responsible for managing the supply chain.

Previously, logistics was considered a custodial activity. Storekeepers were the custodians of supplies stored in small storerooms and large warehouses. Consequently, the science (and art) of logistics, and the people who make the logistics system work, were not considered an important part of family planning. Fortunately, as time passed, more and more program managers have come to understand how important logistics is to a program's success.

The goal of a health logistics system is much larger than simply making sure a product gets where it needs to go. Ultimately, the goal of every logistics system is to help ensure that every customer has commodity security. Commodity security exists when every entity is able to obtain and use quality essential supplies whenever it needs them. A properly functioning supply chain is a critical part of ensuring commodity security - financing, policies, and commitment are also necessary.

Effective supply chains not only help ensure commodity security, they also help determine the success or failure of any logistics support program. Both in business and in the public sector, decision makers increasingly direct their attention to improving supply chains, because logistics improvements bring important, quantifiable benefits. Well-functioning supply chains benefit the organization in important ways by:

- increasing program impact;
- enhancing quality of support;
- improving cost effectiveness and efficiency[19].

1. LOGISTICS IN THE MILITARY ENVIRONMENT

1.1. DEFINITIONS[20]

There are many definitions of logistics and each places a different emphasis on the relationship of strategy, tactics, movement and production. In NATO, however, the agreed definition of logistics reads as follows:

Logistics: The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, the aspects of military operations which deal with:

[19] Ibidem
[20] *NATO Logistics Handbook*, http://www.nato.int/docu/logi-en/1997/lo-103.htm, accessed on 10.06.2015

a. design and development, acquisition, storage, transport, distribution, maintenance, evacuation and disposition of materiel;
b. transport of personnel;
c. acquisition or construction, maintenance, operation and disposition of facilities;
d. acquisition or furnishing of services;
e. medical and health service support.

This definition covers a wide range of responsibilities that fall into different areas of the NATO organization. If one considers that logistics comprises both the building up of stocks and capabilities and the sustainment of weapons and forces, then it is clear that a distinction can be made between two important aspects of logistics: the first one dealing with production and the second one with consumption.

The following definitions of these aspects enjoy widespread acceptance within the NATO logistics community:

a. **Production Logistics** (also known as: **acquisition logistics**) - that part of logistics concerning research, design, development, manufacture and acceptance of materiel. In consequence, production logistics includes: standardization and interoperability, contracting, quality assurance, procurement of spares, reliability and defense analysis, safety standards for equipment, specifications and production processes, trials and testing (including provision of necessary facilities), codification, equipment documentation, configuration control and modifications.
b. **Consumer Logistics** (also known as: **operational logistics**) - that part of logistics concerning reception of the initial product, storage, transport, maintenance (including repair and serviceability), operation and disposal of materiel. In consequence, consumer logistics includes stock control, provision or construction of facilities (excluding any material element and those facilities needed to support production logistic facilities), movement control, reliability and defect reporting, safety standards for storage, transport and handling and related training.

Additionally, as a result of the current operational environment and the scarcity of resources determined by the economic environment, and considering the way the logistic support is provided, two additional types of logistics emerged:

a. **Cooperative Logistics** - there is no NATO definition yet, but cooperative logistics could be described as follows: *"NATO Cooperative Logistics is the totality of bilateral and multilateral consumer and production logistics arrangements to optimize in a coordinated and rationalized way, logistics support to NATO forces. The aim of NATO Cooperative Logistics is to achieve cost savings through economy of scale and increased efficiency in peacetime, crisis and wartime logistics support. Development of NATO Cooperative Logistics arrangements is largely facilitated by the use of NATO Production and Logistics Organizations (NPLOs), particularly the NATO Support Agency (NSpA) using modern techniques in the field of materiel management and procurement."*

b. **Multinational Logistics - f**or multinational operations, logistics must function as an effective force multiplier. With the risk now omni-directional, the diminishing logistic support resources, and the principle of shared logistics responsibilities, the evolution toward multinational logistics becomes of utmost importance. There is not yet a NATO definition of Multinational Logistics but it is proposed that this term cover:

   "The different means to logistically support operations other than purely national, such as multinational integrated logistic support, role specialization support and lead nation support."[21]

1.2. LOGISTIC FUNCTIONS[22]

According to the NATO Logistics Handbook, the functional domains of logistics are presented below.

Materiel Function of Logistics

Production or acquisition logistics covers materiel, from the first phase of the life cycle to its final disposal from the inventory. The first part of the cycle, from specification, design and production is clearly a function of production logistics. Reception of the equipment into service, its distribution and storage, repair, maintenance and disposal are clearly a consumer logistic task. However, the initial design of the equipment which is part of production logistics has to take

[21] Ibidem
[22] Ibidem

account of the consumer aspects of repair and maintenance, and therefore involves both disciplines.

Supply Function of Logistics

Supply covers all materiel and items used in the equipment, support and maintenance of military forces (classes of supply are listed in Section 2.3). The supply function includes the determination of stock levels, provisioning, distribution and replenishment.

Maintenance and Repair Function of Logistics

Maintenance means all actions to retain the materiel in or restore it to a specified condition. The operational effectiveness of land, naval and air forces will depend to a great extent on a high standard of preventive maintenance, in peacetime, of the equipment and associated materiel in use. Repair includes all measures taken to restore materiel to a serviceable condition in the shortest possible time.

Service Function of Logistics

The provision of manpower and skills in support of combat troops or logistic activities includes a wide range of services such as combat resupply, map distribution, labor resources, postal and courier services, canteen, laundry and bathing facilities, burials, etc. These services may be provided either to one's own national forces or to those of another nation and their effectiveness depends on close cooperation between operational, logistic and civil planning staffs.

Explosive Ordnance Disposal (EOD) Function of Logistics

EOD involves the investigation, detection, location, marking, initial identification and reporting of suspected unexploded ordnance, followed by the on-site evaluation, rendering safe, recovery and final disposal of unexploded explosive ordnance. It may also include explosive ordnance which has become hazardous by damage or deterioration. The NATO EOD Technical Information Centre (EODTIC) holds records of all past and present ammunition and explosives, and provides an immediate advisory service on EOD problems.

Movement and Transportation Function of Logistics

It is a requirement that a flexible capability exists to move forces in a timely manner within and between theatres to undertake the full spectrum of Alliance roles and missions. It also applies to the logistic support necessary to mount and sustain operations.

Engineering Function of Logistics

The area of logistic engineering, while not exclusively a logistic function will require close coordination with logistics as the mission is very closely aligned with logistics in terms of facilitating the logistic mission of opening lines of communication and constructing support facilities. The engineering mission bridges the gap from logistics to operations and is closely related to the ultimate success of both. The acquisition, construction and operation of facilities forms the basis for the NISP. This is the term generally used in NATO for installations and facilities for the support of military forces.

Medical Function of Logistics

This function entails the provision of an efficient medical support system to treat and evacuate sick, injured and wounded personnel, minimize man days lost due to injury and illness, and return casualties to duty. An effective medical support system is thus considered a potential force multiplier. Though medical support is normally a national responsibility, planning must be flexible and consider coordinated multinational approaches to medical support. The degree of multinationality will vary depending on the circumstances of the mission, and be dependent upon the willingness of nations to participate in any aspect of integrated medical support.

Contracting Function of Logistics

Contracting has become increasingly important to the conduct of operations, particularly when operating beyond NATO's area of responsibility. It is a significant tool that may be employed to gain fast access to in-country resources by procuring the supplies and services that the NATO Commander requires.

Budget and Finance Function of Logistics

The areas of budget and finance impact virtually every aspect of logistic operations. The funding and budget policies to pay for deployment and sustainment and redeployment are unique. While nations are generally expected to finance their own operations, the specifics of each operation will determine the type and amount of NATO funding for that support. Often items selected for NATO funding include support of various NATO headquarters and theatre-wide infrastructure improvements.

Related Functions

Although ***Host Nation Support (HNS)*** and ***Civil Emergency Planning (CEP)*** are not logistic functions, they are nevertheless closely related to logistics and impact on logistic planning. The availability of HNS offsets requirements for organic military support and thereby

reduces the size and scope of the combat service support force that must be committed to an operation. CEP does as well, to some extent, and also facilitates the accomplishment of the mission by making resources from the civil sector available to the military, particularly in the area of deployments.[23]

1.3. CLASSES OF SUPPLY

According to the NATO Logistics Handbook, NATO classes of supply are established in the five-class system of identification as follows:

Class I

Items of subsistence, e.g. food and forage, which are consumed by personnel or animals at an approximately uniform rate, irrespective of local changes in combat or terrain conditions.

Class II

Supplies for which allowances are established by tables of organization and equipment, e.g. clothing, weapons, tools, spare parts, vehicles.

Class III

Petroleum, oil and lubricants (POL) for all purposes, except for operating aircraft or for use in weapons such as flamethrowers, e.g. gasoline, fuel oil, greases, coal and coke.

*(**Class IIIa** - aviation fuel and lubricants)*

Class IV

Supplies for which initial issue allowances are not prescribed by approved issue tables. Normally includes fortification and construction materials, as well as additional quantities of items identical to those authorized for initial issue (Class II) such as additional vehicles.

Class V

Ammunition, explosives and chemical agents of all types.

1.4. LOGISTIC MANAGEMENT INFORMATION SYSTEM (LMIS)

In my opinion, The entire logistics system is driven by information. We collect information to make decisions; the better information we have, the better decisions we can make.

I consider that LMIS should be the tool that links the accurate, timely, and relevant information to the logistics management system, in a maximized automated manner, while

[23] Ibidem

providing a lean, easy to use but comprehensive user interface for every logistics function and user type, tailored to the level of management they perform. The system should be interlinked with the other Information Management Systems of the entity, such as but not limited to Command and Control (C2), Organization, Budgeting, Procurement, Finance, Equipment Disposal, without affecting the C2 Information System (only the most relevant/mission essential data should be automatically fed into the C2 system, depending on the organizational needs).
Ideally, instead of designing a huge standalone LMIS, with intricate and expensive technical requirements and subject to failure due to an extremely heavy database, the system should be created as lean as possible, based on functional sub-systems linked at Logistics Manager's User Interface, which is to be tailored (different) at each level and function, in close co-ordination with the authority/responsibilities of the respective logistics echelons. As an example, even while the LMIS is based on an unified supply database, according on its user account rights the Logistics Manager at brigade level (2nd Line of logistic support) will see and be able to manage Bde's and subordinated units' inventory, but not the inventory in the 3rd Line of logistic support. This will be possible thanks to his user interface designed to provide access only to the relevant information for him.

Without going any deeper into the more elaborated LMIS design, for the purpose of this paper, I will go ahead and present the aspects I have considered regarding the design elements of a Supply Chain Management Information System (SCMIS) as a sub-system of the LMIS.

2. SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEM (SCMIS) DESIGN ELEMENTS

As I have mentioned above, SCMIS is designed as a sub-system of LMIS, as a system of functional modules linked, similar to LMIS, at user interface (UI) level.

The purpose of SCMIS is to provide an effective tool to assist with the information required by all the activities conducted along the Supply Chain, from procurement/provisioning of equipment from all the classes of supply to their decommission.

The general requirements of SCMIS should include but not be limited to:

- interlinked to the relevant LMIS sub-systems, as well as to other organizational information systems such as Budgeting, Procurement, Finance/Accounting, and other relevant systems;

- compatibility with the Alliance LMIS – can be interconnected or export data in usable formats;
- interlinked functional modules, based on distributed databases;
- instant global system data update on user or Automated Asset Visibility System input;
- effectiveness - support for all the relevant activities and for all the classes of supply, to include the medical equipment;
- efficiency – makes the best use of the existing information systems, networks, and computers, in order to minimize implementation costs;
- provision of timely, accurate, and relevant information, to include reports and feedback from all levels;
- support for both the resupply methods ("push" and "pull");
- support for equipment/customer prioritization;
- at relevant levels, support for procurement, as well as for Collaborative and Multinational Logistics Support requisitions generation;
- flexibility – ability to adapt to unexpected/unplanned situations;
- web enabled, with user account rights in tight correlation with their authority/responsibilities;
- simple UI, tailored to the Echelon/Function information needs;
- backup/redundancy;
- secure/encrypted data;
- secure/encrypted communications.

Obviously, this list can continue, subject to logisticians' and C&I specialists' contributions, and can be lengthened or shortened according to funds' availability for implementation.

According to the design elements I have considered, a simple model of SCMIS should include 2-3 modules:

- Inventory Management Module (IMM) to include Warehousing Management, Unit Inventory Management, Requisitions and Distribution Orders, "Push" requirements estimation, Reports and Returns, Feedback;

- Movement and Transportation Module (M&TM) can be included in the SCMIS or not (since it also has additional requirements pertaining to personnel movement and strategic deployment, the senior or strategic Logistics Manager may decide to keep it as a LMIS sub-system and not to include it in the SCMIS); in any case, the link between SCMIS and the M&TM/IS is very strong, since the M&T activities are vital to the equipment distribution activities;
- Automated Asset Visibility Module (AAVM) – a vital tool for the distribution activity and SCMIS as a whole, since it provides accurate readings and automated data input regarding to inventory and equipment movements, thus minimizing user input errors (user input errors can still effect the data written on RFID tags or barcodes).

Inventory Management Module (IMM)

The IMM is the basis of the SCMIS. It operates the main databases of the system, distributed at the levels of Logistics Managers. Each Logistics Manager only has access to the information required. The higher echelon has visibility over all the subordinated echelons.

The Logistic Managers assess equipment/customer priorities based on Operational Commanders', Account Holders', Major Program Managers', and own priorities.

Depending on their level, the system allows the Logistics Managers to manage their inventory, receive equipment and maintenance requests, issue prioritized distribution orders (including transportation support requests to the M&T system), manage lost/damaged or obsolete equipment, identify shortages in own inventory and request replenishment or procurement, decommission and write-off inventory items, send/receive retrograde movement requests.

The lowest echelon (unit level) only has full access to its only inventory, can input the equipment and maintenance requests and can see their shipping status.

The highest echelon Logistic Manager has full authority over the entire system. The database that generates the information necessary for the "push" method resupply (statistical data regarding consumption rates in various operational environments).

Users at any level can generate reports and send feedback.

The requests to other SCMIS functional modules or relevant LMIS sub-systems are sent horizontally, while the orders, requests, reports and feedback are submitted vertically.

Movement and Transportation Module (M&TM)

This module, if present, is pretty much self-explanatory. It provides a valuable information tool to the M&T Manager, assisting him in performing the M&T support coordination activities. The module provides visibility over the available means of transportation, receives transportation support requests, allows sending of transportation orders and transportation support requests.

The transportation requests in support of the distribution system, generated by the IMM as distribution orders, are received automatically by the module.

Automated Asset Visibility Module (AAVM)

AAVM is the module that takes the data obtained by automated readers and inserts it in the information system. The technical implementation is very similar to any commercial similar system.

The data acquisition implementation/equipment can be any combination of barcode, RFID or GPS tracked tags, able to store data regarding a shipment, package, or warehouse, complemented by the corresponding readers.

In most cases AAVM is also the most expensive component of the SCMIS, since it requires an extensive infrastructure in warehouses, home and deployed bases, transportation key points, depending on the technical solution and the extent of the implementation.

In spite of its high costs, is a very important tool, providing instant information regarding warehouse and unit inventory, shipping units movement and manifests, vehicle movement and so on.

AAVM output data is instantly inserted both in the IMM and M&TM, when a tag attached to a package, shipping unit or vehicle passes through a reader portal or is scanned with a portable/handheld reading device.

As a simple example of use, at the point of origin a tag (usually RFID) is assigned an unique identification number which is electronically recorded on it. Depending on the tag type, more than the identification number can be recorded, such as originator, receiver, cargo manifest and even other relevant data. When scanned at the point of origin, the system subtracts the equipment shipped from the inventory (usually the warehouse inventory) and inserts the data into the distribution system, showing it in transit through various points. When scanned by the recipient,

the equipment from the cargo manifest leaves the distribution tracking system and is automatically recorded into receiving unit's inventory.

3. CONCLUSION

In my opinion, nowadays and in the current economic and operational environment we face, the accurate and timely information is vital for the optimal logistics management. Any army, big or small, should benefit from an logistic information system able to fully support its Logistics Management System.

The scarcity of the available resources, complexity of the operational environment, long distances, integration in a multinational environment and lots of other aspects pose huge challenges to the Logistics Managers. These challenges, in my opinion, can be overcome by the use of information technology structured in a system.

The outcome of using a LMIS in general and a SCMIS in particular would be a better management of the activities in the logistic cycle, reduced costs due to the ability to choose the best supply source and minimize losses, ability to use feedback in order to identify the bottlenecks, solutions, and further improve the system.

The Supply Chain Management Information System I presented in this paper is a more a "wish list" item rather than a model ready to be implemented, of course. It needs a lot of more studies, elements and polishing, supported by technical specifications and cost estimations, in order to be even close to be submitted for approval, budgeting and implementation. But again, the design of a workable and ready to be implemented system was not the topic of the paper.

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EUROPEAN SECURITY STRATEGY – CRITICAL ANALYSIS

LTC. Dorin Petrica PANAITE

Adopted by the European Council on 12-13 December 2003, The European Security Strategy (ESS) identified the need for a common strategic vision regarding the new security environment, in which the EU is a global actor seeking to build a 'fairer, safer and more united world' [1].

The 2008 'Report of the Implementation of the European Security Strategy: Providing Security in a Changing World' analysed the implementation of the strategy, and validate the ESS importance for a 'more capable, more coherent and more active' European Union [1]. Additionally, conflict prevention was identified as the heart of this strategy and it was explicitly set out as a strategic objective for the Union and its Member States.

THE SECURITY ENVIRONMENT: GLOBAL CHALLENGES

The European Security Strategy is a comprehensive document, in which the European Union clarifies its security strategy, identifying the key security challenges, defining its strategic objectives and setting out the political implications for Europe.

Current security environment, characterized by open borders, freedom of movement, flows of trade and investment, and development of information and communication technology, have brought freedom and prosperity to most of the european citizens, but others have received globalisation with frustration and discontent. Recent developments have also increased the scope for non-state entities to play an important role in international affairs. Consequently, the dependence on an interconnected infrastructure in transport, energy, information and other fields has increased, generating new vulnerabilities for the member states.

It might be tempting to focus only on the economic governance, single market, or home affairs, but this would be a mistake, as foreign and security challenge have not lost their importance and should be kept on the top of the EU agenda.

Unfortunately, poverty, undervelopment, illiteracy and disease are causing untold suffering in much of the developing world and give rise to pressing security concerns.

As the security is a precondition of development, areas affected by conflicts are experiencing destruction of the infrastructure, including social infrastructure, increasing criminality, poor investment and lack of economic activity. A significant number of countries, close to EU borders, are caught in a cycle of conflict, insecurity and poverty.

Competition for natural resources, such as food, natural resources, but most important – water - could trigger further turbulence and migratory movements in various regions.

Another major objective of the ESS was to identify the key security challenges and subsequent political implications for the EU, taking into consideration that ”Large-scale aggression against any Member State is now improbable. Instead, Europe faces new threats which are more diverse, less visible and less predictable.” (ESS, Brussels, 12 December 2003) [1]. The final document comprised five major key threats to be considered and addressed:

1.1. Terrorism

Starting in the late 50’s (Paris, 15th September 1958, several Algerian Nationalists fired against French minister’s car, killing 1 and injuring 3 civilians) and steadily increasing since then „Terrorism puts lives at risk, imposes large costs, seeks to undermine the openness and tolerance of our societies, and it poses a growing strategic threat to the whole of Europe.” (ESS, Brussels, 12 December 2003).

According to the European Council, „...between 2009-2013 there were 1010 failed, foiled or completed attacks carried out in EU member states...”, 38 people were killed, and a small number of European citizens have been kidnapped or killed by terrorist groups around the world.

Previously based on Ethno-national or separatist motives, nowadays terrorism is linked mostly to violent religious extremism, caused by the pressures of modernization, cultural, social and political crises, and the alienation of young people living in foreign societies.

1.2. Proliferation of Weapons of Mass Destruction

Although the spread of WMD and delivery systems was reduced due to the latest international treaty regimes and export control arrangements, the possibility of a WMD arms race, especially in the Middle East, is still possible. Moreover, there are serious concerns that terrorist groups, especially Al Qaeda, are seeking to obtain WMD. In 1998, Osama bin Laden declared that “acquiring WMD for the defense of Muslims is a religious duty.”

Several terrorist groups have actively sought weapons of mass destruction (WMD) of one kind or another. In particular, the Japanese cult group Aum Shinrikyo, Al Qaeda and its associates—notably the Egyptian Islamic Jihad, Jemaah Islamiya and Lashkar al Tayyib—figure most prominently among the groups that have manifested some degree of intent, experimentation, and programmatic efforts to acquire nuclear, biological and chemical weapons.

1.3. Regional Conflicts

Even though they are not posing a direct threat to the non-involved countries, regional conflicts occurred as far as Kashmir, the Great Lakes Region or Korean Peninsula "…impact on European interests directly and indirectly, as do conflicts nearer to home, above all in the Middle East. Violent or frozen conflicts, which also persist on our borders, threaten regional stability." (ESS, Brussels, 12 December 2003) [1]. Apart from human casualties, regional conflicts have severe consequences on social and physical infrastructures, economical and political activities, environment; they threaten minorities, fundamental freedoms and human rights.

1.4. State Failure

Directly linked to the aforementioned keys, state failure "…include: lack of legitimacy and accountability to all citizens; inequitable distribution of power, justice and resources; violations of human rights; social and economic exclusion and an inability to deliver public services by weak, non-functioning or non-existent state structures. All of these can create, exacerbate and perpetuate violent conflict." (ESS, Brussels, 12 December 2003).

"The feature of State failure may be divided in two main categories, an internal and an external one.", first concerns the relation of the failed state and its population, and the second concerns the relations of the failed state with other states and international community. ("State failure, sovereignty and Effectiveness", Gerard Kreijen, 2004).

The main threats of a failing state could comprise of a safe haven for "…organized crime, corruption, weapons transfers and terrorist activities. They are also unable to implement international and cross-border regulatory systems necessary for the prevention of organized crime, trade in arms, drugs, people and natural resource exploitation." (ESS, Brussels, 12 December 2003).

1.5. Organised Crime

Widely varying from country to country, the definition of Organized crimes comprises trafficking in humans, illicit goods, weapons and drugs, armed robbery, counterfeiting and money laundering, having an organized aspect, and often linked with terrorism.

According to the European Security Strategy, "Such criminal activities are often associated with weak or failing states. Revenues from drugs have fuelled the weakening of state structures in several drug-producing countries. Revenues from trade in gemstones, timber and small arms, fuel conflict in other parts of the world. All these activities undermine both the rule of law and social order itself. In extreme cases, organised crime can come to dominate the state."

A new form of organized crime, recently addressed is the growth in maritime piracy, especially around the Horn of Africa.

Considering these key threats together – terrorism committed to maximum violence and Europeans fighting abroad in groups affiliated with terrorism, weapons of mass destruction availability, increasing organized crime, the surrounding failed states occurrence – we could foresee some dramatic challenges ahead for the EU in the security field.

Revising the implementation of the ESS, The Report on the Implementation of the European Security Strategy, added new global challenges and key threats, such as:

1.6. Cyber security

The vast majority of businesses and governments across the EU rely on digital networks and infrastructure to provide their essential services, a potential incident having a huge impact by compromising services and stopping businesses working properly.

Security incidents can undermine consumer confidence in online payment systems and IT networks. „Modern economies are heavily reliant on critical infrastructure including transport, communication and power supplies, but also the internet. However, attacks against private or government IT systems in EU Member States have given this a new dimension, as a potential new economic, political and military weapon." (Conclusions on the EU cyber security strategy on 25 June 2013).

1.7. Energy Security

Concerns about energy dependence have increased over the last years. The energy union package aims to ensure affordable, secure and sustainable energy for Europe and its citizens.

Specific measures cover five key areas, including energy security, energy efficiency and decarbonisation.

1.8. Climate change

In 2003, the ESS already identified the security implications of climate change. Five years on, this has taken on a new urgency, described as a "threat multiplier". Action to tackle climate change and cut greenhouse gas emissions is therefore a priority for the EU. Natural disasters generated by the climate change, environmental degradation and scarcity of the resources exacerbate conflict, especially in situations of poverty and population growth.

As depicted in Report on the Implementation of the European Security Strategy „The EU has made substantial progress over the last five years. We are recognised as an important contributor to a better world. But, despite all that has been achieved, implementation of the ESS remains work in progress".

During the research workshops held in Paris (6-7 October 2003) under the overall coordination of the European Union Institute for Security Studies (EUISS), there were identified two clear headings:

- Preventive engagement: how to prevent crises occurring by employing our resources to shape the behavior of problem countries.
- Effective multilateralism: using a rule-based world order to underpin our security.

The concept of preventive engagement is able to avoid more serious problems in the future, and goes beyond the immediate threats to take account of the environment in which those threats are generated. Violent religious extremism is linked to the pressures of modernization, poverty and to the alienation of young people. Many regions are experiencing long conflicts, insecurity, sickness and poverty. The security strategy is made credible by the notion of capability. Today's security threats demand more mobile, more flexible military forces. Actions underway – notably the establishment of a defence agency – represent the first step in the right direction.

To transform EU militaries into more flexible, mobile forces, and to enable them to address the new threats, more resources for defence and more effective use of resources are necessary.

„In a world of global threats, global markets and global media, our security and prosperity increasingly depend on an effective multilateral system. The development of a stronger international society, well functioning international institutions and a rule based international order is our objective."

The European Security Strategy does not explicitly mention the concept, but its implicit presence is evident: „The best protection for our security is a world of well-governed democratic states. Spreading good governance, supporting social and political reform, dealing with corruption and abuse of power, establishing the rule of law and protecting human rights are the best means of strengthening the international order".

Javier Solana, "A Secure Europe in a Better World".

ACTIONS PLANS BASED ON EUROPEAN SECURITY STRATEGY

Part of a broader effort undertaken by the EU to promote peace and stability in the Western Balkans, the European Union Rule of Law Mission in Kosovo (EULEX) is the largest civilian mission ever launched under the CSDP.

The main goal of the mission is to assist and support the Kosovo authorities in the rule of law area, with a specific focus on the judiciary.

The European Union Naval Force (EU NAVFOR) Somalia – Operation Atalanta is conducted in accordance with United Nations Security Council's resolutions and has as primary objectives: protects vessels of the World Food Programme (WFP), deters and disrupts piracy and armed robbery at sea.

European Union training Mission (EUTM) Somalia - is an EU military training mission which aims to strengthen the Somali National Government and the security institutions of Somalia, by providing military training to members of the Somali National Armed Force.

Launched in support of United Nations Security Council Resolution 1872 (2009), the mission is one element of the EU's comprehensive approach to challenges in the Horn of Africa, which includes efforts to: promote progress, improved governance, strengthening the rule of law and responses to development and humanitarian needs.

The European Union Monitoring Mission (EUMM) in Georgia - is an unarmed civilian monitoring mission of the European Union, having the follows priorities: to ensure that there is no return to hostilities and to build confidence among the conflict parties.

The European Cybercrime Center - contributed in catching criminal gangs stealing payment-card information as well as the arrest of hundreds of online pedophiles.

CHALLENGES AHEAD

Current environment, characterized by the shift of wealth and political influence, accelerated by the effects of the economic crisis, the complex mix of traditional and post-modern security threats, as well the deterioration in security in Europe`s southern and eastern neighbourhood poses to the EU new challenges and opportunities. However, financial constraints limit the means to achieve such goals – thus, prioritization becomes vital.

Priorities for future actions should be the implementation of legislation and consolidation of the latest achievements, based on practical cooperation.

Considering the latest evolutions, a need for the revision of the European Security Strategy occurred, comprising three possible directions:

- identifying and addressing implementation problems of the initial document;
- revising the ESS and updating EU`s strategic goals and instruments in line with the current global context;
- issuing a new strategy with a more ambitious and broader approach towards Europe`s role on the global stage.

According to Final implementation report of the EU Internal Security Strategy (2010-2014), certain steps were identified:

- to improve the links between the EU internal and external security actions.
- the respect of fundamental rights in all EU internal security policies. Providing law enforcement officials with simple, efficient and practical tools such as handbooks and training curricula, can help them ensure the correct application of fundamental rights in their day-to-day work.
- the synergies between security policy and other policies, for example the research and innovation policy.

- a common approach to a shared security agenda bringing together all security stakeholders.

EUROPEAN SECURITY STRATEGY – REVISE OR REINVENTED

Security strategies are rarely produced on a regular basis, more often, they are created when political urgencies require. Hence the case in Europe, in 2003, when the Transatlantic rifts over the war in Iraq produced a deep, and unexpected sense of crisis.

Since 2003 EU has undertaken complex actions based on security strategy, but more and more voices say that this strategy should be revised.

Nevertheless, there are arguments against a revised security strategy:

- 'Time for action, not words" – save the energy and time, and implement the policies into practice, to fix existing problems.
- „It is too early to talk strategy" - as current crises require all available attention and the time is now to give the EU direction before the next crisis emerges.
- „We are tired of talking strategy". Some arguments suggest that European governments may be suffering from strategic fatigue, and people would stop paying attention to them, having it revised too often.
- „Implement and focus" - EU should implement what already exists: the current European Security Strategy requires greater implementation and effect. [3]

On the other hand, there are voices asking a reassessment of the European Security Strategy, most of them concern EU internal timelines.

Among the most important arguments are:

- New regional strategies. The EU has already taken steps towards new sub-strategies, required by the real context.
- As NATO has updated its own strategic concept, the EU's 2003 Security Strategy now looks out-of-date, considering geopolitical circumstances, political realities, and its own mission repositioning.
- New cooperation modes. Permanent Structured Cooperation now allows EU member states to embark on "coalitions of the willing" in security policy goals. The obvious risk here is increasing fissures and splintering amongst the EU family of nations.

- New defense obligations. The EU's "mutual assistance" clause (art. 42.7, Treaty on European Union) obligates EU member states to cooperate in cases of armed aggression to their.
- New threat assessment obligations. Separate from the mutual assistance clause, the EU's Solidarity Clause (Art. 222, Treaty on the Functioning of the European Union) calls upon the European Council to 'regularly assess threats facing the Union'. The Internal Security Strategy also calls upon the EU to develop collective threat assessment procedures.

But the most important reason, in my opinion, is that the EU of 2003 and the EU of 2015 looks completely different. Now the EU has 28 members, compared to 15 in 2003, wich means that nearly half of the member states were not involved in the drafting of the security strategy; one of the key concepts of EU stated that „... everything that it does is founded on treaties, voluntarily and democratically agreed by all member countries. These binding agreements set out the EU's goals in its many areas of activity….".

In fact, there have been some steps in this regard, esspecialy after the terrorist attacks on Charlie Hebdo office, Paris, on january, 2015. European Comission proposed a draft joint security strategy for the 28 - member bloc and the establisment of a center for antiterrorist action, to detect and track illegal bank accounts – wich finances terrorist operations, and extremist websites. The document called "The European Agenda on Security" is not yet a concrete proposal for amending European Security Strategy, but it is the beginning of the process.

CONCLUSIONS

In December 2013, the European Council discussed defence and security policy for the first time since 2008, the European Council made several decisions in the realm of security and defense in three distinct areas, as follows:

- to enhance the effectiveness of the Common Security and Defense Policy (CSDP) – by launching a general call to improve EU rapid response capabilities;
- to strengthen EU`s defense capabilities – by increasing member states` cooperation through "Pooling and Sharing" initiatives and the European Defense Agency (EDA) and specifically, by working to develop capabilities such as long-range reconnaissance drones, air-to-air refuellers, satellite communications and cyber assets;

- to boost Europe`s industrial defense sector - by creating an EU-wide defense market and setting three priorities for the Commission, namely to promote research into technologies which can be applied both in the defense and the civilian sector, to harmonize industrial standards across member states and increase Small and Medium Enterprises` (SMEs) access to the defense sector (European Council, 2013).

For now, EU's approach is based on two instruments: the European Security Strategy (external security) and the Internal Security Strategy. Both define security issues under globalization - a force of progress but also a source of risks and challenges.

Another important aspect is EU's relation to partners, primarily the transatlantic relationship and NATO, as central pieces of EU's global vision. Nevertheless, under the European Neighbourhood Policy (ENP), regional integration policies like the Union for the Mediterranean and the Eastern Partnership have an extreme potential in tackling local issues like migration, maritime safety, and energy security.

Of particular importance are today the relations with Russia and Iran. With regard to the first one, agreement is vital to EU's interests and unity. As a consequence, behind EU outreaching towards Ukraine or the Black Sea region must exist a fresh memory of the Cold War, which would provide cautiousness and respect when dealing with a skeptical Russia, especially due to past failed promises that NATO would not expand into Central and Eastern Europe.

Regarding the situation of Iranian nuclear program, concerted pressure must increase and dialogue must always include the USA, China, Russia, but also regional powers, like Israel.
The ever-changing global situation constantly poses new dangers but also creates new opportunities. The European Union has the potential to make a major contribution, dealing with the threats and exploit the opportunities. An active and capable European Union would make a strong impact on a global scale, and it would contribute to a fairer, safer and more united world.

As an overview, in the 21st century, the best scenario for the EU to enhance security and promote it globally, is the one in which the lessons learned of the past shape its future actions, under a successful soft-power approach. The EU must preserve its own strategy cultural mix, its special transatlantic relation but also certainly develop on its unique lifelong.

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COMPUTER SOFTWARE AIDING COMMAND

CDR.ENG Laurenţiu TANASE

In the present war conditions, based on new concepts like “computer network centric warfare” and new military technologies, command and control would not be possible without the existence of modern communications and information systems, efficient and interoperable with one another.

Driving military actions in modern military context is complex and involves the commanders and their major states and great organizational capacity to adapt to new challenges.

Referring to the commanding process in general, military theorists often use the phrase “command and control”. Although, theoretically, these components should be considered separately, in practice they constitute a whole.

"The commander cannot order effective without control, and control, whether executed by the master or the headquarters, not justified without being preceded by a command "[1].

To fully understand these managerial roles, it is necessary to define, and clarify some terms used to explain the meaning and the role of command and control.

Commanding process involving authority and responsibility for efficient use of resources available, as well as action planning, organization, coordination and control of forces with the final aim of fulfilling missions.

"Command is the commanding officer authority exerted on subordinates under powers and rank. Order includes the authority and responsibility to use forces, use of resources and for planning, organizing, directing, coordinating and control of military forces for their missions "[1].

The command has the following components: management, control and development of decision.

"Control is what the evaluator determines how they are perceived, understood and decisions and provisions made by the master in order to direct the subordinates and adapt their actions according to the decision made "[1].

Control must be made permanent, detached and impartial, before, during and after the execution of military actions.

Control aims to optimize the actions of subordinate forces and means to support troops on missions in order to ensure duly and timely fulfilment of objectives. Basic elements of control is the management situation of information about the mission, enemy, terrain, troops and time available.

An important aspect in executing the command and control commands is ability to transmit data in real time.

Following this necessity for conducting military actions were implemented in operational military units from different echelons, C2 system components. They are part of C4ISR modern information system.

C2 is an information system that ensures the transfer of information by all means, for phone, video, in complete safety and secrecy. Using this information system, the commander has available all the information needed to conduct combat actions.

But what about command and control process during peacetime or for non-combat activities?

COMMAND FOR NON-COMBAT ACTIVITIES

Although the main purpose of the army is conducting military actions, though a considerable percentage of current activities is assigned to non-combat activities. Unfortunately for conducting this type of activities, implemented C2 systems are useless. This fact forces the commander to return to traditional methods of command and control, which are slow and unreliable.

This is why, in what follows, I will try to identify a modern alternative to assist commanding officer in fulfilling commanding process.

First I need to say that any military task can be managed as a small project. Therefore, the solution is in the project management software.

This computer software must meet the following requirements to fulfil our organizational needs:

- Multi-user
- Collaborative
- Compatible with existing systems

- Web-based

a. Current status

Usually the commanding process for non-combat activities, takes place in a old fashion way although modern systems are available.

This is because besides the inertia of the system is adding a sum of other factors such as underdeveloped computer network infrastructure, popularization of systems failure and non-unitary training of staff.

But the main reason is lack of an integrated system to meet the needs of a larger proportion of the commanding process. This is because newly implemented systems respond only to limited requirements, helping partially commanding officer.

2. State of the art

Organizations concern for efficient management of resources by using computer software is not new.

Project management software has the capacity to help plan, organize, and manage resource pools and develop resource estimates. Depending on the sophistication of the computer software, it can manage estimation and planning, scheduling, cost control and budget management, resource allocation, collaboration software, communication, decision-making, quality management and documentation or administration systems.[2]

The origins of project management software are rooted in the 1950s when Dupont Chemical collaborated with mainframe computer maker Remington Rand (Univac) to devise the Critical Path Method of network scheduling (CPM). This method was tested in 1958 with the construction of a major new chemical plant. In parallel, the US Navy working together with Lockheed Aerospace devised the automated Project Evaluation Review Technique (PERT) for the Polaris Missile program that ran on the IBM mainframe. Mainframe and Mini computers dominated the project management software arena until the early 1980s when PC computers began to proliferate across business and government circles alike. [3]

One of the most common project management software tool types is scheduling tools. Scheduling tools are used to sequence project activities and assign dates and resources to them. The detail and sophistication of a schedule produced by a scheduling tool can vary considerably

with the project management methodology used, the features provided and the scheduling methods supported. Scheduling tools may include support for: [4]

- Multiple dependency relationship types between activities
- Resource assignment and leveling
- Critical path
- Activity duration estimation and probability-based simulation
- Activity cost accounting

Depending on various criteria, project management software can be classified as:[2]

- Desktop - Project management software has been implemented as a program that runs on the desktop of each user. Project management tools that are implemented as desktop software are typically single-user applications used by the project manager or another subject matter expert, such as a scheduler or risk manager.
- Web-based - Project management software has been implemented as a program that runs on the desktop of each user. Project management tools that are implemented as desktop software are typically single-user applications used by the project manager or another subject matter expert, such as a scheduler or risk manager.
- Personal - A personal project management application is one used at home, typically to manage lifestyle or home projects. There is considerable overlap with single user systems, although personal project management software typically involves simpler interfaces. See also non-specialised tools below.
- Single user vs. multi-user - A single-user system is programmed with the assumption that only one person will ever need to edit the project plan at once. This may be used in small companies, or ones where only a few people are involved in top-down project planning. Desktop applications generally fall into this category.
- Collaborative - A collaborative system is designed to support multiple users modifying different sections of the plan at once; for example, updating the areas they personally are responsible for such that those estimates get integrated into the overall plan. Web-based tools, including extranets, generally fall into this category, but have the limitation that they can only be used when the user has live Internet access. To address this limitation, some software tools using client–server architecture provide a rich client that runs on users' desktop computer and replicate project and task information to other

project team members through a central server when users connect periodically to the network. Some tools allow team members to check out their schedules (and others' as read only) to work on them while not on the network. When reconnecting to the database, all changes are synchronized with the other schedules.

For more information about different facilities of various versions of project management software, you can visit the follow website: http://en.wikipedia.org/wiki/Comparison_of_project_management_software.

In the following I will review some software that meet our requirements and are well elbows specialty market.

a. Microsoft Office Project Server

Microsoft Project is a project management software developed by Microsoft, which is designed to assist a project manager in developing plans, assigning resources to tasks, tracking progress, managing the budget, and analysing workloads.

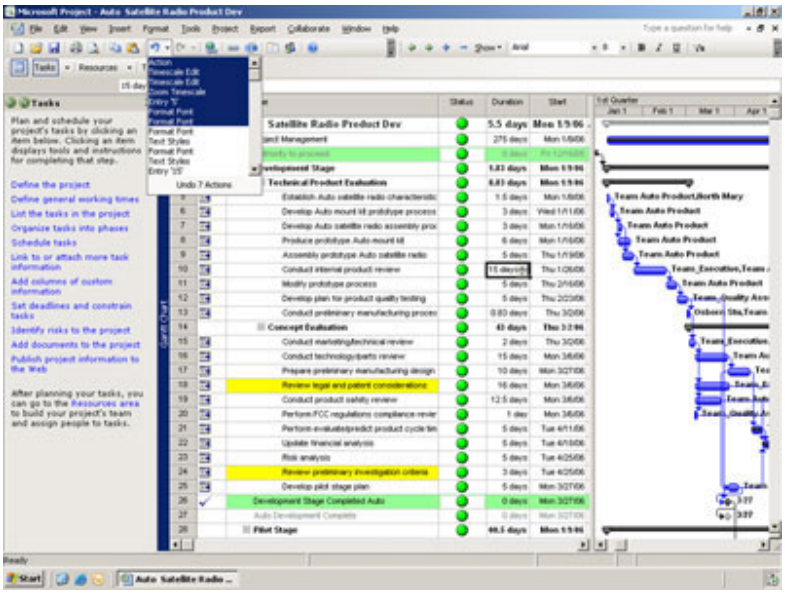

Fig.1 (Microsoft Project 2007)

Project creates budgets based on assignment work and resource rates. As resources are assigned to tasks and assignment work estimated, the program calculates the cost, equal to the work times the rate, which rolls up to the task level and then to any summary tasks and finally to the project level.

Resource definitions (people, equipment and materials) can be shared between projects using a shared resource pool. Each resource can have its own calendar, which defines what days and shifts a resource is available. Resource rates are used to calculate resource assignment costs which are rolled up and summarized at the resource level. Each resource can be assigned to multiple tasks in multiple plans and each task can be assigned multiple resources, and the application schedules job work based on the resource availability as defined in the resource calendars. All resources can be defined in label without limit. Therefore it cannot determine how many finished products can be produced with a given amount of raw materials. This makes Microsoft Project unsuitable for solving problems of available materials constrained production. Additional software is necessary to manage a complex facility that produces physical goods.[5]

The application creates critical path schedules, and critical chain and event chain methodology third-party add-ons also are available. Schedules can be resource leveled, and chains are visualized in a Gantt chart. Additionally, Microsoft Project can distinguish diverse classes of users. These different classes of users can have differing access levels to projects, views, and other data. Custom objects such as calendars, views, tables, filters, and fields are stored in an enterprise global which is shared by all users.[5]

Project is available in two editions, Standard and Professional; both editions are available either as 32 or 64bit options. The Professional edition includes all the features of the Standard version, plus more features like team collaboration tools and ability to connect to Microsoft Project Server.[6]

Pricing: from 1$/user/one-time to 27 089$ - 44 698$ / server[7]

b. Basecamp

Basecamp is a web-based project-management tool developed and first launched in 2004. A new version was launched in 2012.

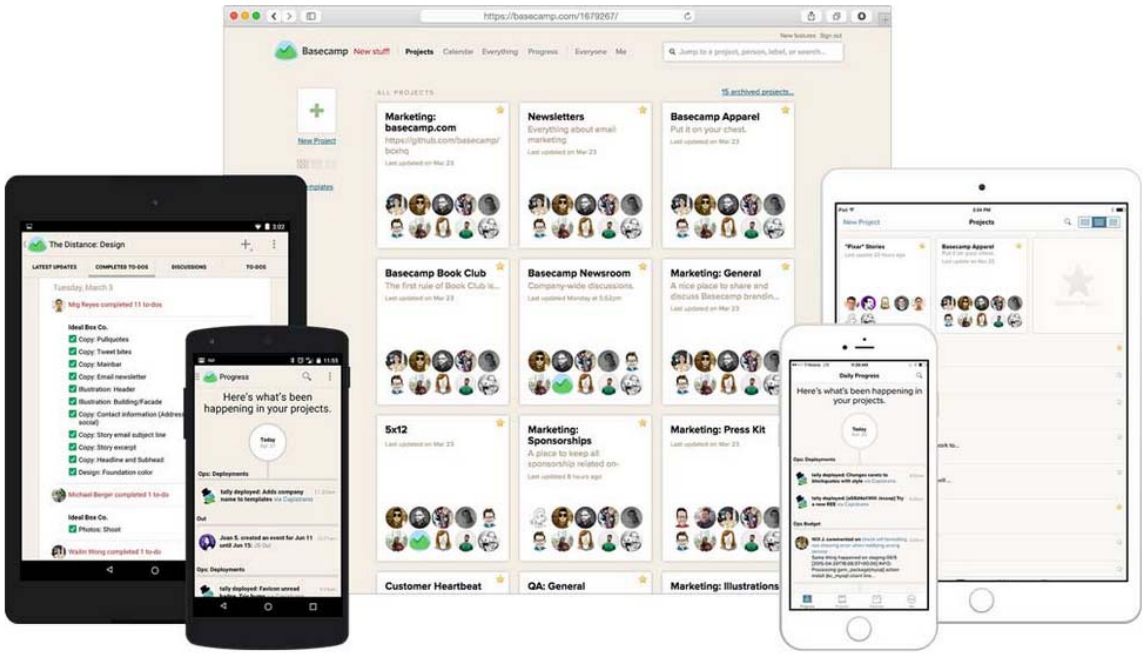

Fig.2 (Basecamp)

Basecamp offers to-do lists, wiki-style web-based text documents, milestone management, file sharing, time tracking, and a messaging system. Basecamp Classic also offers integration with Basecamp's own Campfire product, and features APIs that are used by a host of web and mobile apps.

Basecamp Classic's interface is available in different languages (e.g. Spanish, French, Italian, German, Finnish and Japanese). The newer version of Basecamp currently only supports English as the interface language.[8]

Pricing – from 20$ /month [9]

c. Atlassian Jira

"JIRA is the tracker for teams planning and building great products. Thousands of teams choose JIRA to capture and organize issues, assign work, and follow team activity. At your desk or on the go with the new mobile interface, JIRA helps your team get the job done."[10]

According to Atlassian, JIRA is used for issue tracking and project management by over 25,000 customers in 122 countries around the globe.

JIRA is written in Java . For remote procedure calls (RPC), JIRA supports REST, SOAP, and XML-RPC. JIRA integrates with source control programs such as Clearcase, CVS, Git, Mercurial, Perforce, Subversion, and Team Foundation Server.

Some of the organizations using JIRA for bug-tracking and project management are Fedora Commons, Hibernate, Honeywell Aerospace, Linden Lab, Skype, Spring Framework, and The Apache Software Foundation uses JIRA and Bugzilla. [11]

Atlassian provides JIRA for free to open source projects meeting certain criteria, and to organizations that are non-academic, non-commercial, non-governmental, non-political, non-profit, and secular. For academic and commercial customers, the full source code is available under a developer source license.[12]

JIRA is a commercial software product that can be licensed for running on-premises or available as a hosted application. Pricing depends on the maximum number of users

Pricing – from 10$/month

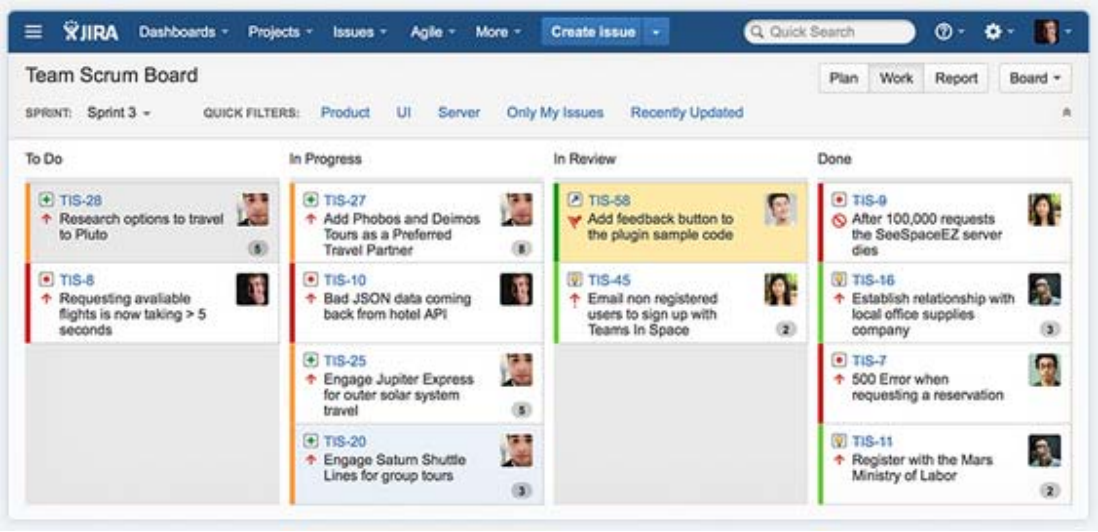

Fig.3 (Jira)

d. 5pm

5pm have the same project management tools as most others, including grouping, time reports, security levels, email notifications and attachment support. An interactive

timeline gives you an alternate view of projects and tasks, but the reason it stands out is its easy-to-use interface and simple design.

The software much simpler and easier to use than some of the others (including industry leader Basecamp). You don't have to hunt for your projects and tasks; everything's right there, pretty much one click away.[13]

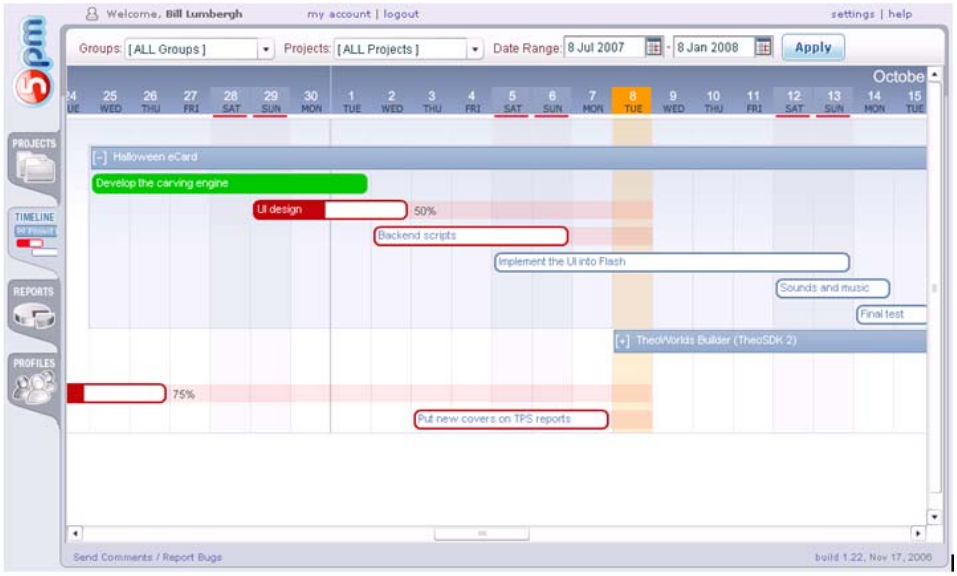

Fig.4 (5pm)

How to use it?

- A project administrator creates a 5pm site for his team (e.g. workawesome.5pmweb.com).
- The administrator can sign up anyone using just their email, which I found a bit invasive because the notification email isn't a request for confirmation of account setup but rather simply tells the receiver that he or she has been signed up for the website and gives them their password.
- The administrator may create different types of accounts: user, administrator, external user and client, and there may be multiple administrators, who may then assign tasks to users and choose to hide tasks from clients.
- Users can download a desktop widget to easily track time (more about it below).
- Users may also go on their team website to check on the progress of any project at any given time.

Navigation is really simple! There's one landing page and all navigation is done through there (see a screen shot below). This page contains permanent tabs through which users can switch among projects, timeline, reports and profiles. Clicking on a tab takes a user into that section of their site, where the user will find a list of drop-down menus that make for effortless navigation among tasks, member profiles, different types of reports and other functions. Administrators can also create diverse groups and invite different team members to each group. All it takes to switch between groups is a click on the drop-down menu at the top of the page.

Users may also upload files so that everything related to a project is right there for all members working on that project to see.

The desktop time tracking widget is one of my favorite features. Users download this widget and it stays on top of all windows (with the option to hide it). To track time, users select the project and the task related to that project from the drop-down menu at the bottom of the timer then click the play button to start tracking time. One annoying thing about the timer is that it logs time in increments of 15 minutes but only when a user goes over a 15-minute chunk, otherwise the user has to manually enter the time. For example, if a user worked for 25 minutes he or she will need to manually select a whole 30 minutes from the drop-down menu.[14]
Pricing 175$/month

e. 24SevenOffice

24SevenOffice is a complete web - based (software as a service) Enterprise Resource Planning (ERP) system. It includes modules for Customer Relationship Management (CRM), accounting, invoicing , e-mail, file / document management and project management.

It is a complete tool that provides full control over all phases of a project – from planning to finance. Everyone involved in projects work and collaborate online are always updated. A project manager can easily plan the project implementation, assign tasks, manage rights and invite external users to participate in the projects. There are no restrictions on the number of projects and external participants.[15]

Facilities:

- Easily create project plans, break deliverables into tasks and assign resources to execute them.
- The project plan can be viewed both as a Gantt chart or a task list.

- Break project into tasks, sub tasks and dependencies.
- Assign resources and share task information.
- Set detail explanations and expectations for each task.
- View project plan in Gantt chart.
- Use previous projects as templates..
- Share documents and important files with the project members.
- Upload and share documents.
- Organize documents in folders.
- Check in and check out for editing.
- Add any of internal or external contacts to projects, and give them appropriate level of access.
- No limit on the number of external participants.
- Share documents and project plan.
- Discuss individual tasks with participants.
- Post messages and discuss on the project wall.
- Review progress and statuses with a growing set of reports.
- Live reporting and analysis.
- Report and analyze data in Excel.
- Assign tasks to internal and external resources.
- Allow participants to comment and discuss the project, individual tasks and give status updates.
- Manage role based access and rights.
- Track task updates.
- Participant work list task management.
- Discuss individual tasks with resources.
- Share project news (wall).[16]

Pricing: - not publicly available

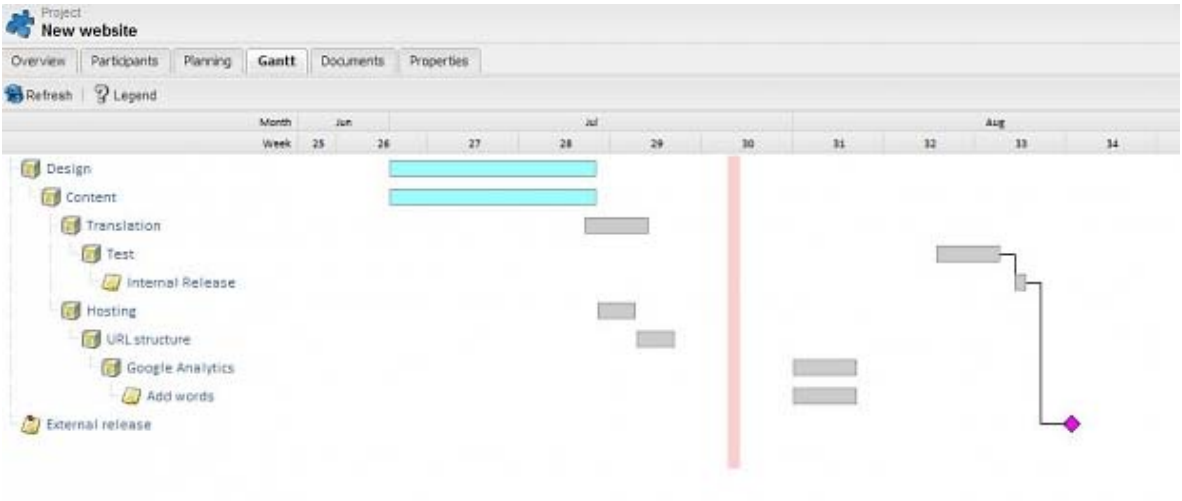

Fig.5 (24SevenOffice)

f. Workfront

Workfront provides a comprehensive, scalable solution that allows organizations across the globe to manage projects, portfolios, work and more. Workfront gives organizations a complete, 360 degree view of their operations, helping every member of the company, from the sales staff to executives, understand, organize and optimize projects. This modern approach to workflow empowers team members to take control and increase productivity.

This is a web-based solution that can be tailored to suit businesses of any size and type, from small advertising firms to enterprise level engineering firms. As such, Workfront pricing varies. It's also suitable for architectural firms, accounting businesses, consulting services and any other organization that uses formal project and portfolio management to get things done.

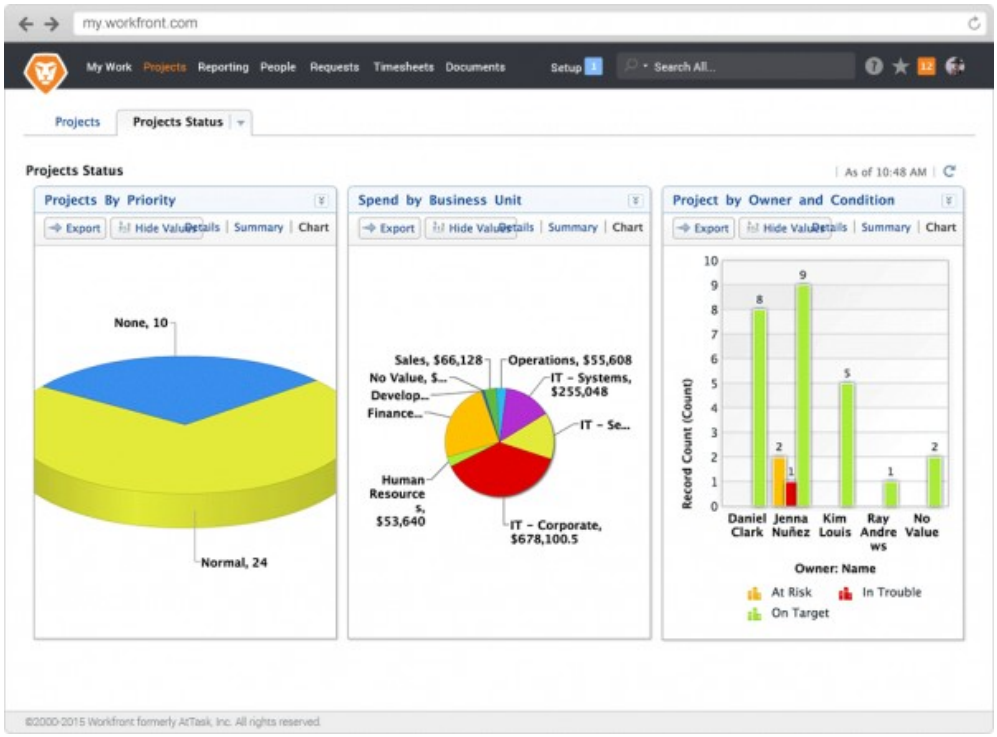

Fig.5 (Workfront)

Workfront provides a simple and intuitive method to streamline, schedule and execute projects. With its interactive Gantt charts, comprehensive real time reporting and customizable project dashboards, Workfront provides complete visibility of the entire project, ensuring projects finish on time and on budget.

With more than 50 standard reports and an unlimited capability to customize to each organization's unique needs, Workfront reports and dashboards are updated in real time, so each team member has access to the most accurate information. It also offers capacity planning, sorting projects by priority and helping companies assign team member and resources to individual tasks. Finally, it empowers teams to work together and gives executives qualitative updates on what tasks are being completed by whom.

Workfront provides an easy-to-use, flexible solution for companies looking to better understand, and thereby improve, their project and portfolio management process.[17]

Pricing : 30 $ /month/user

g. BrightWork

BrightWork is a SharePoint-based project management application that includes a range of best-practice templates and advanced cross-project reporting.

The collaborative templates and automated reporting enable project managers to increase project success and gives senior executives the high level visibility they need to ensure organization satisfaction.

With BrightWork, organizations can get started quickly with just the right amount of project management, and gradually evolve it to where they need it to be.

BrightWork delivers customizable SharePoint templates for managing project types and also for managing across many projects.

Facilities:

- Scalable process request management
- Real-time portfolio dashboards
- High visibility resource management
- Standardized project management templates
- Collaborative toolset
- Automated reported
- Team-focused project sites
- Work management system
- Connected with Microsoft Sharepoint Platform
- Deployment with Low IT Burden interface
- Templates area
- Easy configuration options and management templates

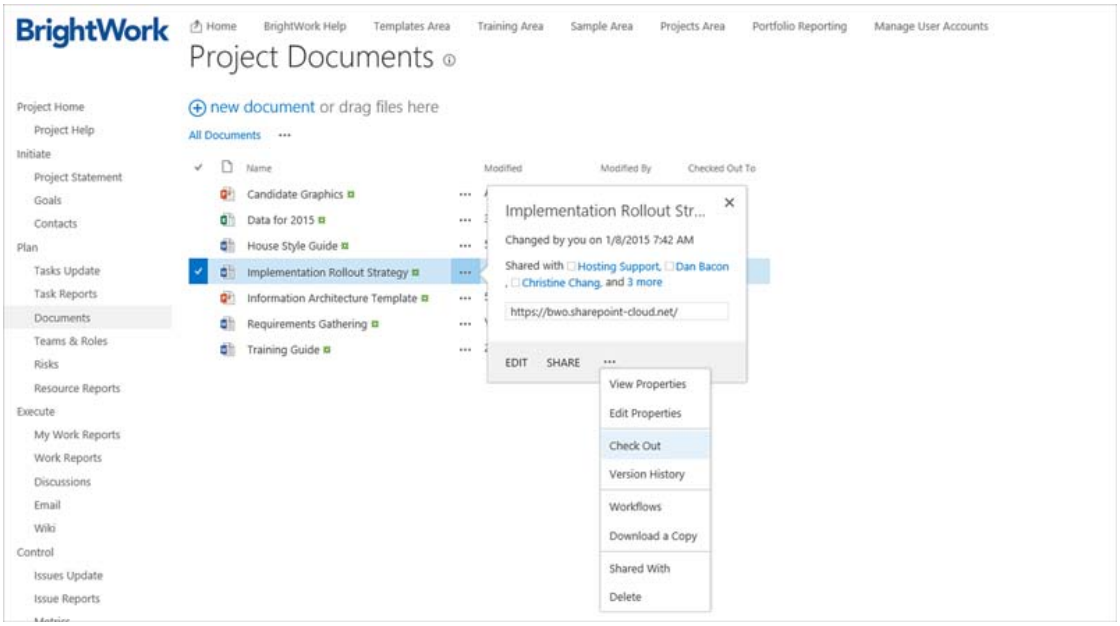

Fig.5 (BrightWork)

BrightWork is available online and on premise for both SharePoint 2013 and 2010 and on premise for SharePoint 2007. [18]

Pricing: from 90$

SYNTHESIS

Following analysis software features and facilities above results the next table:

Facility \ Software	Microsoft Office Project	Basecamp	Jira	5pm	24SevenOffice	Workfront	BrightWork
WEB-based	yes	yes	yes	yes	yes	yes	yes
SaaS	yes	yes	yes	yes	yes	yes	yes
Collaborative	yes	yes	yes	yes	yes	yes	yes
Issue tracking	yes	no	yes	yes	yes	yes	yes
Scheduling	yes	no	yes	yes	yes	yes	yes

Software / Facility	Microsoft Office Project	Basecamp	Jira	5pm	24SevenOffice	Workfront	BrightWork
Project Portfolio Management	yes	no	no	yes	yes	yes	yes
Resource Management	yes	yes	no	yes	yes	yes	yes
Document Management	yes	yes	no	yes	yes	yes	yes
Workflow system	yes	no	yes	yes	yes	yes	yes
Reporting and Analyses	yes	no	yes	yes	yes	yes	yes
Budget Management	yes	no	no	no	yes	yes	no
Time Tracking	yes	no	yes	yes	yes	yes	no
Compatibility	yes	no	no	no	no	no	yes

Table 1 (Technical synthesis)

In order to choose the right software product is necessary to analyze the specific needs and technical facilities of subcomponents of the organization and improvement profitability.

I believe that small-scale testing is required to implement such a system.

It is also necessary to establish the implementation strategy: global, at the organization level or for each subcomponent.

CONCLUSION

In the present warfare conditions, based on new concepts like “computer network centric warfare” and new military technologies, it is strictly necessary implementation and use of modern command and control systems.

This need is particularly pressing in the non-combat activities, where the command is executed through traditional methods which are slow and inefficient.

Considering the fact that any military task can be considered as a small project, the optimal solution is given by project management software.

This type of software market is varied so as well as a variety of options prices.

To fulfil our organizational needs, computer software must meet the following requirements:

- Multi-user
- Collaborative
- Compatible with existing systems
- Web-based

Using this type of software offers a number of advantages such as:

- improving task management
- efficient use of resources
- accessibility from almost anywhere
- easy workflow tracking
- intuitive presentation of evolution tasks
- easy accountability
- fast data updating
- avoid staff overloading
- easy time, risk and cost management
- easy analysis of various scenarios
- real time collaborative work

In conclusion, according to the above, I consider that the implementation and use of project management software according to the organization's needs, especially for non-combat activities, will result in streamlining the command and control and improving resource management process at every level of organization.

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NATO FINANCING

LTC. Mircea URSU

NATO is an International Governmental Organization (IGO) that needs to be financed on day by day basis to ensure their functionality and to provide the facilities required for consultation, decision-making and the subsequent implementation of agreed policies and activities. In this regard, to accomplish its roles, NATO needs capabilities, such as military and civilian manpower, weapon systems, ammunition, airfields, transport, logistic, support, command and control systems, etc. In many cases nations provide these capabilities but in other cases they have to be procured.

The source of financing rests at the level of member countries that make direct contributions to budgets managed directly by NATO, in accordance with an agreed cost-sharing formula that is based on relative Gross National Income[24]. These contributions represent a very small percentage of each member's overall defense budget, and finance the expenditures of NATO's integrated structures, or in many cases from nation's foreign affairs budgets to finance the expenditures of the international staff at NATO HQ. The contributions follow the principle of common funding, that is to say, member countries pool financial resources within NATO and make use of them in a very well regulated framework.

In addition, equally important, the nations are making indirect contributions to NATO. For instance, if nations decide independently to develop a capability or to participate in various projects conducted under the NATO Charter there are available funding mechanism like national funding, multinational funding or joint funding. In some cases the projects can take the form of trust fund arrangements, contributions in kind, ad hoc sharing arrangements or donations. Even more, as it was accomplished with the NATO reform, a relatively old financing mechanism in NATO become the current funding mechanism for the most of NATO Agencies, namely the "Customer Funding Regime".

[24] GNI measure the economic growth of a given country and represent the value of the services and products a country produces within in a calendar year combined with interest payments and dividends from outside countries in the same year.

1. Direct contribution to NATO

1.1. The principle of common funding:

In broader terms the common funding can be seen as a visible sign of the willingness of nations to share roles, risks and responsibilities in which the Allies provide the funding and the NATO Strategic Commands identify the requirements and set the priorities aimed at the provision of core capabilities outside the reach of individual nations.

As soon as a need for expenditure has been identified, countries discuss whether the principle of common funding should be applied – in other words whether the requirement serves the interests of all the contributing countries and should therefore be borne collectively.

The common funding is based on criteria that are held under constant review and changes may be introduced as a result of changing circumstances, for instance, the need to support critical requirements in support of Alliance operations and missions.

As I previously stated the common funding provide only funds where NATO authorities identify the requirements and set the priorities in line with overarching Alliance objectives and priorities. Common funding arrangements principally include the NATO civil and military budgets, as well as the NATO Security Investment Programme (NSIP).

As a general rule all expenditures have to be “eligible” for common funding wherever they are referring to the military budget or the NATO Security Investment Programme. The guiding principle for eligibility is the “over and above” rule: “common funding will focus on the provision of requirements which are over and above those which could reasonably be expected to be made available from national resources”. Generally speaking, if we are referring to the NSIP where this rule have been implemented for the first time, this means that those items which that cannot be provided by nations through the Defense Planning Process may be procured using common funds but only if they are required and affordable. In practice, it is not always evident what a nation could reasonably be expected to provide so eligibility under the “over and above” principle is often determined on case-by-case basis.

Common funding arrangements principally include the NATO civil and military budgets, as well as the NSIP.

1.2. The Civil Budget:

The Civil Budget operates as an annual budget and provides funds for personnel expenses, operating costs, and capital and programme expenditure of the International Staff at NATO HQ. It is financed from national foreign ministry budgets (in most countries), supervised by the Budget Committee and implemented by the International Staff. The Civil Budget is formulated on an objective-based framework, which establishes clear links between NATO's strategic objectives and the resources required to achieve them.

Usually, the Civil Budget provide funding for recurring expenses, but in cases such as the new NATO HQ building, it may become involved with large non-recurring expenses also. The nations are contributing to this budget in accordance with an agreed cost-sharing formula that is based on GNI but in some cases exceptions are applied. It is the case for the new NATO HQ where the cost sharing formula is calculated taking into account the spaces shared between shareholders like embassies from NATO nations, NATO nation delegates, NATO International Staff (civilian and military), NATO Agencies and others.

1.3. The Military Budget:

The Military Budget covers all expenses for the personnel that are working in the International Military Staff and in the Military Command Structure, operation and maintenance of the NATO Command Structure (NCSEP - NATO Command Structure Entities and Programs), the NATO Early Warning fleet (NAEW), the pensions of retired personnel and the expenditures for the ongoing Allied Operations and Missions (AOM).

The Military Budget operates as an annual budget, and it is controlled by the same Committee as the Civil Budget, namely the Budget Committee. Expenditures are implemented by the strategic commands and the funds are provided from the Defense Budgets in the nations. Most of its funding is used for recurring expenses. As is the case for the Civil Budget the nations are contributing to this budget in accordance with an agreed cost-sharing formula that is based on GNI, but in some cases exceptions are also applied. Is the case for the NAEW Programme to which the contribution is being done by the participating member states only based on a specific cost sharing formula. Pending on operational situations for the NAEW Programme some incremental cost can be borne by the Military Budget with the contribution from al NATO members.

1.4. The NATO Security Investment Programme:

The NATO Security Investment Programme (NSIP) originally known as the infrastructure programme covers the expenditures for the major construction and command and control system investments, which are beyond the national defence requirements of individual member countries. It supports the roles of the NATO strategic commands by providing installations and facilities such as air defence communication and information systems, military headquarters for the integrated structure and for deployed operations, and critical airfield, fuel systems and harbour facilities needed in support of deployed forces.

Since it is not possible to implement NSIP projects within the window of an annual budget, the NSIP operates as a multi-annual programme rather than as a budget. Nevertheless, expenditures are reported periodically during the year in order to satisfy the budgeting requirements. The NSIP is controlled by the Investment Committee and expenditures are implemented by Host Nations, military commands, and NATO Agencies. The funds are provided from the nation's Defense Budgets in accordance with an agreed cost-sharing formula that is also based on GNI. The programme has no bank account. Nations make their contributions through the device of the Pay Sheet. A Host Nation, in implementing a project, will pay the contractor in full. Depending on the Host Nation's cost share of the progamme, the Host Nation may then receive funds from other nations or pay other nations in compensation for their projects. All this is monitored and controlled by the NATO International Staff.

1.5. The Medium Term Resource Plan (MTRP)

The MTRP is the primary document used for short to medium-term resource planning. Developed by Resource Policy and Planning Board and approved by NAC, the plan aims to facilitate planning stability by providing a five-year outlook of the requirements for military common funding, assessing the affordability of those requirements in the light of NATO Military Authorities consolidated impact statement, and by making recommendations on the resources to be allocated to the Military Budget and the NATO Security Investment Programme.

The NATO Military Authorities consolidated impact statement provides an assessment of the impact of potential common-funded resources constrains on military activity and capabilities throughout the three resource pillars (manpower, budget and NSIP).

The MTRP builds on the Consolidated Resource Proposal and the Annual Financial Report. The CRP aims to identify the resources required to fulfill the required capabilities.

The MTRP is reviewed every year and as such, it reports on the use of common funds to achieve NATO's objectives and proposes expenditure ceilings for common funding in the following year for the Military Budget and the NSIP.

1.6. Cost sharing calculation

In 2005, after reviewing existing burden sharing arrangements, NATO's Senior Resource Board recommended a new formula that seeks to be "fair, equitable, stable, and objectively based, with an automatic mechanism for regular updates. The new formula excludes from its calculations the United States, which negotiated a ceiling for its cost share percentages at the existing rate (22.2% from total expenditures). The allies also agreed that if new members join the alliance, U.S. contributions would decline on a pro rata basis. The new pro rata apportionment will apply to cost shares after the limited U.S. share has been subtracted. The military and NSIP budgets would be similarly adjusted to account for French participation.

The formula is being based on GNI data, representing an average of figures using current prices and data measuring purchasing power parity, both taken from the World Bank's World Development Indicators. The formula will use a two-year rolling average of each country's GNI to smooth out annual fluctuations. The revised cost share plan was introduced in January 2006, and is being gradually phased in over a 10-year transition period. After additional review, NATO staff recommended in 2006 that future burden sharing arrangements take into account several other factors besides GNI, including nationally provided staffing for critical NATO operational activities, NATO Airborne Early Warning, benefits from NSIP and other projects, and NATO staffing levels. It was recommended that NATO biennially review each nation's contributions to specified NATO operations over the previous four years and adjust the final share according to those contributions.

In the following table is presented the NATO common-funded budgets and programmes cost share arrangements valid from 1/1/2015 to 31/12/2015.

Nation	Civil Budget at "28"	Military Budget at "28"	NSIP at "28"
Albania	0.0870	0.0870	0.0870
Belgium	2.0137	2.0368	2.0368
Bulgaria	0.3247	0.3247	0.3247
Canada	6.0915	6.0915	6.0915
Croatia	0.3066	0.3066	0.3066
Czech Republic	0.9421	0.9421	0.9421
Denmark	1.2113	1.2663	1.2663
Estonia	0.1006	0.1006	0.1006
France	11.1421	10.9682	10.9682
Germany	14.5053	14.6439	14.6439
Greece	1.1029	1.1029	1.1029
Hungary	0.6985	0.6985	0.6985
Iceland	0.0430	0.0430	0.0430
Italy	8.7250	8.7250	8.7250
Latvia	0.1383	0.1383	0.1383
Lithuania	0.2132	0.2132	0.2132
Luxembourg	0.1525	0.1525	0.1525
Netherlands	3.2547	3.2696	3.2696
Norway	1.5486	1.5486	1.5486
Poland	2.6343	2.6343	2.6343
Portugal	0.9497	0.9497	0.9497
Romania	1.0553	1.0553	1.0553
Slovakia	0.4529	0.4529	0.4529
Slovenia	0.2200	0.2200	0.2200
Spain	5.2390	5.2190	5.2190
Turkey	4.1305	4.1305	4.1305
United Kingdom	10.9773	10.4790	10.4790
United States	21.7394	22.2000	22.2000
TOTAL	100.0000	100.0000	100.0000

2. Indirect contributions to NATO

The funding mechanism such as national funding, multinational funding and joint funding are being considered as indirect contributions to NATO. The basic principle that governs the indirect financing of NATO is “costs lie where they fall”. In other words the principle is saying that each country will pay all costs associated with their participation into a NATO lead operation.

2.1. National funding

National planning and defense spending are, in many cases, influenced by Alliance policy and planning activities, which set the overall framework, the level of ambition and the capability targets to be achieved. In this regard the priorities are to be considered. Standardization and interoperability requirements also play an important role. Notwithstanding these factors, however, member countries remain responsible for their own capability development and for the use of those capabilities. In some circumstances, countries choose to cooperate in pursuit of capabilities. This cooperation is often focused on the development of capabilities beyond the means of individual countries, especially smaller ones, deriving benefits from economies of scale, and the conduct of crisis response operations.

Each NATO nation allots funds for different purposes in its annual budget. A significant portion of these funds are reserved for defence and foreign affairs. The greatest part of national contributions come through participation in NATO-led operations and missions, and in efforts to ensure that national armed forces are interoperable with those of other member countries. Member countries incur the deployment costs involved whenever they volunteer forces to participate in NATO-led operations. Following the principle “costs lie where they fall”, with a few exceptions, member countries pay for their own deployed military forces and military capabilities.

However, some of these funds are used by the nation to pay salaries (especially the salaries of armed forces) and to purchase capabilities (such as weapon systems) that are commited to NATO use. In NATO resource community, these funds are known as “National Funding”.

2.2. Multinational funding

Multinational cooperation outside the formal NATO framework involving two or more nations takes many forms. It ranges from the exchange of students at military academies, to logistic support arrangements, combined procurement of equipment, and development of complex weapon systems. Financial activities range from barter agreements, military sales, payments for services rendered, to combined buys and cost-shared development programms. Such funding may be also used for satisfying the capabilities requirements identified within NATO Defence Planning Process. NATO as an organization has neither direct influence nor organized visibility over these cooperative activities.

2.3. The joint funding:

Joint funding arrangements are structured forms of multinational funding within the terms of an agreed NATO charter. The participating countries still identify the requirements, the priorities and the funding arrangements, but NATO has visibility and provides political and financial oversight.

Joint funding arrangements typically lead to the setting-up of a management organisation within a NATO agency. NATO agency activities range from the development and production of fighter aircraft or helicopters to the provision of logistic support or air defence communication and information systems. NATO agencies also coordinate research and development activities or are active in the fields of standardization and intelligence-sharing.

Jointly funded programmes vary in the number of participating countries, cost-share arrangements and management structures.

2.4. Other forms of funding

In addition to common funding and joint funding, some projects can take the form of trust fund arrangements, contributions in kind, ad hoc sharing arrangements and donations. The most important trust fund is the one supporting the sustainment of the Afghan National Army. It is important to know that indirect contributions to NATO are being done not only by NATO member states but partner nations too.

3. The Customer Funding Regime

The customer funding concept is that customers define their priorities, obtain funding for them and negotiate contracts for their implementation. The aim of the customer funding concept is to empower the customer to secure the best value for money in obtaining the services it requires. The essence of the concept therefore is that the customers own the requirements and associated funding and seek the most cost-effective source of supply.

As customer funded organizations, and as integral part of NATO, the NATO Agencies work with their customers on different terms as those that would be applicable to a commercial company (ex. the NCI Agency usually requires advance funding for the work it carries out).

The eligibility for being customer for Agencies has being granted by the North Atlantic Council (NAC), through the Charters of the associated NATO Organizations, and in this way the Agencies have the authority to conclude Administrative Agreements with other NATO bodies e.g. NATO Commands or other Agencies.

The Agencies aims for transparency in their pricing. Applying Service Industry standard practice the Agencies charge their customers based on the direct costs of the services provided and the Customer Rates. All sponsors are treated equally with the same Customer Rates applied to all.

Customer Rates are endorsed by the Agency Supervisory Board and approved for customers by the Budget Committee and are fixed for one year and are non-negotiable. In line with the mandate to break-even (no profit / no loss), the revenue generated from their activities is used to cover for the Agencies operating costs, running and general administrative expenditures and, where applicable, recuperate internal capital investments.

4. Financial Management and Control

Managing the NATO Financial System is relatively similar to any other international organization in the world. The political pressure exists to save the money and to extract efficiencies in the context of limited budgets and tight ceilings. In this context nations are seeking to have the ultimate control of expenditure and to reach the consensus among them on financial allocations.

Under the overall authority of the NAC, the designated bodies exercise managerial control over the principal elements of the Organization's financial structure: the International

Staff, financed by the civil budget; the international military structure, financed by the military budget; and the NATO Security Investing Program, financed throughout its own compensation mechanism.

The NATO Financial Regulations and the implementing rules and procedures govern NATO financial management. The Financial Regulations applied to NATO is providing basic unifying principles around which the overall financial structure is articulated. They can be revised by the Budget Committee and approved by the NAC and are complemented by rules and procedures adapting them to specific NATO bodies and programmes initiated under the NATO Charter.

4.1. Financial management of the civil and military budgets

The basic principle that is applied for developing the civil and military budgets is the principle of annularity, starting at 1st of January and ending at 31st of December. Each budget is prepared based on approved ceilings in the Medium Term Financial Plan (MTFP) for the Civil Budget and the Medium Term Resource Plan (MTRP) for the Military Budget, under the authority of the head of the respective NATO body. The drafted Budgets are screened in the Budget Committee composed of representatives of contributing member countries, and approved for execution by the NAC.

In the case of not achieving consensus over the budget approval before the start of the financial year, under the supervision of the Budget Committee, provisional allocations limited to the level of the budget approved for the preceding year are authorized. This regime may last for six months, after which the NAC is required to decide either to approve the budget or to authorise continuation of interim financing.

As soon as the budget has been approved, the head of the NATO body has the authority to execute it by entering into commitments, obligations and make payments for the purposes for which the budget credits have been approved and within the limits of such credits and within the total amount of approved contract authority for the purpose for which such contract authority has been granted. This authority is limited by different levels of constraint prescribed by the Organization's financial regulations regarding such matters as recourse to competitive bidding for contracts for the supply of goods and services, or transfers of credits to correct over- or under-estimates of the funding required. If the contract is longer than the period for which the

budget is approved (one year) a contract authority to commit NATO fund is required from the Budget Committee.

At the end of the financial year the unexpected balances of committed credits would be carryover to the next year in order to be used according to their commitment. The uncommitted credits will expire and by default will be returned to the contributing nations. In special situations and on case by case bases the uncommitted credits can be „special carryover" and committed in the next financial year according to their approval for „special carryover" by the Budget Committee.

The financial execution of the budget is reported using the Financial Statements that are complying with the International Public Sector Accounting Standards that the NATO Military Authorities have implemented.

According to NATO Financial Regulation the calls for contribution have to be assessed on the basis of the budget authorizations and issued to nations three times per year only if nations do not decide otherwise. The installments are calculated to restrict total currency holdings to the minimum required to meet forecasted NATO requirements.

4.2. Financial management of the NATO Security Investment Programme

The implementation stage within the NSIP starts mainly with the approved projects from capability packages. The capability packages address the investments required by NATO military authorities to fulfill specified tasks and provide estimations of common-funded supplements (in terms of capital investment and recurrent operating and maintenance costs) as well as the civilian and military manpower required to accomplish the task. They are evaluated by the Resource Policy and Planning Board from the perspective of resources allocation (ex. eligibility and affordability) and then approved by the North Atlantic Council.

When Capability Packages are approved, authorization for individual projects can move forward under the responsibility of the Investment Committee. The country or agency that is "Host Nation" may now submit to NATO detailed fund requests for the projects within the Capability Package. The fund request is "screened" on behalf of the Infrastructure Committee by the International Staff, with the help of expert working groups where appropriate. This is the process by which the project is scrutinised for compliance with criteria and standards,

conformance with agreed policy, satisfaction of the military requirement, consistency of costs, interoperability, cost sharing, legal and environmental requirements.

The ceiling of NSIP expenditure is approved within the Medium Term Resource Plan (MTRP) and the financial management system which applies to the program is based on an international financial clearing process. Host nations report on the expenditure foreseen on authorised projects within their responsibility. Following agreement of the forecasts by the Investment Committee, the International Staff calculates the amounts to be paid by each country and to be received by each host nation. Further calculations determine the payment amounts, currencies and which country or NATO agency will receive the funds.

The final step when a project has been completed is the Joint Final Acceptance Inspection to ensure that the work undertaken is in accordance with the scope of work authorized, all deficiencies affecting the operations have been corrected, all financial audit observations have been cleared, the books have been balanced, and the Certificate of Final Financial Acceptance has been issued. As soon as all this conditions are fulfilled the project is accepted by the Investment Committee, and finally it is added to the NATO inventory.

4.3. Financial control

For the military and civil budgets, the head of the NATO body is ultimately responsible for the correct preparation and execution of the budget. The administrative support for this task is largely entrusted to the Financial Controller of the NATO body and follows the principle of segregation of duties between the contracting and accounting officer.

Each Financial Controller has final recourse to the Budget Committee for resolution of any persistent doubt or disagreement he may have with the head of the respective NATO body regarding compliance of any proposed measure or decision with the provision of NATO Financial Regulation. The Financial Controller is charged with the responsibility of ensuring that all aspects of budget execution match the authorized expenditure, and are in accordance with any special controls imposed by the Budget Committee, the financial regulations and their associated implementing rules and procedures. He may also, in response to internal auditing (level 1 auditing by Financial Controller and level 2 auditing by Strategic Commanders), institute such additional controls and procedures as he deems necessary for maintaining accountability.

4.4. The external audit - International Board of Auditors

The International Board of Auditors for NATO (IBAN) conducts financial audits of NATO bodies that result in an audit opinion on the presentation of the financial statements and on the compliance with budgetary authorizations and applicable regulations. The IBAN provides the North Atlantic Council and the governments of NATO member states with assurance that financial reporting is true and fair and common funds have been properly used for the settlement of authorized expenditure.

For the NATO Security and Investment Programme (NSIP) audits cover the expenditure made by NATO bodies and member countries under the NISP. The audit results in the certification of the final amount charged to NATO.

The Board's mandate also includes checking that the activities of NATO bodies have been carried out not only in compliance with the regulations in force but also with efficiency and effectiveness.

5. Committees involved in the NATO financing

Providing resources for NATO several Committees make decisions affecting the resource community. All decisions require a consensus (meaning that no member nation disagrees).

5.1. The North Atlantic Council (NAC)

The NAC is senior committee in NATO to which all other committees reports either directly, or through other committees. The NAC is taken many decisions in the area of resources such as the annual ceiling contributions to civil and military budgets and to NSIP. The NAC is also approving the Capability Packages.

5.2. The Resource Policy and Planning Board (RPPB)

The RPPB is responsible to the NAC for common funding resource management. The main function of the RPPB is to determine the affordability and eligibility for common funding. It has responsibility for the overall management of NATO's civil and military budgets, as well as the NSIP and manpower. The RPPB recommends to NAC annual contributions ceiling for civil and military budget and for the NSIP. The RPPB activity is supported by NATO Office of Resources.

5.3. The Budget Committee (BC)

The BC is responsible to the NAC, through the RPPB, for the common funding for the Civil and Military Budget. The BC reviews and recommends civil and military budgets for all NATO civilian and military entities and approves the Customer Rates for the customer funded NATO Agencies. The BC supervises the budget execution and is reporting to the RPPB on this matter. The BC reviews the NATO Financial Regulation and develops the complementary rules and procedures.

5.4. The Investment Committee (IC)

The IC is responsible to the NAC for the implementation of NSIP projects. The roles of the IC include the screening of project proposal from a technical and financial point of view and reconfirming eligibility at the project level. The IC grants the authorization to Host Nation to commit funds for the approved projects, decide on procurement issues and accepts the projects into NATO inventory. The IC manages the NSIP from a financial point of view within the approved expenditure ceiling and calls forward payments from contributing nations in accordance with approved expenditure forecasts.

6. CONCLUSIONS

The NATO financing is a visible sign of the willingness of nations to share roles, risks and responsibilities and is directed linked to the NATO defence planning process and to Alliance priorities aiming at the provision of core capabilities outside the reach of individual nations.

The NATO common funding complements national activities and acts as a force multiplier and provides a “ready-made” environment for the implementation of a wide variety of requirements. It is performing in a very well regulated framework agreed by member countries.
NATO member countries make direct and indirect financial contributions to the Organization. The largest contribution is being done indirectly and voluntarily by nations mainly through their participation to capability development. Direct contributions are being done to finance the requirements of the Alliance for which costs are borne collectively and serve the interest of all nations.

The funding process is overseen by the North Atlantic Council, managed by the Resource Policy and Planning Board, and implemented by the Budget Committee and the Investment Committee.

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THE PARTNERSHIP FOR PEACE ASPIRATIONS AND CHALLENGES

LTC George Florin VASILIU

The Partnership for Peace (PfP) is a programme of practical bilateral cooperation between individual Euro-Atlantic partner countries and NATO. It allows partners to build up an individual relationship with NATO, choosing their own priorities for cooperation.

The actual PfP program was launched in January 1994 and enabled each Partner to develop individual cooperative relations with NATO. At first, the Partnership focused on the development of forces that would be interoperable with those of NATO, and on issues such as civil emergency planning. The Partnership also provided the mechanisms enabling Partners to take part in NATO-led operations if they wished to do so. Any Partner also has had the right to consult with the Alliance, if it perceived a threat to its political independence, security, or territorial integrity.

NATO's November 1991 Rome Summit proposed the creation of the North Atlantic Cooperation Council (NACC) as a forum for a structured dialogue with former Warsaw Pact countries.

Initially, the NACC focused on residual "Cold War" security concerns, for example the withdrawal of Russian troops from the Baltic States. Meanwhile, improving political cooperation centred on security and defence-related issues including: defence planning, future concepts for arms control, civil-military relations, air traffic management and the conversion of defence industries to other economic purposes. Partners also associated themselves with the Alliance's scientific and environmental programs.

In 1996 NATO re-examined its partnership strategy, created the Euro Atlantic Partnership Council (EAPC) and proposed an Enhanced and More Operational Partnership (EMOP).

The scope of consultations was expanded to include crisis management, regional and arms control issues, the proliferation of weapons of mass destruction and international terrorism.

It also enabled discussion of defence issues - such as defence planning, defence budgets and defence policy and strategy. Civil emergency and disaster preparedness, armaments cooperation, and defence-related environmental operations were also included.

EMOP developed further, based on the accumulated experience of the Partnership and lessons learned in NATO-led peacekeeping operations. Under the Planning and Review Process (PARP), interoperability and capability requirements are laid down for participants to attain and this helps Partners to develop the capabilities that will provide the backbone to the more operational aspects of the Partnership. PARP has been refined to resemble the Alliance's own defence planning process. The Operational Capabilities Concept (OCC) was then developed to enable NATO commanders to know what Partner forces are available and how capable they are of assisting. PARP and OCC combine together to help improve the military effectiveness of the forces assessed.

The EMOP also includes measures to improve training and education efforts, through a PfP Training and Education Enhancement Program (TEEP), designed to meet the current and future demands of the Partnership. Even though training and education typically remains a national responsibility, the program is helping to improve interoperability and promote greater cooperation and dialogue among the wider defence and security communities in NATO and Partner nations, thus ensuring the best use of human and other resources.

1. OVERVIEW ON PARTNERSHIP FOR PEACE

After the collapse of the first communist governments in 1989, the Alliance at its London Summit in July 1990 announced that it would "reach out to the countries of the East . . . and extend the hand of friendship," suggesting also that "military contracts" are drawn up between NATO and Warsaw Pact commanders. The Alliance issued a Declaration on Peace and Cooperation in the thaw of the post-Cold War world to start its outreach to its former adversities[25].

A series of questions were arisen in front of the leaders, like: What could be done to seize the opportunity to set European security affairs on a new, more positive path after the confrontations of the Cold War? What steps could be taken to restore normality to relations among all the countries of Europe, East and West? What help could be given to the states of

[25] Yost 2000, Duignan 2000

Central and Eastern Europe and the former Soviet Union to consolidate their newly found independence and to realize their ambitions to participate fully as democratic countries, both regionally and in the wider world, in addressing multinational security concerns?

The opportunities for achieving Alliance objectives through political means were greater than ever before. Changing the idea of the "hand of friendship" with the “partnership” concept, the PfP program was conceived as a centre piece of NATO's outreach without providing a security guarantee - and was viewed, at the time the program was created, and alternative to enlargement. The PfP garnered more support than enlargement and allowed European neutral countries to be closer to the Alliance[26].

The basic aims of PfP were to promote transparency in national defence planning and military budgeting and the democratic control of national armed forces, as well as to develop the capacity for joint action between forces from Partner countries and those of NATO member countries, for example, in peacekeeping or disaster-response operations.

The political essence of partnership and cooperation at the multinational level consists of regular consultation and contacts on practical cooperation activities designed to build transparency and confidence throughout the Euro-Atlantic area.

The Partnership for Peace, which operates under the authority of the North Atlantic Council - NAC, forges new security relationships between the North Atlantic Alliance and its Partners for Peace. Partner states are invited by NAC to participate in political and military bodies at NATO Headquarters with respect to Partnership activities. The Partnership expands and intensifies political and military cooperation throughout Europe and beyond, meaning Caucasian areas and Mediterranean countries, increase stability, diminish threats to peace, and build strengthened relationships by promoting the spirit of practical cooperation and commitment to democratic principles that underpin our Alliance.

The Partnership does not however involve any guarantees of security such as those that exist between NATO member states in accordance with Article 5 of the North Atlantic Treaty.

To promote closer military cooperation and interoperability with the Partner countries, NATO has developed, within the Partnership framework, peacekeeping field exercises beginning in 1994 and has invited states participating in the Partnership to send permanent liaison officers to NATO Headquarters and Partnership Coordination Cell at Mons (Belgium).

[26] Kay 1998, Goldgeier 1999

Any country wishing to join the Partnership for Peace is first invited to sign the Framework Document. By virtue of their signature, countries reiterate their political commitment to the preservation of democratic societies and to the maintenance of the principles of international law.

A country that participates in the Partnership for Peace program has its own Individual Partnership Program (IPP) to facilitate individual security cooperation and a consultation with NATO.

After signing the Framework Document, the next step in the procedure is for each Partner to submit a Presentation Document to NATO. This document indicates the steps, which will be taken to achieve the political goals of the PfP, the military and other assets the Partner intends to make available for Partnership purposes, and the specific areas of cooperation, which the Partner wishes to pursue jointly with NATO.

The PfP Framework Document commits NATO to developing with the Partner countries a planning and review process, designed to provide a basis for identifying and evaluating forces and capabilities which might be made available for multinational training, exercises and operations in conjunction with Alliance forces.

Since PfP's inception in 1994 interoperability has been a core element in NATO's cooperation with Partners. The PfP Planning and Review Process (PARP), which was introduced in 1994 and considerably strengthened in 1997, is one of the most important vehicles for development of interoperability.

The PARP is offered to Partners on an optional basis and draws on NATO's extensive experience in defence planning. It is in essence a biennial process involving both bilateral and multilateral elements.

A set of Partnership Goals is also prepared, in order to set out the measures each Partner needs to introduce in order to make its armed forces better able to operate in conjunction with the armed forces of NATO countries.

The evolution of PARP makes it resemble the Alliance defence planning process. However the Allies may seek from Partners additional forces and capabilities required for the success of non Article 5 crisis management operations: support and augmentation modules or national staff officers for CJTF operations, capabilities to address risks posed by the proliferation

of weapons of mass destruction and their delivery means and other particular valuable but scarce resources required for such operations are examples.

The Partnership Work Program (PWP) is the NATO menu of PfP activities, both civil and military, developed annually from inputs from Strategic Commands, NATO and Nations and approved by NAC (North Atlantic Council). These activities consist of workshops, seminars, language courses and exercises, which are open to all. There is something like 1200 activities in the PWP for 2003-2004.

Over the years, 33 countries have joined the PfP and signed the PfP Framework Document.

Most of these countries signed the PfP Framework Document aspiring to become NATO members, especially those European. The others, the Central Asia countries for instance, have wanted only to share NATO experience, to get NATO assistance in their own military reform process and to seek for regional security guaranties.

There is another category of European countries that participate in the PfP programs, high interoperable with NATO and big contributors in NATO-led operations, who look for EU integration and/or for NATO cooperation only. These are Austria, Sweden, Finland and Switzerland.

These PfP members' main interests in participating in the PfP involve such aspects as training in various security policy matters; peacekeeping missions; international law relating to war; seminars and conferences on security policy; arms control; medical services, and search and rescue services. These states are at the same time very interested in exchanging expert information in key areas of international security, to which NATO members and the partner states will have shared access.

2. THE PARTNERSHIP FOR PEACE PROGRAM

In the post-Cold War strategic environment, partnership and cooperation has become a central feature of Alliance strategy and activities, which are aimed at enhancing security and stability throughout the Euro-Atlantic area. This commitment is reflected in NATO's new Strategic Concept[27], issued in 1999, which specifically includes partnership and cooperation as one of its fundamental security tasks.

[27] www.nato.int.docu/1999/p99-065e.htm

After the long decades of European division are over, the Western Europe seek to build constructive partnerships with the Soviet Union and the other countries of Central and Eastern Europe in order further to promote security and stability in a free and undivided Europe which recognize the political, economic, social and ecological elements of security, along with the indispensable defence dimension.[28]

Many programs have been started by NATO since 1991 that help foster the close cooperation and working relationships that have been developed among NATO/PfP members since the end of the Cold War.

Today, 22 Partners use the EAPC to consult regularly with 28 NATO Allies on all aspects of security in all regions of the Euro-Atlantic area.

NATO embodies the transatlantic link by which the security of North America is permanently tied to the security of Europe and contributes to the continent's integration and stabilization process through enlargement using the PfP program[29].

The EAPC

In order to raise to a qualitatively new level their political and military cooperation, building upon the success of NACC and PfP, the member countries of the NACC and participating countries of the PfP, have decided, at Sintra, Portugal, in May 1997, to establish a Euro-Atlantic Partnership Council - EAPC. In doing so, they reaffirmed their joint commitment to strengthen and extend peace and stability in the Euro-Atlantic area, on the basis of the shared values and principles, which underlie their cooperation, notably those set out in the Framework Document of the Partnership for Peace.

The EAPC, as the successor to NACC, provides the overarching framework for consultations among its members on a broad range of political and security-related issues, as part of a process that will develop through practice.

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[28] *Statement issued by the North Atlantic Council Meeting in Ministerial Session in Copenhagen, 6-7 June 1991*

[29] Goldgeier, John M (1999) Not Whether but When: The U.S. Decision to Enlarge NATO. Brookings Press, Washington, D. C

The EAPC adopts his own Work Plan for Dialogue, Partnership and Cooperation. The activities included in the Partnership Work Program (PWP) also come under the general purview of the EAPC.

Specific subject areas on which Allies and Partners can consult, in the framework of the EAPC, may include but are not limited to: political and security related matters; crisis management; regional matters; arms control issues; chemical, biological, radiological and chemical (CBRN); proliferation and defence issues; international terrorism; defence planning and budgets and defence policy and strategy; security impacts of economic developments.

While the EAPC is a multilateral forum, it also serves as the political framework for the Partnership for Peace (PfP), a major program of bilateral cooperation between NATO and individual Partner countries.

The Partnership Coordination Cell

The Partnership Coordination Cell (PCC) is a unique PfP structure, based at Mons, Belgium. It was established under the authority of the NAC and executes its tasks under the direct authority of the both NATO Strategic Commanders[30].

The Alliance decided to create the PCC in the earliest stage of formulating the Partnership for Peace program. The Framework Document dated 10 January, 1994, which invites non-NATO nations to join the Partnership, specifically mentions the Cell, though on that day the Cell was merely a concept.

The PCC is an organization, which has indeed developed quickly. Under the direct auspices of the NAC, but not formally part of NATO's integrated military structure, PCC has achieved significant success in developing liaison between NATO and Partner nations.

The tasks of the PCC is to coordinate joint military activities within PfP and carry out the military planning necessary to implement the military aspects of the Partnership Work Program, notably with respect of exercises and related activities in such fields such as peacekeeping, humanitarian operations and search and rescue. The PCC also participates in the evaluation of such military activities.

The PCC as an important player in the development of relations between nations represents the "cutting edge" of PfP!

[30] http://www.nato.int/docu/handbook/2001/hb030206.htm.

NATO and the two special partnerships with Russia and Ukraine

Since the end of the Cold War, NATO has attributed particular importance to developing cooperation with Russia, whose involvement is critical for any comprehensive post-Cold War system of European security. Over the past decade, NATO and Russia have succeeded in achieving substantial progress in developing a genuine partnership and overcoming the vestiges of earlier confrontation and competition in order to strengthen mutual trust and cooperation.

On 28 May, 2002, NATO member states and Russia adopted and signed the Rome Declaration, creating the NATO-Russia Council (NRC), a mechanism for consultation, consensus-building, cooperation, joint decision and joint action on a wide range of security issues in the Euro-Atlantic region.

The NRC provides a more effective and flexible mechanism for joint analysis, joint decisions and joint actions, operating on the principle of consensus.

Building upon early cooperation in the framework of the NACC from 1991 onwards, Russia joined the PfP in 1994 and agreed to pursue "Broad, Enhanced Dialogue and Cooperation" with NATO, extending beyond the scope of cooperation envisaged in the framework of PfP.

In the same time, the NAC meets Ukrainian representatives, normally twice a year, in the forum Charter called the NATO-Ukraine Commission. The role of the Commission is to assess implementation of the Charter and to discuss ways to improve or further develop cooperation. The first NATO-Ukraine Summit Meeting was held in Washington in April 1999.

NATO and Ukraine continues to deepen their cooperation in PfP and within the framework of the NATO-Ukraine Charter, with the aim of addressing common security challenges, developing the interoperability that provides a practical foundation for this joint work and further developing defence reforms.

Among the non-candidate countries, Ukraine has been the most active and frequent host of NATO military exercises on the ground and at sea. It is the only non-candidate country to maintain a joint military unit with a NATO member country: the Polish-Ukraine Joint Battalion, which participates in NATO peacekeeping operations.

Mediterranean Dialogue and Istanbul Cooperation Initiative

NATO's Mediterranean Dialogue was launched in 1994 on the assumption that 'security in Europe is closely linked to security and stability in the Mediterranean' and with an overall aim 'to contribute to regional security and stability'. 'Non-discrimination' and 'self-differentiation' are the key principles of the Dialogue: while all the countries are offered the same menu of activities for co-operation, they are free to choose the intensity and extent of their participation. Activities for cooperation range from seminars and workshops in the field of information, science and the environment, and crisis management to military co-operation. The latter includes observing NATO/PfP exercises and attending courses at the NATO School (SHAPE) in Oberammergau (Germany) and at the NATO Defence College in Rome (Italy).

In the run up to Istanbul the following proposals have been circulating: keeping the Mediterranean Dialogue as it is; creating a Partnership specifically tailored to the Mediterranean countries; or, merging the Mediterranean Dialogue with the EAPC/PfP. The latter has reportedly been removed from the table, because it is already too difficult to implement activities with the present range of members in the EAPC/PfP. In this regard one official from a Mediterranean country insisted on the 'specificity' of the countries involved, stressing that they cannot be compared to Eastern European or Central Asian countries.

The NATO Istanbul Cooperation Initiative was launched at the 2004 Istanbul Summit to engage countries of the wider Middle East and North Africa region. The initiative fosters dialogue and cooperation on subjects of mutual concern, such as combating terrorism, preventing the spread of weapons of mass destruction, and countering the flow of illicit arms, drugs and people.

While the Istanbul Cooperation Initiative is open to the countries of the broader Middle East, currently the initiative is focusing on the Gulf Cooperation Council. To date, Bahrain, Kuwait, Qatar and the United Arab Emirates have chosen to join the Initiative.

Now, Mediterranean Dialogue includes seven non-NATO countries of the Mediterranean region (Algeria, Egypt, Israel, Jordan, Mauritania, Morocco, and Tunisia). Discussions at NATO HQ are at a very early stage, but a strong awareness exists on the scale of the task ahead inconvincing very different Mediterranean countries that a Partnership with NATO is in their interest. A mutual concern over terrorism might ultimately provide the basis for increased co-

operation on both sides of the Mediterranean, but at what price for the broader politico-strategic interests of the Allies?

From partnership to membership

NATO's Membership Action Plan

The launching of the Membership Action Plan (MAP) in April 1999 has helped the countries aspiring to NATO membership to increasingly focus their preparations on meeting the goals and priorities set out in the Plan. Nine countries have declared at the time an interest in joining NATO and started participating in the MAP.

The MAP gives substance to NATO's commitment to keep its door open. However, participation in the MAP does not guarantee future membership, nor does the Plan consist simply of a checklist for aspiring countries to fulfil.

The MAP provides for concrete feedback and advice from NATO to aspiring countries on their own preparations directed at achieving future membership. It provides for a range of activities designed to strengthen each aspirant country's candidacy. The MAP does not replace the Partnership for Peace (PfP) program. It represents the next steep for the countries that aspire to joint NATO. The aspirants' participation in PfP and its Planning and Review Process (PARP) has been tailored to their needs.

Like PfP, the MAP is guided by the principle of self-differentiation: aspirant countries are free to choose the elements of the MAP best suited to their own national priorities and circumstances.

NATO is following the progress made by each aspirant and providing political and technical advice and an annual consolidated progress report on activities under the MAP is presented to NATO foreign and defence ministers at their regular spring meetings each year.

Aspirant countries are expected to achieve certain goals in the political and economic fields.

Defence and military issues focus on the ability of the country to contribute to collective defence and to the Alliance's new missions. Through their individual PfP programs, aspirants can focus on essential membership related issues. Partnership Goals for aspirants include planning targets, which are most directly relevant for nations aspiring NATO membership.

NATO's open door policy

NATO's open door policy is enshrined in the North Atlantic Treaty: *"The Parties may, by unanimous agreement, invite any other European State in a position to further the principles of this Treaty and to contribute to the security of the North Atlantic area to accede to this Treaty"*[31]. In the early nineties, it was evident that the division of the European continent would persist unless Central and Eastern European countries were offered the prospect of joining institutions, such as the European Union and NATO, dedicated to the common pursuit of shared values and goals, freedom and democracy, economic prosperity, political stability and security.

At the 1994 Brussels Summit, NATO leaders stated that they *"expect and would welcome NATO expansion that would reach to democratic states to our East."* The aim of this enlargement process is to extend to other European countries the zone of security and stability that the Alliance has helped build up on its members' territory in over then 50 years of its existence.

NATO has admitted new members throughout its history starting in 1952. The last wave of enlargement became into force in 2004.

In addition to political commitments, membership of NATO involves responsibilities and obligations, in the military field. The enlargement process is structured to enable possible future members to familiarize themselves with the workings of the Alliance and with the responsibilities and obligations stemming from membership and to adapt their forces accordingly.

3. THE FUTURE OF THE PARTNERSHIP FOR PEACE

Partnerships remain central to Alliance policies. The EAPC and the PfP has greatly enhanced security and stability throughout the Euro-Atlantic area. Both are now being upgraded to give Partner countries more focused assistance and bring them closer to NATO. The EAPC's Action Plan on Terrorism is an example on how these relationships are being reinforced to deal with new threats affecting Partners as much as Allies.

The Alliance is also developing its Mediterranean Dialogue (MD) and the Istanbul Cooperation Initiative (ICI) in recognition of the need for closer cooperation with the countries in the Mediterranean region and the broader Middle East.

[31] Article 10, The North Atlantic Treaty, Washington DC, 4 April 1949.

NATO heads of Governments decided at Prague, Istanbul and Riga to upgrade substantially the political and practical dimensions with the MD and ICI countries as an integral part of the Alliance's cooperative approach to security. In this respect, NATO encourage intensified practical cooperation and effective interaction on security matters of common concern, including terrorism-related issues, as appropriate, where can provide added value.

The terrorist attacks, on September 11, 2001 transformed terrorism from a domestic security concern into a truly international security challenge. For this reason, the Allies have been keen to involve the Partner countries in meeting this threat. The Partnership Action Plan on Terrorism agreed in Prague identifies opportunities for concrete cooperation in this area. Broader efforts to assist Partners with domestic reform and security issues should have a positive effect on the root causes of terrorism, and its spill over into other countries.

The NATO Partner for Peace program and the enlargement waves contributed substantially to the process of integration that has helped stabilize NATO and Europe over the past fifty years and promote the development of strong new allies in the war of terrorism.

4. ASPIRATIONS AND CHALLENGES

Aspirations

The PfP program will continue to be an effective force in Eastern European stabilization through interaction and cooperation with member states. Additionally, as the United States continues to participate in PfP exercises and operations, command, control, communications, and computers (C4) interoperability with PfP nations will become incrementally less difficult.

The gradual evolution of the Partnership for Peace program into a permanent alliance fixture with much practical utility, may in the next decades be recognized as the innovation that secured both the primacy of NATO in European security affairs, the security needs of NATO members, and the security of NATO's permanent "associate members" - the partners. In years hence, PfP, and not enlargement may be heralded as the most important adaptation to the security challenges of post-cold war Europe.

Framework should be expanded within existing activities in combating terrorism, in facilitating interaction between PfP countries and in identifying new instruments for action. The presence of partners in ISAF demonstrates the achievement of the PfP program and clearly shows the fact that the partnership will continue to be an essential pillar of the international

coalition against terrorism. In that context, further development and implementation of the PAP-T is indispensable in fighting terrorism.

A changing security environment, once focused on the Soviet threat, is now focused on terrorism, non-state actors and rogue regimes, which could pose significant threat to the European continent.

Now, after the next round of enlargement, the remaining nations will be comprised of Western European states and those from the Balkans, Caucuses and Central Asia, each with different needs, interests, capabilities and regional agendas.

The primary means of maintaining regional security and stability is through engagement of the remaining partner countries by recognizing these varying interests, and continuing to adapt the program to do so as well.

PfP represents the future, growth, strength and transatlantic unity. This happened in a way that Allies and Partners alike have believed in PfP and worked on it. In some missions Partners have taken lead roles as well, such as Sweden and Finland which command units in Kosovo. Where you see Allies, there you see Partners in the Balkans, in Afghanistan, as well as concerning the Global War on Terrorism.

However, PfP needs to adapt, retarget and refocus in the face of today's strategic realities and tomorrow's challenges. The importance of implementation of new instruments in PfP provides necessary support for partner countries, in terms of interoperability of NATO and PfP nations against new threats to security.

Challenges

The landscape of European security has been transformed, and with it Europe's premier security institution. The challenge now is to define the security interests of all democratic and democratizing states of the Euro-Atlantic region and determine how best to collectively address common threats to security and to manage the new threats beyond NATO's borders. NATO must then decide which institutional mechanisms to adapt or add to meet these challenges and choose whether further enlargement or a continually enhanced PfP process will achieve the objectives of the democratic and democratizing states of the region.

Today's new security challenges, terrorism, weapons of mass destruction and failed states, are the threats to stability not only NATO and PfP countries. The idea of a PfP for the

Mediterranean is probably premature, and in any case some of the objectives of PfP in Europe do not apply in the Mediterranean. NATO membership is not on the agenda in the south. But PFP-like co-operative activities concerning defence can contribute to strengthening the Initiative Interested Dialogue partners could participate directly in training and exercise programs for peace support. This involvement would build on the experience of Egyptian, Jordanian, and Moroccan participation in IFOR and SFOR in Bosnia I Herzegovina as well as in ISAF in Afghanistan.

There will soon be more members of NATO than partners in the Partnership for Peace. Some of the partners have no interest in membership in the Alliance; some who seek this goal will likely find it an elusive one for some time. Since its inception, PfP's role as "the best path to NATO membership" has energized participation. Still, NATO members and partners agree that PFP can play a valuable role in enhancing military and security cooperation between NATO and non-member states. NATO remains committed to enhancing cooperation with Russia, Ukraine, yet concrete progress has been elusive.

Given this context, how should PFP programs be adapted to enhance cooperation with and stability in the fragile, less developed countries of the Balkans, Central Asian, and the Caucuses? How do we continue to promote defence reform in Partner countries and improve the interoperability of Partner forces across the full range of missions that Partners and Allies might conduct together?

What have been the main impediments to advancing NATO cooperation with Russia and Ukraine? How can these impediments be overcome? Are shared concerns over terrorism sufficient to sustain enhanced trust and cooperation? Are there other areas of cooperation that should be pursued more vigorously – development of missile defence systems or counter-proliferation efforts?

Since Russia began its illegal military intervention in Ukraine, Russian officials have accused NATO of a series of mythical provocations, threats and hostile actions stretching back over 25 years.

On 1 April 2014, NATO unilaterally decided to suspend practical co-operation with the Russian Federation, in response to the Ukraine crisis.

CONCLUSIONS

The fundamental changes in the international security environment since the end of the Cold War have led to a constant re-evaluation and re-definition of Alliance strategies and policies.

Integral to this strategy is the process of enlargement which, coupled with the Partnership for Peace (PfP) program, continues to extend the strategic area of interest of the Alliance and has led to enhanced international cooperation with non-NATO nations.

NATO should presently to develop co-operative relations with Russia and Ukraine as well as PfP member states and nations participating in the MD program and ICI initiative. But on 1 April 2014, NATO decided to suspend practical co-operation with the Russian Federation.

Over the past decade, strategies built around partnership and cooperation rather than political confrontation and military competition have dramatically altered the Euro-Atlantic security environment. Today, NATO and Partner countries consult regularly on security issues, their forces interact frequently and conduct joint exercises, and their soldiers are deployed alongside each other in NATO-led peace-support operations.

The partnership process involves building bridges of communications and understanding between all the countries involved, many of which are former adversaries as members of opposing alliances, or have been at loggerheads over long-standing regional, territorial, political, ethnic or religious disputes.

Through its active pursuit of partnership, cooperation and dialogue, the Alliance is a positive force in promoting security and stability throughout the Euro-Atlantic area and beyond. Three more PfP MAP countries are expected to be invited to join the Alliance and to begin the accession talks, during the next year NATO Summit, planned to take place in Bucharest.

The Partnership for Peace remains the principal mechanism for forging practical security links between Partners and NATO.

NATO member states and Russia are working together in the NATO-Russia Council as equal partners. NATO and Ukraine continues to strengthen the bilateral relationship, and to pursue policies of transparency and cooperation in matters of common concern.

Allies are determined to continue and enhance support for, and advice to, interested Partners, in their efforts to reform and modernize their defence and security systems to meet the challenges of the 21st century.

Allies, in consultation and cooperation with interested Partners, and taking account of experience developed in South-Eastern Europe, will support regional cooperation in Mediterranean, broader Middle East, Central Asia and the Caucasus.

Partnership and cooperation have already accomplished a great deal, bringing direct benefits to citizens of NATO member and Partner countries alike, in critical areas.

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NATO AND EDA STANDARDIZATION - POLICY & ORGANIZATION

LTC eng Mircea VOINEA

In simple terms, a standard is a document that provides rules or guidelines to achieve order in a given context.

Why we need standards?

We may not be aware of them, but we use standards every day, in all aspects of our daily lives – in communications, media, healthcare, food, transport, construction, furniture, energy, etc.

Some standards have been around for hundreds or even thousands of years – weights and measures, for example.

Standards provide:

a) Safety and reliability – Adherence to standards helps ensure safety, reliability and environmental care. As a result, users perceive standardized products and services as more dependable – this in turn raises user confidence, increasing sales and the take-up of new technologies;
b) Support of government policies and legislation – Standards are frequently referenced by regulators and legislators for protecting user and business interests, and to support government policies. Standards play a central role in the European Union's policy for a Single Market;
c) Interoperability – the ability of devices to work together relies on products and services complying with standards;
d) Business benefits – standardization provides a solid foundation upon which to develop new technologies and to enhance existing practices. Specifically standards:
    - Open up market access
    - Provide economies of scale

- Encourage innovation
- Increase awareness of technical developments and initiatives

e) Consumer choice - standards provide the foundation for new features and options, thus contributing to the enhancement of our daily lives. Mass production based on standards provides a greater variety of accessible products to consumers;

f) Greater freedom of movement of people, goods, services and money, which are all vital in today's economies, reassure consumers that products are safe, efficient and good for the environment.

Consider what the world would be like without standards:

- Products might not work as expected;
- They may be of inferior quality;
- They may be incompatible with other equipment – in fact they may not even connect with them;
- In extreme cases, non-standardized products may be dangerous;
- Customers would be restricted to one manufacturer or supplier;
- Manufacturers would be obliged to invent their own individual solutions to even the simplest needs, with limited opportunity to compete with others;
- Society needs standards!

Standards success stories

- Henry Ford started to build cars using an assembly line process. With the assembly line a small team of people designed the car and assembly process, and a larger team of unskilled workers built the cars. What was so remarkable about Ford's process was that any men off the street, even if he had never seen a car before, could work on the assembly line and with a few instructions he could be a part of the team building cars. In fact it was found that this process was faster, cheaper and more efficient. There was less overlap of skills or knowledge; every person knew what they needed to do their job.
- A good example of the power of standardization is the GSM™ mobile communication technology and its successors (3G, 4G...), truly global phenomena. Although GSM was originally envisaged as a solution just for Europe, these technologies have been deployed world-wide. As a result, travellers today can communicate and use familiar services in every corner of the world – all thanks to standardization.

- Can boast many other similar success stories including, for example, Smart Cards, DECT™, TETRA, Short Range Radio, medical implants, electronic signatures, etc.

1. NATO STANDARDIZATION OFFICE – NSO

1.1 HISTORY

The NSA's 60 years of normative success makes it the oldest Agency in NATO. The Agency was established in 1951in London as the Military Standardization Agency (MSA). In the same year the MSA was renamed to Military Agency for Standardization (MAS), in 1970 the MAS moved from London to Brussels to obtain a higher visibility for NATO Standardization. Consequently the MAS became a part of NATO HQ and was co-located with the International Military Staff (IMS). In 2001 the MAS and the Office for NATO Standardization (ONS), which was created in the 90's as a part of the International Staff (IS), were merged and renamed the NATO Standardization Agency (NSA).

As a result of its history, the NSA is a combined civilian – military organization, subordinate to the North Atlantic Council (NAC) through Committee for Standardization (CS), with the authority to coordinate issues in the field of Standardization.

While the name for this organization has changed several times, the mission remains essentially the same: to initiate and support NATO standardization activities. On 1 July 2014, by decision of the North Atlantic Council, the NATO Standardization Agency was renamed the NATO Standardization Office (NSO).

Interoperability is crucial to the members of the Alliance as well as Partner Nations in order to act together coherently, effectively and efficiently to achieve Allied tactical, operational and strategic objectives. Having a high degree of interoperability enables the Alliance to react swiftly on newly emerging threats and to tackle today's unpredictable challenges. Furthermore, a high degree of interoperability improves efficiency in the use of available resources, which is especially important at a time of economic restraint. Standardization aims to enhance the Alliance's operational effectiveness through the development and implementation of concepts, doctrines, procedures, material and technical standards required to attain interoperability among Allied forces.

Standardization is the key element to achieve, enhance and maintain the Alliance Interoperability in operations.

1.2 THE NSO TODAY

The NSO is the service providing office within NATO, which supports all standardization efforts within their means.

The NSO is an independent NATO Office that reports to the Committee for Standardization (CS) for Standardization Policy and Management and to the Military Committee (MC) for corporate oversight and issues relating to operational standardization. The Office's mission of the NSO is to provide Standardization Management for NATO.

Standardization Management encompasses in particular:

- standardization policy;
- harmonization of NATO standardization activities;
- rules and regulations for development, ratification, promulgation, and support to implementation of standardization products;
- standardization management support to Tasking Authorities;
- terminology policy and guidelines, cooperation with civilian standardization bodies;
- publishing of NATO standards and standardization promotion.

Standardization is defined within NATO as the process of developing and implementing concepts, doctrines, procedures and designs to achieve and maintain the compatibility, interchangeability and commonality which are necessary to attain the required level of interoperability, or to optimize the use of resources, in the fields of operations, material and administration. The primary products of this process and NATO's tools for the enhancement of interoperability are NATO standards covered by Standardization Agreements (STANAGs) between the member nations.

The NSO is the focal point for standardization in NATO headed by a Director supported by a small personal staff. The Policy & Coordination Branch supports the CS responsible for overall standardization policies, defense planning, civil standards, terminology and NATO partners. The operational Branches (Joint, Naval, Army and Air) provide support to MC Standardization Boards (Joint, Maritime, Land and Air), the Medical and Logistic Committee Standardization Board.

Specialist Working Groups of experts from nations and commands develop doctrine and procedures which are ultimately published as STANAGs and Allied Publications. NSO Staff

Officers serve Chairmen of these Standardization Boards and as Secretaries of both, Boards and Working Groups.

The Information & Knowledge Management Branch is responsible for Standardization Business Applications, publication of standards, linguistic support, administrative support and information management.

Main NSO objectives are:

- To develop and maintain the NATO Policy for Standardization and monitor its implementation;
- To be the Alliance authority on standardization matters and the focus of Alliance standardization efforts;
- To develop and maintain processes and tools in support of NATO's standardization activities, notably in support of interoperability processes;
- To identify and address priority areas for standardization;
- To contribute to the formulation of standardization requirements in NATO Defence Planning;
- To facilitate the implementation of NATO Standards;
- To provide standardization management advice and guidance to the standardization community;

Standardization Boards

The Boards consist of members of the appropriate Services of the NATO nations and the NATO Strategic Commands. NSO Boards are in permanent session and meet once a month. Decisions are normally reached on the basis of unanimity. However, as standardization is a voluntary process, agreements may also be based on majority decisions. The NATO Strategic Commanders have a representative on each Board but do not have a vote.

The Joint Standardization Board (MC JSB) deals with Joint and overarching Standardization Policy matters, affecting two or more Services. It manages Working Groups dealing with Allied Joint Operations Doctrine, Information Exchange Requirement/Message Text Format Harmonization, Joint Intelligence Issues and Environmental Protection, NBC Defence Operations.

The Maritime Standardization Board (MC MSB) manages Working Groups dealing with Maritime Operations, Amphibious Operations, Helicopter Operations from Ships other than

Aircraft Carriers, Mine Warfare, Maritime Logistics, NATO Shipping, Radio and Radar Radiations Hazard, Replenishment at Sea, Submarine Escape and Rescue, Underwater Diving and Maritime Information Exchange Requirements.

The Land Standardization Board (MC LSB**)** manages Working Groups dealing with Land Operations, Artillery, Combat Engineering, Explosive Ordnance Disposal, Medical Standardization, Helicopter Operations, Ammunition Interchangeability, Logistics Doctrine, Asset Tracking, Materials Handling/Distribution, Movements and Transport, Range Safety, NBC Defense Operations and NBC Medical Operations.

The Air Standardization Board (MC ASB) manages Working Groups dealing with Air Operations and all aspects of operational doctrine, Air Transport, Air-to-Air Refueling, Search and Rescue, Flight Safety, Aeromedical, Aircraft/Aircrew Integration, Aircraft Servicing and Standard Equipment, Avionics Systems, Aircraft Gaseous Systems, and Air Electrical and Electromagnetic Considerations.

The Medical Standardization Board (MC MedSB) manages the standardization efforts of Working Groups and Expert Panels dealing with Military Medical Structures and Operations Procedures, Military Health Care, Medical Standardization, NBC Medical

The Policy & Coordination (P&C) Branch is responsible for developing, maintaining and monitoring NATO policy related to standardization and standardization management procedures. Through the NSSG (NATO Standardization Staff Group) and by other means, the Branch liaises, as necessary, with the staff of other NATO bodies involved in standardization (e.g. Tasking Authorities and Strategic Commands) as well as national and international standardization entities, fostering coherence of actions and information sharing.

The Policy & Coordination Branch provides staff support to the Committee for Standardization (CS), and Working Groups created by that committee:

- the Standardization Management Working Group (SMWG)
- the CS Terms of Reference Working Group (CSTWG)

The Policy and Coordination Branch includes:

- the Civil Standards Coordination Office,
- the NATO Terminology Office (NTO), and
- the Partner Programs Section.

Committee for Standardization (CS) - is the senior policy committee responsible for standardization policy and management within the Alliance. The CS responds directly to the North Atlantic Council (NAC) and is chaired by the Secretary General, normally represented by two co-chairmen: the Assistant Secretary General - Defence Investment (ASG-DI) and the Deputy Chairman of the Military Committee (DCMC).

The CS meets in plenary session twice a year, normally at NATO Headquarters in Brussels. Together with the Representatives of the 28 Allies, the Military Committee (MC), the Conference of National Armaments Directors (CNAD), the Logistic Committee (LC), the NATO Consultation, Command and Control Board (C3B), the two Strategic Commands (SCs) and all other Tasking Authorities (TAs) are invited to take part to the CS meetings. Partner Nations and observers may also be invited to attend.

The CS has a sub-structure composed by:

- the Standardization Management Working Group (SMWG) and
- the CS Terms of Reference Working Group (CSTWG).

The Standardization Management Working Group (SMWG) is established by the CS to contribute to the effectiveness of NATO standardization in the field of standardization management. It is composed by representatives from Allied and Partner Nations, Tasking Authorities (TAs), NSO and from Standard Developing Organization (SDOs) who have signed Technical Cooperation Agreements with NATO.

The CS Terms of Reference Working Group (CSTWG) is established by the CS to analyze and review its structure and sub-structure. Upon completion of its work, it will be disbanded. The CSTWG is composed by representatives from Allied Nations, Tasking Authorities (TAs) and the NSO.

Staff support to the Committee for Standardizations (CS), the Standardization Management Working Group (SMWG) and the CS Terms of Reference Working Group (CSTWG) is provided by the NSO, Policy & Coordination (P&C) Branch.

1.3 ACHIEVEMENTS

The areas of responsibility where the NSO has made major achievements are:

NATO Interoperability Process

The NATO Interoperability Process is the sequence of activities used to identify, develop, approve and prioritize standardization requirements and coordinate this action with defence planning disciplines. It provides guidance and procedures to all NATO Bodies and is the tool for achieving interoperability in a coordinated and effective manner

NATO Standardization Program (NSP)

The NATO Standardization Program (NSP) is administered by the NSO. It is a database which prioritizes NATO's Standardization requirements as a result of the Force Planning process to achieve interoperability. It is a classified database with limited access.

NATO Terminology Management System (NTMS)

The NTDB contains over ten thousand definitions of terms used in NATO thus achieving a common understanding.

NATO Standardization Documents Database (NSDD)

The NSO administrates the NATO Standardization Documents Database (NSDD) in which the full range of NATO STANAGs and APs are available for download via the NATO Intranet. The NSDD is the main tool for providing the Alliance and the Partners with standardization documents.

Defence Against Terrorism (DAT)

Immediately after 11 September 2001 the NSO tasked the subordinated standardization elements to initiate a review of all STANAGs/APs in order to update or to adjust them to take into account the threat of terrorism. Guidance on how to achieve this was developed and used throughout all TAs. To date, all NATO STANAGs and APs have been reviewed and updated to address DAT, as part of a continuous and ongoing process.

Relevance for the Alliance and its Partners

Combined Operations, reinforced by non-NATO-Nations, are not efficient without common standards. Partners' force contributions to NATO-led-operations can only succeed by using the Alliances' well proved portfolio of standards in all three fields of standardization – operational, material/technical and administrative.

The products of the NATO Standardization Office ensure that the armed forces of the Alliance and other force contributors can operate efficiently together in synergy to achieve the desired level of interoperability required.

2. NATO STANDARDIZATION

2.1 NATO REGULATIONS ON STANDARDIZATION

Standardization is not only aiming at interoperability. NATO standards, NATO agreed concepts, doctrines, procedures and designs not only allow for better/optimized use of resources but also enable nations to participate in operations with small entities able to contribute to capabilities required for NATO led operations (example: field hospital – modular approach: emergency room, initial surgery response capability, diagnostic capabilities, scan capabilities, laboratory, patient holding area, medical supply. Not all nations are able to stand up a complete field hospital but they might be able to provide certain modules).

Interoperability has three main dimensions, *technical* (e.g. hardware, systems), *procedural* (e.g. doctrine, procedures) and *human* (e.g. language, terminology and training). They are complementary to each other and conditioned by national and international provisions. In many cases weaknesses in one dimension can be mitigated by strengths in others (e.g. material interoperability deficiencies can be overcome by procedural standards). Various tools to achieve interoperability, standardization are and will continue to be a key element in achieving and maintaining interoperability.

INTEROPERABILITY

Interoperability is the ability to act together coherently, effectively and efficiently to achieve Allied tactical, operational and strategic objectives.

STANDARDIZATION

NATO Standardization is defined as "*the development and implementation of concepts, doctrines, procedures and designs in order to achieve and maintain the compatibility, interchangeability or commonality which are necessary to attain the required level of interoperability, or to optimise the use of resources, in the fields of operations, materiel and administration".*

STANDARDS

NATO recognises the ISO/IEC5 concept of a standard as follows: "*A standard is a document, established by consensus and approved by a recognized Body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context*". It is noted that "*a*

standard should be based on the consolidated results of science, technology, experience and lessons learned".

A NATO standard is a standard developed by NATO and promulgated in the framework of the NATO standardization process.

AIMS

It is Alliance policy that Nations and NATO Authorities enhance interoperability through standardization to strengthen the Alliance defence capabilities. Nations and NATO Bodies will develop, approve, and collectively implement standardization agreements and Allied Standards to achieve and maintain the required level of interoperability and to optimize the use of resources.

HARMONIZATION OF STANDARDIZATION WITH NATO DEFENCE PLANNING

Coordination among NATO defence planning domains is essential for harmonization and achievement of interoperability. For Nations concerned, Force Planning is a key focus for the standardization process through the force goals and Defence Review Cycles.

UNITY OF EFFORT

Unity of effort is enhanced by harmonization and coordination of standardization activities with Nations, Strategic Commands (SCs) and Senior NATO Committees through the NATO Standardization Organization (NSO).

USE OF CIVIL STANDARDS

The Alliance will use suitable civil standards to the maximum practicable extent unless there are compelling reasons not to do so. Only where no applicable civil standard is available, will a NATO standard be developed.

NATO Policy for Standardization encourages adopting civil standards for use within NATO and for the transfer of NATO standardization documents to a Standards Developing Organization (SDO) for future development. Suitable civil standards shall be approved or recognised for use within NATO preferably without modification.

Cooperation, transfer of standards and other related activities with SDOs will be managed, on a case by case basis, with the approval of the relevant TA/DTA(s).

2.1 LEVELS OF STANDARDIZATION

Standardization has three levels for achieving interoperability.

- Compatibility

Compatibility is the suitability of products, processes or services for use together under specific conditions to fulfil relevant requirements without causing unacceptable interactions.

- Interchangeability

Interchangeability is the ability of one product, process or service to be used in place of another to fulfil the same requirements.

- Commonality

Commonality is the state achieved when the same doctrine, procedures or equipment are used. Nations should achieve the levels of standardization indicated in the standardization requirement.

NATIONAL COMMITMENT

In principle, standardization within NATO is voluntary. Nations shall implement standards as applicable, to the maximum extent possible. In some instances, Nations may agree to the mandatory implementation of specific standards.

2.2 FIELDS OF STANDARDIZATION

The Alliance produces standardization documents in the following fields:

- OPERATIONAL

NATO standardization documents that affect military practices, and may apply to doctrines, tactics, techniques, procedures, training, reporting, maps and charts. In the operational field of standardization, there are five operational domains boards: joint, maritime, land, air, and medical.

- MATERIEL

NATO standardization documents that specify the materiel common technical requirements throughout its life cycle. Materiel may embrace complete systems, including consultation, command and control (C3) systems, weapon-systems and sub-systems, interfaces, assemblies, components, spare parts and consumables, including ammunition, fuel, and supplies.

- ADMINISTRATIVE

NATO standardization documents that facilitate Alliance administration in various areas including, but is not limited to, terminology, finances, human resources and military ranks.

2.3 NATO STANDARDIZATION DOCUMENTS

NATO standardization documents comprises:

a. covering documents:

1. NATO standardization agreements (STANAGs);

2. NATO standardization recommendations (STANRECs);

b. allied standards:

1. NATO standards (NATO STDs);

2. external standards used by NATO, called non-NATO STDs;

c. other standards-related documents (SRD):

Such as implementation guides, catalogues of national data, etc

NATO STANDARDIZATION AGREEMENT

A standardization agreement (STANAG) is a NATO standardization document that specifies the agreement of member Nations to implement a standard, in whole or in part, with or without reservation, in order to meet an interoperability requirement. A NATO standardization agreement is distinct from the standard(s) it covers. STANAGs should be implemented, as applicable, and complied with to the maximum extent possible by Nations and NATO Bodies.

NATO STANDARDIZATION RECOMMENDATION

A STANREC is a NATO standardization document used exclusively in the materiel field of standardization that lists one or several NATO or *non-NATO standards* relevant to a specific Alliance activity unrelated to interoperability.

A STANREC is a non-binding document employed on a voluntary basis and does not require commitment of the Nations to implement the standards which are listed in it.

COVERING DOCUMENT SELECTION

Standards required by NATO will be covered by either a STANAG or STANREC, but not both at the same time. The criteria for selecting the STANAG or STANREC process is the fulfilment of standardization requirements related to interoperability. A current standard required for NATO interoperability would be covered by a STANAG, not a STANREC.

NATO STANDARD

A NATO STD is a standard developed and promulgated in the framework of the NATO standardization process.

NON-NATO STANDARD

A non-NATO STD is a standard developed outside NATO. This includes civil standards, and
national or multinational defence standards.

STANDARDS-RELATED DOCUMENT

A standards-related document (SRD) is a standardization document that facilitates understanding and implementation of one or more Allied Standards. It may provide additional data and information to support the management, and implementation of standard(s).

ALLIED AND MULTINATIONAL PUBLICATIONS

An AP is the name given to both standards and standards-related documents published by NATO.

2.4 NATO STANDARDIZATION ELEMENTS

NATO standardization key players can be categorized as follows:

- Standardization management elements (CS, NSO, NSSG),
- Standardization production elements (TAs and substructure, delegated tasking authority DTAs, WGs), and
- Standardization user elements (SCs, nations).

The Committee for Standardization (CS) oversees the activities of the NATO Standardization Community and is one of the several senior committees reporting to the North Atlantic Council (NAC). Highlight that the CS has no authority over the other committees. The main other committees are Air Traffic Management Committee (ATMC), Logistic Committee (LC), Air Defence Committee (ADC), Military Committee (MC), Conference of National Armament Directors (CNAD), and Consultation, Command and Control Board C3B. These senior committees are the tasking authorities authorized to develop standards in their respective domain.

Committee for Standardization (CS) – functions and responsibilities

CS is principal NATO authority on overall standardization matters on behalf of the NAC and ensures:

- Primary source of standardization advice to the NAC (North Atlantic Council);
- Tasking Authority for standardization management within the Alliance (procedures for production, maintenance and management of NATO standardization documents);

- Develops and maintains the NATO Policy for Standardization;
- Provides standardization management advice and guidance to the standardization community;
- Linkage and coherence with NATO defense planning;

Role of NATO Standardization Office (NSO)

NSO is the executive body supporting the CS and manages standardization activities under the authority of the CS. In addition the NSO provides support to the Military Committee (MC), and the Logistic Committee (LC). The MC is the TA with focus on military operational standardization; the LC is responsibly for logistic operational standards.

NATO Standardization Staff Group (NSSG) - is the internal NATO HQ staff forum, at working level, with participation of the representatives of all TAs staffs and (Strategic Command) SCs. It is responsible for staff liaison, preparation and coordination of related documentation and supports harmonization between the TAs.

NATIONS

Member Nations are requested to:

a. inform the TA/DTA of their interest in participating and contributing to standardization activities;

b. nominate official representatives and point of contacts (POCs) as necessary; and provide their contact information to the TA/DTA;

c. provide responses on RDs, and make decision on ADs;

d. submit SPs to TA/DTAs based on their comments, reservations, objections or breaks of silence;

e. provide responses to terminology proposals through the responsible TA/DTA;

f. implement STANAGs in accordance with their ratification response and inform NATO on their effective date of implementation;

g. review their ratification responses on STANAGs and update, when necessary;

h. inform the TA/DTA, WG and Custodian about any standardization issues and lessons learned to be resolved.

Partner Nations are invited to contribute to the refinement of NATO standardization documents and to adopt STANAGs, when appropriate.

2.5 STANDARDIZATION MANAGEMENT TOOLS

There are three computerized management tools:

a. the NATO Standardization Programme (NSP);

b. the NATO Standardization Document Database (NSDD);

c. the NATO Terminology Management System (NTMS, also called “NATOTerm").

NATO STANDARDIZATION PROGRAMME (NSP);

The NSP is an electronic database which:

a. catalogues top-down Alliance standardization requirements (ASRs) with their standardization objectives (SOs), their related standardization tasks (STs) and the interoperability requirements;

b. catalogues the bottom-up standardization proposals (SPs) and their related STs; every STANAG will be linked to its standardization requirements.

c. tracks the progress on the development of the ASRs, SPs and STs.

Also, it contains sufficient details to enable Nations and TA/DTAs to monitor the progress achieved by the WGs in response to the tasks allocated.

NATO STANDARDIZATION DOCUMENT DATABASE (NSDD)

The NSDD is the management information system which contains all NATO standardization

documents and their related information, including national ratification data.

The NSDD is available to:

a. MINERVA and NS WAN users via the NSA homepage on the NATO HQ secure intranet at http://nsa.hq.nato.int/ where are loaded all NATO CONFIDENTIAL and below standardization documents;

b. authorized users of the NSA’s password-protected website at https://nsa.nato.int/protected/, including only documents up to NATO UNCLASSIFIED.

NATO TERMINOLOGY MANAGEMENT SYSTEM (NTMS)

The NTMS, also called “NATOTerm”, is the reference for all unclassified NATO terminology.

The NTMS is available to:

a. MINERVA and NS WAN users via the NSA homepage on the NATO HQ secure intranet at http://ntms.hq.nato.int/;

b. authorized users of the NSA's password-protected Internet website at https://nsa.nato.int/protected/;

c. the public via the NATO public website at http://www.nato.int/.

3. EUROPEAN DEFENCE AGENCY STANDARDIZATION POLICY

The European Defence Agency is the place to go for European defence cooperation. The Agency supports the European Council and the Member States in their effort to improve the European Union's defence capabilities through cooperative projects and programmes.

The policy of the EDA is to contribute to the implementation of the Common Security and Defence Policy (CSDP) by supporting, coordinating and harmonising European defence materiel standardization, with the overall aims to enhance interoperability, reduce acquisition costs and improve technological competiveness.

3.2 Objectives

European defence standardization is a strategic tool for improving armaments co-operation, enhancing the European Defence Technological and Industrial Base (EDTIB) and a key enabler of an effective European Defence Equipment Market (EDEM). It is the most cost effective way to reinforce and to perpetuate interoperability and is achieved by:

- managing and ensuring the coordination with key players and their actions;
- supporting and monitoring European defence standardization activities;
- promoting common standardization requirements;
- providing a reference set of common standards for European armaments and connecting referenced standards with the EDA capabilities needs.

3.3 Principles

EDA recognises as overarching principles:

- Using civil standards wherever practicable and military standards only where necessary;
- Avoiding duplication between standardization activities, notably with NATO.

3.4 European Defence Standardization Bodies

3.4.1 Within EDA, the Cooperation Planning and Support directorate manages all EDA internal standardization activities and provides permanent standardization support and advice to EDA Ad hoc projects and programmes. In order to fulfil its objectives in standardization,

EDA has created the Materiel Standardization Group and takes an active part within the Defence Standardization Coordination Group.

3.4.2 MSG - The EDA's Materiel Standardization Group (MSG) is the supervisory body for EDA standardization management and custodian of the EDA Standardization Policy and standardization management plan. Amongst others, it is the place where new proposals for European Defence Materiel Standardization activities are assessed after their notification in EDSIS.

3.4.3 DSCG - the Defence Standardization Coordination Group (DSCG) was established in July 2014 as a coordination group amongst stakeholders of European defence standardization: Nations, the Commission, EDA, European standardization organisations (ESO), other standardization bodies, with participation of NATO. It validates and allocates the projects to the most suitable or other European standardization development organisation, after they have been assessed and confirmed by MSG.

3.5 EDA Defence Standardization Environment

EDA recognises as key player in defence standardization sector: Nations, NATO, the Commission, European Union Military Staff (EUMS), the Industry, Civil Standardization Organisations and MSHT.

3.5.1 NATO - NATO Standardization through Standardization Agreements (STANAGs) continues to provide 'binding' operational standard and technical-operational standards for interoperability of defence materiel.

3.5.2 The Commission – EC is responsible for issuing civil standardization mandates, to European Standardization Organisations to develop Standards supporting European legislation and policies. The Commission also supports standardization works not covered by mandates. In the field of defence, the Commission supports developments in European civil standardization that benefit this sector.

3.5.3 EUMS – In the years to come, European Union Military Staff (EUMS) could provide Lessons Learned from operations related to the use or lack of in order to identify interoperability shortcomings that could be addressed through materiel standards development by the appropriate body.

3.5.4 Industry –Industry is a key actor in standardization. They directly or indirectly take part to the standardization processes within European Standardization Organisations (ESOs). Their participation is also encouraged into EDA standardization activities.

3.5.5 Civil Standards Organisations Effective standardization is based on partnering between European governmental bodies and civil standards organisations, in particular the European Standardization Organisations given the preference to using or developing European civilian standards in defence procurement.

3.5.6 MSHT - The Materiel Standardization Harmonisation Team (MSHT) is a non -entitled body of government experts who meet to coordinate views and share best practices; it provides advice to the MSG and other organisations on defence standardization matters and management. It is seen as an efficient bridge with NATO and other non-EU Nations in the field of standardization.

3.6 EDA Defence Standardization tools:

3.6.1 EDSTAR - Reference Set of Common Standards -

The EDSTAR is the European Defence Standards Reference system to list *"best practice"* standards and standards-like specifications to support programme managers in governmental organisations and in defence industry for procurement and development of defence materials. EDSTAR also provides guidance on the selection and application of the best practice standards and standards-like specifications to optimise effectiveness, efficiency and interoperability of defence materiel.

3.6.2 EDSIS

The European Defence Standardization Information System (EDSIS) is a portal for all European Defence materiel standardization services. EDSIS's main function is to enable the participating Member States of the European Defence Agency and industry to advertise Defence materiel standards that are to be developed or undergo major modification.

3.7 EDA Standardization Management Plan

EDA develops a Standardization Management Plan (SMP) that is approved by Nations and updated every year. Progress of actions listed in the SMP is assessed in MSG meetings on a regular basis.

3.8 Project Standardization Management Plans

An EDA Project Standardization Management Plan (PSMP) shall be developed for all projects and programmes in support of the EDA Capability Programme. The following rules shall be followed:

a) Civil standards shall be used wherever practicable and military standards only where necessary.

b) NATO STANAGs (NATO Standardization Agreements) shall be implemented as enablers to increase interoperability.

c) The EDA EDSTAR (European Defence Standards Reference System) shall be exploited as a source of European Industry recognised "best practice" standards.

d) Only active promulgated STANAGs and Standards shall be permitted in PSMP's.

3.9 European Hybrid Standards

Standardization gaps in the security and/or defence domains can be identified by the European Commission (EC), EDA or by Nations. Unless a national standardization solution is preferred, the requirement shall be forwarded to the CEN Defence Standardization Coordination Group (DSCG) who will identify the appropriate responsible European Standardization Organisation (ESO), CEN, CENELEC or ETSI. All standardization gaps identified in a European context shall be reported to the EDA Materiel Standardization Group for requirement assessment and confirmation.

Development of European Hybrid Standards shall be in accordance with the EDA's "Mechanism for the Development of European Hybrid Standards".

ESOs - The European Standardisation Organisations are officially recognised by Regulation (EU) No 1025/2012 as providers of European standards. CEN, CENELEC, and ETSI have been working with the European Commission since 1984, when a cooperation agreement was signed. Revised in 2003, it lays down general guidelines for cooperation.

CEN – The European Committee for Standardisation brings together the National Standardization Bodies of 33 European countries. It provides a platform for the development of European Standards and other technical documents on various types of products, materials, services, and processes. These include air and space, chemicals, construction and more.

CENELEC – The European Committee for Electrotechnical Standardization is responsible for standardisation in the electro-technical engineering field. Voluntary standards prepared by CENELEC help facilitate trade between countries, access new markets, cut compliance costs, and support the development of the EU Single Market. CENELEC also creates market access at international level through its close collaboration with the International Electrotechnical Commission (IEC).

ETSI – The European Telecommunications Standards Institute produces globally-applicable standards for information and communications technology (ICT). These standards also include fixed, mobile, radio, converged, broadcast, and internet technologies. ETSI's purpose is to produce and maintain the technical standards required by its members.

In the case of ETSI, industry can get involved directly in the process of standards development. However, industry can only access CEN and CENELEC through the National Standards Bodies (NSBs).

In Europe there are three different categories of standard:

- International standard - a standard adopted by an international standardization organization;
- European standard - a standard adopted by a European standardization body;
- National standard - a standard adopted by a national standardization body and made available to the public;

CONCLUSION

In my opinion the European Defence Agency ensures the defence standardization which is a very important tool for improving armaments co-operation, to reinforce and to perpetuate interoperability.

EDA is supporting, coordinating and harmonising European defence materiel standardization, with the overall aims in order to enhance interoperability, reduce acquisition costs and improve technological competiveness.

In the future, NATO Standardization through Standardization Agreements (STANAGs) continues to provide 'binding' operational standard and technical-operational standards for interoperability of defence materiel.

EDA Defence Standardization tools ensure that civil standards will be used wherever practicable and military standards only where necessary, NATO STANAGs shall be implemented as enablers to increase interoperability and EDSTAR (European Defence Standards Reference System) shall be exploited as a source of European Industry recognised "best practice" standards.

I think that EDA achieve an efficient bridge with NATO and other non-EU Nations in the field of standardization. As we know, NATO comprises 28 member nations, more than 30 partners, out-of-area expeditionary operations and difference of backgrounds. Today, more than ever, the ability to work together is becoming more and more important for the Alliance. Therefore, nations need to share a common set of standards, especially between military forces, to be able to professionally execute operations in the various theatres. Nations need to do more with less. Nations need standardization to be interoperable.

Standardization is the main tool used to achieve interoperability because it provides, especially in the area of operational standardization, common doctrines and procedures.

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