



RESEARCH ARTICLE

**THE ARCHITECTURAL APPROACH OF ORGANIZATIONAL MODELING
IN THE CONTEXT OF THE INTELLIGENT DEFENSE**

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ABSTRACT

This report introduces the architectural approach for organizational modeling and the administration of the organization as an alternative for implementing the requirements of intelligent defense. When we deal with complex organization, in order to have its comprehensive organizational model, we use such approach, which provides a single environment for all major functional and system perspectives and effective management to achieve its strategic objectives.

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INTRODUCTION

The new challenges shape the foundation of the cooperation among states and nations. This seems more than necessity and goes far ahead as a question of choice nowadays. Practice shows that collaborative work and good coordination among nations brings more security, stability and peace on the Earth. According to Rasmussen, the NATO Secretary General, (from 1st August 2009 till 30th September 2014) the Smart Defense means clarity, practicality and adequacy in the priorities and more coordination of the common efforts (Rasmussen, 2011). The Smart Defense initiative is a concept for cooperation, pooling and sharing of opportunities in the field of the development, acquisition and support of military capabilities in order to face the contemporary security challenges. This is an approach seeking answer to how, using less resources, to gain better results, ensuring more security for less money with joint efforts and work, and more agility. Or “How to invest enough?”, in order to be prepared for the future. One of the answers is by unifying the capabilities of the South East European states with the aim of realization of the multinational projects for establishing defense capabilities.

It is clear that the Smart Defense initiative is not at all something new. It is one from many possible ways for rising up cooperation among states and unifying the efforts of the NATO Member States at a new level with the aim of acquiring certain capabilities under conditions of severe defense budgets’ cuts. The realization of every good idea faces misunderstanding which is commonly expressed in the fact, that not always the Allies find multinational cooperation to be the best alternative. Many questions appear, first related to late execution of timetables of supplies, “overestimated” operational costs and slow decision making, because the defense is tightly linked to national sovereignty, industry and working positions (Rasmussen, 2011).

Another answer or approach which lies at the base and could contribute to achievement of “smart defense” is the architectural approach (Fig. 1). It is the carrier of the idea for close cooperation between the business and the information technologies, which are regarded as integrated entirely (the so called enterprise architecture) (Tujarov, 2010).

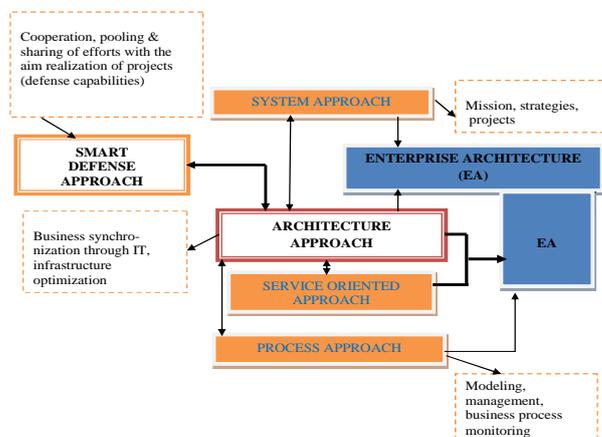


Figure 1 Architectural approach – IT and business interrelationship (Enterprise Architecture)

It comes to the question of priority investment in science, scientific research and technologies, which lay down the foundations of the defense capabilities. The architectural approach as a comprehensive and integration modeling approach for analysis, appears as a powerful instrument for ensuring effective management of any organization, when speaking of achieving its strategic goals. This approach contributes “from inside” either any organization itself, or in cooperation with other organizations to aim at realization of the smart defense concept. Through application of the architectural approach the desired success could be achieved alongside with the organizational transformation, as well as

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improvement of the working processes' effectiveness. This can be done also using IT integration in the organization. Another result could be tightening of the resources and capabilities with the organizational aim. This approach is not revolutionary or unknown. It is another way of thinking and a mean for representation of the information on the organizational environment in the desired details and depth (Zapryanov, Andreeva, Karev, 2012).

"The integration of systems, used in defense, is impossible without applying the architectural approach in planning, acquisition, development and use of new military capabilities. This approach upgrades the structural and functional approaches, while giving opportunity to control and coordinate not only the functions and the tasks of the structural units, number of working personnel, but also the information processes, that are going on in order to support their activities. Besides this, it gives opportunity to define within the model of functioning of the organization, the systematic and technological aspects of the communication and information systems, of the data bases, which are needed for its functioning" (Zapryanov, Andreeva, Karev, 2012).

"The architectural approach gives opportunity to integrate elements in continuous environment:

- policies, concepts and doctrines;
- organizational functions, goals and tasks;
- C2 systems;
- systems for defense planning and operations planning;
- procedures for decisions making;
- organizational structures, processes, documents, information flows and data;
- resource planning and management systems (personnel, finances, materiel)" (Zapryanov, Andreeva, Karev, 2012).

It is clear that under conditions of limited resources, we may answer the requirements of the smart defense not only by pooling and sharing of efforts, but also through application of innovative approaches.

In Bulgaria the architectural approach was used with limited success. Lots of materials were published recently, which contribute to the spread of opportunities, which the architectural approach offers for modeling and transformation management in the defense system. Besides what was done during last years, and the proposals for the establishment of the institution of the "Chief Information Manager" (CIM) in defense, in practice all initiatives stay as good wishes. Because of misunderstanding and concerns, stemming from innovations, the process of implementation of the architectural approach and the responsibilities of the CIM are blocked before 2009 as it is closely connected to establishing more transparency in the organizational structuring and more precisely in the defense budget spending for communications, hardware and software (Zapryanov, Andreeva, Karev, 2012).

At the beginning of 2012 a concept for implementation of the architectural approach was approved. This concept was created by a team from the "Strategic planning" directorate in the MOD. It is scheduled that its implementation will go through three phases, as till end of 2014 all the activities form the first phase should be carried out: training and education for higher qualification of personnel in order enterprise architecture to be implemented;

participation in open tender with a project for financing activities related to the enhanced administrative capacity of the MoD, structures that are under direct subordination to the minister of defense and the Bulgarian Army IAW priority axes III "Quality administrative service and development of the e-government" of the Operative Program "Administrative capacity", co-financed by EU .

In order to achieve overall effect at national level, this approach should be implemented by all governmental bodies, through the policy for implementation of the e-government, with which it will reach its maturity.

Only in this national context the MOD will have full coordination with all stakeholders in the defense system and will adequately face the challenges of the smart defense.

Advantages of the architectural approach

- The architectures fulfill their purpose through providing the needed integrated information to the decision making processes, thus allowing the multiple use of such information and its continuous update.
- The application of the architectural approach saves significant resources and energy in the future, as it ensures transparency of the organizational structures, systems and processes (Afuzova, 2009; Tagarev, 2002), offers instruments and opportunities for effective analytical support. An opportunity appears for comparison and linkage of the defense aims with the required capabilities as well as data exchange with the NATO repository (Radulov, 2011).
- This approach ensures comprehensive understanding of the organizational processes and techniques used, good synchronization among the efforts and activities at different levels and a solid base of the structure of the entire system upon which the future of every organization is being built (Schekkerman, 2006; Shalamanov, 2009).
- The opportunities which are provided by architectures for analysis of the organization at different levels, define their role as universal supporting instrument in the decision making processes. The exact expectations are these architectures to enhance the identification of different problems or requirements and finding out effective solutions. This role supposes implementation of enterprise architecture modeling in the entire depth of the military organization and its all management systems, processes and functional capabilities (Schekkerman, 2006; Lazarov, 2009).
- In the field of defense the architectures present the context of strategy or policy for use of organizational resources. That means they provide visibility of the factors and conditions, shaping the decisions on that how to use the resources in support of the organizational strategy and achievement of the aims of the defense.
- The relative functional area of application of the architectural approach encompass the processes of development of new military capabilities and development of the organizational structures, best use of these capabilities in military operations; optimization of the system processes and expenditures, integration of the combat support, logistics and C2 as well as provision of interoperability. As a whole they contribute to rising up the effectiveness of the entire defense system.

Architecture modeling

The enterprise architecture oriented modeling is the instrument which can be applied to any management system. The reference models are used for multilateral study of the systems in the form as they exist today (As-Is), for defining their shortcomings and finding out recommendations for their future development, i.e. the organization as such we want to be (To-Be). The transformation from the present to the future state is the process of transformation. Till now such an approach was never applied entirely, regarding systems of national defense planning. It was applied partially in the field of defense information technologies capabilities development. In this particular case, it is important to be stressed, that the systems for management are capabilities carriers. These capabilities, as all military capabilities can be analyzed and developed, having in mind the whole spectrum of different points of view in the exact environment and system. An example for such spectrum is the term abbreviated as DOTMLPFI (Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities and Interoperability – integral elements of a military capability). This overarching theoretical frame of military capabilities fully implies in the architectural approach for modeling. There is no conceptual problem this frame and this approach to be used for analysis and development of capabilities integral to defense planning systems. The use of architectural approach allows proactive management of the organization or solving of already identified questions, related to the management of the system, its subsystems and products. The overall and the component effectiveness and efficiency of the resource management are of strategic importance for the achievement of the political aims of the organization. For that purpose a relative strategic choice of timely, relevant and universal instrument for finding out the best possible organizational decisions. This instrument must (Zapryanov, Andreeva, Karev, 2012):

- bring together goals, resources and products of the defense policy;
- presents results, obtained on the basis of deep system analysis;
- takes into consideration the best management practices, instead of traditional bureaucratic administration of defense.

The right choice of similar instrument will stress importance on the strategic character of the development and the wide spread of organizational resources and capabilities in such a way that the benefits to be maximized. Following the leading NATO nations, this approach allows us fully to integrate the military capabilities with the operational requirements and will define clearly the system requirements to the C4ISR system, the development and the support of the data bases, standards and technical means for its build-up, as well as reaching the desired level of interoperability. Significant advantages in the development of defense capabilities on the basis of architectural approach are expected when joint work in net environment is used for planning of NATO rotation forces – NRF.

Enterprise Architecture Model Elements (Ea) (Zapryanov, Andreeva, Karev, 2012)

The basis for enterprise architecture development is a combination of the three pillars, upon which every good

organization stands: clear strategy, good knowledge of processes and resources, new technologies. The end state of EA – depicted working processes and relationships are used for facilitating the decision making and choice of organizational change.

The scope of EA regarding decision making at different levels and for different functional areas in defense include:

Management of organization and systems. Architectures, more precisely the so called federative architectures, are used for effective decision making, which better the resource usage, definition of functional responsibilities, joint work and investments in the relative organizational structure, as well as identification of alternatives for realization of quite a number of requirements related to a certain system (organizational, information, communications, technical, weapon system etc.).

Planning and forming capabilities. The architectures help defining the readiness state of military capabilities to operate in net environment, as well as identification of the gap for the required level of interoperability.

Programming and budget. At programming level part of the architectural views are used for obtaining the needed relation among national interests and aims in the defense sector, the required capabilities in order to achieve them and the available defense resources.

Acquisition, investments and project or portfolio project management for modernization. In acquisition processes the architectures present the system concepts, design and project development providing keeping to the rules and tracking the realization of the operational requirements. They assist the definition of opportunities for meeting operational, technological, standardization and other requirements addressed to a particular military capability.

Operations planning and management. The architectures are used for optimal capability management, resource management and decisions on investments for all aspect of planning, organization and carrying out of one mission or group of missions. The enterprise architecture helps for identification of capabilities gaps and reducing the risk coming as a result of overlapping capabilities (doubling of capabilities). The architecture approach implementation enhances reaching the desired end state, contributes to the success of missions and management the transition to that state.

With the help of architecture of certain military formations it is possible to define how the different military formations, participants, systems and information flows must act together, as well as the potential problems and options for resolving them to be identified.

Providing services for customers outside. The architectures assist functioning of services offered in MOD and the Bulgarian Army. They encompass the spectrum from minimum required services for carrying out assigned tasks to the optimal for the functioning of the organization, according to assigned aims and strategies for development.

The architectures contain the specific services as well, including services for cooperation, exchange and joint work of the ministry with other bodies, institutions, citizens and business entities – priorities when forming the e-government.

For modeling and simulation of the work of the system architectural models are used. They allow research on how the critical factors influence the initial parameter of the model. The simulations and the analyses require implementation of special instruments, which are not part of the architectures or architecture framework. Common among the examples, mentioned above is analysis, which is possible due to the taken under control complexity of the architectural subject (Afuzova, Shalamanov, 2009).

Key types of analysis, which are supported by the architectural approach, are:

Static analysis – includes capabilities review, analysis of compatibility or functional analysis. This type of analysis needs relatively simple analytical instruments, compared with meeting certain requirements, concerning relative subject.

Dynamic analysis – studies the conduct of certain system under different values of the entry parameters.

Experiment – serves for analyzing the operational functions of a certain system using simulation capabilities, which allow high degree of control over the parameters, for which it is impossible or expensive to be manipulated in real environment (Zapryanov, Andreeva, Karev, 2012).

Summary

One way for establishing higher security and stability, when using less resource, is the Smart Defense Concept. The steps for its realization through identification of areas of cooperation among NATO and EU Member States as well as with Partners, not members of NATO or EU, contribute to the enhancement of the process of acquisition, development and support of military capabilities.

The architectural approach as a tool for structuring and functioning of the organization ensures more security and makes easier to a certain degree the cooperation among different participants during planning of changes and making better decisions. In the military organization the enterprise architecture modeling support the process of defining the required capabilities, decision making and defense resources management. The IBM 2008 CEO Survey research data shows

that the efficiency of certain organization/enterprise grows as follows (Tujarov, 2010)

- 2% when optimizing only the information technologies;
- 8% when optimizing only the business;
- 20% when implementing the architectural approach.

References

- Afuzova, ., N. Christov, I. Radulov, P. Andreeva. The architectural approach – instrument for analysis of organizational risks. : Collection of works IKKS, Vol 3, 2009, 104 – 114.
- Lazarov, ., I. Radulov, P. Andreeva. Enterprise architecture oriented modeling in defense. Into: Military Journal, # 6, 2009, p. 25 – 34.
- Open Group <http://www3.opengroup.org/>, 05.12.2014, 09:40.
- Radulov I., P. Andreeva, . Karev. The architectural approach – universal instrument for effective integrated defense capabilities planning and development in the Bulgarian Army. : Annual publication – Faculty „Command and Staff”, National Defense College „G. S. Rakovski”, Sofia, 2011.
- Rasmussen, A. Smart Defence can help nations to build greater security with fewer resources but more coordination and coherence. European Security and Defence 1/2011.
- Schekkerman, J. Extended Enterprise Architecture Framework Essentials Guide. v1.5, Institute For Enterprise Architecture Developments (IFEAD), 2006. // <http://www/enterprise-architecture.info>.
- Shalamanov, V. Model for effective defense management – the role of operational analysis and the integral use of military and civil expertise. Final Report. Sofia, BAS, 2009.
- Tagarev, ., St. Hadjitodorov. Information system „Defense resources planning through programming”. Notes. Sofia, Bulgarian Academy of Science 2002.
- Tujarov, H. – Asenevtzy. Enterprise architecture. // <http://tuj.asenevtzi.com/EA/EA01.htm>, visited on 4th December 2014, 16:25.
- Zapryanov, A., Andreeva, P., Karev, M. The architectural approach for modeling the organization and its military application. Troyan, MPH, 2012.
