

Models of the life cycle of forming project teams in a security-oriented system

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Abstract: In this scientific article one difficult sociotechnical security-oriented system, its functions and purposes are represented. Here we realize the importance of strategic planning and risk management. Many huge projects operate under uncertainty due to neglect of the life cycle phases. Effective life cycle functioning diagram-model helps to succeed in forming qualified teams, prevent emergency, preserve territorial integrity and the interests of citizens. Project approach delineates the phases, sets the transition between groups of processes, creates a coherent system of communication and exchange of experience and information between participants in a security-oriented system. Stakeholders with their functional roles, development and training, clear requirements, process management are determined in this article. It is important to take into account life cycle features in a security-oriented system and use a project and program management methodology in order to realize the strategic goals of mega projects. The group of life cycle processes, their interdependence, influence of internal and external project environment are described here. It is also considered the role of management and monitoring of all project phases and the level of labor costs for its implementation. This work is dedicated to constructing life cycle diagrams of project teams formation in a security-oriented system.

Key words: *project approach, safety-oriented system, project team, life cycle, development of project team members, performance criteria.*

I. INTRODUCTION

Virtually every system or organization goes through a lifecycle. It is influenced by both the external environment and many important internal factors, such as: competitiveness, political and economic component, social factors and several others. New methods of organizational management and control are needed, given all the constraints and based on goals and strategy. Increasingly popular is project management methodology, which allows you to better manage the risks of the project, its team, control all levels of the organizational structure and achieve the set goals, taking into account all limitations. The new challenges and challenges that arise in the life safety system require quantitatively and

qualitatively better management methods, including the formation of competent and reliable team members.

An important task of project management is to form a project team of competent candidates and specialists from different departments and organizations.

Analysis of recent research and publications.

In the world, the methodology of the project approach to managing team members from different fields of activity is becoming increasingly popular and is being considered by many organizations. Review of numerous scientific and methodological standards PmBok, P2M [18; 19] and theoretical developments in project management, based on the scientific works of such scientists as S. D Bushueva, I. V. [1; 2] Chumachenko, I. V [3], Kononenko, V. D [4], Gogunsky, V. A Rach, N. S Bushuyeva, Y. P. Rak, O. B Zachko [7; 8] and others points to the study life cycle of project teams.

Doctor of Technical Sciences I. V Kononenko [4] in his work "Formation of a project team for the development of information and communication technologies" more meaningfully considers an important aspect of the requirements for the competencies of project members. This contributes to the level of performance and satisfaction of the stakeholders and the life cycle is not fully addressed. This, in turn, requires the study of a group of life cycle processes in the future.

V. V Morozov [5] achieved significant achievements in the life cycle issues in his work "Functional role approach to the description of the life cycle of projects of project-oriented corporations". In his work, he focuses on development project corporations and identifies the key eight lifecycle stages and their relationship with the formation of key documents, defining the organizational structure, functions and roles of project members as a basis for successful implementation and achievement of goals. But given the specifics of real estate development projects and programs, we cannot fully utilize this methodology in a security-oriented system.

The work "Model of the life cycle as the basis of project management" VM Molokanova [10] systematized the scientific and theoretical aspects of project management methodology to improve the state of the economy. Considerable role is given to the issues of the financial management lifecycle, not to team members. Therefore, based on this work, it is necessary to consider the life cycle model in complex systems for managing the members of the BOS project teams.

It is also advisable to consider the work of Candidate of Economic Sciences Y. S. Grysyuk [17] "Modeling the life cycle of a project team (Life cycle design project team). The author points out the importance of the stage of project stakeholders determination, methods of project team management. It describes all stages of the project team lifecycle and provides examples for the successful functioning of the organization. This work needs further investigation and has been analyzed to describe the life cycle of a Safety Oriented System (LC BOS).

Research methods. Using system analysis, theoretical and practical aspects (empirical) and project management methodology, as well as basic methodological principles of scientific research, it is possible to describe the life cycle (LC) of project teams in a complex dynamic security-oriented system (BOS)..

RESULTS OF RESEARCH

The definition of a safety-oriented system should be formalized in order to describe the life cycle of forming project teams and to count the specifics of the complex socio-technical system. We analyzed the scientific work on the safety environment [7: 8: 9] and defined a "security-oriented system"(abbreviated SOS) as a complex socio-technical system with a set of factors that affect the security of society and represent the system of heads of state at all organizational and structural units such as paramilitaries of Ukrainian Armed Forces, law enforcement agencies of the National Guard, national police, and non-militarized subsystems of Ministries of Interior. Security-oriented system is also associated with organizations and institutions aimed at ensuring national security, constitutional order, constant protection of human interests and creation of safe living conditions in the state in peacetime. Moreover, it is about maintaining territorial integrity while responding to external and internal circumstances in a special period.

The subjects of national security are: people, society, the state, its sovereignty, inviolability and preservation of internal order. The graphic is shown in Figure 1.

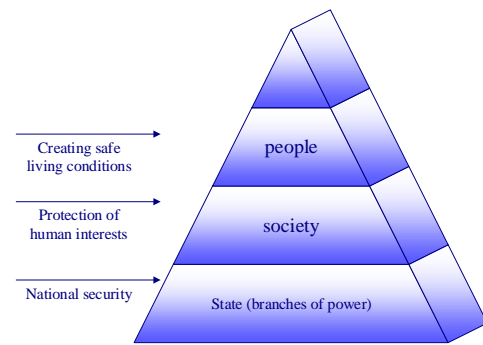


Fig.1 - "Pyramid" of the safety-oriented system of project Stakeholders

The classification of projects may be in accordance to project management methodology divided by these criteria: composition and structure, type of project activity, type, duration, scale and complexity, budget. It is advisable to supplement the classification for security-oriented system:

- by formation (militarized, non-militarized and special);
- in the direction of response (external protection against the aggressor and internal order preservation and creation of safe living conditions);
- by specialty (voluntary units, trained specialists).

An important aspect affecting team members and their interaction is the internal and external environment presented in Figure 2.

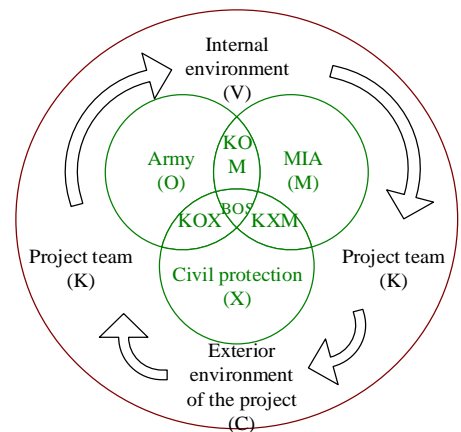


Fig.2 - Model of interdependence of project team members in a security-oriented system considering the project environment

All stakeholder members and requirements should be identified for quality implementation of project management methodology and life cycle process description. The SOS environment is dynamically complex and not stable and this factor influences personnel management and its potential. Today, the challenge for the state is quality selection,

formation, training and management of personnel, that is capable of fulfilling the tasks assigned to it influenced by the project's internal and external environment. The effectiveness of the team itself is a key indicator of success. It is advisable to develop a system of requirements for participants in the learning process, which is presented in table 1.

Table 1 Initiation requirements criteria

Criterion	Characteristic
1. Attitude to work	Perception of workload, ability to master more complex decision-making complex, initiative, organization, self-control, ability to plan, high level of flexibility in performance of work, work with different systems of motivation, reliability, interests, sociability, willingness to risk.
2. Mental abilities	Ability to evaluate, analytical thinking, emphatic thinking, stress resistance, psychological and moral-will qualities, ownership of technology and innovation
3. Physical abilities	Endurance, agility, resistance to high loads, no health problems.
4. Social attitude	Collaboration, communication, persistence, readiness for internationalization of management, knowledge of people to lead them.

The life cycle of a project team (LC) in the SOS brings together a group of project processes: formation, modeling, achievement of maturity, completion stage that is limited by the timeframe from the beginning and completion. Each phase of the life cycle in a security-oriented system can be separated into a subproject.

Features of the life cycle of forming project teams in SOS:

1. Long-term planning;
2. The complexity of formalizing, documenting goals and developing a project concept;
3. Communication and interaction in the BOS mega project through a multi-level organizational structure;
4. Significant risks and uncertainties in the implementation phase;
5. Monitoring and control at all stages of the life cycle;

By identifying each phase of the life cycle [14; 17] and a clear formulation of the processes allows to achieve the goals and significant successes in the implementation of the project, the substantive content of which is presented in table 2.

Table 2. Substantial filling of life cycle stages of forming project teams BOS

Life cycle stages	Substantial content
1. Initiation	Define the mission, SMART goals, charter and concept of the project
2. Planning	Decomposition of tasks and organizational structure, definition of resources, stages of selection, methods of evaluation of members of project teams
3. Realization	Planning tasks, assessing and selecting, recruiting and adapting team members
4. Monitoring and	Analysis of deviations from targets, risk

control	prediction
5. Completion	The process of creating new knowledge, the system of accumulation and accumulation of experience, leadership positions, functioning of a competent team of BOS, project evaluation, documentation generated, analysis to optimize processes in subsequent projects.

Each phase should end with a specific result that allows you to move on or return to the initial stage to correct the deficiencies. The sum of the successive steps that make up a ready-running SOS command can be described by the formula 1, which is given below:

$$\{LC(BOS) = F+S+Z\}, \text{ where:}$$

1. LC- Life cycle
2. SOS is a safety-oriented system
3. Stage of formation (F) of team-initiation and planning;
4. Stage of implementation-formation (S) of the team;
5. Completion Stage (Z) - Ready SOS team of a successful project.

A model diagram of the life cycle of forming project team members at BOS is presented in Figure 4:

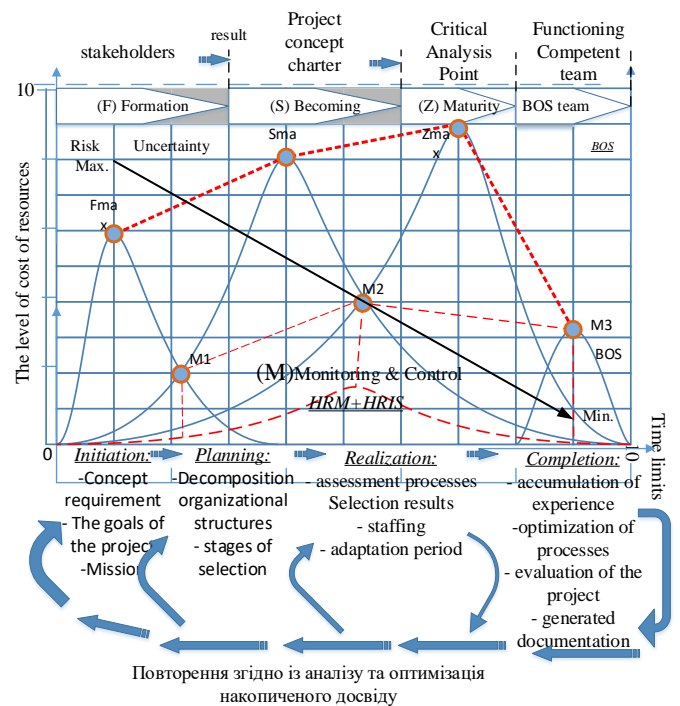


Fig. 4 - Model life cycle diagram of the development of project team members in the BOS.

The initiation phase has the greatest risk and uncertainty, which is reduced in the process by formalizing all processes in the project concept and by bringing it to all stakeholders throughout the project. Monitoring and control of performance is maintained through modern information systems of human resources management and it is of greatest importance at the stage of team formation. The greatest indicator of resource costs occurs when participants reach the stage of "maturity", then a critical analysis is conducted to validate the results or to refine the shortcomings. A ready-made "product" of the life

cycle is a functioning SOS team. At the completion stage, experience analysis, archiving and process optimization for future projects are carried out.

II. CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCHES

In this article, a design approach to describing the life cycle of complex systems of a safety-oriented system was considered, namely, the life cycle in such complex socio-technical systems is considered taking into account their peculiarities and environment. The definition of a security-oriented system is formulated, its purpose, structure and participants are described. The systems, types of teams and their evaluation in the project management methodology were classified.

A life cycle model has been created in a safety-oriented system, taking into account the management processes of monitoring and control, the level of labor costs. In further studies, it is advisable to consider separately each of the phases of the life-cycle of a safety-oriented system and their interdependence on the achievement of goals for the selection and formation of project teams in BOS.

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