Criteria for intellectual forming a project teams in safety oriented system

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Abstract— **One of the constituent components of human resources management is the implementation of the evaluation and selection subsystem of labor resources, the initial elements of which form the basis for making personnel decisions regarding the formation of project teams. To increase the accuracy of the quantitative assessment of the quality indicators of the applicants, it is advisable to formalize the criteria and their weighting factors using the theory of qualimetry and personnel assessment methods. The formalization of these indicators will reduce subjectivism. To optimize and automate the selection process, you should consider expert decision support systems for HR.**

Keywords — life cycle of team development, personnel evaluation methods, candidate selection method and criteria, personnel decision-making support systems.

I. INTRODUCTION

One of the ways to ensure the success of the organization's strategy is to create project teams. Effective implementation of the mission and goals in safety-oriented organizations is achieved through the coordinated work of units at all levels of the safety- oriented system. The quality of human resource management processes, namely: selection, evaluationand staffing play a key role in achieving the goals of protecting the population in a turbulent and dynamic environment.

The processes of project team formation are resource-intensive due to the specifics of specialist qualifications. The main problem for top management in personnel selection is the assessment of the candidate's suitability for his future role in the project.

Leading in the management system are such modern project methodologies as: Prince2, P2M, PmBOK and flexible Agile approaches Scrum, Kanban, Lean, XP.

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II. ANALYSIS OF LITERATURE

The problems of forming project teams in complex socio-technical systems have been studied by many scientists, in particular, S. D. Bushuev, I. V. Chumachenko [2], I. V. Kononenko [4], O. B. Zachko [21] and other.

In the work of S. D. Bushuyev [1], the processes of project knowledge management were studied. A conceptual model was developed, which contributes to the structuring of data with subsequent transformation into a knowledge base.

In the monograph I. V. Chumachenko [2]. multi-projects and applicants who were selected for inclusion in the team were studied. Special software is being developed to implement new methods and models of forming project teams.

In the work [4] "Formation of the project team for the development of information and communication technologies" more meaningfully considers the important aspect of the requirements for the competencies of the project members. This contributes to the level of quality of execution and satisfaction of stakeholders, and the issue of the life cycle is not fully covered. This, in turn, requires the study of a group of life cycle processes in perspective.

In order to solve the tasks of planning and managing a portfolio of projects, enterprises implement projects for the implementation of a number of automated systems, the core of which is the corporate information management system.

Leading companies also use them in personnel management, namely assessment centers. Assessment centers have positively proven themselves in the world. Their methods of comprehensive assessment of personnel are being improved and this affects the success in the process of team formation. Candidates correspond to therole in the projects.

For example, the frequency of use of assessment centers in the USA and Great Britain is approximately as follows: in large companies with more than 500 employees - up to 70%, and in small companies with less than 50 employees - up to 25%.

According to the analytical company Ambysoft, for IT projects, agile methodologies are better than classic models, but companies continue to use traditional methodologies, which help them get successful project implementation only 50% of the time, while agile methodologies exceed this figure (more than 60% success) [19].

The Hamburg Institute of Management Diagnostics has developed a system of requirements for a manager that can be applied in the practice of staffing project groups.

TABLE 1 REQUIREMENTS FOR A PROJECT MANAGER

№	Criterion	Characteristic
1.	Mental abilities	Analytical thinking
		The ability to give an estimate
		Creative thinking
2.	Social relation	Persistence
		Cooperation
		Communicability
		Readiness to risk;
3.	Attitude to work	Load perception
		Initiative, decision-making
		Ability to plan
		Organization
		Control
		Reliability
		Motivation
		interests

III. PRESENTING MAIN MATERIAL

It is important that the evaluation is done objectively, because the value of the integral index (Ik) and the subsequent formation of the rating depends on it.

To increase the accuracy of the quantitative assessment of the quality indicators of the applicants, it is advisable to formalize the criteria and their weighting factors using the theory of qualimetry and personnel assessment methods. The formalization of these indicators will reduce subjectivism.

Qualimetry (Latin: Quales - quality, Greek: Μετρέω - to measure) is a scientific direction that studies the methodology and problems of complex quantitative assessment of the quality of any objects - subjects, phenomena or processes. In the process of forming a team, the manager performs a number of measures regarding the selection of candidates.

TABLE 2 MEASURES FOR THE SELECTION OF CANDIDATES

Selection procedure	Actions of the project manager
Choice of selection criteria	Selects criteria for selecting applicants
Approval of criteria	Approves them
Selection interview	Conducts interviews with candidates
Analysis of applications and questionnaires	Analyzes applicants' applications
Testing	Expert assessment
Making a decision on inclusion in the team	Makes a decision

The effectiveness of team building is influenced by the application of a competency-based approach to team building. Also analysis of applicant profile and psychogram. Analytical data helps to build HRIS information systems, which are designed by specialists.

Criteria should be selected to build a personal profile of the applicant. Evaluation criteria for teams of fire and rescue units::

- Promptness in making the right decisions in freelance situations during work.

- Ability to work in a team

- Ability to act in non-standard situations

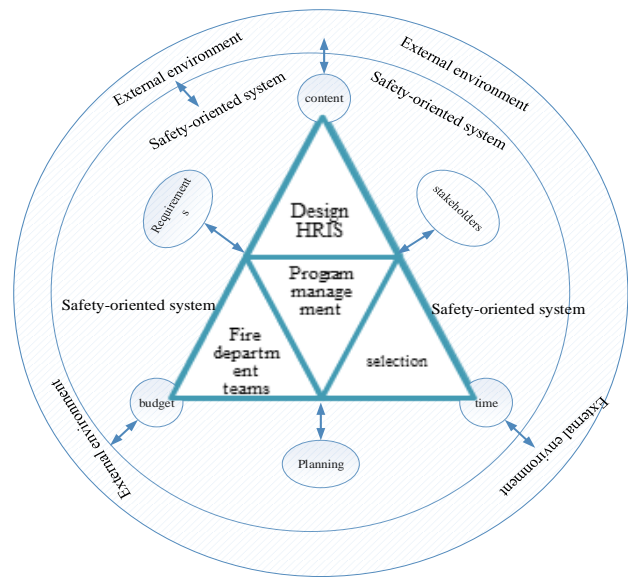- The ability to take responsibility for professional activities

Fig. 1 Conceptual model of the project design HRIS.

For better formalization, let's divide these features into subcriteria.

TABLE 3 SUBCRITERION FOR PROJECT TEAMS CANDIDATES

№	Criterion	Subcriterion
1	Promptness in making the right decisions in freelance situations during work.	Determination
		Reliability
		Confidence
2	Ability to work in a team	Empathy
		Active listening
		Communicability
3	Ability to act in non-standard situations	Creativity
		Openness
		Purposefulness
4	The ability to take responsibility for professional activities	Responsibility
		Loyalty
		Motivation

The general evaluation card of team members' parameters will have the following form.

The formation stage is characterized by the decisive role of the team leader. The project manager focuses on helping team members, their communication, getting to know each other to harmonize processes.

This cycle contains significant uncertainty in the process of which it decreases as the transition to other phases of the project takes place. The toolkit includes detailing the objectives, roles, responsibilities and procedures relevant to the team's actions.

TABLE 4 – CRITERION EVALUATION MODEL

subcriterion, (n)	Compliance level	Compliance level, (kj)	The degree of influence of additional factors, ki	
			Availability of experience	Educational level
Ability to work in a team	1	1,0	1	Higher Education
	2	0,8	1	Higher Education
	3	0,7	1	Higher Education
	4	0,6	1	Higher Education
	5	0,4	0	Higher Education
	6	0,1	0	Higher Education

At the "boiling" stage, there are conflicts in the team. The group must overcome internal disputes for a new phase of team development. At this stage, there is a high risk of project failure.

The creation of team norms should be regulated. The cohesion of team members and clear interaction contribute to the result of higher productivity than in a "work group".
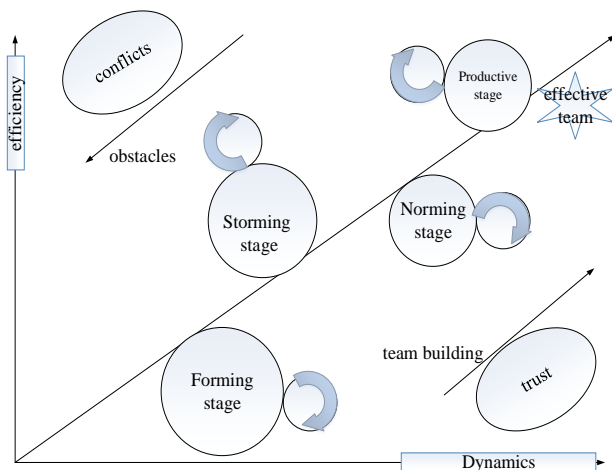

Fig. 2 Life cycle formation project team

After completing tasks, teams often break up, and this phase is also characterized by special processes.

To optimize and automate the selection process, you should consider expert decision support systems for HR. Successful global companies such as Oracl, IBM, SAP use HRIS, which allow effective management and coordination of a large number of personnel and analysis of key indicators for the organization. Such decision support information systems contribute to the achievement of the company's goals.

Their design and development requires a lot of resources. Accordingly, in order to develop such a product for safety-oriented organizations, reasonable methods and models are needed, which will further minimize risks at the stage of implementation of the HRIS project.

The main methodologies of designing information systems include: SADT (structural modeling of IDEF0 notation), RAD (method of rapid prototyping and development), RUP (for modeling IT product development processes). It is advisable to use the client-server architecture for HRIS, which includes such components as: database, knowledge base, OLAP for operational data processing.

An expert system is a computer program that uses knowledge in a specific subject area to solve problems, it is one of the directions of a new field of research called artificial intelligence, which is able to reproduce accumulated experience.

To improve the selection process, it is necessary to create a personnel database before the interview and a questionnaire for each candidate.

This database management system will contain all the information of members for the selection competition, namely: photo, gender, surname and first name, education, address and place of residence, general information about administrative and criminal convictions, medical and mental status, as well as the physical ability to serve in military formations.

The expert system includes six logically systematized stages:

1) identification – setting goals, objectives, task description, input data;

2) conceptualization – analysis and research is carried out by experts in the subject area;

3) formalization – describes the work process and software selection;

4) implementation – implementation of the project;

5) testing – the competence of the expert system is checked;

6) experimental exploitation of the suitability of the expert system.

For the normal functioning of the DSS, informatization and personnel accounting, the database requirements should be taken into account at the design stage.

The relational database is designed using CASE tools, UML, namely EER diagrams in automated software environments. For example, it is advisable to design a personnel database in the MySql workbench environment, which, according to its functionality, allows you to model the logical structure of relationships.
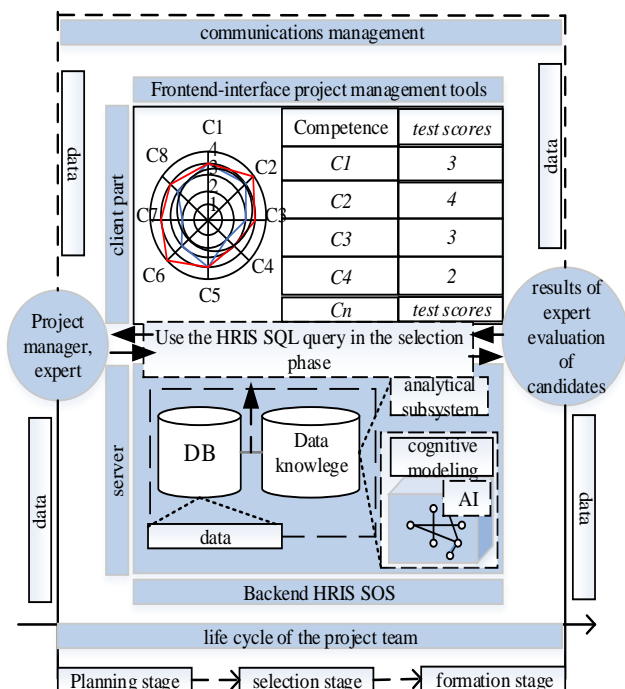
Fig. 3 Prototype Information system for evaluating the competencies of project team members

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