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PROSPECTS FOR USING NON-TRADITIONAL METHODS OF MANAGEMENT IN PROJECTS FOR THE PROTECTION OF POPULATION AND TERRITORIES FROM EMERGENCY SITUATIONS

Abstract. The article analyses literary sources that describe non-traditional methods of project management that can be applied to projects protecting people and territories from emergency situations in the constantly changing environment. Presented are the main features of projects for protecting people and territories from emergency situations. Two types of flexible and extreme project management, which is best suited for such projects, are considered. The definition and main features of flexible project management are presented, as well as the basic principles and methods of flexible control, such as: Scrum, Lean, Extreme Programming (data as of 2018), with the main advantages and disadvantages shown. The positive and negative aspects of extreme management are analyzed, too. The use of these techniques will be effective if the project is in an environment of uncertainty and has no limited resources. In practice the implementation of such approaches in the projects for the protection of population and territories from emergency situations will have a positive effect, provided that all performers will share the principles of flexible management. The possibility of avoiding financial constraints on the implementation of such projects has been shown.

Keywords: extreme project management; flexible project management; emergency situations; uncertainty.

INTRODUCTION

Today, the number of deaths and injuries from natural and man-made emergencies in the world has increased. This is due to urbanization, the increase

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in the number of production facilities and, first and foremost, with the consequences of global warming.

Improving the safety of territories and the vital functions of their population in such conditions requires the use of project-oriented management of the activities forces and means of civil protection, but not to eliminate the consequences of emergencies, as to prevent the emergence of dangerous striking factors. Implementation of such a proactive approach is possible due to the quality management of State Emergency Service of Ukraine (SES of Ukraine) projects, taking into account their limited funding.

Analysis of recent research and publications suggests that today need and relevance of new approaches to project management are gaining popularity in all areas of activity.

In particular, the topic of flexible management is described in these books: *Adaptive project and product management* (Wolfson, 2015, p. 144), *Adaptive IT project management. A guide for budding samurai* (Rasmusson, 2012, p. 272), and in the article by V. Kuzmin (Hansa, 2015, pp. 67-70) and O. Kolyanko (Kolyanko and Ozimok, 2017, pp. 177-182).

The main principles of extreme project management are described in the work of M. Aubry and P. Lièvre *Project Management in Extreme Situations: Lessons from Polar Expeditions, Military and Rescue Operations, and Wilderness Exploration* (Aubry and Lièvre, 2016), D. Walker, *Leading Extreme Projects: Strategy, Risk and Resilience in Practice* (Walker, 2018), in the works of A. Pushnikov (Pushnikov, 2009), A. Pyatkov (Pushnikov, 2009) and R. Vysotsky (Vysotsky, 2013, p. 768).

Therefore, for project management of population and territories protection from emergencies, in which the uncertainty of the project environment is a key importance, new methods of project management are needed to achieve social value – the safety of the population and territories.

The purpose of the article is to identify the practical feasibility of using flexible and extreme project management in the area of protecting population and territories from emergency situations in the SES of Ukraine.

1. PROJECT AIMS AND OBJECTIVES

According to Starodub and Havrys (2018; 2015, pp. 42-46), the portfolio of areas eligible for protection against flooding (or any emergencies) contains a set of protection projects combined together for effective resources management

of the State Emergency Service of Ukraine to achieve the strategic goal of ensuring – population and territories protection.

Managing projects protecting people and territories from emergency situations is an activity aimed at ensuring the safety of citizens in administrative territories with the maximum possible efficiency with limited resources (Starodub and Havrys, 2016, pp. 70-78; Starodub et al., 2018).

The main features of these projects include:

- focus on obtaining social value, rather than financial gain, as a result of the project (measured by minimizing the number of dead, injured and material losses);
- the time and duration limited for the project (determined by the results of forecasting the emergency situations);
- limited availability of financial and human resources (resulting from restrictions on the allocated financial resources and involved personnel staff of the SES of Ukraine);
- the specific direction of the project for a certain purpose (determined the composition and content of specific processes for create civil engineering construction in a certain territory and limited to the implementation it in another territory);
- the uncertainty of the project environment.

Taking into account that the projects protection of population and territories from emergency situations have a specific and definite goal – to ensure the safety of the population and territories – and that the implementation of technologies and necessary resources remains unknown due to the high degree of uncertainty of the project environment, it is expedient to use flexible or extreme type of project management.

2. ASSUMPTIONS AND CHARACTERISTICS OF SELECTED PROJECTS

Flexible project management is a management of values, principles and methods that allow managers at all levels of planned work to effectively manage teams and quickly respond to changes in the market conditions and the business environment (Professional Sequence in Agile Management).

The essence of such management is revealed in Agile (2001) and Waterfall (1970). Let's consider them in more detail.

Agile is a system and ideas and principles of a flexible project management, based on which the popular Scrum, Kanban and others have been developed.

A key principle is development through short iterations (cycles), at the end of each the customer (user) receives the working code or product.

Under the system of Professional sequence in Agile Management there are 12 principles of Agile-development, which can be described in four key points that determine the nature of a flexible methodology development:

1. People and interaction between them are more important than processes and tools.
2. The working product is more important than the completeness of the documentation.
3. Cooperation with the customer is more important than the agreement of the contract term.
4. Readiness for change is more important than complying with the original plan.

Agile has become the basis for a number of flexible techniques, among which are the most famous Scrum, Lean and extreme programming. The use of these techniques are shown diagrammatically in Figure 1.

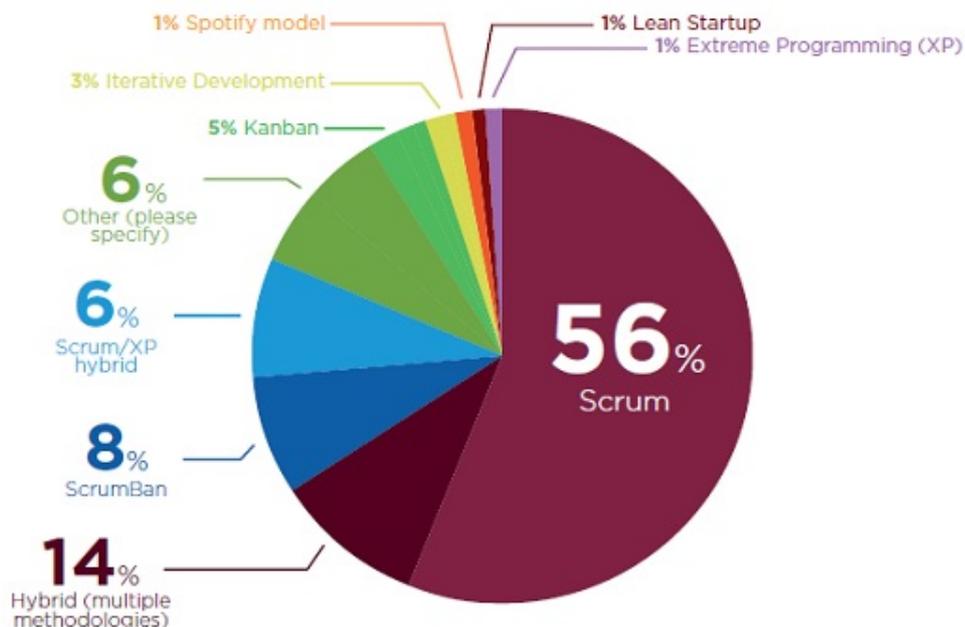


Figure 1. Data of using Agile techniques (data provided as of April 4, 2018)

Source: 12th Annual State of Agile Report, <https://www.qagile.pl/wp-content/uploads/2018/04/versionone-12th-annual-state-of-agile-report.pdf>.

The most popular techniques used in 2018 are Scrum, Lean and Extreme Programming (XP).

Scrum is a flexible development methodology based on the “sprint” – a segment from 1 to 4 weeks, after which a working version of the product must be obtained (Wolfson, 2015, p. 144).

The Lean method is a popular approach to production and organizational management that has its roots in the Toyota Production System. It is based on a philosophy of continuous improvement at all levels of the organization, where one of the key concepts is value (the one for which the customer is willing to pay) (Wolfson, 2015, p. 144).

Extreme programming (XP) is one of Agile methods, where an important role is assigned to a periodic game of planning with the involvement of the customer. It allows the identification of the shortcomings of the previous iteration, the priority of the tasks, the desired functionality of the product, taking into account the wishes of the customer.

The positive characteristics of Agile include:

- short and understandable iterative cycle (2–6 weeks), after which the customer receives a working version of the product;
- high degree of involvement of the executors, organizers and project customers;
- the main indicator of the project progress is the working product;
- risk minimization through a flexible system of changes.

The disadvantages of this approach include:

- stimulation of constant changes in the product;
- increased requirements for the qualification and experience of employees;
- the philosophical nature of the methodology: Agile – this is not an exact instruction for action, but a whole philosophical concept. The team cannot mechanically apply a flexible development mechanism, it is necessary to adopt the key principles of the system;
- difficulty in calculating the final amount of funds spent on the project.

Another approach to flexible project management is the Waterfall methodology.

The Waterfall method is a widely used project management approach, which implies a sequential transition from one stage to another without spaces and returns to the previous stages (Wolfson, 2015, p. 144; Rasmusson, 2012, p. 272). This technique was developed by Winston Walker Royce in 1970. He described six stages of project product development.

At the stage, the system and software requirements define the requirements for the project product. Further, processes of analysis and design are carried out,

during which an internal software architecture and ways of implementing the requirements are developed. At the coding stage, the program code and the software integration are written directly. Next, at the testing stage, the product testing and bug fixes are performed. At the final stage, the operation and technical support of the project product are carried out.

The most significant features of the Waterfall technique are:

- clear and simple structure of the development process;
- detailed project documentation, on the basis of which it is possible to follow the risks, costs of financial and time resources;
- stable tasks that remain unchanged throughout the process;
- evaluation cost and terms of the project delivery, which can be calculated before the development;

The negative characteristics of this technique include:

- not a flexible process in which, if necessary, more time or financial resources will be cutting the testing phase;
- resilience to changes, which makes any changes to the project impossible;
- inertia – in the initial stages, possible changes in time and financial resources, but changing the project in terms of cost optimization, change of functionality or concept is impossible;
- increased risk – testing the finished product rather than its individual particles.

However, comparing all the positive and negative aspects of the approaches to flexible project management and describing the projects of protection population and territories from emergencies, we can conclude that this type of management is suitable for the practical implementation of projects aimed at social value.

Consider a more detailed concept of Extreme Project Management developed by Doug De Carlo in 2004.

Extreme Project Management (XPM) – a methodology for managing complex projects, work on which is conducted in an ever-changing environment (Aubry and Lièvre, 2016).

3. REQUIREMENTS FOR IMPLEMENTING EXTREME PROJECT MANAGEMENT

According to an analysis of literary sources, some researchers argue that extreme project management is only suitable for software development, while others argue that this approach can be used in other projects where there is a high

proportion of uncertainty. However, they converge in one aspect – extreme project management will be effective for experienced teams that implement innovative projects, start up and operate in chaotic, unpredictable conditions.

There are five steps in implementing extreme project management, which should be followed by the team to successfully complete the project.

1. Clearly distinguish the vision of the project before the start of extreme project management.

2. Involve the team in the creative thinking process (brainstorming) to create and select ideas for achieving a sustainable vision of the project.

3. Stimulating the team to test their ideas through the introduction of innovative technologies.

4. Re-evaluation of the team's work in the process of approaching the development process to completion.

5. Distribution of knowledge and practice for future stages of the project or for subsequent projects in general.

From the basic steps of implementing this type of project management spring the main advantages and disadvantages of this approach. The benefits of extreme project management include:

- integrity – the need to analyze the whole project as a single system, without analysing its individual parts;

- human orientation – allows interested persons to interact and communicate in order to meet the needs of the client;

- emphasis on business – once the result is achieved, the team will have a clear vision of how the project will benefit the client;

- humanism – is to take into account the quality of life of the project participants;

- reality as the basis – adaptation project to external factors.

The disadvantages include:

- uncertainty – a feature that restricts use of this type of management in many projects that has critical indicators of non-implementation risk of the project;

- high requirements for the qualification and experience of the project team – it is necessary to constantly adapt to changes in the project environment, to establish effective communication in the team, with stakeholders and project manager;

- the need to change the type of thinking – the team must be rebuilt and be prepared for the impossibility of full control over the project;

- the impossibility of long-term planning.

To realize projects that will protect the population and territories from emergencies through extreme project management, a well-trained team and unlimited financial resources are needed, which is practically impossible in the implementation of the SES of Ukraine projects.

CONCLUSIONS

After investigating the practical implementation of the project protecting a population and territories from emergencies, we can conclude as follows.

To begin with, flexible and extreme project management has a number of its advantages and disadvantages from which it can be concluded that these approaches have great potential in project implementation under uncertain conditions since the primary rule in the work is to understand the permanent and inalienable changes that are part of the work on projects designed to protect people and territories from emergency situations.

Furthermore, the project team is the key to effective implementation of these approaches, which must have high qualifications and extensive experience and be able to assume responsibility for the result of the project being implemented.

Last but not least, in practice, the implementation of such approaches in the protection of people and territories from emergencies will have a positive effect, provided that all performers will share the principles of flexible and/or extreme management, and will also be able to avoid financial constraints on the implementation of these projects.

The use of flexible and/or extreme management will be effective if the project is conducted in an environment of uncertainty and has unlimited resources. In practice, the implementation of such approaches in the projects serving to protect the population and territories from emergency situations will have a positive effect, provided that all performers will share the principles of flexible management, as well as the possibility of avoiding financial constraints on the implementation of these projects.

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PERSPEKTYWY WYKORZYSTANIA NIETRADYCYJNYCH METOD ZARZĄDZANIA
W PROJEKTACH OCHRONY LUDNOŚCI I TERYTORIÓW
PRZED SYTUACJAMI KRYZYSOWYMI

Streszczenie

W artykule dokonano analizy literatury opisującej metody zarządzania projektami, które mogą być zastosowane do projektów ochrony osób i terytoriów przed sytuacjami kryzysowymi. Przedstawiono główne cechy projektów ochrony ludności i terytoriów będących lub mogących być w kryzysie. Rozważono dwa rodzaje elastycznego i ekstremalnego zarządzania projektami, które najlepiej sprawdzają się w tego typu projektach. Przedstawiono definicję i główne cechy elastycznego zarządzania projektami. Ponadto omówiono podstawowe zasady i metody elastycznego sterowania, takie jak: Scrum, Lean, Extreme Programming. Podano statystyki za rok 2018 dotyczące wykorzystania tych metod przez kierowników projektów. Określono główne zalety i wady tego typu zarządzania. Zaproponowano definicję i zakres ekstremalnego zarządzania projektami oraz wskazano pozytywne i negatywne aspekty tego podejścia. W wyniku przeprowadzonych badań ustalono, że stosowanie tych technik będzie skuteczne, jeśli projekt znajduje się w środowisku niepewności i nie ma ograniczonych zasobów. W praktyce zastosowanie takich podejść w projektach ochrony ludności i terytoriów przed sytuacjami kryzysowymi będzie miało pozytywny efekt pod warunkiem, że wszyscy wykonawcy będą podzielać zasady elastycznego zarządzania.

Słowa kluczowe: ekstremalne zarządzanie projektami; elastyczne zarządzanie projektami; sytuacje kryzysowe; niepewność.