

# **FACTORS AND TENDENCIES OF DEVELOPMENT OF AGILE TECHNOLOGIES IN PROJECT MANAGEMENT IN RUSSIAN ENTERPRISES**

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## **Abstract**

Over the last decade the theory and practice of project management has got a significant development. More and more companies use methods and techniques of project management. Its intensive development is accompanied by the emergence and increase of the popularity of certain concepts of project management, including the concept of the flexible project management technologies.

The aim of this investigation was to identify conditions, factors and tendencies in the development of flexible project management technologies of Russian enterprises. The study was conducted using complex of methods. Gained results allowed confirmation of the scientific hypotheses, particularly related to the interest of enterprises in flexible project management technologies.

The evidence of the hypotheses is shown statistically on the base of analysis of the expert judgements. A conclusion about the need of developing scientific and experimental foundation of effectiveness of flexible project management technologies in practice was made.

**Key words:** project management, flexible technology, personnel, hypotheses, expert judgements.

**JEL Code:** M12, J54, O32

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## **Introduction**

In the modern international practice, one of the leading forms of organization of business is becoming a project form, and the popular management conception is project management. Project management development occurs in close relationship with the current changes in the project's environment. As a consequence, new areas of project management appear including

the methodology of flexible project management. The emergence and growth of this methodology is related to increased mobility of project environment factors and the need of adapt flexibly to changing factors. Therefore, modern project management is becoming more flexible in contrast to the stable and unchanging systems of project management. However, the scientific and practical problem is the lack of in-depth studies of various aspects of agile project management, which requires practice to be more accurate in its justification. Awareness of this problem allowed the author to formulate the purpose and to undertake this objective, to study of the current status of flexible project management in the regions of Russia, identification of the factors and trends that kind of management.

## **1 Theoretical basis of the study of flexible project management technologies of enterprises**

It is a well known fact, that flexible project management technologies are such forms of project activities under which many project elements and their management are controllable and purposefully adapted to changing dynamic conditions, for example, the purpose and duration of the project, the totality of project works and necessary resources, the vision of project outcomes and others (Romanenko, 2015).

This definition was formulated by the authors on the basis of summarizing information in various publications (Wolfson, 2015), (Kohn, 2011), (Larson, 2013), (Meredith, Mantel, 2014), (Guide PMBoK, 2013), (P2M, 2009), (Tsvetkova, 2010).

In project management has been developing the concept of flexible project management. In general, the essence of the flexible methodologies totality lies in changes of the project parameters and management of the changes, clarifications, customer requirements concretization. This conforms to a broad scientific understanding of the flexibility, which means the possibility of structural and functional selfimprovement of the object. In accordance with the scientific system theory, flexibility can be viewed through: a) adaptive changes, the apliancy of the system; b) random changes in condition or behavior of the system within certain limits as a result of certain influence (regulatory changes). (Ivanova, Prikhodko, 2004).

For project management, where everything is calculated using different methodologies in advance, there is a risk management, these are responses to deviations from planned events and results and the status of flexibility becomes very important. This is due to the high

mobility of the factors of the project and its environment. Today unexpected developments should not be perceived as a negative situation, but as an attribute of reality to which we must respond professionally. And since this attribute, the project organization are willing to admit it or not, is rooted in the project management system, it is necessary to develop the management system based on the flexible methodology.

In relation to the project management, first of all, were developed so-called flexible project management technologies of the IT-projects for creating software. Further this methodology will be described more explicit.

Agile methodology (eng. Agile software development, agile-technologies or techniques) is a series of approaches to product development, focused on the use of iterative development, dynamic generation of requirements and ensuring their implementation as a result of constant interaction of self-organizing working groups consisting of specialists in various fields (Dingsøyr, 2012). Agile methodologies are built in such a way where changes are welcomed and uncertainty is recognized (Jonkers, 2004). This feature distinguishes agile from alternative iterative methodologies (Mnkandla, Dwolatzky, 2004). A project in an iterative methodology is a static object. Project management is built on pre-defined and difficult to correct rules, regulations, technologies, techniques. Agile methodologies are based on the fact that the progress of the project is constantly undergone unforeseen changes and it is impossible to plan everything in advance (Moe, Dingsøyr, Dybå, 2010), (Santos, Bermejo, Tonelli, Zambalde, 2011).

The official date of the advent of agile methodologies is referred to 2001, when in Utah, USA was released "The Agile Manifesto", signed by representatives of the methodologies that have become the elements of the agile methodologies: extreme programming, Feature driven development, Scrum, Adaptive software development, Crystal Clear, DSDM, Pragmatic Programming. Many companies have tried Agile methodologies in their practice before the adoption of the Manifesto, but their mass usage began after that signing (Wolfson, 2015), (Kohn, 2011).

Originated in the field of information technology and software development, today the concept of flexible project management is all the more massively introduced in other sectors of the economy. However, there is a contradiction between, on the one hand, high interest practices in flexible project management technologies, on the other hand and the insufficient fundamental and applied levels of science in this direction of project management. Therefore, an urgent task is to conduct a deep theoretical and empirical research on this issue.

## **1.1 Methodology and methods of research of condition, factors and development trends of agile project management technologies of Russian enterprises**

Proposed in this paper study aims establishing a current state of the flexible project management practice to identify factors and trends of its development. The study was conducted within a larger programme associated with the establishment of a system for monitoring the quality of project management at enterprises of Russian regions.

The following hypotheses of the study were formulated.

Hypothesis 1. Approximately half of the enterprises use flexible project management technologies or experience interest in them and would like to use ones.

Hypothesis 2. The main group of factors influencing the use of flexible project management technologies are factors of project environment dynamism, in particular, the factors of increased risk, mobility characteristics of projects and project management, dynamics of the objectives and requirements of customers, products or projects services.

Hypothesis 3. The main trend is the continued increase in the scale and depth of flexible project management of Russian enterprises.

As the research methodology was elected a systematic approach and corresponding method of system analysis that will enable to study elements and their relationships in a system of flexible project management, while elements of this system are subjects, objects and flexible project management technologies.

The main empirical method was an expert survey. Processing of the results of expert judgement was carried out using qualitative methods. The expert judgement method was chosen for the following reasons. A reporting system of project management is still poorly developed by the enterprises. If companies with the more developed project management are considered then they have some fragmented data on the number of implemented projects and their success. However, these data is not enough for detailed analysis of project management. Enterprises which have just begun implementing of the project organization form, have no statistical data demonstrating the level of this management. In these circumstances, the only method of obtaining information becomes an expert survey. Experts can provide useful information on various issues of flexible project management.

Data collection method is a selective expert survey of the Omsk enterprises and organizations. There were selected 32 enterprises of Omsk. The selection of enterprises was carried out according to the principles of:

- availability of the company's project activities;
- presence of different levels of project management at the enterprises as well as different elements of the project management system;
- need of covering the study of different enterprises including size, sector, sphere of activity.

Companies meeting these principles were included in the selective aggregate. The representativeness of the sample was ensured by the observance of these principles. The key criterion was qualitative, not the quantitative one.

The criteria of the experts selection at the enterprises were the following: work experience in project activity should be not less than three years, operational experience at the studied company is at least three years. The position of the expert related to the implementation of the project management system was also taken under consideration.

## **1.2 The results of the study of the condition, factors and development trends of flexible project management technologies of Russian enterprises**

The research results allowed to confirm all our hypotheses. For example, 57 % of those in the sample companies are using different methods of flexible project management, 32% of enterprises plan to use them in the future. These data confirmed the first hypothesis that approximately half of the enterprises use flexible technologies in project management.

There are certain conditions under which flexible technologies are becoming the most necessary and effective. In table 1 these conditions are listed and the expert assessment of the frequency of their appearance in the studied enterprises is given. The analysis shows that at the moment there are prerequisites for the transition to the agile technology of the project activities. The flexibility of the project management is timely when communication with the client goes directly, thus the constant changes in the requirements to the result of the project are being discussed, the quality of the result is important, not the time of the project, lining up effective communication, staff is willing to work in an innovative environment, all subsystems of the project closely overlap and are connected. In addition, many experts note that sometimes companies are faced inefficient use of human resources. Flexible technology is aimed at overcoming this problem. Flexible technologies are also well suited to minimize

the risks and increase transparency of the project progress which is also true for the studied companies.

**Tab. 1: Answers to the question: "Does your company have any difficulties associated with following factors?"**

Factors	Yes, often		sometimes		no		Average rating**
	answers	%	answers	%	answers	%	
The constant changes in the requirements to the result of the project	23	71.4	5	14.3	5	14.3	1,55
Communication with the customer goes through the documents, not directly	0	0.0	18	57.1	14	42.9	0,56
The decline in the quality of the result for the sake of meeting project timelines	5	14.3	5	14.3	23	71.4	0,45
The unwillingness of staff to work in an innovative project	5	14.3	14	42.9	9	28.6	0,85
Ineffective project communication	5	14.3	18	57.1	9	28.6	0,87
The weak interaction of the subsystems and subprocesses of the project	5	14.3	9	28.6	18	57.1	0,59
High risks and lack of transparency of project progress	5	14.3	14	42.9	14	42,9	0,73
Inefficient management of human resources projects	5	14.3	23	71.4	5	14.3	1,00

\*\* - differences are statistically significant at the 5% level according to F-criterion (Fisher criterion) (Yes – 2 points, sometimes – 1 point, no – 0 points)

Source: author

The experts were asked an additional question about the importance of certain factors for projects. Their responses are presented in table 2. As you can see, all the typical flexible project management factors are relevant to the respondent enterprises. As a very important factor was called deep involvement in the implementation of the project of the customer and project team, ability of purposes and technologies of the project to change flexibly. The experts realize the importance of flexible management of the project team, the ability of changing and adapting the methods of working with people in the project. This requires special competences of the project managers and professional staff. The data confirm the second hypothesis that the major group of factors influencing on the use of flexible technologies of projects management are factors of project environment dynamism, in particular, the factors of increased risk, mobility characteristics of projects and project

management, the dynamics of the aims and requirements of the customers of products or services of projects.

**Tab. 2: Answers to the question: "How important are the following factors for projects?"**

Factors	very important	moderately important	not important	average rating**
Involvement of the customer in the implementation of project, constant contact with him, asking his dynamic preferences and expectations	85.7	14.3	0	1,857
Involvement of the whole team in the project, vested interest in the success of the project of each team member	57.1	42.9	0	1,571
Clear project goals, able to change as changes come in the environment and vision of the customer of the project outcome	71.4	28.6	0	1,714
Flexible technology of the project implementation, their ability to change if necessary	42.6	57.4	0	1,426
Flexible management of project team, ability to change and adapt methods of work with human resources in accordance with the dynamics of the environment and project	42.6	57.4	0	1,426

\*\* - differences are statistically significant at the 5% level according to F-criterion (Fisher criterion) (Yes – 2 points, sometimes – 1 point, no – 0 points)

Source: author

The presence of factors indicating the timeliness of raising the question of using flexible project management technologies has been established. Then it is necessarily to refer to the analysis of the responses of experts regarding their awareness of these technologies. The question was asked: "Do you know what flexible technology and methods in project management (Agile Project Management – APM) are?" - to which the replies were received:

- yes, we do not just know, we employ them, 42.9 %;
- we know, but do not use - 28,6 %;
- do not know - 28,6 %.

Realizing the fact, that many businesses may not possess the terminology of flexible technologies, we have given a list of techniques derived from flexible technologies, and asked the experts whether they use these techniques. The answers are given in table 3. As you can see, according to 71.4% of the experts indicated that their companies use such practices as dividing the process of product creation in the private sub-processes and execute them through crossfunctional (multi-functional) interaction of team members, and then systematic review together with the project team and the customer quality of intermediate results of individual sub-processes and activities of the project. This is one of the most important elements of agile methodologies. Team work methods are developed, organization-specific

activities in accordance with the agile technologies of project management. For example, widely used a practice in which the project team together with the customer determines customer requirements, clarifies and corrects the project as customer's requirements change. Also used a practical method when gather ideas from teams, which are transferred together with the team in goals and plans.

To the question: "Which of these technologies are not applied, but they are interesting to you, and you would like to use them?" - were named technology:

- to conduct a retrospective analysis of the project, the reasons and factors of success and failure of the project to use the Task Board;

- to use Task Boards to demonstrate the priority of the project work, their performance, project status, problems and ways of their solution;

- to collect team ideas, translate them into goals and plans together with the entire project team.

That is, companies either already using the practical methods of agile technology, or want to try them out on experience. This confirms the third hypothesis that trend is the continued use of flexible project management at the enterprises of Russia.

**Tab. 3: Answers to the question: "What technologies are being applied in the project teams in your organization?"**

Answers	number of respondents	
	persons	%
Gather a team together with the customer and define customer requirements, clarify and adapt the project as customer's requirements change	18	57.1
Create a list of works of the project together with the project team and the customer	9	28.6
To divide the entire process of creating the product into sub-processes and execute them using crossfunctionally interaction between the participants	23	71.4
To divide the work in operation and visually on the Task Board to record what was planned to do, what has been done, what needs to be done	9	28.6
To conduct a retrospective analysis of the project, the reasons and factors of success and failure of the project, to use the Task Board	9	28.6
To systematically check together with the project team and the customer quality of intermediate results of individual sub-processes and activities of the project	23	71.4
To identify with a team positive events and events that require intervention, to systematically detect risks and to eliminate them using a team effort	9	28.6
To use Task Boards to demonstrate the priority of the project work, their performance, project status, problems and ways of their solution	9	28.6
To collect team ideas, translate them into goals and plans with the entire project team	14	42.9
To coordinate the work of all team members, hold meetings in order to share information	9	28.6

Source: author

Flexible technology is characterized by the use of cross-functional project teams. Currently 42.9% of the experts said that their companies encourage creation of temporary

cross-functional teams; the remaining 57.1% of the respondents answered in the negative. It is possible to believe that this result also suggests the positive value of flexible technologies development. Already at the moment about half of the expert organizations resort to the formation of cross-functional teams.

## **Conclusion**

Currently actively developing flexible project management methodology. Our study showed that about half of the surveyed enterprises use these methodologies. For the development of the agile methodologies there is a set of preconditions and factors in the increased dynamism of the environment, the availability of a variety of risks, mobility characteristics of the projects, frequent changes of the goals and requirements of the customers. Also, our study showed that there is a trend of further usage of agile project management. Interviewed experts confirmed that many of the practices of agile project management are used already, or plan to use in the future. Thus, the aim of the study were achieved and the hypothesis was confirmed..

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