PROJECT MANAGEMENT METHODS FOR STIMULATING CO-CREATION IN IT PROJECTS

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Abstract: *Diversity in needs of different users as important project stakeholders contributes greater complexity in dynamically changing project environment. There is a need for chosing different project management approach that meets the requirements and expected qulity level of customers/users on projects of different complexity. Co-creation in projects encourages proactive engagement of the customers/users in different phases of project life cycle and contributes project success.*

Key Words: *Co-creation, Project management, IT, Stakeholders, COS (Complex Adaptive Systems)*

1. INTRODUCTION

In contemporary dynamic and complex global business environment, discontinuity and continuous change are constants. Market significantly changed in the last 50 years. While the 1960s were a decade of mass production, in 1970s companies strove for quality in order to differ, and managers restricted their product range due to quality improvement. In the 1980s, variety was main emphasis of companies, and they made flexible manufacturing systems to provide it, while maintaining quality and high production. In the 1990s, customers needed novelty, which required new products to be introduced fast and effectively. Nowadays customers want their product to have functionality. Organizations need to adopt flexible structures tin order to respond this changing environment, so the project-oriented organization is now very common [1].

Globalization of the project management profession and highly changing requests on projects has imposed need for effective project management approach. Achieving added value seems to be deliberate choice of many organisations. Co-creation was introduced as the answer to customer need to be involved in product development process.

When it comes to project management, companies need to access the type of the project they implement, and to adjust their managerial approach and customer's involvement in accordance with this.

2. THEORETICAL BACKGROUND

2.1. Project-oriented companies as Complex Adaptive Systems

Complexity theory was developed from systems theory and can be applied to a wide spectrum of disciplines.

Complexity theory was based on chaos theory or chaos science. The most important concept of this theory is CAS (Complex Adaptive System) defined by Holland in 1996 [2]. Stacey defines CAS as ''a number of components, or agents, that interact with each other according to sets of rules that require them to examine and respond to each other's behaviour in order to improve it" [2].

A CAS is consisted of a very large number of agents which interact mutually and with a system [3]. This agent-based approach is particularly interesting to management scientists because human groups, organizations, and societies may also be considered as agents that have interaction by some rules. Project-oriented company can be observed as CAS that consists of agents (people) who experiment, explore, self-organize, learn, and adapt to changes in their environment. They exist at the individual, team, divisional, and group level and also in a much larger web of external CAS—their economic, social, and political environments [2].

The project-oriented company can carry out all sizes and types of projects (small and large, internal and external, etc) and the main advantage of this organizational structure is flexibility and ability to adjust appropriate leadership style, in accordance with external constraints.

Youker [4] was the first who created the phrase ''projectized company" in the late 1970s, but the project-oriented company started to be used as a term in the early 1990s [1], [5]. However, project oriented company became the focus of research in recent years [6].This type of organization has many interchanged names–projectized organization, project-oriented project-intensive or project-based.

Hobday [7] emphasizes the importance of projects as the core units of this type of organization. The project presents the primary element in the project-oriented organization and it has a significant role in production and innovation process. Galbraith suggested that there is a

continuum of organizational forms: M-form – Matrix form - Project-based form [8].

According to the Lindkvist [9] project-based companies are defined as companies whose departments are organized around projects. The project work has numerous benefits to organization, and one of them is acceleration of product development [10].

Project oriented organizations can be observed from the general and project management perspective.

From the general management perspective, the core object of consideration is the company and its structures or their cooperation in inter-organizational projects and network contexts [11].

From the project management perspective, authors who consider project-oriented companies in their research are Gareis [5][12], Morris [13] Turner, and Turner and Keegan [14]. These authors are doing research in projects, programs, and portfolios as specific features of the project-oriented company. Turner and Keegan [14] defined a project based company as company that offer products and/or services that are customized of the demand on end users. This kind of organization represents a stimulating environment for product/service co-creation.

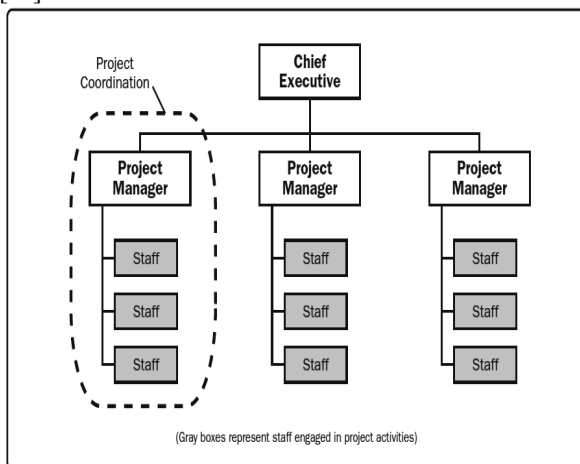Figure 1 presents structure of projectized organization [15].

Fig. 1. Projectized organization [15]

When it comes to project life cycle, cost and staffing are the main objects of observation.

In traditional project management (TPM), cost of changes during the project life cycle increase, while risk and uncertainty decreases during project lasting (Figure 2).
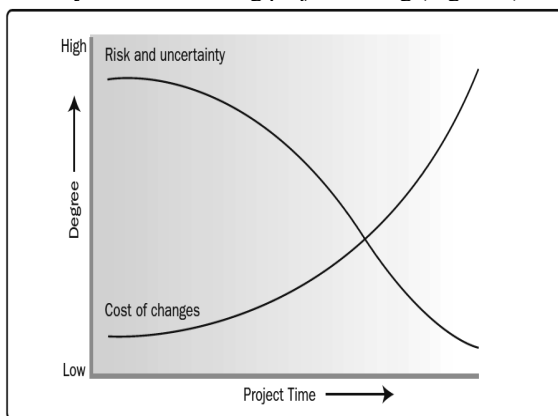

Fig. 2. Impact of variable based on project time [15]

One of the possible forms of project life cycle is adaptive project life cycle[15].

In adaptive project life cycle project managers should keep stakeholder's influence at high level, and the level of costs low. The main characteristic of adaptive life cycle is response to high level of changes in environment and intensive stakeholder requirements. This approach is also familiar as agile method. At the beginning of iteration, the project team have to determine priority list for next iteration. After that iteration, the product should be reviewed by customer. This decreases unfinished and uncompleted products and implies higher dependency between product quality and level of customer enrolment.

Customers and stakeholders need to identify their needs, and then provide adequate feedback on provided deliverables, ensuring their mutual compatibility.

According to PMBOK agile approach is preferred in changing environments, when customer requirements are complex and unpredictable [15].

Agile and extreme project management approaches are the most suitable for stimulating co-creation in IT projects.

2. PROJECT MANAGEMENT METHODS FOR STIMULATING CO-CREATION IN IT PROJECTS

Co-creation is defined as the process of innovation within social and technological networks where participants integrate their resources to create shared value [16].

The most important aspect of co-creation is cooperation between producers and users, initiated by the company in order to create greater value for the user, which is the basis for increasing the competitive advantage of the company [17].

Dutch consulting firm Fronteer Strategy defined four types of co-creation [18]:
1. Club of Experts - radical innovation where the selection process involves experts who meet certain criteria for co-creation participation;
2. Community of kindred spirits – co-creation within a group of people with certain level of expertise, similar interests and goals, who want to create different product/service or improve existing;
3. Crowd of people – co-creation based on crowdsourcing on online platforms where people can share their ideas, vote for other people's suggestions and suggest their potential improvements. The aim of this type of co-creation is to come up with the best proposal for the solution of a particular problem, with the creation of a large pool of ideas for future development activities, and to promote the brand;
4. Coalition of parties- co-creation based on collaboration of organizations that combine the expertise, knowledge and skills to create common competitive advantage.

Described types of co-creation are based on two criteria: openness and ownership.

Openness is determined by co-creation initiators, and it decides whether all interested parties can participate in co-creation, or there is a selection process. On the other hand, ownership of the co-creation results must be

defined - the owners can be both, initiator and co-creator, or just initiator, who gives certain compensation to co-creators for their contribution [18].

The dynamic business conditions require a systemic project management approach and new project management methods.

Wysocki [19] suggested that project management approaches should be based on two variables—project goal and solution, with two values—clear and not clear. The result is four quadrants:

- The Traditional Project Management **TPM** - When the goal and solution are clearly defined,
- The Agile Project Management - **APM** -When the goal is clearly defined but the solution is not,
- The Extreme Project Management - **xPM**- When the goal and the solution are not clearly defined,
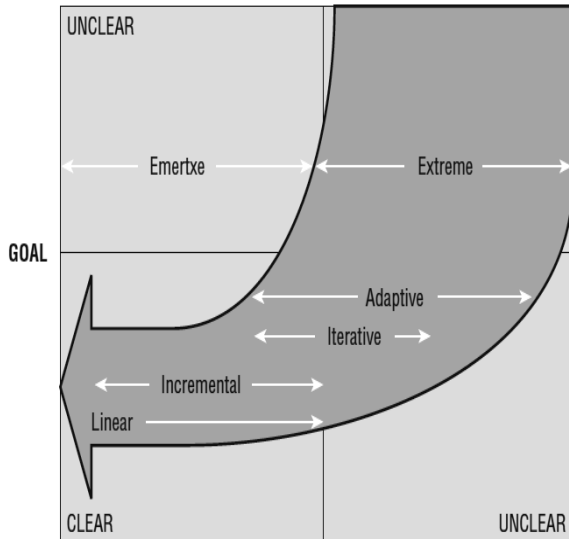- The Emertxe Project Management - **MPx** – When the goal is not clearly defined but the solution is.

Fig. 3. *Requirements and solution* [19]

Regular and frequent feedback and the ability to respond to changes are the basic preconditions for successful IT projects. According to agile concept, contract that specifies basic elements of a project (such as schedule and costs) is not necessary. In most cases, such kind of contract becomes purposeless long before the project is completed, even before the contract is signed. The recommendation for the best contract is to include methods and advices on customer and development team collaboration.

Project managers need to make flexible plans, and they have to prepare themselves for further changes in project.

Agile Manifesto [20] defines 12 principles of agile approach. One of its principles is "Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage". In agile approach, participants embrace the change. From their perspective, the changes are positive because this implies that project team is more familiar with customer's requirements and has possible methods to fulfil them. Agile approach makes the system flexible, thus every change has minimal impact to the system.

Some of the familiar agile processes are [21]:

- SCRUM (Figure 4),
- Crystal, feature-driven development (FDD)
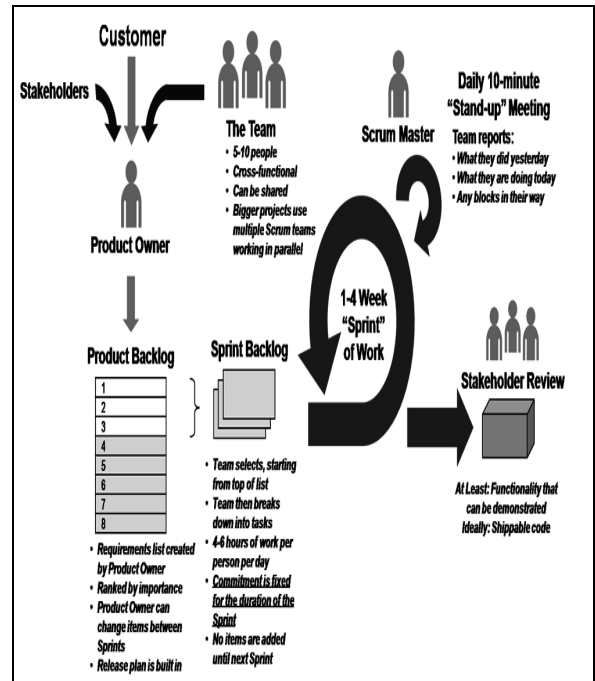- Adaptive software development (ADP),
- Extreme Programming (XP).

Fig. 4. *Agile (Scrum) project management* [22]

The combination of SCRUM and Extreme Programming presents the optimal model for successful managing of IT project teams [23] [21].

Extreme Programming is sometimes considered to be sub-part of agile approach, but Wysocki suggests that, due its specific characteristics, it can be observed as the separate project management approach [19].

These projects include research and development projects and are called extreme projects. In many cases, they are also high-speed projects. Failure rates are often very high in these projects and intensive client involvement is essential.

Extreme Programming groups customers in following categories:

- Person or group that defines features;
- Group of employees working in the same company as the developers (business analysts, marketing specialists, quality specialists, etc);
- User representative chosen by the body of users;
- In some cases, the customer is the person who is project sponsor [19].

Agile and extreme project management approaches are based on assumption that customers/users change the requirements during the project in order to satisfy their needs, because these needs can significantly differ from initial requirements.

4. DISCUSSION

Project-oriented IT Company as Complex Adaptive System implements projects that differ in risk and complexity. Authors of this paper adopted Wysocki's project management approaches – traditional, agile and extreme project management approach [19]. Project manager can determine the type of the project based on complexity, risk, and technological uncertainty,

and **adjust project management approach and methods of co-creation on chosen project** [24]. In this context, in TPM, involvement of the customer/user would be formal and periodic; in APM it would be often and sometimes informal, while in EPM projects, the client/user often takes a leadership position instead of the collaborative position as in APM projects.

Table 1. Matching the elements of management style with project management approach

	PROJECT MANAGEMENT APPROACH		
ELEMENTS OF MANAGEMENT STYLE	TRADITIONAL (TPM)	AGILE (APM)	EXTREME (XPM)
SPECIFICATION	Relatively fixed	Some changes	Many changes
INVOLVEMENT OF CUSTOMER/USER	Formal, periodic	Often, some informal	Very often
RISK	Low	Medium	High
CHANGE	Linear and incremental	Iterative and adaptive	Extreme
GOAL & SOLUTION	Clearly defined	Goal - clearly defined; Solution – not clearly defined;	Not clearly defined;

Authors considered request changes of users/customer on project as the type of co-creation and the process o adding value to projects.
Based four types of co-creation defined by the Dutch consulting firm Fronteer Strategy [18], it is possible to *mach project management approach and type of co-creation*.
Club of Experts is the type of radical innovation where the selection process involves experts who meet certain criteria for co-creation participation; this kind of co-creation is often conducted in Xpm projects.
Community of kindred spirits is the co-creation within a group of people with certain level of expertise, similar interests and goals, who want to create different product/service or improve existing; this type of co-creation matches TMP and APM projects.

4.1 Change of client /user request in TPM

In TPM, clear statement from client is defined, and it includes client needs and wishes, deadline for their realization, information on how much they are willing to pay for the solution etc. The statement with all these information should be delivered to the project manager.
Co-creation is not stimulated in TPM. Specifications are usually defined at the beginning of the project, and changes on the product or service are not often and not easily implemented.
Research data shows that about 20 percent of all projects fall into TPM quadrant [20]. Those projects are familiar to organization that implements them, client clearly defined the goal, and the project team has defined ways to fulfil that goal. In these projects some changes are expected. The projects

implemented in TPM quadrant have been realized a several times before, and established framework for further implementation of similar projects.
When changing TPM requirements, some of the following actions need to be taken [20]:
• Decision making – A decision needs to be made by a project team member if the request requires further analysis.
• An assignment of the request - Project manager needs to assign the request to the team member.
• Writing Project Impact Statement - The analysis need to be conducted by the assigned team member who is appointed to write Project Impact Statement.
• Informing the client - The project manager need to inform the client of the recommendations.
• Approval of change – A decision about approval of change must be made by the project manager and client. Also, if the change is approved they must decide about the period of time for its realisation.
• Updating data – In the case of change in the cost, schedule, resource, requirements need to be updated.

4.2 Change of client /user request in APM

An open and honest environment is the precondition client and the project team collaboration. That means active client participation. Development team has a chance to learn about the client's business needs. The project manager should prepare the client and development team to work and collaborate together. This also means sharing leadership and responsibility with a client manager.

4.3 Change of client /user request in EPM

The Extreme Request Change represents the third project management approach in which solution and goal are not familiar or not clearly defined. These projects are high-change, high-risk, and, in some cases, high-speed with very high failure rates. The client involvement is obligatory.
The main difference between xPM and APM is that xPM requires the client to be more involved within and between phases. In some xPM projects, the client/user has not only collaborative position which they took in APM projects. In these projects they also have leading position.

5. CONCLUSION

In accelerated business environment, companies need to find new ways to add value to their products/services in order to stay competitive on the market. One of the ways of adding value is co-creation. With the aim to quickly respond changes, companies need to adopt flexible management approaches.
Project management is widely accepted approach in IT sector. Most of IT projects are governed using Agile and Extreme project management approach, which are the most stimulating approaches for co-

creation. This paper suggested methods for classifying projects based on different criteria and matching them with co-creation style. These recommendations can help project managers to strategically plan co-creation in IT projects, as well as in some other projects implemented in project-based industries, which can ultimately lead to improved success rate of these projects and greater satisfaction of their users/customers.

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