

THE MULTI-PROJECT ENVIRONMENT CHALLENGES

Velimir TASIC

Summary: One of the most challenging business environments is a multi-project environment (MPE). In this literature review, we try to explore the MPE with the ideas of making a good base for a future research. The reviewed subjects are a multi-project metaphor, a project management development challenge, multi-project management complexity, multi-project management expansion and project selecting process in the MPE. All subjects together build a broader picture of challenges in the MPE diversity and complexity. There are future plans to continue exploring the MPE and propose both a new approach and a new model for selecting projects in the MPE.

Keywords: Multi-project environment, multi-project metaphor, complexity, selecting process.

1. Introduction

Previously, the market was changing slowly and the economic cycles were longer. The companies were able to do the same job for many years, without a lot of investigating and caring for the market. The paradox is that the company is proud of the experience of more than many years, but in truth it is the experience of one or two years repeated every next year. Those times are over. Competition has become global and appears globally. It requires constant improvement and changes for the staying in the game on the market.

The main points of literature review are presented in this research, perspective of research challenges and a literature gap. Many researchers point out the challenges and problems cited by researches published in major journals in the area of the project management. Literature review is explored across following aspect of the project and the multi-project environment. First, in introduction is summary of several challenges of the multi-project environment. Second, those challenges are described with an overview of the project management literature. Third, last words are presenting literature gap that author want to research during the study program.

The first challenge is that, nowadays most of both the techniques and models that are use in the multi-project management are both created and developed for the purposes of the single project management. Those assumptions could be wrong for nowadays multi-project environment [12]. Practice knows qualitative and quantitative methods. Different studies in different areas indicate that both types are in use very often. Research shows also that all companies do not have pre-defined criteria for question: *How to choose a particular model and why?* [6]. Very often the answer is: For this challenge are responsible decision makers and higher level of managers.

Second, challenge is that the development of project management originally began only in a small number of both industries and areas. Most of the techniques and models were created on the basis of the initial fields [22, 14]. Today both other industries and areas try to use those techniques and models in different conditions and manners. Of course, there are some attempts to adapt and improve the models but it isn't enough. Different researches from various professional project management journals show that most of the projects are judged as not sufficiently successful. Dependently on the type of industry percentage is different, but still low.

Third, challenge is that between the industries there are major differences as well as within the companies. Implementation of projects in different areas makes the whole concept very complex [9]. The different projects have different goals and they all usually use the same resources from the same resources pool, but it's more about resourcefulness than about resources. Projects from different areas require different measurement units, time, and understanding from managers to respect diversity and to correctly measure success.

Fourth, through the projects today business is organized almost in all industries. *Just the question is what percentage of the company's business is conducted through the project?* [10]. It is notable that most of the companies use the project model organization mostly as a model for both the development/research and change projects. The company tries to increase efficiency/effectiveness of operations and improve/create new processes/products [18].

Fifth, the selecting process between projects should be viewed from the perspective of strategic directions for the company. It shows in which direction the company wants to develop today and in future [24]. In the literature, there has been a view that prioritization is often viewed through the prism of allocation resources between projects, what gives different power to decisions. Those are above mentioned two ways of thinking thorough companies. It can be confusing and lead to interference in the mindset of the complexity of operations and the distribution of responsibilities.

During the process of prioritizing the company needs to keep in mind the main question: *Where the projects lead company?* [24] There is a nice short story: If somebody doesn't know where want to arrive, any destination/direction is right for that trip.

If we look from economic side it is all about choices – choices on how to use applicable money, time, manpower, knowledge and goodwill, based on current circumstances (both short and long term of strategic goals). Different people value different things to different grade, and thus even individuals and companies with the same amount of resources, in absolute terms can have different portfolios of projects.

All the above mentioned elements point out the need for both an extensive research and concrete contribution to both the further development of the field the multi-project management and area of defining priorities in the multi-project environment.

Starting from the assumption that companies have many projects from both many different areas and with different objectives in their portfolio during the same period; however, they have limited resources. In this way we come to the issue of both establishing priorities and increasing business complexity. The research will present literature review for all notes challenges in the multi-project environment. The literature review is an ongoing process but still at the moment relevant amount it's over and presented in this paper.

The author plans is, later during studies to develop a new model, verify and compare the model with other models. Furthermore, it's planned to propose possible improvements of using existing models. Thus, those contribute to the further development of project management area. The specific focus of the studies research and the main research gap that the researcher found in the literature and modest practice is, both on the market and in the literature, there is no clean model for defining priorities between projects in the multi-project environment. Idea is to research and challenge actual business reality, and in the end of studies to suggest both a new model and a new approach for defining priorities between projects in the multi-project environment.

2. The multi-project environment – metaphor

Current trends and challenges that come from the market show the importance of both the topic and the research. The review of the literature leads to the conclusion that more and more companies try to use the techniques of the project [15] and the multi-project management to improve their business, and more than 60% of the project by value occurrence in the multi-project context [19]. Furthermore, both the literature review and recent research indication that conducting business by projects is increasingly prevalent today. In this chapter with help of metaphor, which is known from literature, we will try to explain complexity of the multi-project environment.

From early '90 idea of the project management has become more imperative in doing business [12]. It was one of options which provide more flexibility for companies [12]. The market has started to become extremely turbulent and companies needed the ability for constant change and innovation [12].

The multi-project context can be described as an idea of group of smaller projects with shorter duration than a single project [19], where the employers are involved at the same time in many projects activities [13].

The aim of the Eskerod P. 1996 research was to explore relationship between employers and projects in the multi-project environment - he takes a challenge to show that picture by means of metaphors. In early '90 it was very few positions in the literature about the multi-project environment. Most of concepts were about coordinating, scheduling and managing a single project [12]. Eskerod P. (1996) found Michael's research and his paradigm about the multi-project environment.

The Michael's (1988) metaphor was about the Chinese wall and a way of its construction. However, the explanation follows idea that each stone presents one project as whole multi-project program. Each stone defines important part of the wall and in the same way each project is a valuable part of the multi-project program.

Firstly, projects are connected with each other and they need to fit in whole concept of the wall. Secondly, an investor should have a picture of the whole wall before start. Thirdly, due to limited resources, priorities need to be defined right. Even if we imagine for each stone one man resource, again it cannot be done at once. Finally, the more experienced man resource is, the better project will be [12]. The term "multi-project program" in that period was defined differently than today. Today it is defined as "program management", where several projects build one bigger project, for example the Chinese wall [12].

With ideas of Michel (1988) explanation, Eskerod's P. (1996) tried to work on his own research in two Danish companies. At the beginning he was disappointed due to companies were not sure in every moment about both the big picture and during working on projects they changed a mode [12]. After some period, working on research, Eskerod P. (1996) concluded that Michel's (1988) metaphor didn't suit anymore to reality of the multi-project environment.

Most of companies, due to turbulent markets and constant innovation need to build wall on the way and don't have clean goals form beginning. The companies need to have ability to be flexible and read early signals for change, which come from market [12]. Another conclusion was that projects are not static stones. They depend on people and do not have clean borders between each other [12]. Afterwards, the final conclusion was that for better understanding the multi-project environment we need a new metaphor [12].

The Eskerod's P. (1996) beginning idea was to build a new metaphor and in that way he contributed to better explanation of the multi-project environment. After the conclusion that

the Michel's (1988) metaphor didn't work anymore, he continued to research for a better explanation. He found Kreiner's (1993) research where the metaphor is presented as a living organism.

A project exists between unpredictable and predictable reality. Something we can assume and start the project but we cannot be sure about reality - it could change in any moment. That is the reason, why better explanation for project is the living organism. Sometimes conditions are given from outside but sometimes the project or top managers could have influence and they need to find a way how to manage turbulent market reality and company's environment [12].

Eskerod P. (1996) builds the new metaphor on two levels, from the view of the top and the project managers.

The paradigm for the new metaphor is the Chinese dragon instead of the Chinese wall [12]. Main points are the same. The Chinese dragon is unique and structured from many carefully united parts [12]. However, the main difference is the dragon is a living organism and, because of it, it's almost impossible to predict its next move [12]. Of course, we can assume and in the case of the dragon probably we can know it from history of moves, but every project is unique by definition and the history cannot help us a lot.

Eskerod P. (1996) makes a broader explanation of the dragon metaphor from the top manager point of view. During life time the dragon moves in many different directions, as projects during life cycle. Because of different activities, different parts of the dragon become stronger than others, as some of the projects from the multi-project portfolio. The whole dragon is very complex structure to manage as it is complex for managers to manage the multi-project environment.

Another point of view is from the perspective of the project managers or from inside of the multi-project environment [12]. If we compare project as a living organism (e.g. the dragon leg) and then the multi-project environment is a living system (e.g. the whole dragon), *what does the nature say about important rules inside of living system?* The one who is stronger and smarter survives longer and achieves more goals. That wisdom works in the multi-project environment too. If a group of the projects gets higher level of priorities and a more skilled and experienced multi-project manager, it will have better projects success. The competition game between the projects appears in many different ways and it is an ongoing process in the multi-project environment [12]. The competition game is crucial in between the project's goals and team members' goals [12].

Afterwards, these two unusual metaphors about the multi-project environment, we can conclude more easily what it is and start to think about a future research for a new model which will manage better this complex environment. From metaphor we know that is a very dynamic and unpredictable concept which can change in any moment. However, with the help of history, we can try to predict and it is important to always keep the company's ability more flexible and ready for change. Next chapter will explore a development challenge of the project management.

3. The project management development challenge

The development challenge of the project management field is presented in following chapter. First of all, we are still in metaphor style. Secondly, it is the main question in the development challenge. Thirdly, the project management during time and last words in this chapter are about to present possible consequences in practice of the project management.

At the beginning of this chapter, let us imagine situation that many of research conclusions come from a small number of industries and then those recommendations are

tried to be used in practice. In this kind of situation, we don't see a good picture and we worry for consequences. However, it helps us to understand better why many projects are evaluated as less successful.

Secondly, the challenge, as it was noted in the introduction of project management area, is: a sample of data, but *where do they come from?* Due to limited resources for the research, project management researchers often make conclusions from a sampling survey [3, 25, 32, 34, 33]. All mentioned authors take an advantage of checking the data sample and show different percentage of the sample diversity. The data come from a small number of fields, most of them from construction industry and some of the data from industry services. It's important to point here that both the construction and the industry service fields are very abstract form of explanation.

Lynn's & al. (2006) try to explore the project management from a perspective of how it has changed during time. The project management has become a part of science from 50's and since that time it is growing across all industries and doesn't recognize continent's borders [30]. During 60's there were established two main associations for the project management [30]. In 70's and 80's there was growing focus on following topics: teamwork, breakdown structures, concepts of systems, project organization, risk, front – end, external influences to projects and initial work on the development of the project management standards [22].

In research of White's & al. (2002) there was noted an interesting comment about poor modeling of 'real world' environment. Almost 60% of respondents described that tools and techniques which were used for managing projects have lack of awareness of the environment. That again reminds us about the sampling question from the beginning of this chapter.

The idea of the sample is very good if we look how it is described in the literature. Certainly, it is not possible to make the research on real world sample and it would be very expensive. However, some of big companies do that on inside basis. That type of research has high credibility for the company. Those research present power and uniqueness of the company. The sample idea helps researchers to achieve a good scope of the research with less cost. At the end, each manager and researcher makes own decision how he will accept and use recommendations from various researches.

The project management development challenge was presented in this chapter. At beginning we were keeping track of imagination. Afterwards the emphasis was given to one of important questions. The middle part of the chapter described the development of the challenge over time. At the end attention was paid to possible consequences of bad usage of techniques and methods of the project management. Next chapter will present the multi-project management complexity.

4. The multi-project management complexity

The complexity is around us and currently we are a part of that concept in many ways. Firstly, we are all stakeholders for many brands. From company's point of view each brand is a smaller or bigger size project. Secondly, we do work for a company in order to earn a salary that the company has several projects too. There are many examples how we are involved in the broader multi-project management environment, but in this chapter we will focus on an inside company perspective. Exploring the multi-project complexity, we will start with its definition. Later on, we will explain relationships between employers, project and skills, and at the end we will note some special forms of the project complexity.

The multi-project management complexity is defined by diversity in social contexts of

a company, which present variety of relationships between many participants from different levels of responsibility/functional affiliation and influence on the multi-project environment [31].

Organizing activities by the project and the multi-project management concepts are positively valuated in practice in many fields, which are seen as useful social knowledge concerned to focus on it [31]. At the first level of using knowledge of the project management in many fields it looks useful and valuable, but using doesn't mean every time understanding in a right way of utilizing – the experience could be negative. Those contexts make the whole project complexity harder to understand.

Svetlana's & al. (2006) try to understand the project management complexity by exploring all relationships and needs inside of the company's daily activities. The relationships and needs are defined as all skills, competencies and ambience inside of many projects across the company. Participants in the research noted three important points for better understanding of the project complexity [31]. Firstly, the communication process and power relation activities between players at the projects. Secondly, the enigma related to the project success factors during the projects. Thirdly, the effects of diversity, insecurity and mystery of supervision. In addition, researchers define the project management environment as a cooperative study mechanism [31].

From the beginning of development of the project management field, the construction industry was the most complex industry and it still takes first position even in contemporary context [9]. The construction or massive industry has many stakeholders engaged among all processes of realization. Those relationships make complexity to become first explanation of any massive project. However, at the construction of project there are other factors which describe complexity too.

The multi-project management complex environment is one off challenging topics in the field of project management. We tried to present it as a part of broader literature review. At the beginning, we presented a broader paradigm of the topic. Next, the definition of the multi-project management complexity was given. The third part of the chapter was dedicated to the relationships inside of company. The ending part presented an example of the most complex industry. Following chapter will present the project management expansion across science and practice.

5. The multi-project management expansion

Fifth chapter starts with an historical look at the project management field of science. Next, the process of development is described over time. The special emphasis is given to the broader scope of the project management topic which is showed across many science fields. At the end of the chapter, a conclusion from the review conference (2008) and our paradigm for future grow are presented.

The project management has become part of science in the early 50's [30], but the project management is much longer with us. The researchers claim that first big projects are the pyramids and the Great Wall of China [18]. Since then, people have been managing the projects. However, at the beginning they were less aware that it really existed. In 2008, at the conference organized by the "International Research Network of Organizing by Projects (IRNOP VIII)", there was a debate on the topic: This house believes that we no longer need the discipline of project management [18]. During the conference the researchers concluded that since the really beginning till today, and probably in future techniques/methods of the project management are key issues in society progress [18].

The research on quality of the project management is constantly developing since very

the beginning, however it has the biggest burst in last 30 years [10]. During the 70's prevalent researches were conducted by practitioners, during the 80's by the professional organizations, and they have started to develop knowledge/standards as a base for the certification system [10].

There are many ways to explain expansion of the project and the multi-project management across many fields of science and practice areas. The Editorial's team (2010) took this challenge and explained it by "citation methods". They were following citations across the major journals in all fields of science. There are a few interesting conclusions. Firstly, a number of citations is constantly growing. Secondly, many journals that mainly write about other topics also have the project management citations. Thirdly, the project management techniques show good results in different areas, – what makes the project management field much richer [10].

A more interesting point of the project and the multi-project management expansion is to look deeper inside of spectrum of the research topics that have been covered over time. Almost for first 30 years of the research prevalent was on the construction industry and for last 20 years the topic spectrum is developing [10]. The spectrum is shared with following order: the construction industry, computer support, time management, risk management, partnership, alliances, human resources management, developing individual competence, the program management, the portfolio management [10] the multi-project management, and so on.

The project, the program, the multi-project and the portfolio management techniques/methods are as an empire, which is constantly developing in both theory and practice [17, 4, 7, 11, 26, 28, 27, 21]. The conclusion at the conference was that we need the project management as a field of both science and practice, but just the question is how to develop and apply that knowledge [18]. Our paradigm is: we need to move away from the traditional way and take a challenge with a little bigger amount of curiosity.

This chapter presented the historical overview of the project management expansion, the diversity of the project management and development process. Furthermore, the last part of it showed the conclusions from the conference and the paradigms for future growth. In the next chapter we will present the project selecting process in the multi-project environment.

6. The project selecting process in the multi-project environment

One of the most important questions in the multi-project environment is how to select projects and thus build the optimal projects portfolio. The project selecting process is presented as a part of broader literature review. Firstly, an introduction, a definition of project selection process and special forms it are presented. Secondly, the description of the selection process and an example of it are described. Thirdly, conclusions and guides for future exploring are pointed out.

The process of project selection is an ongoing activity which deals with an answer to the question: *How to find available resources in current portfolio of projects for a new initiative/project?* It depends on the current situation – the answer is both hard and easy to give. Each company which conducts business by the projects has the process of selecting projects. If the company has a broad spectrum of brands, dealing with this question is more complex.

The researchers Peerasit's & al. (2006) defined the project selection process as constant comparison activity between both new projects and the current projects in company's portfolio. The comparison criteria are numbers both new projects and current projects

portfolio that suit to strategic goals of company [24]. The competition game is constantly active for all projects. Some of the current projects could be stopped due to better results of a new planned initiative/project.

After defining the project selection process, there are few special forms it we should emphasize. The companies often make the project selection process ad hoc and usually for both research and development projects [5]. In the literature the accent is given to the information systems projects [5]. If the company uses a model for the project selection process, in almost 90% of cases the project selection process is done with financial models such as return on investment model (ROI), net present value model (NPV), internal rate of return model (IRR) etc. [5].

The literature has many examples of projects selection process. The optimal supply chain management (SCM) systems are especially interesting. [6]. The SCM is a kind of support system for the company which deals with all activities from material base to final product and delivery to costumers [6, 16]. The SCM systems are very popular and very useful. However, before implementation the companies should check compatibility between a system, a strategy and objectives. Sadly, it isn't practice at the market [8, 6].

The SCM selecting process is explored in the literature in detail. The researchers recommend different, mostly quantitative, methods [6]. To improve the selection process and to avoid the one side checking systems, several researchers suggest exploratory techniques or combination between qualitative and quantitative methods [2, 29, 6]. Each of the companies decides for themselves how they go across the selection process of the SCM systems.

The researchers Nassimbeni's & al. (2003) suggest the evaluation technique usage of the fuzzy logic method. Thus, the fuzzy binary concept and choice-creating techniques are profoundly adequate for measuring the SCM systems [6]. In following lines we will briefly explain the selecting process.

The selection process is mixed with components of a strategic analyze, a system analyze and a group decision creating assessment form [6]. The selection process activities are: creating a team for recognizing the company needs, establishing a strategic goals, creating relationship for supply chain, choice harmonious feature and formatting the feature order, finding out unnecessary options by challenging query defined by essential concern, organizing a consultative meeting with SCM sellers and a model review, assignment of weights, aggregation of the assessments, adaptation of the fuzzy integral value ranking, and selection of the most suitable SCM project [6].

The project selecting process could be explained from both inside and outside company perspective. The example from literature, noted above, is kind of combination of perspectives and across activities it is visible. The idea of this literature review was to focus on inside perspective on the project selection process. In the following conclusion chapter, both reasons for this literature review and its gap will be more deeply explained.

7. Conclusion

This literature review is a first step in the research studies that the author plans to conduct during academic studies. The literature review presents some actual challenges of both the project and the multi-project environment. In the introduction some of main challenges are presented and a briefly explanation is added. Each of the chapters presents one of challenges in details. The challenges are presented by the definition, the specific forms and the example of projects selection process.

The literature has broader list of ideas how to explore the multi-project environment.

This literature review is an overview of following topics: The multi-project metaphor, the project management development challenge, the multi-project management complexity, the multi-project management expansion and the projects selecting process in multi-project environment.

Those topics are a good start base for future plans about research on the projects selection process in the multi-project environment. The presented concepts show diversity and complexity of the literature in the multi-project environment. A future research plan is to explore contemporary challenges in the multi-project environment with assistance of both literature and practice.

The literature gap that the author wants to explore more is both the diversity and the complexity in the projects selection process of the multi-project environment. As a result of the research, a new model and a new approach for projects selection process in multi-project environment will be proposed.

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PhD student, Velimir Tasic,
 Faculty of Management, Management information systems, University of Warsaw
 1/3 Szturmowa Street, 02-678 Warszawa, Poland
 twelimir@hotmail.com