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RISK MANAGEMENT OF PROJECTS IN THE CZECH REPUBLIC

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Abstract: In business practice, projects are accompanied by a wide range of risks. It is necessary to continuously identify and assess the risks of projects. The aim of the paper is to deal with the issue of Risk Management of projects in various enterprises in the Czech Republic. The paper is divided into three main parts. The first part – Introduction is focused on defining the process of Project Management, Role of Project Manager, explains the process of Risk Management of projects and describes the methods, which will be applied subsequently. The second practical part includes analysis of project risks. In the third part, after identifying the most important risks in selected projects, there is a proposal to set up measures for their reduction or complete elimination. The research was carried out in enterprises located on the territory of the Czech Republic. Data collection took place between November 2014 and January 2015 using a questionnaire survey. The article concludes with proposed recommendations in Risk Management area according to the practical experience of project management methods application respecting the specifics of the Czech Republic.

Key words: risk management, project management, role of project manager, risk, project, Czech Republic

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Introduction

The risks are included in each project and can negatively but also positively affect its scope. The risk-free project does not exist and it is not possible to avoid the risks completely. Any undesirable event may result in a disruption of workflow, or can lead to environmental damages, which may have negative impact on the profit of the enterprise (Musil, 2014). It is therefore desirable to work with risks and strive to mitigate the negative impacts, or to make use of the opportunities offered to enterprises. To make the enterprise successful in the long run, it should have a functioning system of risk management Implementation of risk management into decision-making processes is one of the basic conditions of competitiveness of the company and is critical for successful project management. Professional approach to risk management has been qualified for the success as very important and team members can use various techniques of risk analysis (e.g. RIPRAN, scoring method with a risk map, FRAP technique, technology risks trees, sensitivity analysis, scenario planning technique, the use of modelling techniques and simulation for risk analysis etc.).

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Project Management

Kerzner (1998) defines Project Management as a set of activities consisting of planning, organizing, managing and controlling resources of enterprises with relatively short-term goal, which was set for the implementation of specific goals and objectives. According to Project Management Institute (Project Management Institute, 2013) the project represents temporary efforts made to create a unique product, service or certain result. Similarly, the project is defined by other relevant international organizations dealing with project management, e.g. International Project Management Association (International Project Management Association, 2015). Based on the above definitions, we can see the project as a process of gradual change and steps from the initial state through partial milestones and changes towards the scope set. According to PRINCE2 there are six aspects of a project implementation that always need to be controlled: time, scope, costs, benefits, quality and risks (Šviráková, 2014). To manage projects also means to manage human resources, to organize human resources to effective usage of available material resources, to solve problems and emotional issues, and, simultaneously, to meet schedules and budgets (Cimbálníková et al., 2013; Ptak and Daroczi, 2014).
It is obvious that various projects are unmatched in terms of scopes, time and cost requirements. The basic finding is the interdependence of these three requirements. In the case that one variable is changed, e.g. project duration, and its scope should be retained, the costs of the project must be adequately changed. Interdependence of these three variables always exists (also at the project activities level) (Doležal et al., 2012; Svozilová, 2011). From the point of view of the projects and hence risk management complexity the projects can be divided into the following categories: *complex projects* - high-risk, unique, unrepeatable, long-term, many activities, special organizational structure, high costs, many resources, large number of sub-projects, etc., *special projects* - medium to high-risk, medium-term, lower range of activities, temporary assignments for workers, greater organizational unit, decomposition to sub-projects, adequate resources and costs, and simple projects - low to medium-risk, small projects, short-term, simple scope, producible by one person, a few activities (Němec, 2002).

Role of Project Manager

According to Man et al. (2015) the attitude in relation to risk is often described as a stable characteristic of each individual, perhaps related to its personality development and culture. According to Meredith et al. (2014) managing trade-offs is the main task of the project manager. Other important roles being held by the project manager are the facilitator, communicator, virtual project manager, convener and chair of meetings. Standish Group (2007) has made the study about factors which contribute to success of the project. The experienced and qualified project manager is one of them. Chmielarz (2012) noted that the project manager

is a person who has the greatest influence on the project life cycle phases and on the success of the project as well.
Competence of project managers needs to be valued, and then continuously increased. One possibility is precisely certification in the field of project management. In the Czech Republic we can find a few possibilities to get a certificate in Project Management area. Project Management Association (PMA), which is a member of IPMA (International Project Management Association) and PMI (Project Management Institute) where the applicant may obtain an internationally valid and recognized certificate PMP are the most known. According to Kerzner (2015) project management methodologies based upon rather rigid policies and procedures were created because management wanted standardization in the way that projects were planned scheduled, and controlled. Having policies and procedures embedded throughout the methodology is also no guarantee that maturity will be forthcoming. Maturity in project management occurs when people work together correctly.

Risk Management of Projects

With increasing market competition, increasing technology and increasing rate of change, risk management is gaining significance and importance (Burke, 2013). Certain kind of risk anticipation could be seen even in project management in the municipality level, as it was firstly described by Trojan (2012) in the case study of Central Europe. The current aim is the attempt to introduce the quality project risk management according to the principles of risk engineering in relation to the risk management of the organization and use of recommended methods for risk analysis (Lacko, 2009).

Project Risk Definition

Risk is a natural component of the project. It is necessary to recognize it, reduce the possible or acceptable level and it is required to handle the remaining risk (Rosenau, 2007). For projects the risk may be virtually any uncertain event associated with work. There are many ways to characterize risk (Kendrick, 2009). Svozilová (2011) defines project risk as “a vague phenomenon or condition, the incidence of which has a positive or negative effect on project scopes.” Korecký and Trkovský (2011) define project risk as "an event or condition, which, if it occurs, has positive or negative impact on the scopes of the project.” The given definitions show that the risk is any uncertain event, which has a positive or negative impact on project objectives. Risk and uncertainty associated with the amount and quality of information that the project manager has. Risk represents the state between certainty and uncertainty. Information is available, but not enough to guarantee the certainty of success, but with sufficient confidence it is possible to assess the likely outcome Svozilová (2011).

Causes of Project Risk Origin

Authors Šajdlerová and Konečný (2008) divide the causes to *predictable and controllable causes* – e.g. size, extent and complexity of the project, the qualifications and experience of workers, awareness of common goals, the experience of the project manager, deadlines, specification of tasks, errors of labour intensity estimation, personal influences, motivation, project scopes supremacy, contractual relationships, financial stability etc., and *uncontrollable causes* - e.g. political conditions, macroeconomic situation, legislation, social climate, culture, technological advances, resource availability, religious influences, consumers behaviour and mentality. They point out that most frequently occurring cause of risk factors is the human factor, which cannot be assumed and removed.

Project Risk Management Process

This process is a sequence of activities in which events are averted and influences eliminated through preventive or corrective interventions that could compromise the controllability of planned processes or could lead to other unwanted results Svozilová (2011). During the project, there are many threats that can cause danger to the success of the project.
Risk management includes the following processes:

Context Determination. Project risk management should be linked to risk management throughout the organization (enterprise). There is mainly to determine which method will be used and how it will look in its application process.

Risk Identification. This is the identification of the main risks that can threaten the project. It uses the method of brainstorming or so called checklist - list of risks created on the basis of past projects. The project team considers which risks are related to the current project solved.

Risk Analysis. The project team is trying to estimate the probability of hazard occurrence and to measure the amount of financial damages. Risk analysis may be quantitative and qualitative.

Risk Assessment. The purpose of this step is to decide which risks are treated and which are not.

Risk Response Planning. After the risk assessment the project team determines how it will respond to that risk. The most common risk treatment options include insurance against adverse events, risk mitigation through the proposed measure that would reduce e. g. the size of the impact of adverse events on the project or change the value of the probability of expected adverse events, eliminating the risk of finding another solution that risk event does not, create reserves (time, cost or size of critical resources), which allows us to compensate the adverse event, create a plan B (contingency plan) in case the risk occurs (Doležal et al., 2012; Meredith et al., 2014).

As part of the risk management process for the purposes of this paper, we analysed the fundamental processes within selected enterprises, which are the same in major publications devoted to project management (Kerzner, 1998; Burke, 2013; Larson and Gray, 2014) and others: Risk Identification, Risk Assessment and Risk Response Planning.

Methods

The aim of the survey was to deal with the issue of Risk Management of projects in various enterprises in the Czech Republic in terms of their size by number of employees. Research question: *Is the resulting project risk value higher in large enterprises than in small and medium enterprises?* We assumed that in large enterprises the resulting project risk value is higher than in small and medium enterprises.

The research was carried out in 165 organizations located on the territory of the Czech Republic. To collect data a questionnaire survey was used. The questionnaire was constructed and based on the study of primary and secondary sources listed above. Data collection took place between November 2014 and January 2015. The final number of the processed questionnaires was 36, i.e. the return was 21.82%.

In the first step, enterprises were divided according to the size to Small and Medium Enterprises (SME) and Large Enterprises. Subsequently, we identified the main risks that can affect the project in the different types of enterprises (Risk Identification). In the next step - (Risk Assessment), team members assess the significance of each event risk in terms of probability of the event and impact of the event in Small and Medium Enterprises and Large Enterprises separately. When assessing the impact and probability the respondents used a ten-point scale. The resulting values for the impact and probability are calculated based on the arithmetic average responses of individual responders (imp represents the average value impact and probability and p the average value). We calculated the value of the main types of risks that we identified (calculated as the probability score x impact score). Then we constructed a risk map (two-dimensional matrix in the shape of dot plot) separately for the area of project risks in MSE and separately for the area of project risks in large enterprises. In the paper summary we propose ways of reducing negative impacts on the project as well as enhancing positive impacts (Risk Response Planning).

Results

Respondents

In the introduction we described the survey respondents based on the size of the enterprises, type of enterprises n and their entrepreneurship. For the division of enterprises by size, we have chosen the Commission Regulation EC No. 800/2008, a specific criterion in number of employees. 20 respondents (56%) got involved

in the survey who implement projects in small and medium enterprises and 16 (44%) respondents who implement projects in large enterprises.
It is necessary to define which enterprises are considered to be Czech, European, or world optionally. Enterprises with Czech ownership majority are considered to be Czech and enterprises with foreign ownership majority are considered to be multinational. We still closely divide the European and the world enterprises. 80% respondents were from Czech Enterprises, 14% from European Enterprises and finally 6% were from World Enterprises.
Another criterion to categorize respondents was their business area. There was the largest representation of industrial enterprises (36%), trade (17%) and construction (14%). Among the respondents who stated a different type of business (19 percent of enterprises) there were responses as information technology and publishing.

Risk Identification

Based on questionnaire survey five main areas of project risks were identified: Technical Risks, Financial Risks, Management Risks, Environmental Risks, Business Risks.

Risk Assessment

The identified project risk areas were assessed in small and medium enterprises separately and large enterprises separately. Results are shown in Table 1, Figure 1 and Table 2, Figure 2.
It is positive that at the analysis of project risks in small and medium enterprises in the quadrant of critical risk levels (p> 5 and imp> 5) there were no project risks. Particular attention must be paid to the technical and financial risks of projects realized under the conditions of small and medium enterprises operating in the Czech Republic. These risks by scoring method with a risk map are to be found in the quadrant of significant value risk (p <5 and imp> 5).

Table 1. Risk Assessment - Small and Medium Enterprises

	p	imp	v
Technical Risks	4.60	6.05	27.83
Financial Risks	2.35	5.15	12.10
Management Risks	3.40	4.75	16.15
Environmental Risks	2.80	3.35	9.38
Business Risks	3.00	4.15	12.45
Total Risk	77.91		

In our survey, the most common technical risks were failure; eventually malfunction of the product and final quality of the product that was delivered to the customer. Management, business and environment risks did not present a greater risk in this type of enterprises, but it is necessary to continuously monitor the

probability of their occurrence and possible impacts that may cause these risk areas.

For large enterprises (over 250 employees), we examined the risks in the same areas as for small and medium enterprises. We can submit that we have not identified any critical risks. The results are almost identical to MSE, but in the quadrant of significant value risk (p <5 and imp> 5) there were management risks, the impact of which on the ten-point scale increased by 1.94 points to MSE. The most important management risks that occurred by respondents include risks associated with corporate governance and risks associated with project management. Project management difficulty and complexity of the enterprise organizational structure have a significant relationship with the risk of the project especially in large enterprises.

Table 2. Risk Assessment - Large Enterprises

	p	imp	v
Technical Risks	4.38	7.00	30.66
Financial Risks	2.75	6.00	16.50
Management Risks	4.06	6.69	27.16
Environmental Risks	2.88	3.69	10.63
Business Risks	3.06	4.69	14.35
Total Risk	99.30		

According to our survey, the resulting risk value in MSE at 77.91 points compared to resulting risk value in large enterprises, which stood at 99.30 points.

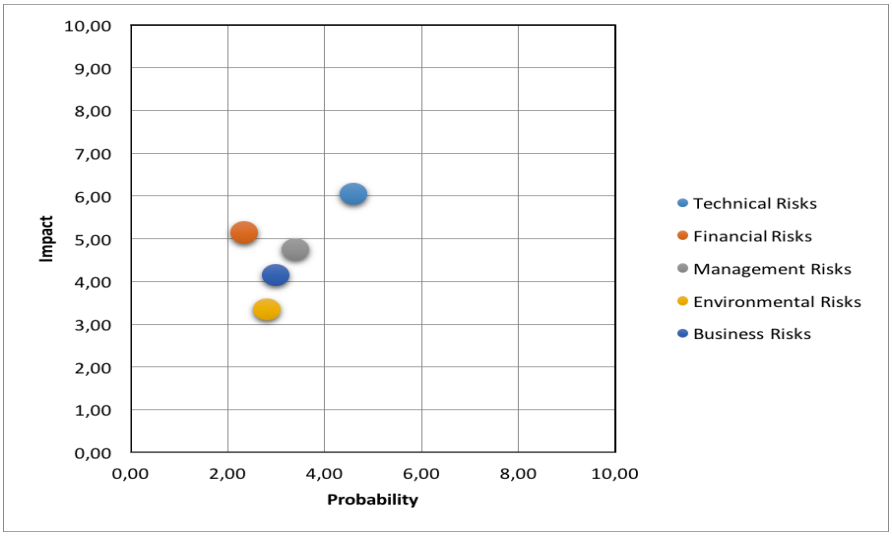

Figure 1. Risk Map – Small and Medium Enterprises

From Table 1, Figure 1 and Table 2, Figure 2 we can see that *in large enterprises the resulting project risk value is larger than in small and medium enterprises.* Based on the assessment of identified risk areas, projects implemented in MSE and large enterprises with the number of employees over 250, we finally came to Risk Response Planning, which is part of the Summary of this paper.

Summary

Risk Response Planning. Based on the literature sources study referred to e.g. (Musil, 2014; Šviráková, 2014; Cimbálníková, Bilíková and Taraba, 2013; Trojan, 2012; Korecký and Trkovský, 2011; Šajdlerová and Konečný, 2008) and our own experience we have formulated the basic ways of risk response (Mitigating Risk, Avoiding Risk, Transferring Risk, Retaining Risk).

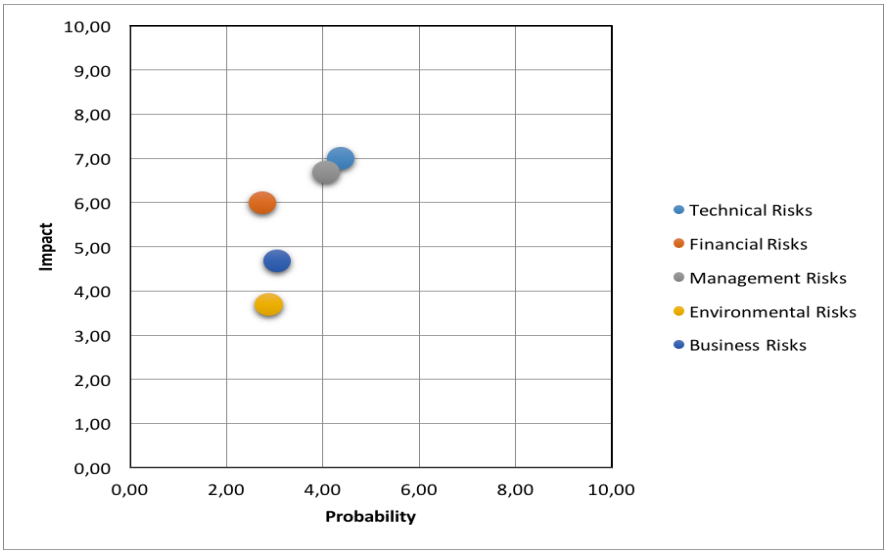

Figure 2. **Risk Map – Large Enterprises**

Mitigating Risk. Risk reduction is usually the first option considered by project managers. With this approach, it is possible to use techniques that aim to reduce the probability of project risk and the negative impacts mitigation techniques of risks being analysed. More commonly the techniques of reducing the probability are used in practice. We can recommend rigorous testing, the testing regime, or possibly the production of prototypes prior to the date of product launch.
We also recommend purchase of high quality materials and equipment. The advantage is to reduce the probability of falling risk in technical project risks, but it is necessary to count with higher costs. Another option, which should be taken into account by project managers, is the training system, particularly relating to the implementation of the final product. From impact reducing techniques we can

recommend the use of two or more simultaneously executed processes. If one of the processes fails, there is an alternative for the project manager. In this way the risk of negative impact on the project is minimized, but for the price of increasing the total cost of the project.

Avoiding Risk. Some risks can be eliminated already in the pre-project phase. If the value is above the acceptable level of risk, we recommend the use of tested technology, proven practices instead of experimenting with new technology. Also the use of experienced managers' knowledge and skills compared with newcomers is a step which significantly minimizes project risks.

Transferring Risk. Project risk insurance is another option to minimize project risks. However, it must be remarked that insurance of certain project tasks is not always possible (impossibility of clear statement of the possible insurance event) or is prohibitively expensive. It is also possible to pass on some risks to customers or other subjects. Here it is necessary to take into account whether the subject is able to ensure the fulfilment of the project in the event that the risk event occurs. As part of risk transfer enterprises can use warranties and guarantees as well.

Retaining Risk. If the risk probability is low or the risk elimination is not possible to provide by other means, enterprises access to risk acceptance. In this case it is necessary to create sufficient financial and time reserves and thorough preparation of contingency plans. Making of contingency plans we will discuss in future articles.

These areas we have described collectively within the MSE and large enterprises, since the methods described may be applied within the Risk Management by Project Management in all types of enterprises. Please note, however, the increasing importance of management risks with increasing enterprise size (in terms of number of employees).

Research Limitation and Future Study Directions

The survey has a certain limit. The main limitation is the small number of analysed questionnaires. In the next phases of research, we suppose to increase the number of respondents; then the results could be generalized with greater accuracy. As part of the survey, we paid no attention to the process of Risk Monitoring and Control, which maintained records of and evaluated the other sub-processes (Risk Identification, Risk Assessment, and Risk Response Planning) in order to improve Risk Management. All risks must be constantly monitored because it can cause a number of possible events. These include changing the conditions that affect the probability value or the damage value (or both) at any risk; there will be significant new threat or any contrary passes, a situation that will require activating prepared measures etc. This issue will be elaborated in further research of Risk Management, which will be implemented in enterprises in the Czech Republic.

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ZARZĄDZANIE RYZYKIEM PROJEKTÓW W REPUBLICE CZESKIEJ

Streszczenie: W praktyce gospodarczej projektom towarzyszy szeroka gama ryzyk. Konieczna jest ciągła identyfikacja i ocena ryzyka związanego z projektami. Celem artykułu jest zajęcie się kwestią zarządzania ryzykiem projektów w różnych przedsiębiorstwach w Republice Czeskiej. Niniejszy artykuł podzielony jest na trzy główne części. Część pierwsza - Wprowadzenie koncentruje się na zdefiniowaniu procesu zarządzania projektami, roli kierownika projektu, wyjaśnia proces zarządzania ryzykiem projektów i opisuje metody, które będą stosowane w kolejnych częściach. Część druga, praktyczna, obejmuje analizę ryzyka związanego z projektem. W trzeciej części, po zidentyfikowaniu najważniejszych zagrożeń w wybranych projektach, zaproponowano ustalenie środków dla ich zmniejszenia lub całkowitego wyeliminowania. Badania zostały przeprowadzone w przedsiębiorstwach znajdujących się na terytorium Republiki Czeskiej. Zbieranie danych miało miejsce w okresie od listopada 2014 do stycznia 2015 roku za pomocą badania ankietowego. Artykuł zakończono proponowanymi zaleceniami w dziedzinie zarządzania ryzykiem zgodnie z praktycznym zastosowaniem metod zarządzania projektami z uzwględnieniem specyfiki Republiki Czeskiej.
Słowa kluczowe: zarządzanie ryzykiem, zarządzanie projektem, rola menedżera projektu, ryzyko, projekt, Republika Czeska

項目在捷克共和國風險管理

摘要：在經營實踐中，項目都伴隨著各種各樣的風險。以連續識別和評估項目的風險是必要的。本文的目的是為了應對在各個企業在捷克共和國的項目風險管理的問題。本文分為三個主要部分。第一部分 - 介紹的重點是定義項目管理，項目經理的角色的過程說明項目風險管理的過程，並介紹了這些方法，這將是隨後應用。第二個實踐部分包括的項目風險分析。第三部分，在選定的項目中識別最重要的風險之後，就建立了他們的削減或取消完整的措施的建議。該研究在位於捷克共和國境內企業進行了研究。數據收集採用了問卷調查2014年11月和2015年1月之間進行。文章最後建議在風險管理方面按照項目管理的應用方法尊重捷克共和國的具體實踐經驗的建議。
關鍵詞：風險管理，項目管理，項目經理，風險管理，項目，捷克共和國的作用。