

# PROJECT RISKS AND OPPORTUNITIES MANAGEMENT

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**Abstract** The first half of the paper describes the existing concepts of risk and uncertainty, and shows how the opportunities can be identified and exploited as the possible risks of uncertainty. The second part of the paper addresses the opportunity exploitation as the supporting approach for a PMBOK project risk management process. It describes the common used processes as planning, identification, analysis of the opportunities and possible treatment strategies.

**Keywords** Project, Uncertainty, Risk, Opportunity, Project Risk Management process.

## I. INTRODUCTION

In order to determine and evaluate the risk in investment projects we need to describe the concept of the risk. Risk is the recognized possible loss, usually measured as the probability of the unfavorable event [9]. When we talk about risk, we usually also think about the concept of uncertainty. The uncertainty show the events that exits and activity results are nondeterministic and the degree of impact of those events can be both positive and negative. Jaafari (2001) defines uncertainty as an unknown probability of occurrence of an event [5]. Wideman (1992) describes uncertainty as a lack of knowledge of future events and the risk is viewed as the probability of those outcomes which are unfavorable. While the probability of favorable outcomes may be viewed as opportunity [12]. So, used opportunities carry with them associated risks and the greater opportunity, the greater is the degree of uncertainty and the consequent associated risk. Hence, opportunity and risk are tied together and, indeed, one can be seen as the result of the other. This relationship can be shown diagrammatically in Figure 1.

Many authors use the concepts of the risk and uncertainty together when they talk about occurrence of unfavorable events. The dictionary of economics propose the following definition: risk is „the chance of things not turning out as

expected” [1]. The encyclopedic dictionary of international finance and banking describes that risk “refers to the variation in earnings. It includes the chance of losing money on an investment” [10]. So the risk of investment is understood as the probability of future loss, which is potential and quantifiable. In the context of project management, project risk is „the cumulative effect of the chances of uncertain occurrences adversely affecting project objectives. In other words, it is the degree of exposure to negative events, and their probable consequences impacting on project objectives, as expressed in terms of scope, quality, time and cost” [12].

So the constant goal of project management should be moving uncertainty away from risk and toward opportunity. The authors from “Project Management Institute - *PMI*” (2004) indicate that “project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one objective” [8]. Cooper *et. el.* (2005) mark that risk thus has two elements: the likelihood or probability of something happening, and the consequences or impacts if it does [3]. Positive consequences or impacts describe opportunity („positive risk“) – „a risk that will have a positive impact on project objectives, or a possibility of positive changes“. Negative consequences or impacts describe threat („negative risk“) – „a risk that will have a negative impact on project objective if it occurs, or a possibility for negative changes“ [8]. Using this viewpoint the project risk management is analyzed by Cooper *et. el.* (2005), Chapman and Ward (2003), Kendrick (2003), Hilson (2001), so the paper also will be based by this approach.

Risk is exposure to the consequences of uncertainty. It is the chance of something happening that will have an impact upon objectives. It includes the possibility of loss or gain, or variation from a planned outcome, as a consequence of the uncertainty associated with following course of action [3].

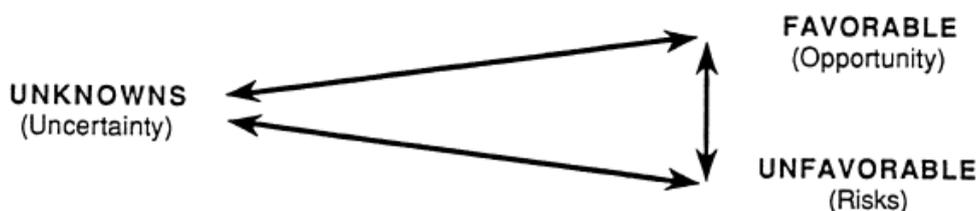


Fig. 1. The uncertainty, opportunity and risks relationship [12]

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Project risk management highlights more negative results of uncertainty, but opportunities are related with positive results and it is important to get additional benefits in order to enhance the project results. For example, changes in dynamic

environment associate with opportunities, so it is important to recognize them, and operate quickly enough to use and get related benefits.

Managers most often think about the risk management as negative results and the only important objects are uncertainty and risks. Many authors understand the value related with opportunities, but some of them propose to evaluate opportunities with separate process [3], the others management of opportunities associate with common project risk management process [4, 8] or analyzed with some modified and enhanced to facilitate perspective, as for example, an uncertainty management perspective [11]. In this paper the management of opportunities is analyzed as a part of risk management process, but in instance case it can be important to evaluate the positive risks only as opportunities, which make positive impact to project.

## II. MANAGING OPPORTUNITIES

Project risk management is understood as a formal process where risks are systematically identified, assessed and provided for [12]. So, project risk management includes the phases related with risk management planning, identification, analysis, response, monitoring and control on a project, and these phases are updated during project execution. The phases could be also selected to present the unique characteristics of the project in the best way [7], but the main objective of project risk management is to increase the probability and impact of positive events, and decrease the probability and impact of negative events. The approach is used to support PMBOK project risk management process, so it is important to overlook the phases of the process [8]:

- *Risk management planning* – this phase is used to decide how to approach, plan and execute the risk management activities for a project.
- *Risk identification* – this phase is needed to determine the risks, which might affect the project and document their characteristics.
- *Qualitative risk analysis* – risks are prioritized for subsequent further analysis or action by assessing and combining their probability of occurrence and impact.
- *Quantitative risk analysis* – the phase is needed to numerically analyze the effect on overall project objectives of identified risks.
- *Risk response planning* – the phase includes developing options and actions to enhance opportunities, and to reduce threats to project objectives.
- *Risk monitoring and control* – in this phase managers track identified risks, monitor residual risks, execute risk response plans and evaluate their effectiveness during the project life cycle.

These phases influence each other and interact with other knowledge areas. Each phase involve effort from one or more employee subject to needed of the project, and occurs at least one time in the project.

### *Management planning*

When authors talk about opportunities, then most often they recommend to use the same actions as in the risk management

planning phase. Used inputs, tools and techniques could be the same but the attention should be spare to enhance the outcomes rather than minimizing possible negative effects of the project [2].

The structured risk elements need to be adjusted to suit opportunity management as the opportunities often requires a different thinking from thinking about risks, so the key elements may need to be structured to encourage a productive minds for identifying, evaluating and managing opportunities. It is important in early project stages, where the key elements for opportunities can include important strategic aspects of the project [3].

### *Opportunities identification*

The process for identifying opportunities is similar to the phase used for identifying risks and could be done in the same time using brainstorming approach or other methods for selecting information. Members of project teams are less familiar with thinking about opportunities than risks, so the process could be adjusted to evaluate the strategic benefits of the project opportunities and account a separate opportunity register. In other occasions, the project risk management process or separate phases of identifying project risks and associated and needed treatment actions will also result in the identification of opportunities.

### *Analysis of the opportunities*

Opportunities could be considered by themselves (without negative impacts), the scale is similar to that for risk analysis, but with only positive outcomes (an example is shown in Table 1). The other scales could reflect the objectives, needs and nature of the organization and the characteristics of the project as used during *Risk identification* phase.

**Table 1.** Example of description for positive impacts [3]

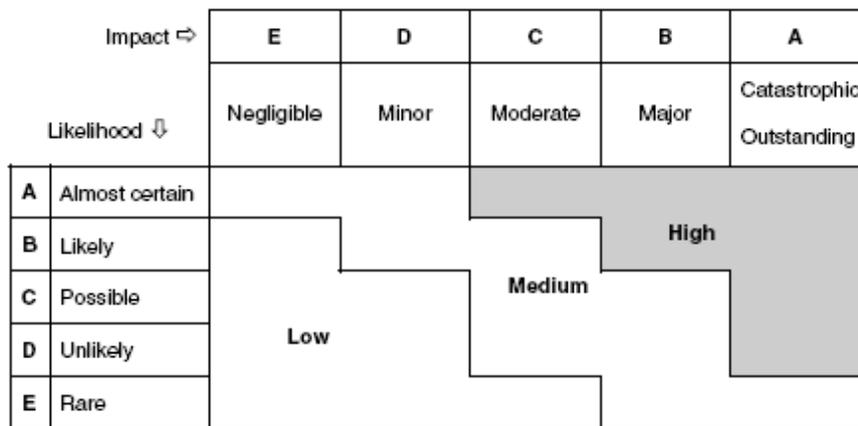
Level	Descriptor	Description
A	Outstanding	Significantly enhanced reputation, huge financial gain
B	Major	Enhanced reputation, major financial gain
C	Moderate	Some enhancement to reputation, high financial gain
D	Minor	Minor improvement to image, some financial gain
E	Insignificant	Small benefit, low financial gain

Table 2 shows an example of scales for opportunities and risks. In an example, the words are essentially the same for the positive and negative impacts. This scale is usefull if different measures for each criterion of interest are needed. It may be possible to use probability evaluation scales, as it shows the probability of positive results, but if the different scales are used for opportunities and risks, then they can decrease the efficiency of an example and foul appraisers [3].

The qualitative opportunity analysis matrix, which is based on experience, cold be used to join the likelihood and consequence ratings to assign the level of opportunity (as shown in Figure 2).

**Table 2. Impact rating scales for risks and opportunities**

Level	Potential impact, in terms of the criteria for the project	
	Risks	Opportunities
A	Catastrophic: Most criteria may not be achieved	Outstanding: Most criteria may be enhanced substantially
B	Major: Most criteria threatened, or one not achieved	Major: Most criteria may be improved, or one enhanced substantially
C	Moderate: Some criteria affected	Moderate: Some criteria improved
D	Minor: Easily remedied	Minor: Some benefit
E	Negligible: Very small impact	Negligible: Very small benefit



**Fig. 2. Risk and opportunity priorities [3]**

The priority setting matrix is almost the same as used in PMBOK *Qualitative risk analysis* phase for risks; the only difference is that the legend is changed.

**Response planning**

The priorities, which are created for opportunities in the analysis and evaluation process could be interpreted in the same way as risk priorities, with the focus on capturing and exploiting the opportunities rather than avoiding or mitigating the possible problems [3]:

- *Extreme opportunity*: a detailed planning is performed at senior levels to prepare and capture the opportunity.
- *High opportunity*: senior executives attention is needed and management responsibility should be specified.
- *Medium opportunity*: is managed by specific monitoring or response procedures.
- *Low opportunity*: is managed by procedures that do not need the specific application of resources.

The actions for risks, which have positive or negative results are defined in PMBOK project risk management process *Risk response planning* phase. After opportunities have been changed or shared, there may be residual opportunities that are formed with no immediate actions.

In a strategy or scenario risks are described and needed response actions are taking into account. It is a way to define

processes in a broader way and used tools and techniques to minimize or share. Strategies are useful by creating response actions for negative impact or possible problems where managers have low knowledge or expertise [3]. They include managers actions related with positive risks for objectives of the project. There can be only one or a set of strategies, which are the effective for each selected risk. Hilton (2001) notes, that if effective responses are not developed and implemented, than the chances of the project achieving its objectives will be reduced [4]. The authors from “Project Management Institute - PMP” (2004) accentuate the following strategies [8]:

- *Exploit*. The aim of this strategy is to eliminate the uncertainty associated with a particular upside risk [4]. The strategy may be selected for risk where the organization needs to ensure that the opportunity is realized. Directly related response actions include assigning more resources to the project to reduce the time to completion or provide better quality than originally planned.
- *Share*. This strategy includes allocating ownership to a third party who is best able to capture the opportunity. The risk-sharing partnerships, teams, special-purpose companies or joint ventures could be established on purpose of managing opportunities [4].
- *Enhance*. The strategy changes the size of the opportunity by increasing probability and / or positive

impacts to the project, and maximizing key drivers of these positive impact risks.

- *Strategy for both Threats and Opportunities („Acceptance“)* is adopted because it is seldom possible to eliminate all risks from a project. The strategy shows how the project team has decided not to change the project management plan in order to deal with risk, or it is unable to identify any suitable response strategy. This strategy can be used both for threats and opportunities and be either passive or active.
- *Contingent response* strategy is designed to use only if certain events occur. Project team make a response plan that will only be executed under certain determined conditions, if they believe that will be sufficient warning to implement the project plan.

Opportunities propose potential profit, so it is possible to interest the other party and by sharing the efforts to exploit the opportunity. However, implementation of the opportunity is related with costs, so it is important to evaluate possible agreements that they are not related with new risks, because the other party can not efficiently give needed resources, the works and management become more difficult to implement.

### III. CONCLUSION AND SUMMARY

The projects face a broad array of uncertainties which have the potential to affect achievement of their objectives and project outcomes. But some of these uncertainties would give benefits if they occurred. Risk management can give an important contribution and benefits to effective project management. So, authors identify and manage opportunities in general risk management process or with other modified and enhanced perspective, but the main objective remains the same. They all try to identify opportunities as well as threats early enough, take appropriate action to exploit them, exclude additional benefits in order to improve project outcomes.

This paper showed how the benefits can be identified and realized using an extension of the standard risk management process. It gives better understanding about impact of the opportunities on an project success and how analyze positive risks alone or handle opportunities and threats together by the same project risk analysis process. Additionally, opportunities identification, analysis phases and useful response strategies are outlined to give better focus. Project managers need to evaluate both threats and opportunities. If they manage only negative risks then a lot of project manager's responsibility is ignored and possible opportunities will be lost.

### REFERENCES

- [1] Bishop, M. Essential economics. The Economist. Profile books, 2004, p. 282.
- [2] Chapman, C., Ward, S. Project Risk Management: Processes, Techniques and Insights, Second edition. John Wiley & Sons, 2003, p. 389.
- [3] Cooper, D. F., Grey, S., Raymond, G., Walker, P. Project Risk Management Guidelines: Managing Risk in Large Projects and Complex Procurements. John Wiley & Sons, 2005, p. 384.
- [4] Hillson, D. A. (2001), 'Effective strategies for exploiting opportunities'. Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI 2001), presented in Nashville USA, 5-7 November 2001.
- [5] Jaafari A. (2001), 'Management of risks, uncertainties and opportunities on projects: time for a fundamental shift', *International Journal of Project Management*, Vol 19, pp. 89–101.
- [6] Kendrick, T. Identifying and Managing Project Risk. Essential Tools for Failure – Proofing Your Project. AMACOM, 2003, p. 354.
- [7] Pennock, M. J., Haines Y. Y. (2002), 'Principles and Guidelines for Project Risk Management', *Systems Engineering*, Vol. 5, No 2, pp. 89-108.
- [8] PMBOK Guide. A Guide to the Project Management Body of Knowledge. – 3<sup>rd</sup> ed. Project Management Institute, Inc., 2004, p. 388.
- [9] Rutkauskas, A.V. Pelno inžinerija. Kaunas: Technologija, 1999. 252 p.
- [10] Shim, J. K., Conostas, M. Encyclopedic dictionary of international finance and banking. CRC Press LLC, 2001, p. 323.
- [11] Ward, S.; Chapman, C., (2003), 'Transforming project risk management into project uncertainty management', *International Journal of Project Management*, Vol 21, pp. 97–105.
- [12] Wideman, R. M. Project and Program risk management: A Guide to Managing Project Risks and Opportunities. Project management institute., 1992, p. 57.