RISK MANAGEMENT APPROACHES AND PRACTICES IN IT PROJECTS

Didraga Otniel
West University of Timisoara, Faculty of Economics and Business Administration

Bibu Nicolae
West University of Timisoara, Faculty of Economics and Business Administration

Brandas Claudiu
West University of Timisoara, Faculty of Economics and Business Administration

Risk is identified in project management literature as an important factor influencing IT projects success, and it is relevant for both academic and practitioners' communities. The paper presents the past and current approaches to risk management in IT projects. The objective of this paper is to compare the different approaches and relate them to existing practices. Project management literature and practice have brought different approaches to risk management, and as a result, many projects ended in failure. We present how risk management is considered in the literature, and we compare the main two approaches: the evaluation approach and the management approach. The contingency approach does not consider risk management to be a specific process as it is an embedded process in the other project management processes. Then, we present the main practices in risk management. The methodology applied is based on documentary study review and analysis of the concepts used by the literature. We analyzed the literature published between 1978 and 2011 from the main journals for IT project management and found out that the essence of project management is risk management. The risk management practices have a considerable influence on stakeholders' perception of project success. But, regardless of the chosen approach, a standard method for identifying, assessing, and responding to risks should be included in any project as this influences the outcome of the project.
Key words: risk management, IT projects, risk management approach, risk management practice.
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1. Introduction

Information technology plays a continuously increasing role in economy and successful IT projects are very important for companies. Mismanaged software (development and/or implementation) projects are very common and result in failure (Standish Group International, 2009).

Effective IT project management has been receiving attention from academics and practitioners since 1978 (Alter and Ginzberg, 1978). However, the effects of risk management are not always easy to establish.

There are several approaches to **risk management** in the IT projects literature, but the main ones are: the *evaluation* approach, the *management* approach and the *contingency* approach.

Risk management has become a key factor within organizations since it can minimize the probability and impact of IT project threats and capture the opportunities that could occur during the IT project life cycle (Alhawari et al., 2012).

The Project Management Body of Knowledge defines risk as an uncertain event or condition that, if it occurs, has an effect on at least one project objective: scope, schedule, cost and quality (Project Management Institute, 2008: 275).

There are causes for a risk and, if it occurs, there is and impact. Risk conditions can be related to certain aspects of the environment of the IT project or organization that may contribute to project risk, such as poor project management practices, lack of integrated management systems, concurrent multiple projects or dependency on external participants who cannot be controlled (Project Management Institute, 2008). Risk refers to all events, occurrences and actions that may

prevent the organization from realizing its goals. Risk is everywhere and is a potential problem that might happen. Regardless of the outcome, it is a good idea to identify risk, assess its probability of occurrence and estimate its impact (Alhawari et al., 2012).

Regarding the use of risk management in projects, professionals state that risk management must be conducted because all of the project management handbooks say so, and it should be done in the way the standard handbooks recommend it (Project Management Institute, 2008; Office of Government Commerce, 2007; Association for Project Management, 2006; 2004). This concept is found in literature that focuses on risk management (Ropponen and Lyytinen, 1997).

Project risk management has the objective to decrease the probability and/or impact of negative events in the project and to increase the probability and impact of positive events (Project Management Institute, 2008: 274).

Risks may have many manifestations: natural disasters, security breaches, failings of human resource, third-part vendors, financial turbulence, unstable business environments and project failures (Alhawari et al., 2012).

Researchers have had a common interest concerning risk and uncertainty in IT projects. Early authors (Alter and Ginzberg, 1978; Zmud, 1980; McFarlan, 1981; Boehm, 1991; Barki et al., 1993) treat risk management as an ex-post evaluation process (Bakker et al., 2010a).

Gemmer (1997) affirms that effective risk management requires functional behaviour of the stakeholders, which means that they may not necessarily comply with the risk management procedure. Dey et al. (2007) affirm that generally stakeholders must be involved in the risk management process, and this is crucial for the project's success or failure (Jiang et al. 2000).

2. Research methodology
The methodology used is based on documentary study and literature review and analysis of the concepts used in the literature. We analyzed the literature published between 1978 and 2011 from several journals including: International Journal of Project Management, Project Management Journal, International Journal of Information Management, The Journal of Systems and Software, Journal of Management Information Systems, having as research items: *risk management* and *IT projects*.

3. Results
3.1. Evaluation approach to IT project risk management
From the evaluation approach, the process of risk management is an analysis for determining the risk factors and causes of project failure. It aims to learn from past projects, by evaluating risks that have already occurred. The evaluation may result in modifying the use of the methodology of risk management or even changing the methodology. The contribution of the evaluation approach of risk management to project success is *indirect*, as the information gathered is used in future projects (Bakker et al., 2010a).

The *evaluation approach* answers the question *what* causes projects to fail and has three main elements:
- known risk factors as input for a project;
- the process of project risk management that collects information about risks and failure of the project;
- new factors that are added to the list of known risk factors.

This approach assumes that it is likely that knowledge of the risks and their causes will have a positive impact on the project outcome. The aim of this approach is to create project predictability in new projects by using information regarding risks and causes of project failure gathered from previous projects (Bakker et al., 2010a).

The promoters of the evaluation approach (Jiang and Klein, 2000; Procaccino et al., 2002; Wallace et al., 2004; Han and Huang, 2007) assume that knowledge of risks implies that they can and will be managed, therefore the project will end successfully.

3.2. Management approach to IT project risk management

This approach answers the question *how* to deal with risks in order to prevent project failure.

The management approach to risk management has processes based on rational decision making and complies with the engineering view on project management. It focuses on identifying the events and situations specific to projects that can interfere with the original plan and developing measures to keep the current project on track. The contribution of the management approach of risk management to project success is *direct*, as it focuses on the relevant and specific risks of the current project. The promoters of the management approach (Gemmer, 1997; Ropponen and Lyytinen, 1997; Jiang et al., 2000; Kutsch and Hall, 2005; Dey et al., 2007; Bannerman, 2008) generally recognize risk management as a process consisting of well defined steps of identification, analysis, response, monitoring and control (Bakker et al., 2010a).

The differences between the two main approaches are presented in table no 1.

Table no 1: Comparison of the two main approaches in risk management

The evaluation approach focuses on:	The management approach focuses on:
Finding generic IT risks	Finding specific IT risks
Future projects	Current project
Analysis only	Various activities and practices
Creating general applicable information	Achieving direct results

Source: Bakker et al., 2010a

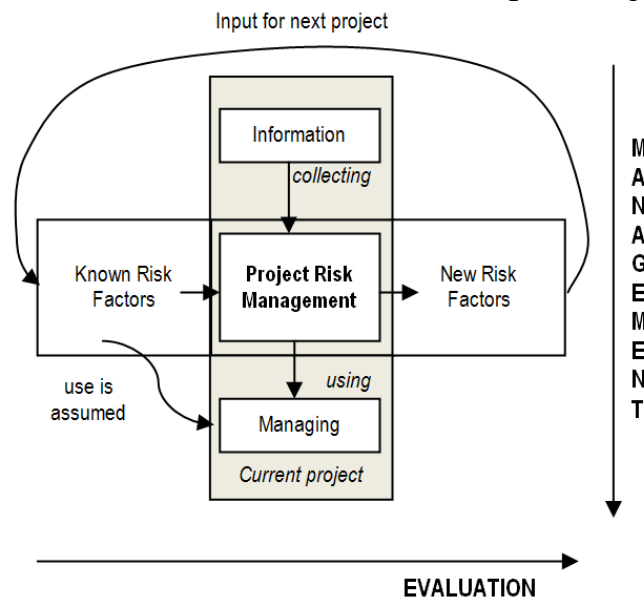Figure no 1 presents a combination of the main two risk management approaches.

Fig. no 1. The two main approaches to project risk management combined
Source: Bakker et al., 2010a

3.3. Contingency approach to IT project risk management

One other approach discusses risk management from a contingency perspective (Nidumolu, 1995; Barki et al., 2001; Jiang et al., 2006; Sauer et al., 2007).

The *contingency approach* to risk management considers project success to be dependent on how well the project as a whole is able to deal with uncertainties in the project environment (Jun et al., 2011) as project uncertainty is negatively associated with project success (Jiang et al., 2002).

According to the contingency approach, risk management is not considered to be a separate management process. Instead it is embedded in the various processes and procedures of the project (Jun et al., 2011).

3.4. Risk management practices

Risk management has developed rapidly over the recent decades as an integral part of project management (Del Cano and Cruz, 2002). It includes the processes concerned with risk management planning, identification, analysis, responses, and monitoring and control on a project (Project Management Institute, 2008). Risk management is a discipline, which integrates knowledge from a variety of different business fields and where wide varieties of methodologies treat specific problems (Alhawari, 2012).

Risk management is very important and integral part of any business and well recognized by the project management institutions (Del Cano and Cruz, 2002). Risk management refers to strategies, methods and supporting tools to identify, and control risk to an acceptable level (Bruckner et al., 2001). The risk management objective is to identify all applicable risks in a project. This involves ranking the risks based on their importance, frequency of occurrence, level of impact and then establishes the actions needed to control the identified risks. According to the Project Management Institute (2008) and Besner and Hobbs (2006), the main risk management practices are presented in Table no. 2.

Table no 2: Risk management practices

Risk management practice	Description of the practice
Risk Management Planning (Project Management Institute, 2008; Besner and Hobbs, 2006)	Writing in the project plan about how risk management will be executed on the project, not writing a list of risks
Risk Identification (Project Management Institute, 2008; Besner and Hobbs, 2006)	Naming and identifying risks by: filling out questionnaires, consulting experts, doing brainstorm sessions, conducting interviews, etc.
Risk Registration (Besner and Hobbs, 2006)	Recording and maintaining the list of risks in: a database, one or more documents, spreadsheets, etc.
Risk Analysis (Project Management Institute, 2008, Besner and Hobbs, 2006)	Analysing risks: by estimating probability and impact, using simulations like Monte Carlo, etc.
Risk Allocation (Besner and Hobbs, 2006)	Assigning a person to be responsible for taking care of each risk
Risk Reporting (Besner and Hobbs, 2006)	Delivering information about risks and the status of risks to stakeholders.
Risk Control (Project Management Institute, 2008; Besner and Hobbs, 2006)	Organizing meetings with various stakeholders in order to present the status of project and establish actions for risks

Source: (Bakker et al., 2010b)

Kutsch and Hall (2009) conclude that little research has been taken to establish whether project managers involved in IT projects really apply risk management and what reasons lay behind their decisions to not pursue any active management of risk in some cases. The literature focuses on what project managers should do, more than on what they did do (reactive attitude instead of proactive attitude). As long as no evidence is produced to explain why IT project managers fail to apply project risk management, the acceptance of best-practices in project risk management standards is insufficient.

4. Conclusion

Risk is an inherent component of software development projects, as well as implementation projects. The essence of project management is risk management (Larson and Gray, 2011:234).

There are two main approaches in IT project risk management: the evaluation approach and the management approach. Also some researchers consider another one: the contingency approach.

Success or failure of an IT project often depends on the contributions of stakeholders: top management, functional managers, customers, suppliers, contractors, and others (Larson and Gray, 2011), and that is why stakeholders must be involved in the risk management process.

All of the techniques and practices of risk management try to increase stakeholder satisfaction and increase the chances of project success.

Risk management should be proactive not reactive, and although many managers believe that the analysis, assessment and treatment of risks depend on subjective judgment of the project stakeholders, some standard method for identifying, assessing, and responding to risks should be included in all projects. This is supported by the "self-evidently correct" risk management practice (Williams, 2005). The actual process of identifying project risks forces some discipline at all levels of project management and improves project performance.

Risk management is an iterative process and it occurs all through the project life cycle. When risk events occur, using an effective risk management technique will facilitate measuring the project performance in terms of schedule, cost and quality. The risk management practices have a considerable influence on stakeholders' perception of project success.

Effective risk management requires adherence to a thinking in which risks are treated, not denied and problems are identified and not hidden (Larson and Gray, 2011:234).

Regardless of the approach, a standard method for identifying, assessing, and responding to risks should be included in any project as this influences the outcome of the project.

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