A study of the impact of project classification on project risk indicators

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Abstract

Project risk management is essential for ensuring project success. Current risk management tools lack predictive ability to indicate potential risks before the start of a project. This study was conducted to determine whether or not project classification, which is known at the outset of a project, can be used by project managers to proactively identify likely risk events in engineering design projects. This study compared the types of risk events experienced during the project, using risk indicators, when undertaking three different types of projects: compliance, operational, and strategic projects. Risk indicators were developed to capture circumstances (risk events) with potential predictive power about the likelihood of a risk occurring during a given project. Interviews were conducted with employees involved in eleven engineering design projects, within a single organization. Interview notes were transcribed, and risk events were identified and coded using a set of risk indicator codes. Codes were summarized at the project level and compared based on the project classification. The results indicate that the type of risk events occurring in projects does vary based on project classification. Both the type and frequency of risk indicators were found to vary based on project classification. These results suggest that risk management plans can be customized, at the outset of the project based on project classification, which may increase the likelihood of project success.
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1. Introduction

Many organizations fail to consistently deliver successful projects. The consequences of failing to meet project objectives can be significant in competitive business environments (Maylor et al., 2008). The cost of project failures and cost overruns for the Information Technology (IT) industry alone were estimated to be approximately $150 billion in 2008 (Gray and Larson, 2008). Failed projects have many consequences, including financial losses, negative press, loss of customer trust, and loss of competitive advantage. There exists a strong need for research that improves project success.

Risk management is among the primary activities of project managers (Project Management Institute, 2008). The identification of risk events is one of the first steps of risk management. The implementation of preemptive project management strategies has been shown to reduce project risk events (Miller and Lessard, 2001). A good understanding of risk events can help project managers create more informed risk management plans and can lead to reduced project risk (De Bakker et al., 2012).

This study focused on developing a deeper understanding of project management and risk by studying the relationship between the project classification and risk indicators. In particular, the study

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was designed to determine whether or not project classification impacts the type and frequency of risk indicators experienced in the course of design project completion. The researchers partnered with a large engineering design organization and identified eleven design projects, undertaken to address different organizational objectives. A framework introduced by Gray and Larson (2008) was used to classify the eleven engineering design projects as compliance, organizational, or strategic projects. Through a series of interviews with individuals who worked directly on the projects, information about risk events that occurred in the course of each project was gathered. Interview transcripts were created and coded, using a coding schema developed by the research team, but informed by the project management literature. Risk events were categorized and coded into a set of risk indicators. A quantitative analysis was then undertaken to determine whether or not risk indicator codes varied in type or frequency, based on the project classification. Prior to the initiation of the study, a review of the literature was undertaken to inform the definition and assignment of project classification and to inform the definition and operationalization of a set of risk indicator codes. A summary of key findings from the literature review, as it relates to project classification, project success factors, and project risk management are summarized next.

2. Literature review

2.1. Project classification

A project is a unique one-time endeavor constrained by an allotted time period, budget, resources, and requirements (Vidal and Marle, 2008). Organizations undertake projects to accomplish short and long-term goals and to take advantage of market opportunities (Gray and Larson, 2008). Project management is a specialized management methodology utilized for achieving business goals and for implementing strategies and work tasks. Project managers utilize different management methodologies and styles depending on the goals of the project, but the strategies employed for each project should align with the business strategies and the overall goals of the organization (Srivannaboon and Milosevic, 2006).

While organizations differ in how projects fit within individual corporate strategies, projects (and the goals they are designed to achieve) generally can fit into one of three classifications: compliance, operational, and strategic (Gray and Larson, 2008). Compliance projects are necessary for meeting regulatory requirements for conducting business in certain regions. For example, the purpose of a compliance project may be the modification of a product to meet new certification metrics specified by a regulatory entity. The continued production of the product, in this case, depends on successful certification. Compliance projects are often "must-do" projects. The second project classification, operational, includes projects that are necessary for improving current operations. Operational projects often do not have the level of urgency associated with compliance projects. Examples of operational projects are total quality management projects and product redesign projects. The third classification, strategic projects, are undertaken to support the long-term goals

of an organization, such as increasing the organization's revenue or creating a market advantage. Incorporating new technology into an existing product or revamping manufacturing processes are examples of strategic projects. As projects play an increasingly important role in an organization's success, the identification of factors leading to project success and failure has also become an important area of study. The next section details those frameworks developed in the literature, which can be used to identify factors that may contribute to project success and failure.

2.2. Project success factors

A successful project achieves all of the objectives that make up the project's purpose (Anderson and Merna, 2003). The definition of project success, however is not well-defined (Maylor et al., 2008). This ambiguity stems, in part, from differences in what is important to different project stakeholders. For example, customers may view a project as successful if all functionality requirements are met; however, if the design organization delivering the project realizes financial loss, the same project may be viewed as a failure. Not surprisingly, the literature includes multiple definitions of what constitutes project success. Table 1 summarizes a range of project success definitions pulled from the project management literature.

Although different definitions for project success can be found in the literature, there is overall agreement that one important role of project managers is to attend to those factors that are primary to achieving project success (Nagadevara, 2012). Factors contributing to project success or failure are referred to in the literature as critical success factors (Chow and Cao, 2008; Zwikael and Globerson, 2006). Table 2 highlights seven published frameworks for critical success factors. The most important contributors to project success, as identified in these seven different frameworks, are the external environment; the internal organizational structure; the proficiency of organizational management; the level of team member coordination; and project elements, e.g. project size, uniqueness, degree of innovation, etc. Since managing critical success factors may determine which projects succeed and which projects fail, an important element of project planning is to proactively identifying risks that might compromise a particular

Table 1
A summary of project success definitions.

Definition	Reference
The success is defined by a set of criteria that the outcome or the solution must meet to be considered 'successful' (p. 19)	Babu and Srivatsa (2011)
Keeping to an efficient schedule will lead to a more successful project. (p. 187)	Clift and Vandenbosch (1999)
Project success is an objectively measureable state describing how well the project performed. (p. 445)	De Bakker et al. (2012)
A project is successful when the objectives are met. (p. 516)	Maylor et al. (2008)
Project success is made up of how successful project management and the end product are. (p. 2)	Van Der Westhuizen and Fitzgerald (2005)