# BARRIERS TO PROJECT RISK MANAGEMENT: AN INVESTIGATIVE FRAMEWORK (STUDENT PAPERS, GRADUATE)

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## ABSTRACT

Risk management (RM) helps project managers plan for and mitigate problems which arise from project uncertainty, thereby improving project performance across multiple measures such as cost, time, and quality. Despite widespread recognition of the RM concept and its theoretical benefits, many authors report that in practice those benefits are seldom achieved. This study explores risk literature to determine which factors may have a negative impact on RM and synthesizes the information into a comprehensive framework. This framework is designed for use as part of a case study methodology to investigate the existence of project-related or organizational barriers which might undermine the effectiveness of RM.

## INTRODUCTION

Every project contains some inherent uncertainty, and the average level of uncertainty has consistently risen over the past several decades as projects became increasingly complex and greater competition forces organizations to execute more quickly [1]. When this uncertainty is not effectively managed, projects often suffer poor performance across multiple measures such as cost, schedule, and quality. Therefore, the success of a project requires the management of uncertainty throughout the project life-cycle [15].

Today, RM is widely recognized as an important project management discipline and is tied to multiple critical success factors (CSFs) [1]. Risk literature promises significant benefits for those who practice RM, and numerous studies indicate that managers across a wide spectrum of industries have accepted the efficacy of RM. But despite the solid framework and prevalent application of the RM process, "businesses still struggle, surprises still occur, projects still fail and the future remains unpredictable" [7, p. 9]. Failed RM translates to wasted resources, and this disincentive leads many organizations to skimp on or forego RM due to the additional associated costs [21], even though these costs should theoretically be outweighed by the savings from risk avoidance [8].

In an effort to understand the above paradox, RM-related studies have been conducted which investigated a variety of factors, or *barriers*, which were theorized to have a negative impact on RM implementation. These studies investigated RM within specific industries such as construction [9], research and development (R&D) [20] and software engineering [18]. This paper aggregates the results of a number of studies to create a framework consisting of two general types of barriers: project-related and human/organizational. The framework can be used to evaluate the impact of barriers on overall RM effectiveness within specific organizations or industries.

The purpose of this paper is to establish a methodology for investigating the existence and impact of barriers to RM implementation. This methodology can be applied to a specific organization or to an entire industry if data from multiple cases are available. The assumption is that projects involve some degree of partnership between a client organization and a contractor (i.e. vendor) organization. The methodology employs the following research questions:

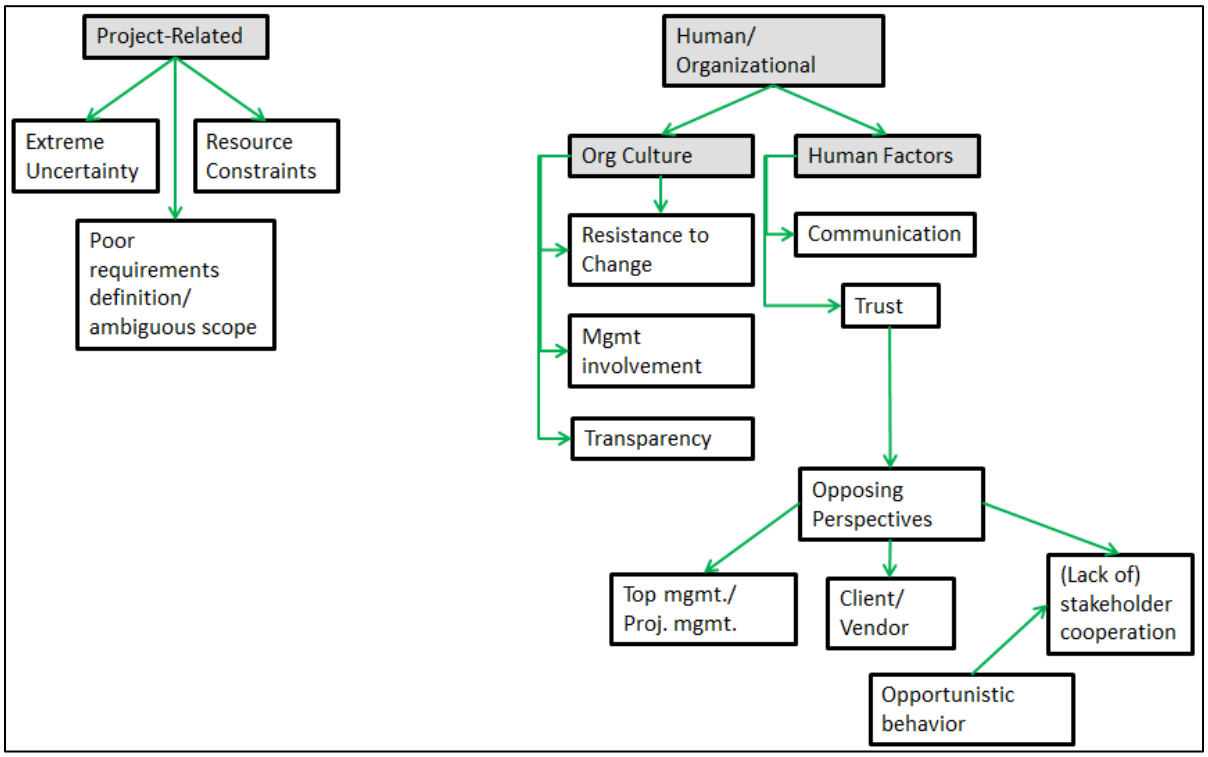
1. Which sources of project risk are most frequently encountered?
2. What processes do client and contractor personnel use for managing project risk?
3. How effective are the client's and contractor's RM processes in terms of minimizing negative impacts and exploiting opportunities?
4. Which organizational and project-related factors have an impact on the client's or the contractor's implementation of risk management?

The next section discusses the risk literature pertaining to barriers from which the theoretical framework is derived. Following the literature review, the methodology for collecting and analyzing the data will be discussed. The paper will conclude with an explanation of the expected practical and theoretical contributions of this research.

## THEORETICAL FRAMEWORK AND CONTEXT

Risk literature suggests that the presence of barriers may reduce the effectiveness of RM. Some researchers have attempted to measure the impact of barriers in different industries through surveys, case studies, and other methods [21]. Others, however, simply identify some barriers as problematic but do not attempt to quantify or compare their effects on RM effectiveness [20]. This research synthesizes the barriers identified in the literature into a single, comprehensive framework (see Figure 1), which can be used as an investigative tool to identify where an organization may be experiencing problems.

**FIGURE 1: BARRIERS TO RM IMPLEMENTATION**



## Project-Related Barriers

The first of the two types of barriers shown in Figure 1 involves technical issues related to the project itself, such as a lack of input data for risk analysis. Data can be difficult to obtain [21], and RM often depends on historical data and lessons learned from past projects to supplement investigative data. If historical data do not exist and/or investigative data are too difficult or costly to obtain, then the only options are to perform RM with incomplete data or to forego RM entirely. For purposes of this research, such a lack of available data will be referred to as *extreme uncertainty*. This barrier can be found in industries such as environmental remediation where "investigation efforts cannot completely define the nature and extent of subsurface contamination" [10, p. 17].

The time and money required to obtain risk-related data and perform RM are frequently cited in risk literature as excuses for not performing RM [8] [9] [11] [21]. In one example, Hwang et al. surveyed small- and medium-sized construction companies in Singapore [9]. The researchers found that although more than 75% of participants felt that RM was important to cost, schedule, and overall project performance, the companies were frequently unable to justify the cost of RM due to intense competition in a difficult economy.

Lastly, in order to effectively implement RM, the project's scope and requirements must first be clearly defined. This barrier is especially relevant during the project planning stage where risk analysis is used to adjust cost and schedule estimates. Schmidt et al. stress that it is unrealistic to expect the contractor to make reasonable estimates of the project cost when the requirements are not clearly defined [18], and Thamhain argues that unclear deliverables and objectives reduce the effectiveness of RM [20].

## Human/Organizational Barriers

Effective RM requires adequate resources and clearly-established procedures, but it also requires an organization that is willing and able to implement those procedures. Hillson and Murray-Webster explain the importance of a mature risk culture, which they define as the attitude held by individuals and organizations toward risk [7]. This attitude has a large impact on the success or failure of the RM process. Other authors concur that many of the drivers toward effective RM are "derived from the human side" [19. p. 4] and that processes are inseparable from the people who execute them [1].

One attitude which may reduce the effectiveness of RM is resistance to change, and resistance behaviors can be active or passive [5]. Risk literature suggests that there is still some resistance to RM principles, possibly due to the relative novelty of the concepts compared to some of the older and better-established project management activities. A study by Tummala et al. shows that resistance to change poses a significant problem for RM implementation [21], and Papke-Shields et al. explain that RM is a newer knowledge area than cost, time, and scope, and is also "softer" and difficult to quantify [14, p. 10].

Another potential barrier to effective RM is the lack of involvement of an organization's leadership. For example, the Department of Energy's 2008 Root Cause Analysis attributed a lack of management emphasis and direction to the failure of its RM process [3]. Leadership involvement in RM is closely tied to an organization's risk culture; project leads and senior management need to work together to increase awareness of risk throughout the organization [18] [20]. Similarly, Hillson suggests that leaders provide a clear statement laying out their vision and policy regarding RM in order to communicate the desired risk culture to their employees [6].

In addition to management involvement, effective RM requires organizational transparency so that participants clearly understand the process and the information that influences decisions about risk. Williams defines transparency as "the extent to which the organization provides relevant, timely, and reliable information, in written and verbal form, to [other stakeholders]" [22, p. 6]. In one example, Schmidt et al. explain how a contractor hired by the Australian government was not required to report on its RM [18]. The client tended to overreact when new risks were identified, so the contractor ceased providing information about risks, which led to more problems for both parties. The authors conclude that "being open on both sides about risks right from the start can prevent unwelcome surprises, and can lead to a more constructive approach to handling problems" [18, p. 4].

Transparency may also be considered both an antecedent and an outcome of another factor with a significant impact on RM: trust [22]. Laan et al. describe two kinds of trust: competence trust, which reflects the level of trust one has in the abilities of others; and intentional trust, which deals with the intentions of a partner towards the relationship [12]. In a trusting relationship, partners will be communicate more openly about risks, which will ultimately lead to better RM and more favorable project outcomes [12]. Doloi argues a similar point, explaining that joint RM improves with perceived trust and confidence among partners [4].

Communication is another key influence on the effectiveness of RM, and like transparency, communication is related to trust [4] [12]. Better communication leads to more effective organizational processes, including RM [20], and allows for faster responses to new risks and problems that arise, thereby minimizing their impact [18]. Furthermore, whenever communication, trust, or transparency is low, the project may suffer a lack of cooperation among stakeholders [4] [12] [18] [22]. Without sufficient cooperation, the client and contractor may fail to achieve an optimal solution when a problem occurs [13].

The two final barriers discussed in this section can develop from poor stakeholder cooperation: opposing perspectives and opportunistic behavior. Opposing perspectives undermine an organization's ability to identify and address the causes of project performance issues; for example, senior management in R&D projects frequently blames performance problems on project managers (PMs), whereas the PMs frequently attribute the problems to risk situations outside their control [20]. Opposing perspectives can also occur between the client and contractor, as we previously saw in Schmidt et al.'s example; the client became alarmed whenever it learned of a new risk, and the contractor decided that the resulting paperwork and additional scrutiny outweighed the benefits of any collaboration that might result from sharing the risk information. Opportunistic behavior is similar to opposing perspectives in that project participants have different priorities. De Man and Roijakkers explain opportunistic behavior as the actions of self-interested participants trying to maximize the results for their organization rather than the project [2]. These behaviors undermine trust [12], and may result in reduced transparency and cooperation.

The presence of any of the barriers discussed in the previous sections can compromise an organization's ability to manage uncertainty in its projects. The variation among results from studies of barriers in risk literature suggests that the existence and impact of a particular barrier may depend on factors which are unique to an organization or industry. Therefore, the following methodology should first be applied to a single organization or multiple organizations within the same industry. If multiple studies find similar patterns, then a broader generalization may be feasible.

## RESEARCH METHOD

### Data Collection

In order to determine the effectiveness of an organization's risk management and assess which (if any) barriers are impacting its implementation, this methodology suggests a case study approach. The study should include multiple cases, where a case is defined as the RM implementation for a specific project executed by a client organization. Data should be collected from in-person interviews with client and contractor personnel. Each interview should focus on a specific project with which the interviewee has extensive experience. The goal in each case is to understand how RM was performed, which barriers may have had an impact, and what factors contributed to the existence of those barriers. The barriers represent the independent variables (IVs) and will be linked to the dependent variable (DV), RM effectiveness. Based on this model, the existence of barriers should result in reduced effectiveness, and a lack of barriers should coincide with a successful RM process.

The interview questions should elicit both quantitative and qualitative data. Interviewees will provide an assessment of the effectiveness of their project's RM and of the various barriers discussed earlier using a Likert scale of one to five. These data, while subjective, will allow the direct comparison of the interviewees' responses. Other questions should explore the context for the barriers and for the discussion of the efficacy of RM efforts. These context questions will be qualitative and should address two key issues: What types of risks are most frequently encountered, and how is RM being performed in terms of activities and processes? Additionally, interviewees should be asked to provide explanations and examples following each of the Likert scale responses.

### Data Analysis

Quantitative data collected from the interviews can be analyzed using any statistical software package. A multivariate table would show the strength of any correlations between the IV and DVs as well as any multicollinearity among the DVs. The sample size would be relatively small because interviews were the means of data collection, but any statistical findings of significance may strengthen the validity of the qualitative results. There are many possible methods for analyzing the qualitative data; for this methodology, the constant comparison method [17] could be used to code interview responses and create themes. These themes would explain the success or failure of project RM in terms of the barriers identified in the literature review and provide project- and organization-specific details to help the client organization address the cause of any barriers. Lastly, assuming the study involves multiple cases, a technique such as cross-case synthesis [23] could also be used to examine the qualitative details and identify similarities and differences in the occurrences of the barriers across projects.

## EXPECTED CONTRIBUTIONS

The barriers discussed previously are the most relevant based on risk literature, which reveals a recurring theme that although RM is perceived as necessary and organizations desire the theoretical benefits of performing RM, the process implementation is often undermined by one or more barriers. By identifying and addressing these barriers, an organization may be able to improve the effectiveness of its RM activities and thereby increase the accuracy and reliability of its cost and schedule estimates. The combined benefits of more accurate estimates and improved project performance via RM translate to better overall project performance with respect to cost and schedule. Furthermore, each case study will build upon the existing body of RM knowledge, and in conjunction with other similar studies will

help management professionals to better understand the causes and impacts of barriers to RM implementation.

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