

Project Risk Management: Use and Benefit of Various Tools

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ABSTRACT

This study is about project risk management tools. The aim has been to identify which tools have the greatest potential for contribution to risk management processes in the Norwegian oil and gas industry, and which factors contribute to efficient risk management. Empirical data from the Norwegian industry have been gathered using a questionnaire. The results revealed strong relationships between project system complexity, average tool score and risk management contribution. Furthermore, the results of the analysis show that some of the previous recommendations of tools for project risk management may have been based on a restricted set of determinants. On the other hand, similarities are also found with previous research in terms of the highest ranked tools based on perceived contribution to the risk management performance. Compared to the previous findings, this study indicates that a new measure for project management performance is needed, and that the recommendation of tools based on the risk management contribution index may be flawed. Nevertheless, it is concluded that several of the recommended tools are of great value across industries.

Keywords: *Oil and Gas Industry, Project Risk Management, Risk Tools, Structural Equation Modeling, Survey*

INTRODUCTION

Project risk management (PRM) is a field of great interest in both academic and industrial circles on the national and global scene. PRM constitutes one of nine main knowledge areas of project management in the PMBOK (PMI, 2004, p.237) where the objective is stated as: “to increase the probability and impact of positive events, and decrease the probability and impact of events adverse to the project.”

It is also recognized as a vital part of project management by other significant frameworks and best practices for project management

such as the Association of Project Management, British Standards Institution and Office of Government Commerce (Kutsch & Hall, 2010). According to Crawford, Pollack, and England (2006), it is one of few areas in the project management literature that consistently has received high attention in the prominent project management journals.

The research area has thus evolved to be very extensive and many different issues have been elucidated. Among these are, for instance: managerial behavior (Kutsch & Hall, 2010); inclusion of opportunities (Hillson, 2002); the precision of estimates (Elmaghraby, 2005);

portfolio risk management (Teller, 2013); and cross-cultural perceptions and multi-disciplinary techniques (Goodwin & Strang, 2012).

According to Hällgren (2012, p. 804), the majority of the recent research in project management is focused on “gap-spotting,” which is found to hamper the development of the project field because long-held, and sometimes false assumptions, are rarely challenged. This argument is recognized by the authors, leading the paper to be founded upon the work of Raz and Michael (2001), who conducted a questionnaire within the Israeli software and high-technology industries (SHTI).

In our study we have collected data from the Norwegian oil and gas industry (OGI) and various tools are examined to point out which tools are most likely to be associated with successful project management and efficient risk management of projects. The following research questions have been studied:

- *Which tools for PRM have the greatest potential for contribution in the Norwegian OGI?*
- *Which factors contribute to efficient PRM in the Norwegian OGI?*

Specifically, the aims of this research study have been to investigate the use and benefits of various tools for project risk management in the Norwegian oil and gas industry, and examine how risk management strategy and the formality of the process influence the contribution from the risk management process (RMP) and project management performance (PMP). A second main objective was to explore differences between the oil and gas industry and other industries.

The study also explores the external validity of the previous findings of Raz and Michael (2001) in a different culture and industry – which was identified as potential further research in their conclusions. The OGI was chosen for this purpose because it is offshore based - which involves rigorous risk management requirements, and because it is the largest and most important industry in Norway.

By benchmarking various tools for PRM in the Norwegian oil and gas industry, managers may be able to make decisions that are more informed if they adopt a PRM process in their organization. At the same time, it may provide information with respect to the transferability of theories within project management across various industries and cultures.

LITERATURE REVIEW

Conceptual Model

In a study investigating the use and benefits of tools for PRM Raz and Michael (2001) identified the tools that were most widely used: those that were associated with successful project management in general and those with effective PRM in particular.

In their study, they gave the term tool a wide meaning (Raz & Michael, 2001, p.10); “including not only special purpose tools, but also methods, practices and processes that are likely to contribute to the management of risks in projects.” Their research was inspired by the benchmarking approach of Camp (1989).

Their cross-sectional research disclosed a Person correlation of 0.36 at a 0.0008 level of significance between average tool score (ATS) and project management performance (PMP). This positive relation was interpreted as evidence that “respondents who come from environments conducive to better project management performance are more likely to assign higher scores to project risk management tools” (Raz & Michael, 2001, p.13).

Further, a Person correlation of 0.67 at a 0.0001 level of significance was found between ATS and risk management contribution (RMC). This positive correlation was interpreted as evidence that: “those respondents who believe in the value of the risk management process as a contributor to overall project success are more likely to apply the tools in the list” (Raz & Michael, 2001, p.15).

According to Vidal, Marle, and Bocquet (2011), project system complexity (PSC) needs to be understood and measured to

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