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Research on the Importance of Project Pisk Management to Project Success

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ABSTRACT

A project is a one-time task that needs to be completed within a limited amount of resources and time. The nature of project management is to obtain the value of certainty by managing uncertainty. In helping customers to achieve current value, future value, at the same time, project management can realize company's financial value, business value, and the value of their own capabilities. Project risk management plays an extremely important role. However, the market environment is constantly changing, it is important for the successful delivery of the project if it can cope with various risks in the process of project implementation for the project team. Good project risk management can help to reduce the probability of decision errors, avoid losses, and increase the value of the enterprise. The focus of this study is to introduce the application of project risk management in project implementation by developing a conceptual framework. This theoretical research is carried out attempts to theorize the relationship between project risk management and project success. It is found that project risk management contributes to project management system in four aspects: identification, analysis, responsing and monitoring. These findings introduce the significant usage of it in the process of a project from inception to completion, as well as offer reference for other researchers on how to improve project risk management to promote the smooth realization of the project.

Keywords: Project Risk Management; Project Success; Management Systems

INTRODUCTION

The most important challenge faced by businesses and organizations today is how to improve productivity and ensure project success (Rath & Bhattacharya 2023). Business managers are seeking new strategic approaches to ensure the long-term stability of their organizations according to the 2019 Annual Sustainable Business Leaders Survey (Silvius 2019). Tulder et al. (2014) describe the impact of effective management methods on different areas of an organization, such as enhancing the effectiveness of strategic decision-making, improving technology upgrade, strengthening human resource management, improving supply chain management and financial management. Ensuring corporate sustainability requires companies to pay more attention to the improvement of products, services, business models, production processes, government policies and resources management in response to changes in the market (Project Management Institute 2017). Project management plays an important role in in improving these aspects and can effectively promote the rapid development of the organization and society (Rasnacis & Berzisa 2017).

Changes in project management methods are the result of enterprises responding to market turbulence and changing consumer needs (Fioravanti et al. 2018; Cakmakci 2019). In such cases, traditional project management methods may not be fully applicable to the dynamic market environment and complex projects (Kaim et al., 2019; Trzeciak 2020). Meanwhile, changes in project management are based on the analysis, summary and shortcomings of traditional project management methods. Uncertainties and risks in a project can significantly affect the successful implementation and the success rate of the project (Ismael & Shealy 2018). The uncertainties and risks that may occur in the process of project management can be evaluated through prior risk identification (Maceika et al. 2021), accurate analysis of risk and the degree of influence on the realization of the project goals, and the next countermeasures can be determined based on the evaluation results (Woźniak 2021). Effective management of project risks and decision-making and methods to deal with potential risks can improve the success rate of projects, and thus better achieve project objectives (Doskočil & Lacko 2018; Zaleski & Michalski 2021). This can also reduce

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project costs and ensure that projects are executed according to established plans and standards (Ahn et al. 2020). Therefore, some researchers put forward project risk management is an important factor in the project decision-making, instead of a mere simple technical analysis (Taherdoost 2018).

Scholars have studied project risk management for many years (Thamhain 2013), but its research is still of great value (Tavares et al. 2020). Risk is inevitable in the course of a project and may occur at all stages of a project before completion. However, due to the dissimilarity of the area, complexity, or characteristics of the project, the risk can be large or small, so project risk identification is very important (Shrivastava and Rathod 2015). Different researchers have different definitions of project risk, but for the purpose of this study, we define risk as "factors that may arise that have a negative or positive impact on the implementation of the entire project and/or its various parts." This definition is similar to PMI's definition of risk as "an element of uncertainty that, if it occurs, would positively or negatively affect one or more project objectives" (PMI 2017). Project risk management is pivotal to project management, moreover, effective management of risk is essential to the success of the project (Camilleri 2011; Wu & Zhou 2019).

THE THEORETICAL BACKGROUND

Project Management

David & Lewis (2007) pointed out that "project management is the key to success in today's complex world". Project management first began in the 1940s in the United States to implement the "Manhattan Project". Since then, with the application of Gantt chart, Critical Route method (CPM) and program review technique (PERT), project management has gradually formed a set of scientific and systematic methods. At present, there are four main international project management standards: (1) PMBOK (Delisle 2019), compiled by the American Project Management Institute (PMI), scientifically divides project management into five process groups: the initiation, planning, execution, control and closure of project. According to the characteristics of each process and the main problems it faces, The project management knowledge system is summarized into nine knowledge areas: the management of content, time, cost, quality, human resources, risk, procurement, communication and aggregation. (2) ICB3.0 (2006), prepared by the International Project Management Association (IPMA), the 46 elements of project management competence are selected from the technical, behavioral and environmental categories to illustrate the competencies required by the project manager in project management and their importance. (3) PRINCE2 developed by OGC (Simonaitis et al. 2023), PRINCE2 is a structured project management process based on project business presentation, quality management, risk management, organization management, plan management, change and schedule control. (4) "Project Management Quality Guide" (ISO10006) (Suikki 2006) proposed by the International Organization for Standardization (ISO), ISO10006 is mainly based on the PMBOK framework, which specifies the quality system elements, concepts and practices that play an important role in project management and have an impact on the achievement of quality standards. The guide has broad versatility and is suitable for many types of projects of all sizes.

Project Success

Project success is a topic that many researchers and practitioners are concerned about. There are two main reasons why project success is so important, on the one hand, success is the goal of every project and the common desire of all participants. In addition, project success is a process result achieved within a certain range of stages, after which the project team begins to seek new research and practice (Radujkovic et al. 2021). Some scholars have studied the success of the project. For example, Cleland(1986) argues that "the significance of project success needs to be defined in two ways: the extent to which the technical performance objectives of the project are achieved on time and within budget; The project's contribution to the strategic mission of the company." interestingly illustrate different perspectives on project success: "Architects may consider success in terms of aesthetic appearance, engineers in terms of technical ability, accountants in terms of budgeted expenditure, HR managers in terms of employee satisfaction. And ceos measure success based on where they are in the stock market." By studying a series of project management literature Freeman and Beale (1992) put forward five most commonly used factors for measuring project success: technical performance, executive efficiency, management and organization (customer satisfaction), team member growth, innovation and business performance. In the words of Prabhakar (2008), "The project

manager is an important factor in determining the success of the project, and his or her leadership style and ability are critical to the success of the project." Herath & Chong 2021) comes up with five key components of project which are the management of human resource, project design, project efficiency, stakeholder, budget and the special key success factors.

Project Risk Management

Different scholars have studied project risk management from different aspects (Shayan et al., 2022). In addition, what most definitions have in common is that project risk management is an ongoing process of identifying, analyzing, prioritizing, and mitigating the likelihood that these risks will have a negative impact on project success in some respects, such as cost, schedule, quality, safety, technical innovation and final product or service (Crispim et al., 2019). Furthermore, it is proposed by the Project Management Institute (2017) as a process that focuses on the planning, identification, analysis, management, monitoring, and control of project risk. Besides, Willumsen et al. (2019) believe project risk management is the risk avoidance of the project system process to increase the probability of the organization to realize the preset goals. Ayub et al. (2019) proposed that the primary goal of project risk management at the start-up stage is to report the decision-making process of project implementation approval to senior management at the start-up meeting. Project risk management is a continuous process, starting from the project planning and planning stage to the project completion (Haniff & Salama, 2016). It pointed out that project risk management is a complex and long lasting process, which needs project teams to have relevant capabilities and experience to implement risk management by other researchers, such as Hofman et al. (2017) and Tavares et al. (2019).

Wellington Project Management made an analysis of the risk existing in current project management in 2017 and the analysis which involved 768 project managers who come from 392 organizations, and ultimately he found that only 30% of organizations applied risk management in the project planning process. Similarly, The Project Management Institute carried out a research of 5,402 project managers who came from different countries in 2018. Improper application of risk management resulted in project failures accounting for 28% of the total number of projects compared to the previous year (PMI 2018). Therefore, project risk management is very imperative for the successful implementation of the project. The main factors of project risk management include the identification, analysis and response strategy of risk. In addition, the risk response strategy includes risk recognition, risk assessment, and implementation of targeted resolution strategies to reduce the risks that could lead to project failure, mitigate the negative impact of events, and thus improve the effectiveness of the project (Kaur & Singh 2018).

RESEARCH METHODOLOGY

Theoretical research shows the importance of project risk management (PRM) for project success, often in the form of conceptual frameworks. It provides hypotheses on a subject by putting concepts from fifferent scholars research together (Briner & Denyer, 2012). Theoretical research can provide a better understanding of what constitutes project risk management and its importance to project success. This study establishes a framework to explore the role of project risk management on three key elements involved in project success. This research method forms a theoretical framework of development by comparing and analyzing similar ideas of different scholars.

According to the steps of research design proposed by Machi and McEvoy (2016), a scientific approach was ensured in this paper. The first step is defining the research question. According to the previous research, it can be found that the application of system approach in project success research is limited. Therefore, it is necessary to explore the various areas of project risk management implementation in an organization in order to determine how to effectively use this approach to promote project success. The second step is to propose a solution. At present, the research on the importance of project risk management for the successful implementation of projects is fragmented, and a theoretical method is urgently needed to sort out and analyze related concepts. The third step is to gather information from the source. Relevant references are from Scopus, Web of Science, and Google Scholar.

The theme of the project consists of two key words :1) "Project risk management (PRM)" and 2) "project outcome". While there are many papers in both domain 1 and domain 2, however, when search for keywords of their relationship does not involve many papers. Therefore, in this study, the authors attempt to combine the two for further exploration and identify the conceptual connection between PRM function and the successful components of a project to highlight

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one application of the PRM approach. Step 4 Build an argument based on important points gained from the literature. This paper analyzes the literature according to this step, and proposes the significance of implementing PRM in the success of the project. The fifth step is to summarize the literature analyzed. We analyze and summarize the elements of project risk management and project success, so as to establish the relationship between the two, which provides a valuable framework for the connection between the components of project success and project risk management. The last step is to verify the rationality of the proposed research framework by asking relevant research experts. In the area of project success, taking into account their experience, six experts with insights into the application of PRM were selected according to a purposeful approach to further confirm the validity of the theoretical framework.

4. RESULTS AND DISCUSSION

Key Components of Project Success

In order to find the primary factors for the success of the project, a systematic review of Academic Search Completion (EBSCO) and an analysis of papers published between 2015 and 2023 (Web of Science) represent modern thinking, trends and research results in the field. There are many key factors for project success, and the key factors vary by industry and project (Machi & McEvoy 2016; Herath & Chong 2021). Here are some common key factors:

- Planning: A comprehensive plan lays a good foundation for the establishment of a successful project from the very beginning. The plan helps to clarify the purpose of the project, the required personnel conditions, the time planning of the project, the specific division of labor of the project and other relevant elements. A good plan not only enhances the confidence of the project team members for the delivery of the project, but also enables the stakeholders to understand the progress of the project.

- People: People are the most important resource in the project, and the successful implementation of the project cannot be separated from people. This element includes the project manager, project members, stakeholders, and customers, and the project manager is the most important for the completion of the project. A project manager should have excellent leadership, which is the significant ability, mainly in determining the direction, making decisions, influencing others and so on. The project manager is the banner of the whole team, leading the team to achieve the project goal is the primary assignment of the project manager.

- Infrastructure: Infrastructure which is a significant factor that guarantee the delivery of projects, especially large-scale infrastructure projects, because of its large scale, complex structure, and usually take a long time. If we want to do a good job in schedule management, we need to reduce time reasonably by improving efficiency (Dezhkam et al., 2019). Today's project infrastructure fully embodies the combination of technology and management, such as the combination of advanced construction technology and digital information technology (for instance artificial intelligence, BIM, Internet of Things, etc.) and reasonable management means. The application of new ideas, tools and methods to traditional infrastructure construction projects to improve the efficiency of the project is also one of the manifestations of "new infrastructure".

The Role of PRM in Project Success

As mentioned above, the characteristics of PRM are divided into four aspects. These four parts are closely related to each other to ensure the smooth operation of the project. The function of PRM has been recognized in previous studies, and the researchers mainly mentioned four functions, including 1) recognition, 2) analysis, 3) response, and 4) monitoring (Crispim et al., 2019). This paper elucidates the role of these 4 PRM to the above three aspects of the project success system as follows:

Firstly, project risk identification is the most important factor of risk management and it is the systematic classification and comprehensive identification of potential risks that have not yet occurred and objectively existing risks by various methods on the basis of data collection and investigation. Project risk identification can not be completed at once, it should be carried out regularly and systematically throughout the whole project operation process. Risk identification plays an vital role in the whole risk management process. Only by correctly understanding the risk can we correctly analyze the risk, and then we can reasonably deal with and control the impact of the risk. However, project risks are latent in most cases, and new risks may emerge at any time as the project life progresses. Therefore, in the process of project risk identification, the most important thing is not to miss the risk factors,

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especially the factors that have important influence on the goal of the project. The process of risk identification is an active process of finding risk, describing risk and confirming risk. The project risk identification process which can be generally divided into five steps: 1) Determine target; 2). Identify the most important players; 3). Collect information; 4). Estimate the project risk situation; 5). Identify potential project risks based on direct or indirect symptoms.

Secondly, Project risk analysis analyzes identified risks to determine their potential impact and likelihood. This can be done through qualitative analysis (assessing the severity and likelihood of the risk) and quantitative analysis (assessing the risk using mathematical models and statistical methods). Besides, it included project risk prioritizing: Ranking risks according to their severity and likelihood to determine which risks need to be prioritized. This helps the project team focus resources and attention on the most important risks.

Thirdly, After the project management team has developed a risk response strategy, the focus is on ensuring that these strategies are effectively implemented. Risk responses need to be actionable and often adapted to project progress and changes in the external environment. The key to a successful risk response strategy is planning ahead and executing quickly when needed.

Fouth, risk monitoring which involves the continuous monitoring of activities to ensure the implementation of the risk management plan and the evaluation of its effectiveness. Any newly identified risks will be incorporated into the risk monitoring process and the risk assessment and response plan updated based on their priority. Risk monitoring is not limited to monitoring identified risks, but should also consider uncertainties in the overall environment to prevent the occurrence of new risks. In summary, the role of PRM in a project management system is illustrated in Figure 1. The framework is based on a review and summary of previous literature, and is then considered for legitimacy by seeking expert opinion.

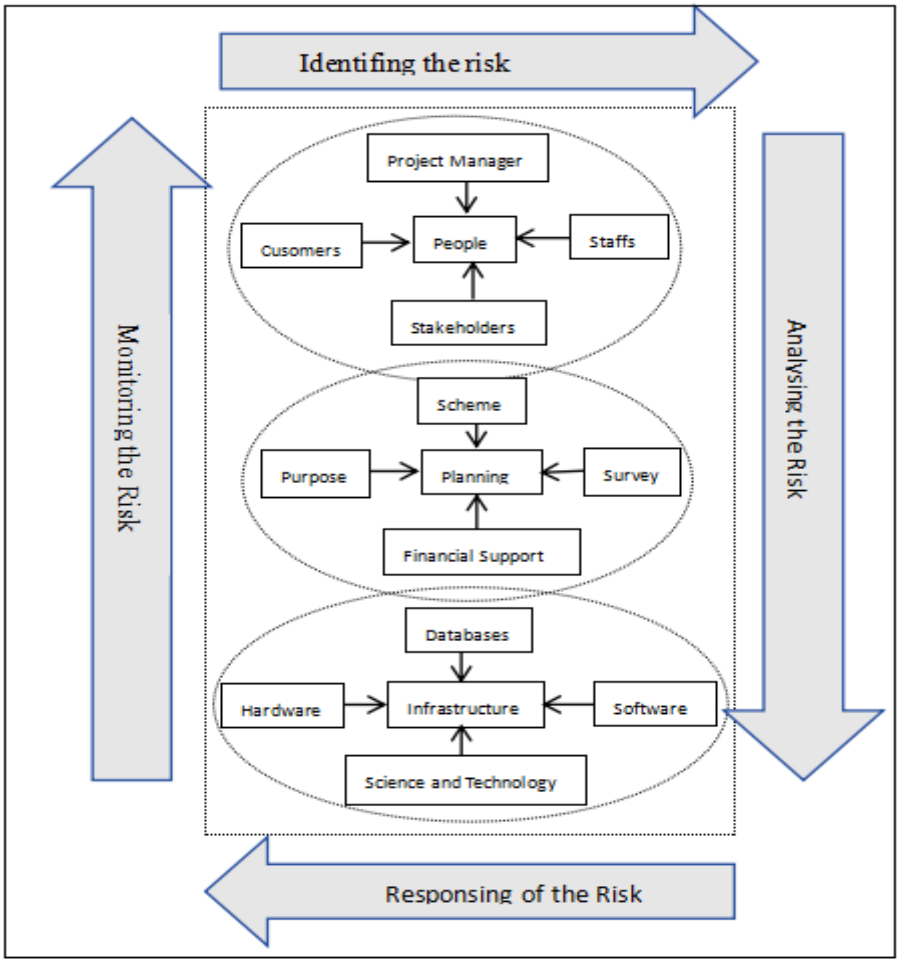

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Figure 1. The System of Project Pisk Management to Project Success

CONCLUSION

One of the obstacles that often occurs in the implementation of enterprise project systems is the unclear definition of responsibilities and personnel communication or the lack of unity and collaboration among various elements. The project success system based on project risk management is a comprehensive strategic system that requires the participation of multiple parties to jointly identify, analyze, feedback and supervise risks. This system helps to select the most important elements and sub-elements of the project, as well as to improve the economic benefits of enterprises by combining project with the target, efficient use of resources and the minimization of investment risks. Many elements in this system are dynamically changing, so project risk management should also be dynamically monitored and identified. For example, the sub-set of the element of project people includes the item of customer, and customer preferences may change at any time, which requires tracking and analysis of customer preferences through big data technology, so as to identify the risk of product preference. The employees of the enterprise may also be dynamic, which requires the project manager to predict and reduce the risks in advance, and ensure the stability of the team members as much as possible and the achievement of predetermined goals. The internal consistency of these four elements of project risk management with the project elements and their integration justifies the application of the systems approach.

Through the analysis of the existing research results, this paper introduces three components of the project success system based on project risk management, which mainly includes three elements (1) people, 2) plan and 3) structure, and focuses on the four key functions of project risk management :1) risk identification, 2) risk analysis, 3) risk response, 4) monitoring and optimization. At the end, a conceptual framework is provided to describe the value of the four project risk management functional areas to the three aspects of the project success system. We find that project risk management plays a positive role in the successful completion of the project. The benefits of applying this framework include focusing on the elements that risk management should identify and monitor, thus narrowing the scope of project risk management and greatly improving project productivity and the probability of project success. The framework provides a systematic reference for the establishment and improvement of enterprise management system, and can help managers no longer simply regard the three systems of people, plans and facilities as independent systems with the lowest interaction degree. The system enables the project information to be shared quickly in different departments within the enterprise, so that the managers can fully grasp the feedback information of each department, and give timely and effective solutions. In addition, project risk management promotes circularity and operational flexibility for project success, and improves the quality of strategic decisions based on timely and valid data information. It provides a certain reference for the authors of subsequent research on related topics.

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