

Impact of Risk Management on Project Success: An Empirical Investigation in Jordanian Ministry of Environment

Dr.mervat mohmmad Al Mhirat
City manager Deputy for health and agriculture affair. Greater Amman Municipality

DR. Hani Jazz'a Irtemeh
The World Islamic Science & Education University

Abstract

The purpose of this study is to identify risk management and its impact on projects success in Jordanian Ministry of environment. The Population of this study was Jordanian Ministry of environment projects in North, Centre and South Jordan with total number of (62) projects. In order to achieve the objectives of the study descriptive analytical approach was deployed. A questionnaire based was developed consisted of (42) paragraphs; out of (500) questionnaires were distributed; (430) questionnaires were received, with a return rate equal (86%), all were valid and reliable for further analysis. The study arrived to a set of important results, among the most: There is a significant positive relationship between risk management components (risk planning and definition, risk analysis, response to danger, evaluation and review of risk) in achieving project success. In the light of these results, a set of recommendations were provided.

Keywords: Risk management, Project Success, Jordan Ministry of environment.

Introduction

The concept of risk management emerged as a continuous process followed by any project to address the risks associated with its activities and implementations. It is concerned with the investigation of the risks involved in the project in order to enable project management to deal with future risks and difficulties that could hamper its track. In addition, it contributes to the efficient use of resources that affect the success of the project. The Project Management Institute (PMI) considered the project management is one of the ten parts of knowledge building in the most important and difficult in the project management areas. Risk management consists of four main steps: planning and definition, risk analysis, risk response, risk review and assessment.

Risks can be classified into two types and may have potential negative effects as follows: First, the traditional risks are based on physical or legal causes such as natural disasters, fires, accidents, etc. Second, the intangible risks such as those dealing with knowledge, efficiency, communication and relations between contracting parties; adhering to the timetable for completion and achieving performance, operational efficiency and quality standards, and risks related to the inability to provide the necessary human resources and labor, And the failure of contractors and suppliers to meet their contractual obligations as a result of inappropriate risk management or non-compliance with their proper applications. Previous studies in the project management in information technology and construction have shown that the application of risk management has affected project performance in terms of efficiency, performance improvement and productivity enhancement. Moreover, the lack of project risk management is one of the reasons for failure of projects such as failure to comply with the deadlines of the project, increasing cost and poor quality performance. Till now the using of risk management in environmental projects and their impact on their success is undiscovered. Therefore, the current study aimed to identify the impact of risk management on the success of projects in terms of time, cost, quality and satisfaction of stakeholders. To sum up, the current study tries to answer the following questions:

1. What is the impact of risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (time)?
2. Do risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) impact project success (cost)?
3. What is the impact of risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (quality)?
4. Do risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) impact project success (satisfaction)?

Research objectives

The research aims to achieve the following objectives:

1. To understand the impact of risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (time).
2. To identify the impact of risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (cost).

3. To determine the impact of risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (quality).

4. To understand the impact for risk management components (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (satisfaction).

Theoretical Background

The process of improving the performance of projects is through the management of all types and forms of risk that may be exposed effectively. This reason imputes organizations to develop risk management programs where the responsibility of risk management lies on the management by designing and implementing risk management programs within the organization and it's carried projects (Kinyua et al., 2015). Miller (2001) presented a theoretical framework for risk management in projects consists of eight components: internal environment risk, goal setting, event identification, risk assessment, risk response, control activities, information and communication, and follow-up. Previous studies have listed several definitions for risk management for example, Prabhakar, Guru Prakash, 2009) defined risk is the possibility of a deviation from the expected desired or desired outcome, and its main objective of risk management is to measure risk for monitoring and control. PMI (2014) perceived Risk as the probability of loss or profit arising from uncertainty. According to (Thomas, 2008) risk is the failure of projects to achieve the desired goals and that these risks arise from several factors related to the surrounding environment.

McNamara and Stark(2014) defined risk management as an attempt to identify potential threats to projects and their potential to take appropriate action to address these threats and to verify their likelihood as consideration of these possibilities leads to action to reduce these risks. Cagliano et al.(2015) argued that there are many techniques may be used to control risks at the lowest possible cost, including risk avoidance methods through loss prevention, control, or project rejection before the organization is exposed to further loss arising from a particular activity.

Project risk management aims to implement projects according to the approved budget, on time and within the required specifications. Risk management has been closely associated with project management as one of the potential threats to the project, which may lead to disparities in achieving the pre-defined objectives and the success of the project (Holt, 2004). The traditional view of project risk management emphasizes the importance of planning as one of its main processes and linked to project activities in an integrated way throughout its life cycle (Dvir et al., 2002). Several models and frameworks for risk management and managing project uncertainties have appeared as an attempt to better regulate and apply risk and uncertainty management (Mills, Donald, 2001). Olsson (2008) argued that risk management is critical to the success of the project as the organization is able to deal with various risks and threats. In addition, he confirmed that it is a mistake to face threats individually. Where organizations tend to launch several projects simultaneously for their development and more efficient work; new risks arise in the individual project as a result of project dependencies (PMI, 2008). The project management institute supports the broad risk management trend involving reallocation of resources between projects taking into account the additional risks and problem detection (Sanchez et al., 2009). In addition, the ability to deal with risks, and the correctness of the information on which actions are taken. To sum up, it is logical to link risk management components and project success in terms of time, cost, quality, and stakeholder satisfaction. Based on the above arguments, the research model can be formulated as it appears in Fig.1.

Study Model

The methodological treatment of the study's problem requires designing a hypothetical model as shown Figure (1) which indicates to the logical relationships with the study's variables.

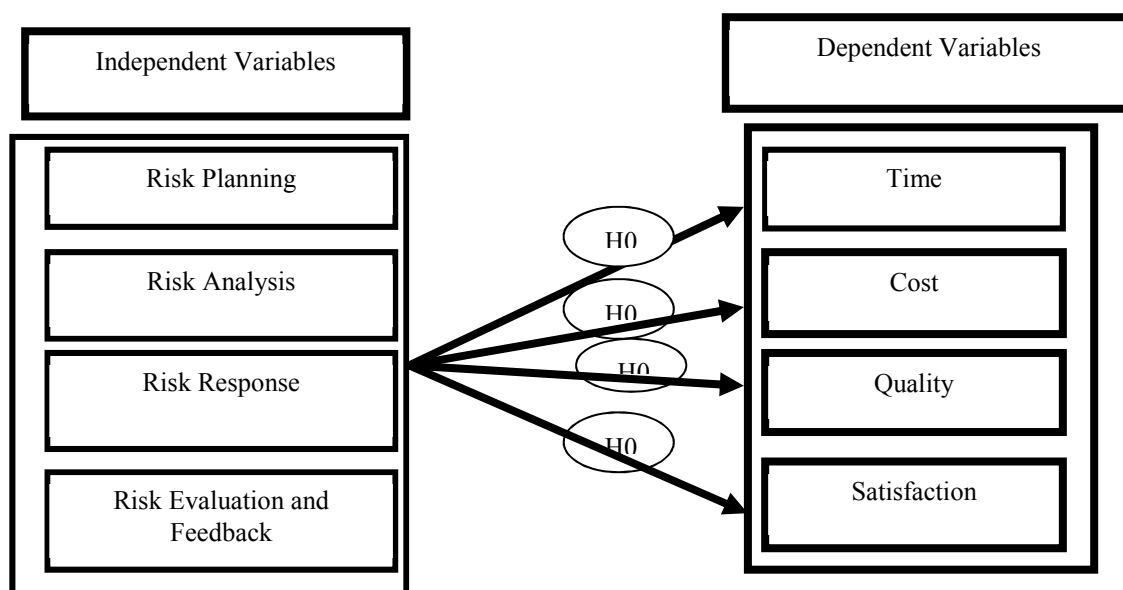


Fig. 1: Research Model

Research hypotheses:

H01: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (time) at $\alpha \leq 0.05$.

H02: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (cost) at $\alpha \leq 0.05$.

H03: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (quality) at $\alpha \leq 0.05$.

H04: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (satisfaction) at $\alpha \leq 0.05$.

Research methodology

The descriptive analytical approach is the most suitable approach for this study. The Descriptive is related to describing the phenomena in its natural context whilst the analytical approach is concerned with collecting real data about the phenomena under investigation in order to analyze, measure, and explain the data to offer a solution for the problem. The population of this study consists of all the Jordanian ministry of environment projects which represents (62) projects. The sample of this study consists of (500) individuals working at the 62 projects of the environment ministry projects.

Unit of analysis

The unit of analysis for this research represents all employees and partners working at Jordan environment ministry projects that were determined in strategic plan for ministry of environment which represents 500 individual and because of the small size a decision was to survey all.

Content Validity

The validity of research tool depends on its ability on collecting the relevant data and measured the variables. Therefore, the researcher checked the content validity by circulating the research questionnaire to a panel of experts (16 members) in the research topic working at state and private university to check the face validity and the relevant of each item to the related construct. The panel suggests moderation, deletion, and re-writing some of the questionnaire items. After taking all the suggestions in our account a new version of the questionnaire was issued and circulated to the research sample.

Reliability Test

In this study Cronbach's Alpha was used, reliability scores are expressed numerically as a coefficient. A coefficient score will be 1.00 if a test is perfectly reliable. Coefficient of at least 0.60 is required to indicate an acceptable degree of reliability (Sekaran, 2004).

Table (1): Cronbach's Alpha

Construct	Cronbach's Alpha
Risk Planning	85.13
Risk Analysis	87.67
Risk Response	80.74
Risk Evaluation and Feedback	76.2
Time	84.34
Cost	83.26
Quality	72.19
Satisfaction	86.69

Table (1) shows that Cronbach's Alpha coefficient value for independent variables were ranging from 0.762 and 0.876 and for dependent variables were ranging between 0.729 and 0.866 which means that Cronbach's Alpha coefficient value is accepted and highly reliable.

Hypotheses Testing

This section is related to hypotheses testing to determine the impact of Risk management dimensions on project success at $\alpha \leq 0.05$ as follows:

First Hypothesis: H01: There is no statistical significant impact for risk management dimensions (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (time) at $\alpha \leq 0.05$. In order to test this hypothesis, multiple regression analysis was used as follows:

Table (2): Multiple Regression for Risk management Dimensions on Time.

Dependent Variable	Model Summary		ANOVA			Coefficient				
	R	R ²	F	F Sig.	DF	construct	Standard error	B	T	Sig.T
Project Success(Time)	.658(a)	.433	81.258	.000(a)	4	Risk Planning	.041	.075	1.839	.067
						Risk Analysis	.055	.205	3.749	.000
						Risk Response	.053	.309	5.789	.000
						Risk Evaluation and Feedback	.048	.174	3.624	.000

Table (2) shows that F Value is equal to (81.258) at a significant level ($p \leq 0.05$). This indicates that there is an impact for risk management dimensions on project success (time). Therefore, we reject the null hypothesis and accept the alternative one. The R value indicates that the impact of risk management dimensions on project success (time) is positive and equals to 65.8%. Based on the value of R², risk management dimensions explain about 43.3% of the variance in project success (time). Moreover, on the basis of t values, one can tell that risk analysis, risk response, and risk evaluation and feedback have a positive impact on project success at ($p \leq 0.05$); Whilst risk planning shows no significant impact on project success (time) at ($p \leq 0.05$).

Second Hypothesis: H02: There is no statistical significant impact for risk management dimensions (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (cost) at $\alpha \leq 0.05$. In order to test this hypothesis, multiple regression analysis was used as follows:

Table (3): Multiple Regression for Risk management Dimensions on cost.

Dependent Variable	Model Summary		ANOVA			Coefficient				
	R	R ²	F	Sig. F	DF	construct	Standard error	B	T	Sig.T
Project Success(cost)	0.640(a)	.409	73.518	.000(a)	4	Risk Planning	.0440	.162	3.640	.0000
						Risk Analysis	.0600	.124	2.064	.0400
						Risk Response	0.059	.354	6.042	0.000
						Risk Evaluation and Feedback	.0530	.153	2.892	.0040

Table (3) shows that F Value is equal to (73.518) at a significant level ($p \leq 0.05$). This indicates that there is an impact for risk management dimensions on project success (cost). Therefore, we reject the null hypothesis and accept the alternative one. The R value indicates that the impact of risk management dimensions on project success (cost) is positive and equals to 64%. Based on the value of R², risk management dimensions explain about 40.9% of the variance in project success (cost). Moreover, on the basis of t values, one can tell that risk planning, risk analysis, risk response, and risk evaluation and feedback have a positive impact on project success

(cost) at ($p \leq 0.05$).

Third Hypothesis: H03: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (quality) at $\alpha \leq 0.05$. In order to test this hypothesis, multiple regression analysis was used as follows:

Table (4): Multiple Regression for Risk management Dimensions on quality.

Dependent Variable	Model Summary		ANOVA			Coefficient				
	R	R ²	F	Sig. F	DF	construct	Standard error	B	T	Sig.T
Project Success(quality)	0.603(a)	.364	60.738	.000(a)	4	Risk Planning	.0460	.1600	3.481	.0010
						Risk Analysis	.0620	.0740	1.196	0.232
						Risk Response	.0600	.3090	5.122	.0000
						Risk Evaluation and Feedback	.0550	.200	3.678	.0000

Table (4) shows that F Value is equal to (60.738) at a significant level ($p \leq 0.05$). This indicates that there is an impact for risk management dimensions on project success (quality). Therefore, we reject the null hypothesis and accept the alternative one. The R value indicates that the impact of risk management dimensions on project success (quality) is positive and equals to 60.3%. Based on the value of R², risk management dimensions explain about 36.4% of the variance in project success (quality). Moreover, on the basis of t values, one can tell that risk planning; risk response, and risk evaluation and feedback have a positive impact on project success (cost) at ($p \leq 0.05$); whilst risk analysis has no significant impact on project success (quality) at ($p \leq 0.05$).

Forth Hypothesis: H04: There is no statistical significant impact for risk management (risk planning, risk analysis, risk response, risk evaluation and feedback) on project success (satisfaction) at $\alpha \leq 0.05$.

Table (5): Multiple Regression for Risk management Dimensions on satisfaction.

Dependent Variable	Model Summary		ANOVA			Coefficient				
	R	R ²	F	Sig. F	DF	construct	Standard error	B	T	Sig.T
Project Success(satisfaction)	0.608(a)	0.37	62.390	.000(a)	4	Risk Planning	.0450	.1620	3.587	.0000
						Risk Analysis	.0610	.0990	1.627	0.104
						Risk Response	.0590	0.348	5.859	.0000
						Risk Evaluation and Feedback	.0540	0.129	2.399	.0170

Table (5) shows that F Value is equal to (62.390) at a significant level ($p \leq 0.05$). This indicates that there is an impact for risk management dimensions on project success (satisfaction). Therefore, we reject the null hypothesis and accept the alternative one. The R value indicates that the impact of risk management dimensions on project success (satisfaction) is positive and equals to 60.8%. Based on the value of R², risk management dimensions explain about 37% of the variance in project success (satisfaction). Moreover, on the basis of t values, one can tell that risk planning; risk response, and risk evaluation and feedback have a positive impact on project success (satisfaction) at ($p \leq 0.05$); whilst risk analysis has no significant impact on project success (satisfaction) at ($p \leq 0.05$).

Conclusion and Discussion

The study found that the risk management components (risk planning and definition, risk analysis, risk response, risk assessment and review) impact on the success of projects in terms of the time dimension of the project of Jordanian ministry of environment. Excluding risk planning and definition, when analyzing the expected risks using quantitative and qualitative methods, The time set is accurate and can be rescheduled in partnership with contractors or suppliers and refer to the records and documents for each project. This result is consistent with the study of both (Cheng et.al, 2013; PMI,2008).

The study found that risk management (risk planning and definition, risk analysis, risk response, risk assessment and review) has impacted on the success of projects in their dimensions (cost) as project costs are linked to the time schedule prepared in partnership with stakeholders based on past and current financial information whilst no impact for risk planning and definition dimension on project success (time). This result is consistent with the results of (Didraga, 2013; Al-Shibly et al 2013).

The study revealed that risk management dimensions (risk planning and definition, risk analysis, risk response, risk assessment and review) have impact on the success of projects in terms of quality in the projects of Jordanian ministry of environment. This result comply with the results of (Didraga, 2013) while the difference

between the actual quantities planned is considered the risks that delay the project success; the technical of the project against the time commitment in agreement with the stakeholders since the beginning of the project may be caused by the differences between the implementation and specifications required due to misunderstanding of the schemes and specifications of the lack of trained and qualified employee.

Finally, the study showed that risk management dimensions (risk planning and definition, risk analysis, risk response, risk assessment and review) have impact on the success of the projects (stakeholder satisfaction) of projects of the Jordanian Ministry of the Environment. This result is in line with the results of (Bakker et al., 2010). In fact, timely delivery of the project based on the needs of stakeholders, clear criteria and information is available and feedback from them when their needs are higher than the possibilities available in the project will result in its failure to meet all the objectives for which it was established.

Recommendation

Based on the research results, the following recommendations can be offered:

1. The senior leadership in the Jordanian Ministry of Environment should adopts risk management as a methodology and knowledge field when they starts implementing new project.
2. Keeping abreast of developments in the field of risk management in general and environmental projects in particular.
3. Develop a clear and specific guide to addressing the risks to environmental projects that will be a reference for project personnel to address when risk exposure is in accordance with best practices.
4. Attention to the human element to meet different risks through training Project personnel and finding a job title in each project (risk officer).
5. Develop policies that support and stimulate the spirit of innovation and direction to develop risk management prediction plans.
6. Activate communication and engagement channels for all stakeholders by supporting activities and activities related to retention policies to ensure exchange of data and information between the Ministry and stakeholders.
7. Develop and apply technological methods and procedures in risk management to ensure accurate and accurate forecasting and forecasting of risks, and maintain data without relying on the inherent experience of staff.
8. The necessity of conducting analytical studies on the causes and failure of projects in the Jordanian Ministry of Environment.
9. The need to set criteria for the success of environmental projects in the Ministry of the Environment of Jordan depends on the criterion of commitment to time, cost and quality and the satisfaction of stakeholders

References

- Anthony., Mills,(2001), A systematic approach to risk management for Construction.Structural survey, 19(5):p.p 245-252.
- Baccarini., David ET, (2004), Management of Risks in Informationtechnology Projects, Industrial Management and data Systems2,(4):268-295.
- Bakker., K, Boonstra ., A, Wortmann., H, (2010), Does riskManagement contributes to IT project success? A meta-analysisofempirical evidence. International Journal of Project Management,28(5):p.p 493-503.
- Cagliano A.C., Grimaldi S., Rafele C. (2015). Choosing project risk management techniques.A theoretical framework. JOURNAL OF RISK RESEARCH, vol. 18 n. 2, pp. 232-248
- Drennan., Lynn, McConnell., Allan , Stark., Alastair, (2014), Risk and crisis management in the public sector. Routledge Taylor & Francis Group, London and New York.
- Didraga, O. (2013). The role and the effects of risk management in IT projects success. Informatica Economica, 17(1), 86-98.
- George.,Rejda, McNamara., Michael, (2014) , Principles of Risk Management and Insurance (12th Edition, Pearson Series in Finance.
- Kendrick .,T, (2003),Identifying and Managing Project Risk: Essential Tools for Failure-proofing .American M A, New York.
- Kinyua., Esther, Ogollah., Kennedy, David ., Mburu, (2015), Effect Of Risk Management Stratgies On Project Performance Of Small And Medium Information Communication Technology Enitrrprises In Nsirobi, Kenya, International Journal of Economics, Commerce and Management , 111(2):p.p1-30.
- Miller., Roger, Donald., Lessard, (2001), Understanding and managing risks in large engineering projects, International Journal of Project Management, 19(8):p.p 437-443.
- Olsson ., R, (2008), Risk management in a multi-project environment: an approach to manage portfolio risks.

- International Journal of Quality & Reliability Management, 25 (1):p.p 60-71.
- Pinto,J, (2007), Project Management – Achieving Competitive Advantage. Pearson–Prentice Hall, Upper Saddle River (NJ).
- Prabhakar, Guru Prakash, (2009), Projects and their management: A literature review, International Journal of Business and Management, 3(80:p 3.
- Project Management Institute. (2013). Project Management Body of Knowledge (PMBOK Guide) – fifth edition.
- Samson., S, Reneke., J, Wiecek., M, (2009),A review of different Perspectives on uncertainty and risk and an alternative modeling Paradigm. Reliability Engineering and System Safety. 9(4): p.p558–567.
- PMI Standards Committee, (2008), Guide to the Project Management Body of Knowledge, Newtown Square, PA: Project Management Institute.
- Roque.,Rabechini, Carvalho., Marly, (2013), Understanding the Impact of Project Risk Management on Project Performance: an Empirical Study. Journal of technology management & innovation. (8)2:p.p64-78.
- Thomas., G. Fernandez., W, (2008), Success in IT projects: A matter of Definition? International Journal of Project Management, 26(7):p.p 733- 742.
- Holt., Robin, (2004). Risk management: The talking cure. Organization articles, 11(2): P.p251-270.
- Raz.,Tzvi, Shenhar., Aaron, Dvir., Dov, (2002), Risk management, project success, and technological uncertainty, R&D Management ,32(2):p.p 101-109.
- Sanchez., H, Robert., B, Bourgault., M, Pellerin., R,(2009). Risk management applied to projects, programs, and portfolios. International Journal of Managing Projects in Business, 2 (1):p.p 14-35.
- Sekaran, U., &Bougie, R. (2010). Research methods for business: A skill building approaches (5th Ed.). West Sussex, UK: John Wiley & Sons Ltd.