THE IMPACT OF PROJECT RISK MANAGEMENT ON THE PERFORMANCE OF CONSTRUCTION PROJECTS IN UNITED ARAB EMIRATES

Amany Mohamed Gamea Ali Al-Hashimi, Universiti Teknikal Malaysia Melaka
Mohd Rayme Bin Anang Masuri, Universiti Teknikal Malaysia Melaka

ABSTRACT

The construction industry is booming in the UAE, and many multinational construction companies entered the market. Despite the significant role of the real-estate industry to UAE's economy, the performance of contractors is a major concern for the stakeholders and clients. In many instances, contractors are blamed for poor performance and criticized for having limited knowledge in the application of requisite management techniques. The records showing that a large construction companies have won many residential projects in UAE but at the end they have a big loss due improper handling to project schedule over a series of sub-contracts. The aim of this study is to examine the relationship between project risk management and the performance of construction companies in UAE. This study applies quantitative methods to examine the relationship between project risk management and project performance. The total number of population equal to 1270 individuals. Those individuals represent project managers and the staff in project management department in Aldar Company for construction and properties. The findings from previous studies show that project risk management has a significant effect on project performance in construction industry. Construction project performance is measured through six dimensions namely: Health and safety, quality management, project productivity, construction cost, construction time, client satisfaction, while construction risk management is measured through five dimensions namely: risk identification, risk evaluation, risk analysis, risk control, risk monitoring.

Keywords: Project Risk Management (PRM), Construction Project Performance (CPF), Risk Management (RM), Construction Projects.

INTRODUCTION

The construction industry is the pillar part of the economy due to its important contribution in the infrastructure of any country (De Araujo et al., 2017; Yusof et al., 2016). Today, the construction industry bears a potential risk comparing to other industries due unexpected risks associated with budget and schedule (Sambasivan et al., 2017). As risks in construction projects are unpredictable, therefore managing risks in construction projects has been recognized as a very important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability. Based on this claim Project Risk Management (hereafter referred as PRM) is a comprehensive discipline. It is found that some developing countries are lacking effective PRM in the construction projects (Nawaz et al., 2019). PRM is beneficial when implemented in a systematic manner throughout the lifecycle of a construction project, from the planning stage to completion (Iqbal et al., 2015). In addition, the understanding of critical success factors of organizational risk management is essential to ensure successful completion of construction works (Waleed, 2018). Therefore, construction projects should always be supervised by skilled managers who have the ability to

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deal with the potential risks that might face different challenges during the implementation of projects (Elgadi, 2019).

The United Arab Emirates (hereafter referred as UAE) represent an icon in the world in terms of development in various fields; especially infrastructure, real estate. In addition to that, the UAE has exceptional economic and cultural characteristics associated to other countries in the Middle East. The construction projects in UAE is the pillar of success at the present and for the future. UAE construction sector has witnessed a qualitative leap in terms of jobs requirements and type of production. Therefore, construction companies in UAE at the present time are looking for experienced professionals with effective management skills rather than technical experience in order to avoid potential risks on large volume construction projects (Hassan et al., 2016). Hence, project managers in UAE, especially in construction industry should be very experienced and qualified for the job. The majority are well qualified and have primary backgrounds from discipline professions. Al-Hajj & Sayers (2015) claimed that project management is perhaps an essential discipline to the growth of economy in UAE. Based on these arguments, this study will discuss the concept of risk management in construction projects and identify the relationship with Construction Project Performance (CPF).

The Aim of Study

The aim of this study is to development a robust risk management framework for improving the performance of construction projects in Aldar company for construction and properties in Abu Dhabi. To achieve this aim, this study examined the relationship between project risk management and the performance of construction companies.

RESEARCH METHODOLOGY

This study applied quantitative methods to answer research questions and examines certain hypotheses. Quantitative methodology relies on measuring variables using a numerical system, analysing these measurements using any of a variety of statistical models, and reporting relationships and associations and associations among the studied variables (Debra, 2015). The residential construction market is dominated by the UAE's two major cities, Dubai and Abu Dhabi. In this study the total number of population equal to 1270 individuals. Those individuals represent project managers and the staff in project management department in Aldar Properties. Following a predefined sampling technique, the number of individuals in the study sample will be defined in order to initiate the survey and collect primary date from the respondents.

Challenges of Construction Projects in UAE

Despite the construction industry in the U.A.E has been enjoying an unprecedented boom over the past decade. However, the majority of the projects witnessed delays and cost overruns, indicated that a significant percentage of the project management professionals do neither hold academic qualifications in project management nor do they attend relevant professional training in risk management (Mohamed et al., 2010). In the same context, Ajmal, et al., (2017) examined the underlying dimensional structure of project management practices to identify key factors that underpin the successful completion of projects. The survey findings of their study revealed that formal trainings in PRM methodologies and standards for the project team is required to improve the coverage and accuracy of project risk assessments. The records showing that a large construction companies have won many residential projects in UAE but at the end they have a big loss due improper handling to project schedule over a

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series of sub-contracts (Michael, 2019) as construction delays are a common phenomenon in civil engineering projects (Remon & Abdel-Hakam, 2016). Another risk is negative cash flow on construction performance in the Dubai area. Cash shortages can lead to project failure and business bankruptcy (Khalil et al., 2012). All these risks need for effective PRM. In other words, the large construction projects in UAE need for project managers having hard and soft skills which enable them to deal with the potential risks and influence PRM process on the performance of construction projects. But without an in-depth understanding to the role of project managers on the interrelationship between PRM and CPP, the challenges of risk management remain present and high.

Some reports showed that the absence of a PRM has a negative impact on the performance of construction organizations and prevents them from responding systematically and reasonably to risks during the phases of the project. Considering that managing potential risks can reduce uncertainty and minimize losses, it is essential to assess the existing practice and develop new model by creating effective PRM practices and implementing them in construction sites so that PRM can play a central role in achieving stable execution to construction work. Hence, risks are expected in every phase of the project lifecycle and some risks may be raised in many phases of the project. The Fitch Solutions Operational Risk Index shows that UAE have good level of PRM index, but there is still an area for improvement which need further investigation to exceed 90-degree index as shown in Table 1.

	Operational Risk	Labour Market Risk	Trade and Investment Risk	Logistics Risk	Crime and Security Ris
UAE Score	**72.2**	**71.3**	**79.1**	**67.9**	**70.5**
MENA Average	47.4	52.3	48.0	48.1	40.9
MENA Position (out of 18)	1	1	1	3	1
Global Average	49.7	50.3	49.8	49.3	49.2
Global Position (out of 201)	18	11	3	42	33

FIGURE 1
FITCH SOLUTIONS OPERATIONAL RISK INDEX

Note: 100=lowest risk, 0=highest risk, Source: Fitch Solutions Operational Risk Index

Despite there are many risk management frameworks that have been cited in previous studies in various industries (Iqbal et al., 2015; Nawaz et al., 2019) the review of literature shows a lack of empirical evidences in UAE context. This study recognized the need for robust risk management framework in construction domain which explain the role of RM on the performance of construction contractors. Such a framework could help organizations working in construction industry to reduce the risks in construction works to the minimum.

Project Risk Management

Risk Management (RM) is an essential component of management and accountability in all kinds of projects. It is a systematic approach applied across the implementation phases

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of any project, which supports the achievement of its strategic objectives through the application of a proactive approach in identifying, analyzing, assessing, prioritizing and monitoring risks in the entire project lifecycle **(**Petr & Blanka, 2018**).** The application of RM helps organizations to deal with the challenges on the work in the future and dealing with uncertainties, RM cannot be separated from the mechanisms for prioritization and planning. The goal of the RM approach is to help ensure the sustainability of project work. Moreover, RM helps organizations to reduce unexpected risks by constantly looking into the future and implementing "worst-case" scenarios. It also provides a consistent methodology for project implementation and it is important to point out that risks and opportunities are two factors that are not mutually exclusive. Effective risk identification techniques focus on opportunities as much as they focus on risks, bearing in mind that failure to monitor opportunities to achieve project goals is a risk in itself (Al Ariss & Guo, 2016).

Project Risk Management (hereafter called PRM) is considered one of the most important practices to ensure successful implementation of projects. There is no doubt that risk management is one of the most important pillars of project management, as it is impossible to implement any project without going through the risks that may be encountered during the course of the project, which necessitates the need to work on developing a clear and thoughtful methodology for managing these risks in the correct way to achieve the project objectives (Etges et al., 2017). According to PMI, risk is defined as "an uncertain event or circumstance, and in the event of its occurrence, a positive or negative impact on the objectives of the project" occurs. Risks are not limited to the negative impact on the objectives of the project, but sometimes a positive effect occurs, which is absent from some, as most people associate the word "risk" with negative results only, unlike reality. Examples of positive risks include ending project implementation before the specified date, getting better results than planned, and not using all the resources allocated to the project (Ghassan, 2017).

Risk Management in Construction Projects

Construction projects face different kinds of risks and uncertainties (Ali, 2018). Risk factors in construction projects have been identified in several studies. Risk in construction industry is defined as a challenge in the whole phases of the project which need to manage and control (Waleed, 2018). Risks in construction projects are associated with the uncertainty of project completion, quality of output, and project final cost. Thus, risk in the activities of construction projects are not limited to a particular aspect (Oladapo, 2006). The review of literature shows many empirical evidences support the importance of RM in construction projects, these risks are identifiable and recognized by experts in RM in every construction project regardless of the project size and volume of construction work. The most common risks in these projects is the differentiation in the design and scope of work as well as the time frames for completing project's schedule. The increase of complexity of construction project produces more risks, while the change in the design resulting in extra additional sources of risks, increase the duration of project completion and maybe extra budget (Abazid & Harb, 2018). Overall, research on risk management in construction projects has attracted attention over the past two decades. To achieve the goals of construction projects and make them successful, special attention must be paid to identifying, mitigating and managing the various risks that may arise during project implementation (Yuan et al., 2009). Risks arises in construction projects could be a reason of lack of quick decisions, inadequate project planning and management, and inefficiency in the implementation of project phases (Ali et al., 2018). In general, the sources of risks of any construction project fall into three categories (Jafarnejad et al., 2014):

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i. External Risks: These risks are related to finance, politics, legal matters and environment.
ii. Internal Risks: These risks are related to project design, construction plan, management, and internal relationships.
iii. Force Majeure risks: These risks are associated with natural disasters, wars, global crises, and other reasons beyond the control of investors and contractors.

In general, the construction sector and construction projects are particularly risky, as Zavadskas, et al., (2010) claimed. While Iqbal, et al., (2015) argued that risks in construction projects can affect project goals such as schedule, cost and quality; they assumed that the risks associated with construction project are varying to late payments, financial problems, accidents/safety issues, bad planning, poor performance by subcontractors, interchangeable exchange rates, incorrect perimeter rates, and delays of materials delivery. Jaser (2005) suggested that RM in construction projects is a formal arranged process for systematically identifying, analysing, and responding to risks throughout the execution period of a project in order to sustain an acceptable degree of risk control as shown in Figure 1.

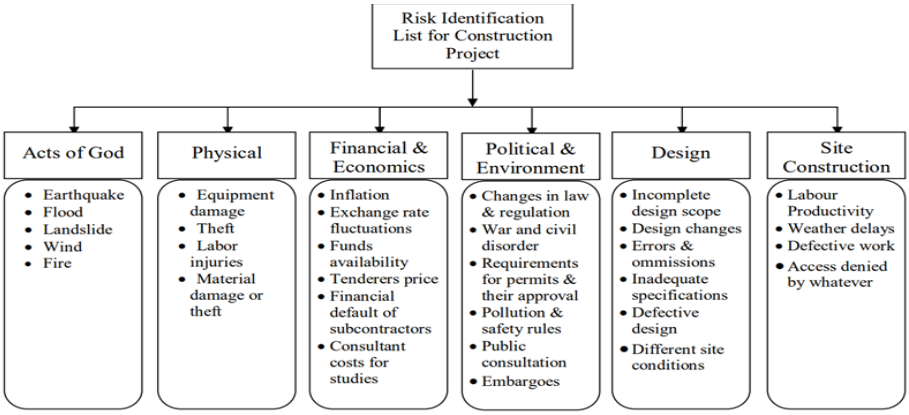

FIGURE 1
RISK CATEGORIZATION LIST (SOURCE: JASER, 2005)

Moreover, RM practices are important strategy to protect the probability of construction projects, but it is similarly important to conserve capacities of the RM system's performance on a steady way. The literature review in this section reveals that construction companies need to be effective RM and use different helpful measures for risk response. In addition to that, the construction companies should provide enough resources into supervising the RM strategy's success during the progress of a project (Basova & Mitselsky, 2011). Thus, proper estimation of risks, an organization is powerless to track the development of the RM, which in turn can donate to a project effectiveness. In other words, it is very significant to recognize the possible risks before commencing the first phase of a construction project.

A proper way to accomplish risks and finally, successfully measure management presentation during a project must defend the project from any possible imperfections in future. Also, it is important that both RM construction performance are related together which will be justified in next sections. Avoidance of risk is the mean that lead to the occurrence of risk are stopped, for example: stopping the purchase of a property or resuming a business in order to avoid taking legal responsibility; usually this method is used in the event that the risk is large and this method can be used for all kinds of risks However, this method has its drawbacks, as it prevents the decision-maker from satisfying some needs or limiting the progress of the project or activity. As a result, this method has no cost due to leaving the

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organization facing the risk completely. It should be noted that this method degree the degree of risk to zero (Mcshane & Rustambekov, 2015). Every company works in the construction fields should understand the main constructs of RM in order to be ready for unexpected risks in the future (Zhang & Fan, 2014). Risk management approaches can be shared into main-strategy and sub-strategy. These approaches are principally to answer to negative risks by avoiding, transferring, mitigating, and controlling risks (PMI, 2013). While sub-strategies include certain practices such as, risk distribution using more precise estimation methods (Jung et al., 2016). The following RM practices are used my almost all companies working in construction projects to deal with risks (Fang et al., 2013; Ali et al., 2018).

Risk Identification

Risk identification is the first and principal step of PRM process as presented in Figure 2, (Abdulmoneim et al., 2008). To avoid the potential risks that may hinder the implementation of any project, it is essential to identify the risk in advance, the expected risks must be classified and identified before initiating the first phase in the project. Alshibly (2013) investigated the impact of risk management on construction projects success. The results of Alshibly's study indicate that there is an impact exists between both risk identification and risk assessment on project success, scheduled time, planned budget, and the ability to comply with technical specifications.

Risk Evaluation

The next phase in RM is the assessment of risk. There are many statistical methods for assessing the degree of risk, but the simplest, most effective, and most commonly used risk is describing the degree of risk as: high; medium; risk is assessed by focusing on two aspects; the impact of the risk and its probability of occurrence as shown in Table 2.

Table 2
RISK LEVELS (OHANIAN, 2010)

Likelyhood	**Consequences**				
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
	Risk is easily mitigated by normal day to day process	**Delays up to 10% of Schedule Additional cost up to 10% of Budget**	**Delays up to 30% of Schedule Additional cost upto 30% of Budget**	**Delays up to 50% of Schedule Additional cost up to 50% of Budget**	**Project abandoned**
Certain >90% chance	High	High	Extreme	Extreme	Extreme
Likely 50% - 90% chance	Moderate	High	High	Extreme	Extreme
Moderate 10% - 50% chance	Low	Moderate	High	Extreme	Extreme
Unlikely 3% - 10% chance	Low	Low	Moderate	High	Extreme
Rare <3% chance	Low	Low	Moderate	High	High

As shown in Table 2, the lower the degree of risk to the lower left, the lesser the degree of impact in terms of impact and probability, and the lowest is left in the leftmost left.

Risk analysis

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The third step in RM is analysing the risk. The study of Abu Hujair (2014) showed the means by which an organizations analyse the risks according to the methods indicated in Table 3. The various methods used in risk analysis based on the standard issued by the Institute of PRM (IRM) in conjunction with several organizations specialized in the UK. The specific scope of PRM planning is defining all kinds of risks using either qualitative risk analysis or quantitative risk analysis and then initiate risk response, and control risks to protect the project (Etges et al., 2017). The inputs required for the qualitative risk analysis process are the organization's operating assets, scope statement and plan (Rahman, 2018). The various Methods of risk analysis as shown in Table 3.

Table 3
METHODS OF RISK ANALYSIS (ABU HUJAIR, 2014)

Risk type	Analysis methods
Upside Risk	• Market Survey • Prospecting • Marketing Test • Research & Development • Business Impact Analysis
Downside Risk	• Threats analysis • Error Tree Analysis • Failure Analysis
Upside and Downside Risk	• Dependency Modeling • SWOT analysis • Event – Tree analysis • Business Planning • External Environment Analysis • Uncertainty decisions

Risks Control

The fourth step in RM process is controlling the risk to reduce or eliminate its impact on the project. This step must come in sequence after completing the previous three steps; identifying, evaluating, and analysing risks. Risk control includes the methods needed to deal with risks based on the following practices (Baccarini et al., 2004).

Risk Monitoring

The last phase in RM process is monitoring the risk. Current PRM practices shows the need for effective and correct recognition, identification and investigation of risks with suitable and appropriate risk control techniques; while these practices should be done correctly and finished sequentially, the last step is to continuously monitor the risk as well as achieving the following steps (Rahman, 2018): Checking of PRM has been done according to the plan, Evaluating if PRM lead to recognizing and testing the risk accurately, Learn from current risks to respond on future risks.

In conclusion, based on the discussions in the literature, the five dimensions of PRM namely: risk identification, risk evaluation, risk analysis, risk control, and risk monitoring were selected as the most cited indicators of PRM in the literature and were therefore included in the empirical design of the measurement model of PRM as shown in Figure 2.

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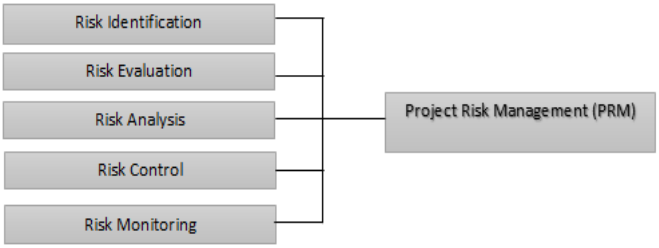

FIGURE 2
THE CONSTRUCT OF RISK MANAGEMENT IN CONSTRUCTION PROJECTS

Project Performance

For the successful implementation of the project, careful planning is necessary. It takes into account environmental impacts, schedules, budgets, industrial security at the job site, availability of building materials, logistics, public hassle, and bidding (Beatham et al., 2004). The performance of each construction project depends on the success factors. The success factors of a project are elements of the project likely to be affected by an increased likelihood of success; These are independent variables that make success more likely. Project success criteria are measures that measure a positive outcome of the project; they are a dependent variable that measures the success of a project. Success factors are the contribution to a management system that leads directly or indirectly to the success of a project or a business (Robson, 2014). The success factors of a particular project are not universal for all projects, because different projects and different people prefer different sets of success factors. The success criteria of a project also differ from project to project and what is acceptable in a project without affecting the perceived success is considered as an unnecessary mistake in another project Ahadzie (2015). For example, the delay of a project to ensure that the objectives are achieved is of little importance for the success of this project. However, this delay can be catastrophic by creating a functional center that must be implemented before starting (Ankomah et al., 2010). The process of completing a project is complex. This is usually a wide range of human, budget and technical variables. With respect to project management, Critical Success Factors (CSF) are characteristics, circumstances or variables that can have a significant impact on the success of a project if it is supported, managed or managed. managed properly (Cross, 2019). Sumesh, (2015) developed a conceptual model (see Figure 3) which reveals the basic constructs and relationships between CSF and project success.

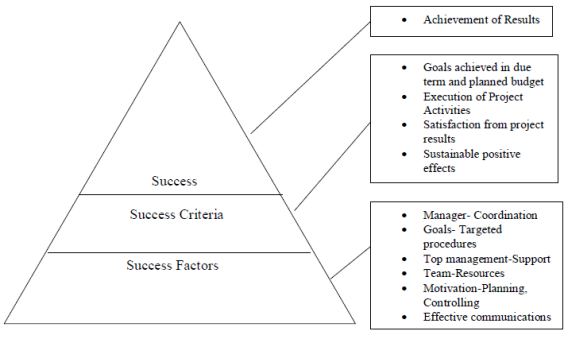

FIGURE 3
CONCEPTUAL MODEL OF CRITICAL SUCCESS FACTORS AND PROJECT SUCCESS (SUMESH, 2015)

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Construction Project Performance

Construction is a sector of industry close to the fields of architecture and civil engineering, and it is specialized in the study of structural engineering, which is the process of constructing buildings or establishing the infrastructure of a place. Far from being a single activity, large construction operations encompass many professions and industries. Typically, it is managed by the project manager job, supervised by the construction manager, design engineer, construction engineer or project engineer (Egwunatum, 2017). The topic of Construction Project Performance (hereafter referred as CPP) is discussed in lots of studies in the past. The success of construction projects is based on four important metrics: cost, time, quality target and participant's satisfaction (Oladapo, 2010) as indicated below.

Cost Performance

Project cost performance is a metric used to assess project performance with respect to the cost of the project (Egwunatum, 2017). It is an importance factor because project resources are often limited and the cost may overrun during the implementation of construction works.

Time Performance

Project time is an essential factor to measure the performance of a project. Time is one of the many challenges in construction works. Time monitoring aims to assess the performance of project with accordance to the planned schedule over a specific period of time (Mahmoud, 2020). Therefore, schedule or time performance is calculated in terms of the percentage increase in the actual completion period over planned completion period.

Quality Performance

Project quality performance measure aim to assess the performance of projects with accordance to the quality standards as indicated in the contract. Thereby, quality of materials and works can be measured in terms of matching with the specification set in the contract (Egwunatum, 2017).

Key Performance Indicator (KPI) in Construction Projects

The success of the construction works can be measured through performance indicators (Ofori-Kuragu et al., 2016) whereas a KPI measurement of the performance is a well-known tool in many researches in construction domain. Most performance indicators help measure the dimension of a projects in a particular industry. Thereby, to improve the performance of construction companies, it is necessary to rely on KPI because it is a trusted tool for measuring the performance of wide spectrum of industries (Beatham et al., 2004). There are two categories of indicators in KPIs, which can be used to evaluate the success of a construction project (Bernard, 2012). It is evident that KPIs act a vital role in offering information on the performance of construction jobs, projects, and businesses. Many investigates and studies are piloted to determine KPIs. Largely of them are project particular. They focus on the performance measurement at the project stage. Current research, which has been directed for performance estimate and comparison at the establishment point, is incomplete in the literature. Also, most of the conducted academics have improved KPIs that are appropriate for exact national characteristics.

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Previously, construction companies used financial procedures to measure and estimate their performance (Bassioni et al., 2004). The most important problem deceits in the fact that financial pointers are cover indicators, in the sense that they express the results of managerial activities already taken. Though, managers demand recent, up-to-date, and frequently nonfinancial information to be able to take righter decisions (Bassioni et al., 2004). After a long dependence on financial measures, many analyses and researches have been conducted to advanced performance measurement structures that comprised financial and nonfinancial indicators. The equalized scorecard (BSC), first proposed in 1992 issue of Harvard Business Review (HBR) by Kaplan and Norton, shows four different performance viewpoints from which managers can select measures. The BSC complements financial indicators with active measures on client satisfaction, internal procedures, and the administration invention and development activities - operational measures that are the drivers of future financial performance as exposed in Table 4.

Table 4
SUMMARY OF PERFORMANCE INDICATORS IN CONSTRUCTION

#	Author and years	Country	Performance indicators	
1	DETR (2000)	UK	Profitability	Return on value added
			Productivity	Ratio of value added
			Return on capital employed	Repeat business Interest cover
2	DTI (2002)	UK	Customer satisfaction People Environment	
3	El-Mashaleh (2003); El-Mashaleh, et al., (2007)	USA	Schedule performance	Safety
4	Rankin, et al., (2008)	Chile	Client satisfaction Cost performance	Profitability
			Safety	Training
			Productivity	Planning effectiveness
			Quality	Cost variation
			Efficiency of labor Rework	Schedule variation
5	Yu, et al., (2007)	Korea	Profitability	Development
			Growth	Technological capability
			Stability	Business efficiency
			Customer satisfaction	Information
			Market share	Organization competency
6	Nudurupati, et al., (2007)	UK	Quality	Safety
			Clients satisfaction	Time
			Employee satisfaction Environment impact	Cost
7	Wang, et al., (2010)	USA	Profitability	Market shear
			Return on capital	Quality
			Cash flow	Internal business
			Reliability	Innovation & learning
			Customer focus	Environment
8	Horta, et al., (2010)	Portugal	Productivity	Safety
			Profitability	Customer satisfaction
			Growth	Predictability

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Based on the above mentioned models and studies, the potential KPI performance indicators are used in this study to measure CPP. Six dimensions namely: Health and safety, quality management, project productivity, construction cost, construction time, client satisfaction. These performance indicators are selected as the most cited indicators of CPP in construction industry.

Relationship between Project Risk Management and Construction Project Performance

The review of previous studies revealed a strong association between PRM and CPP. A statement that "a higher risk may lead to a higher gain" (Opran, 2012), and minimizing the risks in projects will improve the output of projects. Risks have a significant impact on a construction project's performance in terms of cost, time and quality (Vlăduț, 2013). As the size and complexity of the projects have increased, an ability to manage risks throughout the construction process has become a central element preventing unwanted consequences. Risk management is recognized as an important exercise in order to achieve better performance of construction projects. Success in construction project is indicated by its performance in the achievement of project time, cost, quality, safety and environmental sustainability objectives. The research of Lawrence (2015) indicated that risk management practices at planning stage had an effect on project performance.

PRM is a concept which becomes very popular in a number of businesses. Many companies often establish a PRM procedure in their projects for improving the performance and increase the profits (Ewelina & Mikaela, 2011). PRM is recognized as an important exercise that creates value to a project and improves CPP. While the factors such as cost, time, and quality are essential measures of a CPP in construction industry, the success or failure in any construction project can be seen through effective risk management (Mohd et al., 2019). Thus, applying effective PRM practices positively impacts CPP and leading to high degree of project success. It is found that the lack of adequate knowledge and poor PRM in construction projects causing weak CPP (Mohd et al., 2019). It is recommended that more attention be placed on organizing PMS according to their effect and influence and more emphasis should be put on communication and PRM by developing plans for effective communication and risk handling when carrying out projects (Cross, 2019). In the same context Roque & Carvalho (2013) examined the impact of PRM on CPP. The results of their study showed that adopting PRM practices has a significant positive impact on project success. They also show a positive impact from the presence of a risk manager on project success. From the practical point of view, paying attention to uncertainties during the project, making use of the PRM techniques and deeply understand the business environment are critical success factors, demanding attention of project managers and risk managers.

In the similar background, Ekaterina (2008) inspected PRM in the different gaining options: design-bid-build contracts, design-build contracts and collaborative form of joining. Deeper understanding is predictable to contribute to a more effective PRM and, thus, a better project production and better value for both customers and independents. The study includes nine construction projects newly presented in Sweden and contains a feedback form examination and a sequence of meetings with consumers, contractors and advisors complex in these construction projects. He found a great degree of association among PRM and CPP in construction industry in Sweden. Alshibly (2013) investigated the impact of risk management on construction projects success. The results of Alshibly's study indicate that there is an impact exists between both risk identification and risk assessment on project success, scheduled time, planned budget, and the ability to comply with technical specifications. While another study conducted by Abazid & Harb (2018) carried out in order to obtain a comprehensive conceptualization on risk and the consequences it has in the fields of construction and the required management operation. Along with the utilities and techniques

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adopted to control risk in the construction industry, the effect of risk on the project assessment is also discussed.

CONCLUSIONS

The debate in this chapter offered a preferable comprehending of risk influences and their effect on construction projects in UAE. The plans of risk management, which recognized in this study, correspond to a general recommendation of risk management through the performance of construction projects. Project managers and other experts can use the suggested organization of skills to progress plan to affect and manage risks in diverse situations. By managing risk correctly, project managers can confirm that their projects will be disposed to fewer loses and will be accomplished within the restrictions of scope, time, cost and quality and advance the performance of the project at the end. In UAE, a few previous efforts have been done to identify risk and skills indicators that can be used to measure the performance of construction projects. No insight evidences are provided into the overall performance of construction firms. In addition to that, KPI indicators have not been examined in the construction industry in UAE. Therefore, a set of KPIs that can be used to measure the performance of construction company is used in this study as a basis for empirical measurement of construction projects performance through KPI. To bridge this gap, this research aims to identify a set of KPIs that can be implemented by construction executives in measuring the construction performance at the company level in UAE. More specifically, the author attempt to fill the gap in the body of literature by examining the most important KPIs that can be used to measure the performance of construction companies working in UAE. The findings from previous studies shows that project risk management has a significant effect on project performance in construction industry.

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