Institute of Technology Management and Entrepreneurship

THE DEVELOPMENT OF PROJECT RISK MANAGEMENT FRAMEWORK: THE CASE OF UNITED ARAB EMIRATES

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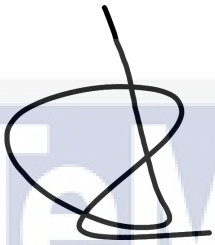
DECLARATION

I declare that this thesis entitled “The Development of Project Risk Management Framework: The Case of United Arab Emirates” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : 

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of the degree of Doctor of Philosophy in Management.

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DEDICATION

To my beloved family.

ABSTRACT

The construction projects have witnessed fast development in recent decades and sustainable growth in the United Arab Emirates (UAE). Today many multinational construction companies entered the UAE construction market which imposed more pressure on local companies to improve construction performance. In most instances, construction contractors are blamed for poor project management and criticized for having limited knowledge in the application best management techniques, especially risk management. The records showed that large construction companies involved in residential projects in UAE have reported fair number of losses due improper project execution and neglecting many potential risks over a series of sub-contracts. Hence, the aim of this study is to examine the impact of risk management and skills of project managers on the performance of construction projects in UAE, as well as developing a project risk management framework. This study applied quantitative methods based on SEM to examine the relationship between the variables. SPSS and AMOS software have been used to conduct the analysis. The survey was managed in three large construction companies located in Abu Dhabi and Dubai. The total number of population equal to 1270 individuals represent project managers, civil engineers, quantity surveyors, project director, mechanical engineers, electrical engineers, ICT, architects and landscape architects. The finding shows that risk management and project manager's skills has significant effect on project performance of construction companies. In addition, the results reveal that project manager's skills partially mediate the relationship between risk management and project performance. The outcome of this study will help project managers assigned for construction projects to understand the main skills they must have to ensure successful completion of construction projects, whereas the practices of risk management (e.g. risk identification, risk assessment, risk response, and risk monitoring) are the basic skills that every project manager should be experienced to ensure swift completion of construction works as schedules and within the allocated budget. The implication of this study is developing a Project Risk Management Framework which can be adopted by authorities, contractors, and developers for improving the performance of projects in the UAE.

PEMBANGUNAN RANGKA KERJA PENGURUSAN RISIKO PROJEK: KES EMIRIAH ARAB BERSATU

ABSTRAK

Projek pembinaan telah menyaksikan pembangunan pantas dalam beberapa dekad kebelakangan ini dan pertumbuhan mampan di Emiriah Arab Bersatu (UAE). Hari ini banyak syarikat pembinaan multinasional memasuki pasaran pembinaan UAE yang mengenakan lebih banyak tekanan kepada syarikat tempatan untuk meningkatkan prestasi pembinaan. Dalam kebanyakan keadaan, kontraktor pembinaan dipersalahkan kerana pengurusan projek yang lemah dan dikritik kerana mempunyai pengetahuan yang terhad dalam teknik pengurusan terbaik aplikasi, terutamanya pengurusan risiko. Rekod menunjukkan bahawa syarikat pembinaan besar yang terlibat dalam projek kediaman di UAE telah melaporkan sejumlah besar kerugian akibat pelaksanaan projek yang tidak wajar dan mengabaikan banyak potensi risiko ke atas beberapa siri sub-kontrak. Oleh itu, matlamat kajian ini adalah untuk mengkaji kesan pengurusan risiko dan kemahiran pengurus projek terhadap prestasi projek pembinaan di UAE, serta membangunkan rangka kerja pengurusan risiko projek. Kajian ini menggunakan kaedah kuantitatif berdasarkan SEM untuk mengkaji hubungan antara pembolehubah. Perisian SPSS dan AMOS telah digunakan untuk menjalankan analisis. Tinjauan itu diuruskan di tiga syarikat pembinaan besar yang terletak di Abu Dhabi dan Dubai. Jumlah populasi bersamaan dengan 1270 individu mewakili pengurus projek, jurutera awam, juruukur bahan, pengarah projek, jurutera mekanikal, jurutera elektrik, ICT, arkitek dan arkitek landskap. Dapatan kajian menunjukkan bahawa pengurusan risiko dan kemahiran pengurus projek mempunyai kesan yang signifikan terhadap prestasi projek syarikat pembinaan. Di samping itu, keputusan mendedahkan bahawa kemahiran pengurus projek sebahagiannya menjadi pengantara hubungan antara pengurusan risiko dan prestasi projek. Hasil kajian ini akan membantu pengurus projek yang ditugaskan untuk projek pembinaan memahami kemahiran utama yang mereka mesti ada untuk memastikan projek pembinaan berjaya disiapkan, manakala amalan pengurusan risiko (contoh pengenalpastian risiko, penilaian risiko, tindak balas risiko dan pemantauan risiko) adalah kemahiran asas yang perlu dikuasai oleh setiap pengurus projek untuk memastikan kerja-kerja pembinaan siap dengan pantas mengikut jadual dan mengikut bajet yang diperuntukkan. Implikasi kajian ini adalah membangunkan Rangka Kerja Pengurusan Risiko Projek yang boleh diterima pakai oleh pihak berkuasa, kontraktor dan pemaju untuk meningkatkan prestasi projek di UAE.

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LIST OF ABBREVIATIONS

UAE	-	United Arab Emirates
PRM	-	Project Risk Management
RM	-	Risk Management
PMI	-	Project Management Institution
CPP	-	Construction Project Performance
NIST	-	National Institute for Standards and Technology

LIST OF PUBLICATION

1. Al-Hashimi, A. M. G. A., and Masuri, M. R. B. A., 2022. The Effect of Risk Management and Project Manager's Skills on the Performance of Construction Projects in United Arab Emirates. resmilitaris, 12(3), pp.2910-2924.

2. Al, A. M. G. A., and Masuri, M. R. B. A., 2022. The Effect of Risk Management on the Performance of Construction Companies in the United Arab Emirates. *resmilitaris*, 12(3),pp.2896-2909.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Today, the construction sector is on the pillar of development in cities in all countries around the world (Nabawy et al., 2021), the construction industry is a core component of economic progress (De Araujo et al., 2017; Yusof et al., 2017). The challenges facing the construction industry related market changes (Anbang and Hailong, 2015) and other factors such as the skills of project managers (Singh and Misra, 2021; Peltokorpi et al., 2021). Construction is big industry and includes various facilities such as housing, non-residential building, government buildings, bridges and roads, civil utilities, and even factories. Thus, the performance of construction companies is an important success factor for every construction project (Omar and Mahdjoubi, 2022). It is crucial for the construction companies to complete all activities of the project according to the specified budget allocations and schedule (Rolstadas, 2014).

Nowadays, in comparison to other businesses and industries, the construction companies are facing potential risks due to unanticipated events and challenges associated with the budget and timelines (Sambasivan et al., 2017; Bhandari and Molenaar, 2020; Pham et al., 2021). Construction projects are characterized by intensive financial input, complex procedures, long execution period, risky environments, and many challenges linked to communications between the main contractors and sub-contractors (Ziyu et al., 2017). If these issues are not properly managed, the expected outcome of the project could

not be achieved (Alkaissy et al., 2020). In a different way, Rasheed et al. (2015) notified those risks in construction projects differ across nations and not similar from one project to another. Zarrouk et al. (2017) further elaborate that construction risks could be contributed by many factors, such as climate and weather, workers' motivation, knowledge and experiences, political issues, local authority regulations and rules, economic and financial factors, and a multiplicity of local cultural. However, poor risk management is the main reason why many construction companies failed to complete execution of projects the end at the present time (Srinivasan and Rangaraj, 2020).

Construction has become the one of the largest industries in this global era. However, the lack of qualified managers is the biggest problem that caused unstable performance in this industry (Adhiprasanggaa et al., 2016). Moreover, project management has been more commonly accepted and implemented by real-estate companies, but risk management remains the most concern point in this domain (Bhandari and Molenaar, 2020), the specific requirements that construction contractors should provide to be able in managing the construction risks remain a greater concern (Violante, 2018).

It is evident that risk management is critical to the effective completion of construction projects (Pham et al., 2021). As a result, construction companies should respond to risks by implementing various risk management strategies and hiring skilled project managers who are capable to deal with every kind of risk that affect project execution (Alshammari et al., 2020). Both international and domestic contractors are likely affected by the construction risks, as they should have the skills of predicting risks and analyze them (Dlamini and Cumberlege, 2021; Tepeli et al., 2021). From this perspective, Omar and Mahdjoubi (2022) claimed that risk management help contractors in United Arab Emirates (UAE) to control the delays in projects and exceeding the allocated budgets

for construction of properties in the country. Accordingly, one of the main concerns in construction projects in UAE is to hire project managers who are a professional risk manager and have good experience to deal with the new technologies. In other words, the hard and soft skills of a project manager are a critical success factor in construction industry (Pham et al., 2021). This means that construction companies must be directed by trained managers who are prepared to identify, analyze, evaluate, control and monitor risks that may develop throughout the course of a construction project (Elgadi, 2019).

Because of the benefits of using risk management across the construction project's lifespan, from planning to completion, the use of risk management may be advantageous in the construction sector (Iqbal et al. 2015). Nevertheless, certain emerging countries, such as the UAE, have been reported to be a good example of having successful construction companies who turned cities like Dubai and Abu Dhabi to be icons in the world (Nawaz et al., 2019). As risk management is critical for completing construction projects successfully and considered the key for success in this industry (Waleed, 2018).

1.2 Background of study

The construction projects in the UAE are the current and future pillars of prosperity (Yuan and Skaik, 2014; Alhanouti and Farrell, 2021). The construction business in the UAE has grown significantly, both in terms of labor demand and in terms of the quality of the construction works as well. While project management is an essential part of the UAE's economic development, according to Al-Hajj and Sayers (2015). To mitigate probable risks on large-scale construction projects, contractors are now looking for experts from abroad who have significant managerial skills, those managers are more important for construction projects rather than technical expertise (Hassan et al., 2016). The impact of

efficient use of time on project development, as well as low time and cost efficiency, was a major issue widespread in the global development industry, and the UAE was not a special case (Bayer, 2021). This means that project managers in the UAE's construction industry, particularly, should be competent comparing to managers from outside the country. It is critical for the construction industry in the UAE to be managed by professional project managers, particularly their capacity to anticipate risks, in order to ensure continuing contribution to the economy (Zhang and Mohandes, 2020).

In terms of development in many areas, the UAE are a global icon, particularly in infrastructure and real estate. Furthermore, in comparison to other Middle Eastern countries, the UAE has unique economic and cultural qualities. This individualism connects to the widely varied cultural and cultural mix in labor, with emigrants from 132 countries constituting 88.5 percent of the overall workforce (Human Development Report, 2016). Plentiful oil resources in the UAE are promoting its fast-economic development. The current government of the UAE is working to reduce the country's reliance on oil by expanding its economy beyond the oil sector, such as through real estate development. While the UAE has seen a major decrease in the demand for large-scale real estate, the growth of construction industry is more connected to medium-scale projects to replace oil trade revenues.

The UAE is characterized by a large number of domestic and international companies that operate in the construction market. However, the construction companies are not immune from all kinds of risks and the consequences of poor project management during the implementation phases of construction works. Despite that, the construction industry in the UAE has experienced unprecedented boom. Yet, many construction projects in UAE struggle to complete in time and in many cases exceeding the budget and

costs of materials due to lack of risk management, which in turn caused a negative impact on the performance of construction contractors (El-Sayegh, 2014). The potential number of operations involved in construction projects raise the concern on the possibility to complete these projects to the end (Chatterjee et al., 2018). Risk management is thought to have a key function to play in ensuring consistent construction work performance. It is found that every stage of the project lifecycle comes with its own set of risks. Hence, the lack of studies on risks management during the life cycle of construction project has led to the failure of many constructions or substantial delay in completion of these project in almost all countries in the world (Marinho and Couto, 2021). If managing possible risks can help to lessen uncertainty and minimize losses, then evaluating current procedures and building new models by applying effective risk management in construction sites is crucial.

According to the Fitch Solutions Operational Risk Index for the year 2018, the UAE Operational Risk index is 72.2, putting it in 18th place out of 201 nations (Blake, 2022). There are certainly more areas need improvement, and UAE's building and construction industry needs to spend more effort and encourage researching in construction risk so that to enhance their ranking in terms of risk management. Every country witnesses a significant economic growth and vast development in its cities like UAE should consider the factors (i.e. risk management and manager's skills) that contribute to safe and protected construction projects. Table 1.1 shows Risk Index of Middle East and North Africa (MENA), whereas 100 = Lowest risk, and 0 = Highest risk.

Table 1.1: Fitch Solutions Operational Risk Index
(Source: Blake, 2022)

	Operational Risk	**Labor Market Risk**	**Trade and Investment Risk**	**Logistic Risk**	**Crime and Security Risk**
UAE Score	72.20	71.30	79.10	67.90	70.50
MENA AVERAGE	47.40	52.30	48.00	48.10	40.90
MENA Position (out of 18)	1	1	1	3	1
Global Average	49.70	50.30	49.80	49.30	49.20
Global Position (out of 201)	18	11	3	42	33

Despite there are few studies in the past reported the essential need for practicing risk management in UAE, such as El-Sayegh (2014), and Fauzilah et al. (2020), the literature in this field still lacking empirical evidences on the reality of applying risk management by major construction companies in the country. Appropriate methodologies are essential to determine and evaluate construction risks and using reliable approaches to eliminate, reduce or mitigate risks in construction sites (Harthi, 2015). In this regard, Waleed (2018) found a gap between construction project risk management in theory and actual practice of risk management in UAE construction projects. Likewise, Alshibly et al. (2015) in examining the relationship between risk management and project performance and their impact on project success have found a lack of researching in this area. Thereby, A risk management framework is needed in the construction field (Gunduz and Almuajebh, 2020). In other words, a construction management framework could help businesses in the construction industry to keep risks to a minimum level (Zheng et al., 2020). This is because project managers need the skills of risk management, while the role of project manager's skills on achieving success in construction cannot be denied (Elmezain et al., 2021), and this claim applies on almost all construction companies in the UAE.

In the UAE, large construction companies have been awarded many residential projects in the UAE. It has been reported these companies have not completed the majority of these projects and suffered a substantial loss as a result of improper project coordination's with subcontracts (Michael, 2019), as construction delays is widely known to be problem (Remon and Abdel-Hakam, 2016). As a result, improving the performance of construction companies through validation of a framework that tells how risk management and project manager's skills could foster the performance of construction companies in UAE, and why this framework is essential to the country's economic development on the long-term, whereas the focus should be on time, quality, and budget performance in the UAE construction industry (Al-Jayyousi, 2021). Thus, this research project will evaluate the reality of the risk management process in construction companies operating in UAE in order to understand how risk management and the skills of project managers contribute to the performance of construction companies.

1.3 Problem Statements

Despite the construction industry in the UAE has witnesses a dramatic development in recent decades, the majority of these projects, especially those in real-estate faced considerable delays and exceeding the budgets, suggesting that the skills of project managers were one of the reasons, some reports revealed that the majority of project managers in UAE construction projects are missing the professional competencies in risk management, and they did not update their skills in project management methods (Abazid and Harb, 2018; Motaleb, 2021). Some international companies in the construction industry in the UAE have been exposed to lots of challenge, e.g., workers' diversity, lake of effective risk management plans, and even shortage of expertise (Al-Malkawi and Pillai,

2013; Bodolica et al., 2015; Albattah et al., 2021). Another example is is green building construction industry in the UAE which is facing overinvestment problems due to an unreasonable delay in completing the project; these factors affect the overall quality of the green building construction project in the country (Al-Hosani and Rashid, 2021).

Moreover, many delays in construction projects in UAE have been occurring in recent years because of unexpected events such as financial crises and the pandemics (Motaleb, 2021). Whereas the delay in delivering the construction works is a common problem all over the world. Thus, it has become a major and challenging problem to complete the project on schedule and within the estimated cost (Khalid, 2018; Sanni-Anibire et al., 2022; Hossain et al., 2022). However, most of them do not make much progress at the end because they do not hand their project to the right manager, consequently, project managers ensure that the tasks performed contain everything needed to complete the venture, as specified in the agreement.

The previous arguments reveal why it is essential to hire appropriate project managers who are able to deal with a diversity of issues and circumstances in construction (Shane et al., 2014). It has been reported that each stage of the construction project lifecycle has its own set of risks. In other sense, the skills in risk management plays an important role in ensuring a consistent performance of construction projects. However, the lack of studies on risk management in construction market has resulted in the failure or significant delay in the completion of major projects all over the world (Marinho and Couto, 2021), whereas the UAE is not an exemption.

In this regard, El-Sayegh (2014) found that construction companies in UAE exposed to various risks (i.e. delays, high cost, insufficient quality), and contractors have serious issues to deal with these risks, there is a shortage of qualified project managers or