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Controlling The Effects Of Organizational Risk On Time And Cost In The Construction Industry In The UAE

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Abstract
This paper illustrates the relationship between the organizational risk and construction project success (time and cost) in the UAE (United Arab Emirates). A questionnaire was developed from the literature surveyed and was distributed to 40 people from the construction industry in the UAE. In total, there were 24 respondents (65%). Hypotheses were proposed based on previous literature; these state that there is a positive relationship between independent variables (organizational risk effects, owner effects, contractor effects, consultant effects) and the dependent variable (success factors in the construction project). SPSS was used to establish reliability, and the overall Cronbach's alpha was 0.92. In correlation and regression tests most of the elements showed Pearson's correlation above 0.3, and significance was less than 0.05.

Keywords
Organizational risk, Time overrun, Construction, Contractor, Cost overrun.

1. Introduction

The construction industry in the UAE is considered one of the core businesses which supports the country's economy, hence it has a considerable impact on economic development, but the dilemma is that within this industry, there are inherently delays in the projects. Mills (2001) reports that this is affected by many factors such as changes in the weather, quality of material, and efficiency of the employees. Risk management is used for decision making because risk as well as uncertainty might lead to the failure of the project by affecting its performance, cost and quality. While risk can be mitigated, it can never be eliminated. Lack of risk identification in the construction industry and lack of risk measures leads to the project failure if risk occurs during the lifecycle of the project.

Therefore the aim of this study is to control the effects of organisational risk on time and cost in the construction industry in the UAE. This is achieved by answering the following question: How do the owner, contractor and consultant influence time and cost overrun in the UAE construction project?

2.0 Literature review

Aloini *et al*. (2012) report that although the construction industry is a strong pillar for the world economy, on the other hand it is a complicated sector, with implications for time and cost overrun which makes it an

unsuccessful business sector. According to Low (2009) risk management in construction projects is one of the key success factors for the projects which leads to the achievement of the objectives of time, cost and quality. Time overruns occur in the construction projects due to the lack of knowledge and experience; this issue exists even in the developed countries (Akintoye, 2014). Therefore the project owner much recruit an experienced consultant and effective project manager to carry out appropriate estimation and planning (Kazaz *et al*., 2012; Ramanathan *et al*., 2012). The owner during the tendering stage, selects the contractor from among all those which declare their interest participating. The owner should have proper criteria in place for awarding the project to the most suitable contractor. An incompetent contractor, or selecting the cheapest contractor may lead to a low-quality project (Low, 2009; Huang, 2011; Ramanathan *et al*., 2012; Akinsiku *et al*., 2014). Only reliable contractors with good track record should be awarded the job (Memon *et al*., 2014). The owner should be capable financially to avoid delaying payment to the contractor for the completed tasks (Olawale and Sun, 2010; Amehand Osegbo,
2011). Such delays would affect the contractor's cash flow therefore affecting procurement processes and holding up the tasks, eventually leading to time overrun (Kazaz *et al*., 2012; Memon *et al*., 2012). Variation in scope and change in design are the most common factors that lead to time overrun in construction projects (Olawale and Sun, 2010; Ameh and Osegbo, 2011; Memon *et al*., 2011, 2012; Akinsiku *et al*., 2014). Contractors should have proper materials, tools and equipment to carry out all site work (Mills, 2001; Olawale and Sun, 2010; Ameh and Osegbo, 2011; Akinsiku *et al*., 2014). Poor management of the contract has negative implications for the project including delay in site access and approvals. Thus, the owner and consultant must provide the relevant information and the drawings for the contractor (Olawale and Sun, 2010; Ameh and Osegbo, 2011). Memon *et al*. (2011) added that lack of resources and hiring of inadequate labor decrease the productivity. To ensure openness of communication, the right information must be communicated to higher authorities without fear so that corrective action, if any, can be decided to develop partnership approach and effective communication in which the client, the consultant and the contractor will work as a strong team (Memon *et al*., 2012; Akinsiku *et al*., 2014; Keyvanfar *et al*., 2015). Failure of the consultant to estimate accurate cost and schedule can cause delay (Olawale and Sun, 2010; Keyvanfar *et al*., 2015).To mitigate time and cost overrun, skillful employees should be hired to increase productivity (Memon *et al*., 2011; Kazaz *et al*., 2012; Ibironke *et al*., 2013; Kaggwa *et al*., 2013) and to ensure efficient supervision of the site to obtain maximum productivity (Memon *et al*., 2012; Kaggwa *et al*., 2013; Akinsiku *et al*., 2014; Keyvanfar *et al*., 2015). According to Olawale and Sun (2010), hiring a competent subcontractor has a positive effect in decreasing time overrun; failure of the consultant to estimate the accurate schedule and cost will increase time overrun because the budget was not prepared for the additional cost. Memon *et al*. (2012) recommended a number of actions to ensure project success; these included implementing total quality management (TQM); measuring the performance of the project with other similar projects; conducting weekly meeting to follow up the progress in the project; and highlighting the obstacles in the meeting. They further suggested that to mitigate time and cost overrun, a competent project manager should be assigned who can follow up the tasks and ensure that they are as per stipulated schedule and cost; hire skillful labor should be hired to increase the productivity as well as quality; and defects and technical and management training should be provided for all participants in the project in all levels (Memon *et al*., 2012; Akinsiku *et al*.,2014).

3.0 Conceptual framework

The following model was adopted from a review of the above-cited literature; it aims to facilitate understanding of and develop insights and direction towards the effectiveness of the client, contractor and consultant on time and cost overrun.

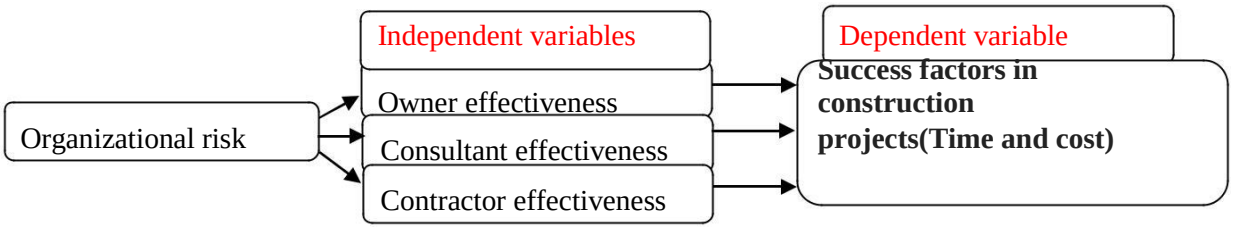

Figure 1: Theoretical Framework of the Effectiveness of the Organizational Risk on Time and Cost Overrun in Construction Projects

Ameh and Osegbo (2011), assert that the owner can be a major contributor to time delays in the project by delaying access to the site and in granting approval for the contractor. Other factors were mentioned in the literature review supporting that the success of the owner leads to the success of the project; therefore no cost and time overrun.

Based on the above the following hypothesis was proposed:

Hypothesis-1: There is a significant positive relationship between organizational risk related to owner and time and cost success factor.

Kaming *et al*. (1997) reported that time overrun occurs due to the deficiencies of the contractor, while Huang (2011) added that having a successful contractor leads to the success of the project. Memon *et al*. (2011) believe that the contractor is responsible for cost and time overrun.

Based on the above the following hypothesis was proposed:

Hypothesis-2: There is a significant positive relationship between organizational risk related to contractor and time and cost success factor.

Ejaz *et al*. (2013) noted that the success of the project is related to the success of the project parties, particularly the consultant, in utilizing the resources effectively, which is one of the best practices to mitigate time and cost overrun and ensure eventual success of the project.

Based on the above the following hypothesis was proposed:

Hypothesis-3: There is a significant positive relationship between organizational risk related to consultant and time and cost success factor.

All participants owner, contractor and consultant can have a positive influence in the time and cost overrun (Salunkhe and Patil, 2014). Organizational risk has a major influence on time and cost overrun; ensuring the success of the participant leads to success of the project.

Based on the above the following hypothesis was proposed:

Hypothesis-4: There is a significant positive relationship between organizational risk and time and cost success factor.

Table1: Summary of Organizational Risk Related to the Owner

Organizational risk related to owner capability	Sources
The owner should be financially capable, to avoid delaying payment to the contractor for the work done.	Kazaz *et al*., (2012), Memon *et al*., (2012), Ameh and Osegbo (2011), Olawale and Sun(2010).
Focus more on selection of contractors.	Low (2009), Huang (2011), Akinsiku *et al*., (2014), Ramanathan *et al*., (2012), Memon *et al*., (2014).
Ensure openness of communication. Right information must be communicated to higher authorities without fear so that corrective action, if any, can be decided.	Memon *et al*., (2012), Akinsiku *et al*., (2014), Keyvanfar e (2015).
variation on the scope, change of the design	Olawale and Sun (2010), Ameh and Osegbo (2011), Memon *et al*., (2011; 2012), Kazaz *et al*., (2012), Akinsiku *et al*., (2014).

Table2: Summary of Organizational Risk Related to the Contractor

Organizational risk related to contractor capability	Sources
Organize site properly to achieve maximum productivity.	Memon *et al.,* (2012), Akinsiku *et al.,* (2014), Keyvanfar *et al.,* (2015).
Hire skillful labor therefore ensuring efficient labor productivity Hire competent subcontractor	Memon *et al.,* (2011), Kazaz *et al.,* (2012), Ibironke *et al.,* (2013), Kaggwa *et al.,* (2013) Olawale and Sun (2010), Ibironke *et al.,* (2013)
Lack of materials, tools and equipment	Mills (2001), Olawale and Sun (2010), Ameh and Osegbo (2011), Akinsiku *et al.,* (2014)

Table3: Summary of Organizational Risk Related to the Consultant

Organizational risk related to consultant capability	Sources
Experienced consultants should be chosen.	Ramanathan *et al.*,(2012), Kazaz *et al.,* (2012), Akinsiku *et al.,* (2014).
Develop coordination among contractor, owner and consultant.	Memon *et al.,* (2012), Akinsiku *et al.,* (2014), Keyvanfar *et al.,* (2015)
Failure to estimate the accurate cost and schedule. Poor site supervision.	Olawale and Sun (2010), Keyvanfar *et al.,* (2015)
Inaccurate design during tendering phase	Memon *et al.,* (2012), Kaggwa *et al.,* (2013), Ibironke *et al.,* (2013), Kaggwa *et al.,* (2013), Akinsiku *et al.,* (2014), Keyvanfar *et al.,* (2015) Kaggwa *et al.,* (2013)

Table4: Success factors in construction projects(Time and cost

Success factors in construction projects	Sources
Hire competent project manager and labor.	Akinsiku *et al.,* (2014), Memon *et al.,* (2012)
Training for all participants to improve their technical and managerial skills.	Akinsiku *et al.,* (2014), Memon *et al.,* (2012)
Implementation of total quality management.	Memon *et al.,* (2012)
Measure performance with other similar projects.	Memon *et al.,* (2012)
Conduct weekly or monthly meeting to track the progress in the project.	Memon *et al.,* (2012; 2014)

4.Methodology

The questionnaire survey method is used to address the research question. The questionnaire was designed from the data obtained from the literature review (Wang *et al.*, 2004; Keyvanfar *et al.*, 2015). As the study focus is project success in the UAE relevant data were gathered by administering the questionnaire to the participant by using online survey. This questionnaire has two sections; the first relates to demographic factors and the second section is about the effectiveness of the organization risk management and the success factors for the construction project. A total of 18 items were measured and 40 questionnaires were sent out. The response rate was 24 (65%). SPSS was used to carry out the analysis, and the answers were designed based on a five-point Likert scale as follows: Not effective at all, slightly effective, effective, very effective and Exceptionally effective, from 1 to 5 respectively. The respondents' designations were Managers (40.7%), Engineer/Planner/Architect (33.3%), Senior Engineer/Planner/Architect, (14.8%), Others (7.4%) and Technical Director (3.7%). Organization ownership was Government sector (59.3%), Private sector (33.3%), Joint Venture (3.7%) and Others (3.7%). Length of respondents' experience in the construction projects were 1-5 years (33.3%), 5-12 years(33.3%) and less than one year (18.5%). No respondent had more than 20 years of experience. According to Policy (2016) Cronbach's alpha is used to determine how strongly items are related to each other. Cronbach's alpha indicates the internal consistency measurement (reliability) (Bonett and Wright, 2015). As per Gliem and Gliem (2003), a Cronbach's alpha value is considered excellent at 0.9, good above 0.8, and acceptable at 0.7. A value of between 0.5 and 0.7 is poor and less than 0.5 is rejected.

Cronbach's alpha value was found to be 0.92, which is excellent.

5.Data analysis

5.1Correlation

In this section a correlation test was run to calculate Pearson's correlation coefficient and significance, in order to determine the strength of the relationship for all the variables. If the Pearson's correlation is close to +1 then this indicates a strong positive relationship (agreement), while -1 implies a strong inverse relationship (disagreement). If the Pearson's correlation is zero or a very small value close to zero then this indicates a weak relationship or insignificant relationship between variables (Assaf and Al-Hejji, 2006; Olawale and Sun, 2010; Nathans *et al*., 2012). If the correlation coefficient is less than 0.01 then there is a strong relationship, less than 0.05 is acceptable and more than 0.05 implies no relationship (Memon *et al*., 2012). A significant positive relationship was found between success factor (dependent factor) and owner effectiveness (independent factor), $r= 0.759$ and $p < .001$; the more effective the owner is the greater the success factor, which supports hypothesis-1. The significance was more than 0.077 between contractor factor and success factor; therefore hypothesis-2 is rejected. A significant positive relationship was found between success factor and consultant effectiveness, $r= 0.699$ and $p < .001$; the more effective the consultant is, the greater the success factor, which supports hypothesis-3. The relationship is significant and positive between organizational risk effectiveness (independent global) and success factor (dependent factor), Pearson correlation is $r= 0.608$ and significance is less than 0.01. Thus increasing the organizational effectiveness leads to an increase in the construction project success factor; this supports hypothesis-4.

5.2 Regression test

A linear regression test was carried out to find whether the dependent factor can be predicted by the independent factor (Foster, 2001). R square and adjusted R square were 0.577 and 0.557, respectively, between owner effectiveness and success factor. This indicates that more than 57% of variance in the success factor can be explained by owner effectiveness. The Beta value 0.711 indicates that when one unit is changed in owner effectiveness a 0.711 unit increase is expected in the success factor. R square was 0.488 between consultant effectiveness and success factor; this indicates that more than 48% of the variance

in success factor can be explained by consultant effectiveness. The Beta value of 0.649 indicates that when one unit is changed in consultant effectiveness a 0.649 unit increase in the success factor is expected. R square was 0.369 between organizational risk factor (global factor) and success factor, this indicates that more than 36% of variance in success factor can be explained by organizational risk. The Beta value 0.196 indicates that when one unit is changed in organizational risk a 0.196 unit increase in the success factor is expected; hence this test supports the correlation finding which supports and accepts hypothesis-4.

6.Discussion

As per the findings from the correlation test, it is apparent that the more proactive the owner is the less the time overrun. As proposed in hypothesis-1 and supported by both correlation and regression tests, the main factor for owner success is to be capable financially and choose the most competent contractor even if it is not the cheapest to avoid low-quality work and defects. This finding is congruent with previous studies by Ameh and Osegbo (2011) and Memon *et al.*, (2011). The relationship between consultant effectiveness and success factor is positive as proposed. Based on the literature, the findings in SPSS supports the hypothesis, and concurring with the literature as reported by Ejaz *et al.*, (2013), time and cost overrun in the construction is related to the effectiveness of the project parties, particularly the consultant. Although literature reports a positive relationship between contractor effectivenss and success factor, in the correlation test the significance was more than 0.05, thus the hypothisis was rejected, which does not match with the findings of Kaming *et al.*, (1997), Huang (2011) and Memon *et al.*, (2011).

7.Conclusion

This paper contributes to increasing awareness of the relationship between organizational risk factors and success factors in construction industry projects in the UAE. It was apparent from the findings that owner and consultant effectiveness lead to decreased time and cost overrun. In contrast statistical evidence was not found for the relationship between contractor and success factor. This paper has limitations particularly with the small sample size (24 respondents). It is recommended that future research in this area employs a larger sample size so findings can be generalised to a larger population. Furthermore there are numerous factors were not covered in this study, which are recommended to be covered in future research.

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