Global Business and Management Research: An International Journal
Vol. 12, No. 3 (2020)

The Success of Construction Projects: Empirical Evidence from the United Arab Emirates

Abdul Aziz Noor Ali Khan
Asia Pacific University of Technology and Innovation
Email: abdulaziznoor2012@yahoo.com

Jugindar Singh Kartar Singh
Asia Pacific University of Technology and Innovation
Email: Jugindar.singh@apu.edu.my

Devinder Kaur
Asia Pacific University of Technology and Innovation
Email: Devinder.kaur@staffemail.apu.edu.my

Thilageswary Arumugam
Asia Pacific University of Technology and Innovation
Email: thilages@staffemail.apu.edu.my

Abstract
The aim of this research was to examine the factors that contribute towards the success of construction projects. More specifically, this study examined the influence of project quality, project cost, project planning, project scope, and communication towards the success of construction projects in Abu Dhabi. This was a quantitative study that used a survey method to collect data from a sample of 151 respondents. The findings revealed that quality management had the most substantial impact on the success of projects. All the predictors in this study, namely project quality, project cost, project planning, project scope, project communication, had almost the same level of impact on the success of projects. Therefore, project managers should understand that multiple factors contribute to the success of construction projects. Projects managers should formulate, implement, and monitor the five predictors that were included in this study. This study is the first of its kind in Abu Dhabi that added to existing knowledge. The study proposes that project managers should focus on the critical success factors that were identified in this study.

Keywords: Project quality, Project cost, Project planning, Scope, Project communication, Project success

Introduction

The global construction industry is continuously growing, and in 2019, the construction industry saw overall market growth despite cost pressures, labour shortages, and trends toward fixed-bid projects (Deloitte, 2020). The construction industry is essential for the development of countries. As stressed by Michael (2011), the construction industry will contribute around 13.2% of the World's GDP by 2020. Winch (2009) added that construction projects contribute towards the creation of physical assets that are exploited to achieve social and economic ends. The world construction industry is expected to see a growth of 3.1% up from 2019's 2.6%. (Brown, 2020). However, in 2020 the forecast growth for the construction industry has been downgraded to 0.5% due to the COVID 19 crisis. The construction industry includes the construction of buildings, roads, and bridges that contribute towards the economic growth of

nations. The construction industry in the United Arab Emirates (UAE) saw more robust activity in 2020, and a total of $53.8 billion worth of projects were awarded in 2019 (Abbas, 2020). However, a high percentage of projects were delayed in UAE (Faridi and El-Sayegh, 2006; Motaleb and Kishk, 2010). Several challenges are encountered, and the key challenges highlighted by Deloitte (2020) encompasses sustained cost pressures, ongoing labour shortages that affect productivity, and trends toward fixed-bid projects. Another concern highlighted by Deloitte (2020) is the low earnings before interest and tax (EBIT) from construction activities which is on average, just 5.5 per cent of sales.

Past research has identified several factors that contribute towards the success of construction projects (e.g., Tayeb et al., 2018; Loganathan, 2017). The study by Tayeb et al. (2018) identified clear scope, the experience of the team, qualified technical resources, adequate financial resources, closure of crossing points and reputation of contractor as factors that contribute towards the success of construction projects. Joshua et al. (2017) highlighted that other critical factors such as management capabilities, resource, quality standards, financial resource and relationship with shareholder could affect the success of the construction projects. Loganathan (2017) study on construction projects in India revealed that project standards, skilled human resources, health and safety and supply chain affect the success of projects. Another study by Omran, Abdulbagei, and Gebril (2012) identified ten success factors that contribute towards the success of projects. The success factors include feedback capabilities, decision-making ability, client experience, contractor experience, adequacy of financial resources, leadership skills of the project manager, teamwork, adequate materials, labour productivity and compliance to regulatory requirements. Gudienė et al. (2013) added that there are seven significant predictors of the success of construction projects that include project-related predictors, external predictors, institutional factors and the project management and team members related factors. From another perspective, Alzahrani et al. (2013) stated that the determinants of the success of construction projects encompass turnover history, quality policy, human resources planning, waste disposal, successful completion of past projects and company image. Winch (2009) stressed that optimal decision-making in construction is one of the critical determinants of success. One of the fundamental problems highlighted by Winch (2009) is that the management of information is uncertain. This includes a lack of information to make the right decision. Based on past research, the success of construction projects is predicted by several factors (Gudienė, 2013). This further indicates inconsistencies in the findings among researchers. Furthermore, despite several studies, there is still disagreement among researchers on the key predictors of success of construction projects (Ahadzie et al., 2008). The continuous changes in the internal and external environment can further affect the success of projects. In addition, as stated by Toor and Ogunlana (2010), the same old predictors of project success can no longer be the sole determinants of project success. Therefore, there is a need to study the factors that can contribute towards the success of projects in UAE.

Construction projects are not easy, and there is a lot of risk involved (Winch. 2009). Successful delivery of projects is crucial, but a lot of construction projects face delays (Doloi, Sawhney and Iyer, 2012; Durdyev et al., 2017). During the initial stage of projects, the uncertainty is high (Winch, 2009). According to Shabbab Al Hammadi (2016), eleven factors can potentially cause a delay in the construction project in Saudi Arabia. The factors that are related to delay of construction projects are workforce human resources, design, financing, organisation culture, consultant, material, client, and external factors. Delay in construction projects can lead to cost overrun and quality level that has been a common problem in construction projects. Therefore, to minimise delays and the associated cost overruns, the study of the critical success factors is justified (Larsen et al., 2015). Past researchers have stated that cost overrun of projects is vital and needs to be studied and recommendations should be implemented to

alleviate the problems associated with delay of projects (Al-Hazim, Salem, and Ahmad, 2017). Delay of projects can also have negative consequences on all stakeholders that encompass project client and the project team (Marzouk, 2014). Project delays can demotivate the project team. The researcher added that this factor not only delays the construction project but also over run time, cost, and quality of the project. Delay in construction projects can eventually lead to their abandonment.

Past research has demonstrated that the predictors of success of projects are inconsistent amongst several studies. In addition, delay of projects leads to cost overruns and in extreme circumstances, even the abandonment of projects. This study will examine the influence of project quality, project cost, project planning and scheduling, project scope and project communication towards the success of the construction project in UAE. To the knowledge of the researcher, this is the first study of its kind in UAE. This study is expected to fill the gap existing in the current literature. The findings of this study will provide a valuable understanding to clients of construction projects, project managers and other stakeholders on the predictors of successful completion of construction projects.

Literature Review

Project Success

Project success has conventionally been defined as completion or delivery of the project with the time, cost and quality that conforms to specifications that were planned (Barnes, 1988). Molenaar et al. (2013) articulated that the traditional theory of time, cost, and the quality triangle is associated with the success of projects. Ika (2009) agreed with the Molenaar (2013) with the traditional definition but highlighted that the golden triangle measures do not focus on other current predictors of project success. In this aspect, Farid (2011) stated that companies are facing challenges to complete projects and there are added predictors of project success such as manpower, process management, construction method, machinery, and material. Winch (2009) further argued that the traditional definition is a somewhat limited notion. According to Winch (2009), this definition ignores the stakeholder's interests. Furthermore, the definition is execution-based rather than taking a total project life cycle approach. As stated by Winch (2009), appropriate intention and predictability of realisation are two challenges in achieving project success. Winch (2009) made a distinction between process integrity and product integrity, and stated that the objectives for budget, schedule, and conformance to intention, provide a definition of process integrity. Process integrity encompasses the provision of a safe working environment and a minimum impact on the environment. This includes conformance to safety, health, and environmental regulations (Winch, 2009). Cooke-Davies (2002) further differentiated project success and project management success. Project success refers to the achievement of overall objectives of project. Project management success relates to the delivery or completion of projects within the specified cost, time, and quality (Cooke-Davies, 2002). The project management methodology (PMM) was developed to improve project effectiveness and success (Vaskimo, 2011). The Project Management Institute (PMI) have defined pillars or dimensions for the successful delivery of projects. Multiple principles and processes have been implemented to ensure the success of construction projects (Project Engineer, 2020).

There are several determinants of project success, but there are still ongoing studies on what exactly are the key predictors of project success. Joshua et al. (2017) highlighted that the critical predictors of project success encompasses management capabilities, resource, quality standards, financial resource and relationship with shareholder can affect the project success of the construction project. Studies have also found a relationship between organisational culture and success or delay of projects (Arditi, Nayak, and Damci, 2017). A study by Sohu et

al. (2018) revealed that good project management team, effective site management, the full commitment by stakeholders and effective project planning and the experienced team were positive predictors of the success of construction projects. For construction projects in India, the key predictors identified by Loganathan (2017) include skilled resources, safety and health, and an efficient supply chain. The success of projects also depends on the project methodology, and according to Al-Hajj (2018), construction projects can be successfully implemented through the formulation and implementation of effective project management methodologies. Another researcher (Abudi, 2013) added that communicating effectively and efficiently is one of the critical success factors. Another study by Hamid (2013) mentioned that the adoption of critical success factor (CSFs) and procurement strategies (PSs) effectively could lead the successful delivery of construction projects. Therefore, the predictors of project success can vary across projects. For instance, Wells (2013) found that the Project Management Methodology may not be fully appropriate for all organisations. For some types of projects, the methodology may be inappropriate.

Relationship between Project Quality and Success of Project

Traditionally, the success of a project is associated with cost, time, and quality (Atkinson, 1999). Saputra and Ladamay (2011) defined project quality as meeting the functional, legal, and aesthetic requirement of a project. To ensure quality and control of projects, Project Management Institute specified rules, procedures, and regulations. As specified by the Project Management Institute, quality assurance and quality control are two distinct processes within the Project Quality Management knowledge area. Quality control refers to the process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes (Roseke, 2020). It includes the implementation of quality processes that moves through various phases of the project such as procurement of materials, inspection upon receipt and monitoring of contractors (Patterson, 1983). Quality assurance refers to the audit function that evaluates project quality results. This included design, specifications, and materials selection (Patterson, 1983). Quality Management involves the process that determines the quality standards that govern the project deliverables (Roseke, 2020). According to Burnett (1998), quality management is an essential part of the system development lifecycle and must be included in the project plan. He stressed that the quality of deliverables is an integral part of project management. According to Burnett (1998), quality management refers to planned and systematic activities to achieve and maintain the quality of deliverables.

In the Project Management Body of Knowledge (PMBOK), project quality management is one of the knowledge areas. The objective of knowledge and processes pertaining to project quality management is to ensure that high-quality projects are delivered. Lack of effective project management can lead to the failure of projects (Liberato, Varajão, and Martins, 2015). Higher quality and effective project management practices lead to higher quality and lower cost of projects (Milosevic and Patanakul, 2005). Preethi and Manoharan (2017) argued that quality control plays an essential role in the construction project. Without high-quality control, the project can fail (Preeti and Manoharan, 2017). Akewushola (2012) also argued that project success is one of the criteria used by organisations to determine whether they have successfully accomplished the quality and objective of the project. Despite the importance of quality management practices, a study by Varajão, Colomo-Palacios, and Silva (2017) found quality management was relegated to lower importance, and this was highlighted a significant concern. Most of the past studies point towards the critical role of project quality in construction projects. Based on the support from previous literature, it is posited in this study that:

H1: Project Quality is related to the success of construction projects

Relationship between Project Cost and Success of Project

Project cost is one of the critical facets of project management, and each project must establish the policies and procedures for budgeting and controlling cost (Project Engineer, 2020). Substantial increase in cost beyond the budgeted amount can be a nightmare, and inadequate control over cost can result in failure of project (Project Engineer, 2020). Researchers have stressed that project cost is one of the critical criteria of project success (Ahadzie, Proverbs, and Olomolaiye, (2008). The study by Bassi et al., 2017) found that cost control was among the top three success criteria. Abdel-Hafeez, El-Attar, and Abdel-Hafeez (2016) also stressed that cost control is one of the critical components for any construction project. Memon et al. (2010) added that cost overrun is one of the most common issues is construction projects. There can be several factors that contribute towards cost overruns. The study on project cost overruns by Memon et al. (2010) highlighted that the determinants of cost in construction projects differ from one country to another. The differences can be contributed to different circumstances that influence the construction industry in each country. However, the study stated that most of the factors that contributed to project delays were related to financial issues.

Past research has established that cost control is one of the predictors of project success. A study by Bassi et al. (2017) revealed that cost was the second most critical criteria that contribute towards the success of projects. Arcila (2012) also argued that cost overrun was one of the factors that affected the success of construction projects. A study by Abusafiya (2017) further revealed that project cost was an important factor that affected project success. Memon et al. (2014) stated that project cost is one of the critical factors of project management lifecycle that affected the success of projects. In terms of ranking, a study by Alem (2018) revealed that project cost was among the ten most critical factors that contributed towards the success of projects. A study by Morteza and Kamyar (2009) also revealed the after time; the cost was the second most critical criterion for the success of projects. However, some researchers have argued that certain projects, such as software projects need not be completed within budget (Procaccino et al., 2005). It is noted that most of the past studies point towards the critical role of the project cost in construction projects. Based on the past literature review, it is posited in this study that:

H2: Project Cost is related to the success of construction projects

Relationship between Project Planning and Success of Projects

The project management plan is the master plan that includes detailed information that is needed to plan, acquire, and manage the resources to complete the project. (Project Engineer, 2020). In any project, project planning is highly crucial but is immensely underrated (Project Engineer, 2020). As suggested by the Project Management Institute (PMI), project planning should constitute about 20 – 30% of the time required to perform the project work. Low level of attention paid to project planning can lead to delays, increase costs, and lower probability of project success (Project Engineer, 2020). A study by (Papke-Shields, and Boyer-Wright, 2017) indicated that a good project management framework should incorporate the strategic planning characteristics. This will yield good insights into the relationship of PM behaviours to eventual project success. The study further added that the relationship between many tools/techniques and the rational adaptive approach is a broader approach in project management (Papke-Shields, and Boyer-Wright, 2017). A study by Badewi (2015) found the project management practices that include project planning were positively related to project management success. Another study by Idoro (2012) argued that project planning is a very significant part of the project success and project performance because project planning is a continuous process that is used in every phase of project until the project is delivered. Zwikael (2014) further emphasised that project planning is the main element of project management and project

managers must determine the strategy with the help of project plan management in order to set the decisions concerning its execution in order to deliver project on time. Davis (2014) stated that project planning is a method to develop the project strategies, project scope, establish the project objective and set sufficient milestone to ensure the project is successfully delivered. Tsoy, and Staples (2020) further added project planning as a new attribute to critical success factors of projects. This reflects the crucial role of project planning under the current environment. Past studies show that project planning plays a vital role in the success of projects. Therefore, based on the past literature review, it is posited in this study that:
H3: Project planning is related to the success of construction projects

Relationship between Project Scope and Success of Projects
The Project Management Institute (PMI) stated that scope management is one of the critical knowledge areas specified in Project Management Body of Knowledge (PMBOK). Scope management encompasses the process that is necessary to ensure that only the required work is included in the project delivery (Project Engineer, 2020). All the requirements are compiled into a scope statement that defines the project comprehensively. Scope creep and other issues related to scope can be the leading cause for project failure. In any project, the scope management plan specifies how the scope will be defined, developed, monitored, controlled, and validated (Roseke, 2020). Olaposi (2018) stated that project scope should include all those activities which are necessary for project to be completed. Failure to manage scope can lead to scope creep. The scope creep in project management refers to changes that can lead to uncontrolled growth of the project (Kendrick, 2015). Therefore, a lack of understanding or failure to define the scope comprehensively can contribute to unsuccessful projects (Mirza, Pourzolfaghar, and Shahnazari, 2013).
Past studies have looked at the relationship between project scope and success of projects (e.g., Mirza, Pourzolfaghar, and Shahnazari, 2013; Ogunberu, Olaposi, and Akintelu 2016). A recent study by Corvello, Javernick-Will, and Ratta (2017) found that project scope management processes were significantly related to project performance. They recommended that organisations should implement systematic project scope management to improve project performance. The study by Mirza, Pourzolfaghar, and Shahnazari (2013) concluded that higher probability of project success could be achieved through better understanding and distinction between project and product scope. Pre-project planning is also highly recommended. Abbas, Din, and Farooqui (2016) stated that utilisation of pre-construction planning practices would result in some solid foundation towards design-construction integration to achieve maximum efficiency and success of construction projects. Thus, a comprehensive scope statement prior to project execution can lead to project success. Bingham and Gibson (2017) added that developing adequate scope definition and a structured approach for project execution is essential. Rose (2005) stressed that project scope that includes clearly defined goals is one of the predictors off project success. According to Agarwal and Rathod (2006), the project scope is the most critical predictor in a software project's success. Proper scope management practices and processes can minimise scope creep that generally occurs when a project receives variation orders on the originally agreed scope (Nath and Momin, 2014). Variations orders can lead to project delays and cost overruns (Nawi el al., 2014). Past studies show that project scope management plays a vital role in the success of projects. Therefore, it is posited that:
H4: Project scope management is related to the success of construction projects

Relationship between Communication and the Success of Projects
The Project Management Institute (PMI) stated that communications management is one of the pieces of knowledge specified in Project Management Body of Knowledge (PMBOK).

Communication management is referred to as the glue that holds an entire project team together. A project can be derailed due to poor communication management (Project Engineer, 2020). Project communications management is about more than regular status updates. Communication plays a critical role because it deals with project information and effective communication among the project team members (Project Engineer, 2020). Anderson et al. (2006) also stated the rich project communications is the major contributor to project success. According to Čulo and Skendrović (2010), communication management is one of the most critical areas that need improvement. Čulo, and Skendrović (2010), stressed that to ensure the success of project, the information about the project that encompasses goals, status, budgets, expectations, and resources must be communicated regularly to all stakeholders. Cervone (2014) also stressed that communication is a critical factor in a project's successful delivery. However, as stated by Cervone (2014), project teams often fail to observe some basic rules for communicating with their stakeholders. A good project manager needs to prepare a clear communication plan to communicate the issues and problems encountered in the project (Aiyewalehinmi, 2013). Poor communication leads to uncertainties and conflict among stakeholders. A study by Mavuso (2016) also stated that communication that includes communication skills and plan, technology, project briefing, teamwork, stakeholders frame of references and environment is one of the factors that influenced successful delivery of projects. According to Wu et al. (2017), communication conflicts are frequent in construction projects. Conflict of communication between the project team and other stakeholders leads to poor communication. This will affect the successful delivery of the project. Past studies generally point towards the crucial role of communication management, and it is posited in this study that:

H5: Project communication management is related to the success of construction projects

Methodology

As stated by Saunders et al. (2016), this research started by asking questions about research beliefs and assumptions that are related to this study. As explained by Saunders et al. (2016), research philosophy is about the system of beliefs and assumptions about the development of knowledge. Based on the beliefs and assumptions, this study is based on positivism philosophy. Positivism was selected because this study entails working with an observable social reality (Saunders et al., 2016). The deductive approach to theory development was appropriate for this study because theory and hypotheses were developed in this study for further testing and confirmation (Saunders et al., 2016). This was a quantitative study, and a cross-sectional collection of primary data was done. Data was collected from a sample of qualified respondents using non-probability sampling.

The target population were project team members involved in the development and implementation of construction projects in Abu Dhabi. Sampling was done to select several cases of elements within the population that will represent the population (Saunders et al., 2016). Convenience sampling was appropriate as it allowed reaching qualified participants conveniently with no requirements whatsoever (Saunders et al., 2016). To calculate the appropriate sample size, the formula by Tabachnick and Fidell (2013) was applied. Based on this formula, the sample size must be at least "50 + 8m" where 'm' is the number of predictors. Based on the calculation done, the minimum sample size must be 90 respondents. However, the target sample size was set at 100 respondents. This will allow better accuracy of results.

Self-completed questionnaires were sent to the sampling elements to collect primary data. The questionnaires were disturbed electronically and by hand among the team members of construction projects in Abu Dhabi. One hundred and fifty questionnaires were sent electronically, and another one hundred and forty questionnaires were sent by hand. As

expected, the response rate of the questionnaires sent electronically was poor. Follow up was done and after a lapse of one month, only thirty-five questionnaires were received electronically. Another one hundred and eighteen questions were received through the direct distribute and collect method. There was a total of 151 good questionnaires. Two questionnaires were removed due to missing data. Ethical considerations were strictly observed in this study. The ethics encompassed voluntary participation, no harm to participants, and maintenance of confidentiality and privacy of the respondents**.**

The data was edited and updated into the SPSS Version 20 system. Descriptive statistics were generated to describe the profile of respondents. A feel of data was accomplished by generating descriptive statistics that include frequency distributions, central tendency, and standard deviations. Reliability and normality testing were done to check the goodness of data. The first step was to get a feel of the data. The questionnaires were checked for missing data (Sekaran and Bougie, 2016). Finally, hypothesis testing was done based on multiple regression analysis.

Results

There were 151 respondents who participated in this study. Around 89 respondents were male (58.94%), and the remaining 62 respondents were female (41.06%). Males represent a higher percentage of employees in the construction projects in Abu Dhabi. Based on age groups, nine respondents were below 23 years old (5.96%), and 35 respondents fall under the age group between 23-33 years old. Another 88 of respondents fall under the age group of between 34-43 years old (58.2%). The remaining 19 respondents were above 43 years old (12.58%). This means that most of the respondents were middle-aged and between the age group of 33-43 years old. Majority of the respondents were undergraduate degree holders (74 respondents). Another 62 respondents had a master's degree or higher qualification. The other respondents had a diploma or lower qualification. Only around 40% of the respondents were certified PMP holders.

Reliability testing to check the consistency of data was based on the Cronbach alpha value that was generated by the SPSS system. As a rule of thumb, the Cronbach alpha value should be 0.7 and above (Nunally, 1978). In this study, the Cronbach alpha value for the dependent variable was 0.907. The Cronbach alpha value for all the five independent variables was also above 0.8. This confirmed the consistency of the data that was collected. For validity testing, exploratory factor analysis was done. The value of the Kaiser-Meyer-Olikin (KMO) was above 0.5, and this test confirmed the sampling adequacy for each variable in this study (Field, 2009). As a rule of thumb, the KMO values must be above 0.5 (Field, 2009). The value of communalities for each indicator was examined to check the proportion of each variable's variance that can be explained by the factors. The results of the exploratory factor analysis showed that communalities in this study were above 0.7, and this shows that the extracted components represent the variables well. As stated by Kline (1994), a high communality explains that a larger amount of the variance in the variable has been extracted by the factor solution.

In order to test the hypothesis of this study, a multiple regression analysis was undertaken. The multiple regression analysis showed whether there was a statistically significant relationship between the independent variables and the dependant variables. The R-value of .974 indicates a high level of prediction by the predictors of this study. The R^2 of .948 shows that the five independent variables explained around 95% of the variances in the success of projects (Field, 2009). The F-value is 527.606. In addition, the F-test indicates a significant value (0.000). The F-Test and the significance (0.000) shows that the model fit is good, and the five independent variables predicted the dependent variable reliably.

Table 1: Model Fit Summary

Multiple R	.974
Coefficient of Determination (R Square)	.948
Adjusted R square	.946
F Value	527.606
Sig	.000

A Multiple Regression analysis using SPSS system was done to examine the relationship between the dependent and independent variables in the study. The β value indicates the relationship between an individual independent variable (project quality, project cost, project planning, project scope and project communication) and the dependent variable, namely project success. The significance level, which is the P-value, should be less than 0.05 (Pallant, 2010). Project quality was positively and significantly related to project success based on the P-value ($p< 0.005$) and Beta value is .304. Therefore, Hypothesis H1 is accepted. The second hypothesis H2 states that project cost is related to the success of construction projects. The results show a Beta value of .224 and a significant p-value ($p<0.05$). Therefore, hypothesis H2 is supported. The third hypothesis H3 states that project planning is related to the success of construction projects. The results show a Beta value of .232 and a significant p-value ($p<0.05$). This indicates there is a significant relationship between project success and project planning as the p-value, which is lower than 0.05. Therefore, hypothesis H3 is supported. The fourth hypothesis H4 stated that project scope is related to the success of construction projects. The results show a Beta value of .215 and a significant p-value ($p<0.05$). Therefore, hypothesis H4 was supported. The fifth hypothesis H5 states that project communication is related to the success of construction projects. The results show a Beta value of .217 and a significant p-value ($p<0.05$). Therefore, hypothesis H5 was supported. Overall, the results showed that all five hypotheses have a significant and almost similar impact on the success of construction projects. Although project quality shows the highest impact, the difference between the other variables is not high.

Table 2: Coefficients

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.091	.075		1.218	.225
Quality	.297	.096	.304	3.099	.002
Cost	.224	.101	.224	2.217	.028
Planning	.230	.091	.232	2.520	.013
Scope	.144	.087	.215	2.154	.040
Communication	.179	.097	.217	2.182	.031

Dependent Variable: Project Success

Discussion of Findings

The first hypothesis was to empirically test the influence of quality on the success of construction projects. The results showed that there was a significant and positive relationship between quality and project success ($B= .304$; $p<0.05$). This means that the higher the implementation of quality control and quality assurance in construction projects, the higher will be the probability of successful delivery. The results of this study are also consistent with past findings (Preethi and Manoharan, 2017; Akewushola, 2012). Prior studies have argued

that quality control plays an essential role in the construction project (Preti and Manoharan, 2017). Researchers have also argued that quality is one of the crucial factors that contribute towards the success of projects. This study also found that project quality has the highest impact on project success. Therefore, project managers must incorporate the policies, processes and activities that determine quality policies, objectives, and responsibilities so that the project is successful and will satisfy the needs of the clients.

The second hypothesis was to find out the relationship between project cost and the success of construction projects. The result of the study confirmed that project cost had a positive and significant relationship with the success of the construction projects in Abu Dhabi (B= .224; $p<0.05$). This indicates that effective project cost plan can lead to the successful delivery of construction projects. The result obtained in this study is also consistent with past studies (Arcila, 2012; Abusafiya, 2017). Poor cost controls in projects can result in cost overruns, and this can eventually lead to failure of project (Arcila, 2012). Past researchers have stressed that cost control is one of the crucial factors the t affect the success of projects (Abusafiya, 2017; Memon et al., 2014). The result indicates that project managers should have a strict project cost control processes to avoid cost overruns. Without proper control over project cost, the new cost may continue to appear without good justifications.

The third hypothesis was to find out the influence of project planning on the successful delivery of projects. The results of the study were consistent with past studies (Badewi, 2015; Zwikel, 2014). It was confirmed that project planning had a significant and positive influence on the successful delivery of construction projects (B= .232; $p<0.05$). The results of the study indicate that project management practices that include project planning are crucial for successful project delivery (Badewi (2015). Project planning is a very significant part of the success of any project success project planning must be a continuous process that is used in every phase of the project until the project is delivered (Idoro, 2012). Therefore, project managers must develop a comprehensive project plan and determine strategy with the help of project plan management to make decisions concerning its effective execution and delivery within the planned schedule (Zwikael, 2014). Project managers should develop a master plan for each project that includes the detailed information necessary to complete the project.

The next hypothesis was to test the influence of scope management on the success of construction projects. The results of this study revealed that this hypothesis was supported (B=.215; $p<0.05$). The finding of this study is also consistent with the results reported by past studies (Corvello, Javernick-Will, and Ratta, 2017; Mirza, Pourzolfaghar, and Shahnazari, 2013). Therefore, organisations should implement systematic project scope management to improve project performance and success (Corvello, Javernick-Will, and Ratta, 2017). Cost savings and scope creep can be avoided by pre-project planning where the requirements are clearly defined and communicated to all stakeholders. The comprehensive scope statement that is agreed by all stakeholders prior to project execution can lead to project success. The project manager should compile the project requirements into a scope statement that accurately defines the project deliverables and leave as little as possible open to interpretation. This can result in minimal or zero variation orders.

The last hypothesis was to find out the relationship between communication and success of projects in the construction industry. The results showed that communication had a positive and significant influence on the successful delivery of projects (B= .217; $P<0.05$). The results of this study are consistent with findings in other studies. Anderson et al. (2006) also stated the rich project communications is the major contributor to project success (Čulo, and Skendrović, 2010; Cervone, 2014). In any project, communication management is one of the critical areas that need continuous improvement. Therefore, information about the project goals, status, budgets, and expectations must be continuously communicated to all stakeholders

to avoid any uncertainties or conflict (Čulo, and Skendrović, 2010). A good project manager needs to plan, manage, and control all communications during all the phases of a project.

Conclusion and Implications

The results of this study revealed that all five predictors of project success in this study had a positive and significant relationship with the successful delivery of construction projects. All the five predictors, namely project quality, project cost, project scope, project communications and project planning, had around the same level of impact on the success of construction projects. Although the results showed that quality management had the highest impact, but the difference was low compared to the other determinants. The results suggest that the aggregate power of several factors is necessary to implement projects successfully. The findings of this study discussed the influence of project quality, project cost, project scope, project communications and project planning towards the implementation of successful construction projects lead to the conclusion that project managers should focus on multiple factors to improve successful delivery of projects.

There are several practical implications of this study. The objective of this study was to identify the key factors that contribute towards the success of construction projects. The cost of delays or unsuccessful projects can be substantial in the construction industry. Unsuccessful projects can cause severe problems to stakeholders that include the project clients and contractors. The results of this study provide a better understanding to project managers and other stakeholders on the crucial task of managing project quality, project cost, project scope, project communications and project planning. The results of this study are expected to help project managers to avoid problems such as scope creep and cost overruns in construction projects. Based on the results of this study, pre-planning must be included as an essential activity and communication are the key to keeping the project team motivated. Project managers should focus on project quality and identify quality standards. This includes the quality plan that determines the quality requirements, measurements, and quality controls. This study also had some theoretical and academic implications. Firstly, this research is the first of its kind that examined the combined impact of project quality, project cost, project scope, project communications and project planning towards the implementation of successful construction projects in Aby Dhabi. The findings will provide additional insights for academicians and researchers. Firstly, the study highlighted that the project management "triangle" of scope, time, and the cost is no longer the key determinants of successful projects. Due to changes in the environment and landscape, project managers need to accommodate other elements such as communication, scope, and quality management. This research further added further knowledge to the existing body of knowledge. The findings are useful to academicians and future researchers.

Study Limitations

Several limitations were noted in this study. Firstly, this study focused on construction projects in Abu Dhabi only. This limits the generalizability of the results of this research. Future studies should be extended or replicated in other countries or cities. Secondly, this was a quantitative study that used closed-ended questions. Therefore, there is a limitation on in-depth responses from the respondents. A qualitative study is recommended to get more in-depth information and experience from project managers and other key people in projects. Another limitation is that this study did not consider the different phases of projects. There can be differences based on the different phases of projects. A longitudinal study can provide views of stakeholders over different phases of the projects. This study also did not include any mediators or moderators. The inclusion of mediators and moderators can offer better results.

References

Abbas, W. (2020, February 8). UAE, GCC construction set for growth in 2020. Khaleej Times. https://www.khaleejtimes.com/business/local/uae-gcc-construction-set-for-growth-in-2020

Abbas, A., Din, Z.U. and Farooqui, R. (2016). Achieving greater project success & profitability through pre-construction planning: A case-based study. *Procedia Engineering*, 145, 804-811.

Abdel-Hafeez, M.M., El-Attar, S.S. and Abdel-Hafeez, W.A. (2016). Factors Leading to Cost Overrun Occurrence in Construction Projects. *Port Said Engineering Research Journal*, 20(1), 71-77.

Abudi, G. (2013). *Managing communications effectively and efficiently* [Conference presentation]. PMI® Global Congress 2013—North America, New Orleans, LA. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/managing-communications-effectively-efficiently-5916

Abusafiya, H. A. M. (2017). Causes and Effects of Cost Overrun on Construction Project in Bahrain: Part I (Ranking of Cost Overrun Factors and Risk Mapping). *Modern Applied Science*, 11(7), 20-27.

Agarwal, N. & Rathod, U. (2006). Defining 'success' for software projects: An exploratory revelation. *International Journal of Project Management*, 24(1), 358–370

Ahadzie, D.K., Proverbs, D.G. and Olomolaiye, P.O. (2008). Critical success criteria for mass house building projects in developing countries. *International Journal of Project Management*, 26 (1), 675-687

Aiyewalehinmi, E. (2013). Factor Analysis of Communication in the Construction Industry. The *International Journal of Engineering and Science* (IJES), 2(10), 49-57.

Akewushola, R. O. (2012). Effect of project management on project success. *Australian Journal of Business and Management Research*, 2(3), 1-11.

Alem, B. (2018). *Project Success Criteria and Success Factors in The Case of Projects Financed by Development Bank of Ethiopia* [Unpublished doctoral dissertation]. Addis Ababa University).

Alzahrani, Jaman I., and Margaret W. Emsley. (2013). The impact of contractors' attributes on construction project success: A post construction evaluation. *International journal of project management*, 31(2), 313-322.

Al-Hazim, N., Salem, Z.A. and Ahmad, H. (2017). Delay and cost overrun in infrastructure projects in Jordan. *Procedia Engineering*, 182(2017), 18-24.

Al-Hajj, A. (2018). The Impact of Project Management Implementation on the Successful Completion of Projects in Construction. *International Journal of Innovation, Management and Technology*, 9(1), 21-27.

Andersen, E.S., Birchall, D., Jessen, S.A. and Money, A.H. (2006). Exploring project success. *Baltic journal of management,* 1(2), 127-147

Arcila, S. G. (2012). Avoiding cost overruns in construction projects in the United Kingdom. *Nature,* 362(6420), 486-486.

Arditi, D., Nayak, S. and Damci, A. (2017). Effect of organisational culture on delay in construction. *International Journal of Project Management,* 35(2), 136-147.

Atkinson, R. (1999). Project management: cost, time, and quality, two best guesses and a phenomenon, it's time to accept other success criteria *Int. J. Project Management*, 17(6), 337-342.

Badewi, A. (2016). The impact of project management (PM) and benefits management (BM) practices on project success: Towards developing a project benefits governance

framework. *International Journal of Project Management*, 34(4), 761-778.

Barnes, M. (1988) Construction Project Management. *International Journal of Project Management*, 6(1), 69–79.

Bassi, A., Arrigoni, A., Demma, B., Galli, M. and Gallera, R. (2017). Criteria and Factors in the Success of Projects and their Management–Survey by Swiss Companies. In Management Challenges in a Network Economy: *Proceedings of the MakeLearn and TIIM International Conference 2017 (119-134)*. ToKnowPress.

Bingham, E., and Gibson Jr, G.E. (2017). Infrastructure project scope definition using project definition rating index. *Journal of management in engineering*, 33(2), 04016037

Brown, A. (2020, April 3). Construction growth for 2020 forecast at just 0.5%. KHL International Construction. https://www.khl.com/international-construction/construction-growth-for-2020-forecast-at-just-05/143240.article

Burnett, K. (1998). The project management Paradigm. Springer-Verlog London.

Cervone, F. H. (2014). Effective communication for project success. OCLC Systems and Services. *International Digital Library Perspectives*, 30(1), 74-77.

Cooke-Davies, T.J. (2002). The "real" success factors on projects. *Int. J. Project Management*, 20 (3), 185-190.

Corvello, V., Javernick-Will, A. and Ratta, A.M.L. (2017). Routine project scope management in small construction enterprises. *International Journal of Project Organisation and Management*, *9*(1), 18-30.

Čulo, K. and Skendrović, V. (2010). Communication management is critical for project success. *Informatologia*, *43*(3), 228-235.

Deloitte, (2020). 2020 engineering and construction industry outlook. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-2020-engineering-construction-outlook.pdf

Davis, K. (2014). Different stakeholder groups and their perceptions of project success. International *Journal of Project Management*, 32(2), 189-201.

Doloi, H., Sawhney, A., Iyer, K.C. and Rentala, S. (2012). Analysing factors affecting delays in Indian construction projects. *International Journal of Project Management*, 30(1), 479-489.

Durdyev, S., Omarov, M. and Ismail, S. (2017). Causes of delay in residential construction projects in Cambodia. *Cogent Engineering*, 4(1), 1-12.

Farid, M.I. (2011). *Critical Success Factors of Project Management of River Normalization Project* [Doctoral dissertation]. Universiti Teknologi Malaysia. http://eprints.utm.my/id/eprint/33874/5/MuhammadItsnaFaridMFAB2011.pdf

Faridi, A S, and El-Sayegh, S M (2006). Significant factors causing delay in the UAE construction industry. *Construction Management and Economics*, 24, 1167-76.

Field, A. (2009). *Discovering Statistics Using SPSS: Introducing Statistical Method* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Gudienė, N., Banaitis, A., Banaitienė, N. and Lopes, J. (2013). Development of a conceptual critical success factors model for construction projects: a case of Lithuania. *Procedia Engineering*, 57(2013), 392-397.

Hamid, A.A.B., 2013. Factors Affecting the Success of a Construction Project [Doctoral dissertation] Universiti Teknologi Malaysia.

Ika, L. A. (2009). Project success as a topic in project management journals. *Project Management Journal*, 40(4), 6-19.

Idoro, G. (2012). Evaluating levels of project planning and their effects on performance in the Nigerian construction industry. *Construction Economics and Building*, 9(2), 39-50.

Joshua, O., Amusan, L. & Akuete, E. (2017). Project management a panacea to improving the

performance of construction project. *International Journal of Civil Engineering and Technology*, 8(1), 1234-1242.

Kendrick, T. (2015). *Identifying and Managing Project Risk: Essential Tools for Failure-Proofing Your project* (3rd ed.). AMACOM.

Kline, P., (1994). *An easy guide to factor analysis*. New York, NY: Routledge.

Larsen J.K., Shen G.Q.P., Lindhard S.M. and Brunoe T.D. (2015). Factors Affecting Schedule Delay, Cost Overrun, and Quality Level in Public Construction Projects. *Journal of Management in Engineering*, 32(1), 1-29

Liberato, M., Varajão, J. and Martins, P. (2015). CMMI implementation and results: the case of a Software Company, in: Modern Techniques for Successful IT Project Management (pp 48-63). *IGI Global*.

Loganathan, S. (2017). Identifying and Addressing Critical Issues in the Indian Construction Industry: Perspectives of Large Building Construction Clients. *Journal of Construction in Developing Countries*, 22(1), 121-141.

Mavuso, N. (2016). *Factors of communication management for successful project delivery in the Swaziland construction industry.* Republic of South Africa, Department of Quantity Surveying, Faculty of Engineering, the Built Environmentand Information Technology, Nelson Mandela Metropolitan University.

Marzouk, M. M. (2014). Analysing delay causes in Egyptian construction projects. *Journal of Advanced Research,*, 5(1), 49-55.

Memon, A.H., Rahman, I.A., Abdullah, M.R. and Azis, A.A.A. (2010). Factors affecting construction cost in Mara large construction project: perspective of project management consultant. *International Journal of Sustainable Construction Engineering and Technology*, *1*(2), 41-54.

Memon, A.H., Rahman, I.A., Abdullah, M.R. and Azis, A.A.A. (2014). Factors affecting construction cost performance in project management projects: Case of MARA large projects. *International Journal of Civil Engineering and Built Environment*, 1(1), 30-35.

Michael, O. N., 2011. A Building Regulatory System Gone Haywire. *Architectural Association of Kenya Newsletter,* 1(1), 20-27.

Milosevic, D. and Patanakul, P. (2005). Standardised project management may increase development projects success. *Int. J. Project Management*. 23 (3), 181-192

Mirza, M.N., Pourzolfaghar, Z. and Shahnazari, M. (2013). Significance of scope in project success. *Procedia Technology*, 9(1), 722 – 729

Molenaar, K.R., Javernick-Will, A., Bastias, A.G., Wardwell, M.A. and Saller, K. (2013). Construction project peer reviews as an early indicator of project success. *Journal of management in engineering*, *29*(4), 327-333.

Motaleb O, Kishk M. (2010). An investigation into causes and effects of construction delays in UAE. In: Egbu C, editor. Proceedings of 26th Annual ARCOM Conference; Sep 6–8; Leeds, UK. Association of Researchers in Construction Management (pp 1149–1157). http://www.arcom.ac.uk/-docs/proceedings/ar2010-1149-1157_Motaleb_and_Kishk.pdf

Morteza, S.G., Kamyar, K.C. (2009), Generic Project Success and Project Management Success Criteria and Factors: Literature Review and Survey. *WSEAS Transactions on Business and Economics*, 8(1), 456-468

Nath, A., & Momin, M. M. (2014). Project scope management: A pivotal tool for project's success. *International Journal of Management, IT and Engineering*, 4(8), 279.

Nawi, M.N.M., Lee, A., Azman, M.N.A., & Kamar, K.A.M. (2014). Fragmentation Issue in Malaysian Industrialised Building System (IBS) Projects. *Journal of Engineering Science & Technology* (JESTEC), 9(1), (2014).

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Ogunberu, A.O., Olaposi, T.O. and Akintelu, S.O. (2016). Factors Affecting the Choice of Project Scope Management Practices among Telecommunication Organisations. *Global Journal of Management and Business Research*, 16(3).

Omran, A., Abdulbagei, M.A. and Gebril, A.O. (2012). An evaluation of the critical success factors for construction projects in Libya. *International Journal of Economic Behaviour*, 2(1), 17-25.

Pallant, J., (2010). *SPSS survival manual: A step by step guide to data analysis using the SPSS program*. 4th Edition, McGraw Hill, New York.

Papke-Shields, K.E. and Boyer-Wright, K.M. (2017). Strategic planning characteristics applied to project management. *International Journal of Project Management*, 35(2), 169-179.

Patterson, J. L. (1983). Quality management: the project managers [sic] perspective. *Project Management Quarterly*, 14(1), 33–38.

Preethi, S. and Manoharan, M. (2017). Project Management and its Effects of Quality Control in Construction Sector. *International Journal of Engineering and Management Research (IJEMR)*, 7(2), 92-96.

Procaccino, J. D. Verner, J. M. Shelfer, K. M. & Gefen, D. (2005). What do software practitioners really think about project success: an exploratory study. The *Journal of Systems and Software*, 78(1), 194–203

Project Engineer, (2020). Project management. https://www.projectengineer.net/

Roseke, B. (2020). Project Quality Management According to the PMBOK. https://www.projectengineer.net/project-quality-management-according-to-the-pmbok/

Rose, K. (2005). *Project Quality Management: Why, What and How*, J. Ross Publishing, Florida Saputra, Y. A. & Ladamay, O.S.A. (2011). Project Reliability: Probability of a Project Meets its Quality-Cost-Time Target Under Uncertainty. *International Journal of Electronic Business Management*, 9(3), 220-230.

Sekaran U., and Bougie, R. (2016). *Research Methods for Business*: A Skill Building Approach, Seventh Ed., Chichester, West Sussex, UK: John Wiley and Sons Ltd.

Saunders, M., Lewis, P., and Thornhill, A., (2016). *Research methods for business students*. Harlow: Financial Times Prentice Hall.

Shabbab Al Hammadi, M. S. N. (2016). Study of Delay Factors in Construction Projects. *International Advanced Research Journal in Science, Engineering and Technology*, 3(4), 87-93.

Sohu, S., Jhatial, A.A., Ullah, K., Lakhiar, M.T. and Shahzaib, J. (2018). Determining the critical success factors for highway construction projects in Pakistan. *Engineering, Technology & Applied Science Research*, 8(2), 2685-2688.

Tabachnick, B. G. and Fidell, L. S. (2013). *Using Multivariate Statistics*,' 6th Ed., Pearson Education.

Tayeh, B.A., Al Hallaq, K., Alaloul, W.S. and Kuhail, A.R. (2018). Factors affecting the success of construction projects in Gaza Strip. *The Open Civil Engineering Journal*, 12(1), 301-315.

Tsoy, M. and Staples, D.S. (2020). January. Exploring Critical Success Factors in Agile Analytics Projects. In *Proceedings of the 53rd Hawaii International Conference on System Sciences*. http://hdl.handle.net/10125/63861

Toor, S. and Ogunlana, S. (2010). Beyond the iron triangle: stakeholder perception of key performance indicators (KPIs) for large-scale public sector development projects. *International Journal of Project Management*, 28 (2010), 228-236

Varajão, J., Colomo-Palacios, R. and Silva, H. (2017). ISO 21500: 2012 and PMBOK 5 processes in information systems project management. *Computer Standards & Interfaces*, 50(10), 216-222.

Vaskimo, J. (2011, October 12). Project management methodologies: an invitation for research [Conference Presentation] IPMA World Congress 2011, Brisbane, Queensland, International Project Management Association, Amsterdam, The Netherlands.

Wells, H. (2013, June 17-19). An exploratory examination into the implications of type-agnostic selection and application of project management methodologies (PMMs) for managing and delivering IT/IS projects. *Proceedings IRNOP 2013 Conference, Oslo, Norway*.

Winch, G.M., 2009. *Managing construction projects*. John Wiley & Sons.

Wu, G., Liu, C., Zhao, X. and Zuo, J. (2017). Investigating the relationship between communication-conflict interaction and project success among construction project teams. *International Journal of Project Management,* 35(8), 1466-1482.

Zwikael, O. (2014). The moderating effect of risk on the relationship between planning and success. *International Journal of Project Management*, 32(3), 435-451.