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THE IMPACT OF QUALITY PERFORMANCE ON THE CONSTRUCTION PROJECTS PERFORMANCE: A CASE OF LIBYAN CONSTRUCTION INDUSTRY

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ABSTRACT

Project management today has is one of the most important factors that draw the success path of the organization's strategies. Project performance is a crucial issue for the construction industry. It is often used, such as project deliverables completed in a timely manner and meeting customer satisfaction and to identify measures of success. This study aims to investigate the impact of quality performance on the construction project performance in Tripoli city, Libya. This study employed the cross sectional approach, the questionnaire instrument is used to collect the data from 139 respondents from the construction industry. The result revealed a significant and positive impact of quality performance on the construction projects performance. The construction organizations must have a clear mission and vision to formulate, implement and evaluate performance. The environment of construction organizations should be proper to implement projects with success performance.

1. Introduction

Performance is related to many topics and factors such as time, cost, quality, client satisfaction; productivity and safety. Construction industry in the Libyan industry suffers from many problems and complex issues in performance. There are many realistic reasons such as closures, amendment of drawings and amendment of the design. In addition, there are other different reasons affecting construction projects performance such as poor management and leadership; inappropriate participants; poor relations and coordination; absence of motivation, control, monitor or decision making systems; inadequate infrastructure, political problems; cultural problems and economic conditions (Abdelnaser Omran, 2015). Project managers are required in the construction industry as the level of construction activity continues to grow, as the requirement for more amazing cost control and financial management of project continues to increase. According to Kendra and Taplin (2004), associations in the construction industry are expanding emphasis on timely schedules, cost budget, quality control and the quality of the projects. Unfortunately, construction professionals are often asked by the organizations to take on leadership roles in the industry without formal preparation. According to the Yukl (1989) mentioned that leadership is the person who involving the influence of task objectives and strategies, influencing commitment and compliance in task behavior to achieve the objectives, influencing group maintenance and identification and influencing the culture of an organization. Without realizing the importance of the quality of leadership, the expectation of the project may not be reached to the specification.

2. Literature Review

KPI focuses on time, cost, quality, customer satisfaction, order changes, business performance, and health and safety. In addition to the previous framework, project performance monitoring systems were established based on KPI and EPP proposals, comprising eight PM groups: people, communication, time, cost, quality, environment, customer

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satisfaction and health and safety (Korkmaz & Park, 2018). Li, Zhang, Ai, Dong, and Yu (2018) proposed a framework for a performance measurement process (PMPF) in accordance with the BSC model, with the addition of "project" and "suppliers" views. Larsen, Shen, Lindhard, and Brunoe (2015) proposed a performance measurement system with a strong indicator. Lokhande and Ahmed (2015) provide a system and guidance to identify and implement the best practices in a performance measurement system. Abdelnasser Omran (2015) proposed building PMS to create CSFs found with various constructions KPI applications. Other applications of many KPIs over the years include KPI designs Chan & Chan (2004) to measure the success of construction projects, and Omran and Abdulrahim (2015) has proposed a framework for a project measurement system that includes KPI and matched the goals and objectives of the organization.

In Taiwan, Sears, Sears, Clough, Rounds, and Segner (2015) suggested a method of analysis. It was introduced to track ongoing and completed public building projects. This approach consists of two stages: used and then. The phases used are cost, quality, time, communication and technology / tools; in the post-maintenance phase, they are cost, quality, time and range. The main aspects of use are cost, quality, time, communication and technology; in post-maintenance phase, they are cost, quality, time and range (Aziz & Abdel-Hakam, 2016).

3. Methodology

This study experienced the quantitative methodology of research. The methodology incorporates four parts such as study design, measurement, the process of data collection and data analysis method. All of these parts are described in this study. The methodology of study provides the important method that collects, gauges and analyzed the information. There are different means and instruments that can be exercised by researchers for grasping essential information.

The study adopted probability sampling technique to promote equal chance of representation of the subjects and generalizability. This study aims to examine the relationship between the key performance indicators and the performance of the construction projects in Tripoli, Libya, so the construction companies in Tripoli selected as population for the study. According to rough statistics, there is around 372 Construction Company in Tripoli. According to Krejcie and Morgan (1970) should random sampling 372 company be representatives of the given population. In this study adopted simple random sampling method total of 190 questionnaires will be distributed to staff from the top and middle management were asked to give their agreement whether important each factor that influences them to put their best efforts at work, and they are deeply motivated by these factors. The Measurements for quality performance is adopted from Mwangi (2012), and the measurements for Construction Projects Performance were adopted from Ibrahim (2008) and contained 4 variables with 5 questions for each variable.

The whole data was mainly entered into Microsoft Excel and then analyzed with SPSS software. The SPSS version 23 proposes detailed analysis options that view the data thoroughly and determine trends that have not been recognized. The correlation test is assigned to test the relationship significant and directions among the study constructs, while the regression test was used to determine the impact of each assigned factors within the construct on the dependent variable of the study.

4. Results

This study has used a random sampling method in terms of distributing the questionnaires and selecting the samples for the study. Using this type of technique requires analyzing the respondents' profiles. The respondents' profiles test aims to identify and recognize each sample that was selected to participate in the research. The main reason for the respondents' profiles test is to make sure that all the samples were chosen and selected randomly. The project unit profile (project) shows that most types of organizations are 54 contractors (38.8%) and 34 (24.5%). At the same time, the consultant pays 45% at 32.4 and loses 6 respondents. For the type of project, the majority of projects are buildings with 75 buildings, representing 54, water and drainage 35 and 25.2%, while roads and transport are 24 years old and a percentage of 17.3. Secondly, according to the profile of the respondents, they are classified as project managers 85, with a percentage of 61.2, followed by respondents who are organizational actors with a percentage of 28.8, while the site manager or office technician is 14 respondents, representing 10.1. The majority of respondents with more than 10 years of experience, 69 respondents, accounting for 49.6. then answer their 5-10 years' experience and 21.6 percentage points, while their response time is less than 2 years and 14 answers 10.1%.

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Table 1: Respondents profile

Demographic characteristics	Categories	Frequency	(%)
1. Sample profile			
Type of Organization			
	Private	34	24.5
	Consultant	45	32.4
	Constructor	54	38.8
	Missing	6	4.3
Project Type	Buildings	75	54.0
	Roads and transportation	24	17.3
	Water and sewage	35	25.2
	Missing	5	3.6
2. Respondents' profile			
Respondent Job title	Project Manager	85	612
	Site Engineer/ office engineer	14	10.1
	Organization Manager	40	28.8
Years of Experience	Less than 2 years	14	10.1
	2-5 Years	21	15.1
	5-10 Years	30	21.6
	More than 10 years	69	49.6
	Missing	5	3.6

The reliability of an instrument is the degree of consistency which measures the attribute; it is assumed to be measuring (Senouci, Ismail, & Eldin, 2016). The less variation an instrument creates in repeated measurements of an attribute, the higher its reliability. Reliability can be countervailed with the stability, consistency, or dependability of a measuring tool. The test is conducted on the same sample of people on two occasions then compares the scores obtained by computing a reliability coefficient.

Since Cronbach's coefficient alpha is applied as a measurement of internal consistency, it is used in this study to measure the reliability of the questionnaire between each field. The Cronbach's coefficient alpha was calculated for each part of the questionnaire. The most identical values of alpha indicate that the mean and variances in the original scales do not differ much, and thus standardization does not make a great difference in alpha. The results of the reliability analysis summarized in Table 2 confirmed that all the scales display a satisfactory level of reliability (Cronbach's alpha exceeds the minimum value of 0.7). Therefore, it can be concluded that the measures have an acceptable level of reliability.

Table 2 Reliability test

No	Variable	Items	Cronbach Alpha
1	Project quality	6	.862
2	Construction Projects Performance	6	.851

Convergence competence refers to the extent to which many of the objects used in the study to measure the same concept are consistent (Ramayah, Lee, & In, 2011). The validity of the convergence of measurements used in this study has been examined based on the value of the main loads and the average deviation (AVE). Initially, the main loads were checked to ensure that items with a load of at least 0.5 remained unchanged.

The variables AVE were then evaluated. The AVE criterion is defined as the high average of square loads of construct-related indicators. The AVE value of at least 0.5 and higher indicates that a latent variable can explain on average

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more than half of the variance of the indicators considered sufficient. In addition, composite reliability was used to study the consistency of the measurement objects used in this study. Composite reliability is better suited for PLS-SEM compared to Cronbach's Alpha device, which prioritizes indicators based on their reliability during model evaluation (Hair, Sarstedt, Ringle, & Mena, 2012). Composite security should be greater than 0.70, such as Bernstein and Nunnally (1994).

Table 3: Outer loading of indicators

Construct	Items	Loading	AVE	Composite Reliability
Cost	C1	0.831	0.754	0.855
	C2	0.880		
	C3	0.872		
	C4	0.876		
	C5	0.910		
	C6	0.880		
	C7	0.829		
Construction projects performance	PER2	0.857	0.631	0.895
	PER3	0.802		
	PER4	0.764		
	PER5	0.844		
	PER6	0.694		

A similar analysis was conducted to test another direct relationship, and that is between project quality and project performance. The results indicated the presence of a significant relationship ($\beta = 0.269$, $p<0.01$) as hypothesized in H1 and, therefore, can be considered as supported.

Table 4: Summary of the path coefficients and direct effects

Hypotheses	Relationship	Std. Beta	Std. Error	t-value	Decision
H1	Q -> PER	0.269	0.102	2.639	supported

**Significant at $p<0.01$, *Significant at $p<0.05$, Bootstrapping (n = 500)
Q = Project quality, PER = Project performance

As mentioned in the previous sections, this study has revealed that quality is positively related to projects performance. The findings showed that there is a positive significant relationship between quality and projects performance. The result is consistent with previous literature which indicates that the availability of personal with high experience and qualification and the quality of equipment's and raw materials in projects have a positive relationship with projects performance. Also, monitoring safety principles during project implementation and qualification of constructors competing to implement the project have a positive relation with project performance. For instance, the study that conducted by Attakora-Amaniampong (2016) stated that the quality of the project is an important factor affecting project success.

It has been suggested that this is the wrong goal to try to find the best compromise between quality and cost. Instead, project managers should try to eliminate all the faults and make the right things for the first time. Similarly, compromise models have limit values because they do not include hidden costs caused by poor quality. Hidden costs, such as customer loyalty or lack of sales in the future, can be significant not only affects the success of the project but also the success of the business. Monitoring of compromises and reasonable decision-making between these three factors is difficult, especially if sufficient quality should always be achieved. Maintaining a minimum level, even if trading decisions set requirements for project quality management.

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5. Conclusion

In order to enhance the projects performance Project managers, office managers and organizations managers ought to consider the key determines of construction project performance. This study presents remarkable implication for Private, consultant and constrictors and practitioners. Consultants should be more interested with key determine of project performance namely quality by choosing the most important criteria in order to improve their performance and to increase owner's satisfaction. In addition, consultants are recommended to facilitate and quicken orders delivered to contractors to obtain better time performance and to minimize the cost and time of projects and enhance the quality of construction projects. Contractors should not increase the number of projects that cannot be performed successfully due to its cost or limited time. In addition, contractors should consider knowledge management in their cost estimation and projects productivity. There should be adequate contingency allowance in order to cover increase in cost and project time. A proper motivation and safety systems should be given to enhance projects quality and productivities.

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