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RESEARCH ARTICLE

Factors Affecting the Success of Construction Projects in Gaza Strip

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Abstract:

Background:

The construction sector is the main pillar in the Palestinian economy, where the Qatari Grant projects form the largest part of the construction projects spent in Gaza Strip.

Objective:

This research aims to improve the performance of all parties involved in the Qatari projects by identifying the factors of success and revising the factors of failure dominating the construction projects in Gaza strip.

Methods:

This study was carried out through distributing ninety-three questionnaires to the contracting companies working in Qatari grant projects, the consulting offices supervising Qatari grant projects, the Ministry of Public Works and Housing, and the Qatari committee.

Results:

The study found that the most affecting factors are: the clear scope of the project, the experience of the design team, the experience of the contractor, closure of crossing points, the highly qualified technical staff, the availability of funding, the mechanism of payments, reputation of the contractor, delay in obtaining fund and sufficient time for design.

Conclusion:

The results have led to several recommendations aimed to achieve the success of construction projects in general and Qatari projects in Gaza Strip in particular. These are: the need to give sufficient time to design, sufficient consideration of all proposals, the inclusion of all parties in the design phase, studying the surrounding circumstances, identifying alternatives to materials to be used instead of others, and the need to employing a highly experienced technical team and conducting training courses. In addition, the contractor's interest in delivering a high-quality work that satisfies all parties must be taken into consideration.

Keywords: Construction industry, Gaza Strip, Qatari Grant, Success Factors, Palestinian economy, Qatar projects.

1. INTRODUCTION

The construction industry is one of the main sectors of the Palestinian economy [1]. It plays a significant role as a tool for economic growth and development of the society. Construction industry implies a complexity as it involves raw materials, machinery, finance, technology, human resources and so on. Moreover, it has a direct influence on other industries. It interacts with almost all spheres of human endeavour. Unfortunately, the fundamental complexity,

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uncertainty, and dynamism of most construction projects create difficulties even for the skilled project managers [2]. It is used to make decisions to anticipate results parameters, of risk management for disaster prevention and is used to sequence redundancy to ensure the availability of the required facilities. However, most probably the projects will end up with schedule delays, budget overruns and specifications [3].

The construction industry is constantly changing with developments in new technologies and business [4]. Therefore, construction companies must develop new applications and design new strategies to be more competitive in the industry and succeeded in their business. In recent years, there has been an increase in the studies of critical success/failure factors especially in project management area [5]. The traditional approach to success in the construction industry is to focus on the ability to plan and execute projects [6]. Conventionally, the success parameters for projects in this industry are cost, time and quality [7]. However, due to the uncertain business environments, it is crucial to focus on corporate success in order to be competitive in this environment.

The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depend on the methodology that requires sound engineering judgment. Contrary to the well of owners, contractors, and consultants many projects experience extensive delays and thereby exceed initial time and cost estimates [8]. This problem is more evident in the traditional or adversarial type of contracts in which the contract is awarded to the lowest bidder-the awarding strategy of the majority of public projects in developing countries including Gaza Strip.

Pheng (2006) [9] defined project success as the completion of a project within acceptable time, cost and quality and achieving client's satisfaction. Project success can be achieved through the good performance of indicators of the project. Chan (2002) [10] stated that a construction project is considered successful when it is completed on time, within budget, and of acceptable quality regardless of the complexity, size, and the environment within which it is constructed. However, construction performance is subject to many variables and unpredictable factors. The performance of parties, resource availability, environmental conditions, and contractual relations contribute to construction performance [11].

Gudiene *et al*., (2013) [12] defined success as the degree to which project goals and expectations are met, while Jari and Bhangale (2013) [13] defined it as meeting the required expectation of the stakeholders and achieving its intended purpose. This problem is more evident in the traditional or adversarial type of contracts in which the contract is awarded to the lowest bidder- the awarding strategy of the majority of public projects in developing countries including Gaza Strip. Kong and Loh (2012) [14] defined it as the performance with respect to budget, schedule, and quality. Shaban (2008) [15] stated that project success is the completion of a project within the acceptable time, cost and quality and achieving client's satisfaction [16].

The functions and profitability of contractors, no claims, the court proceedings and the “suitability of purpose” of the occupiers were used as success criteria of the project [17]. Meeting the stakeholder’s expectation and achieving the desired purpose is also an indicator of success. However, the concept of project success remains ambiguous in the minds of construction professionals. Success is not well defined in the modern construction projects because teams will find themselves in unique situations where the definition of a project will vary from one to another [18]. Eventually, project success is a topic that has often been discussed and rarely agreed upon [12]. Table **1** summarizes the critical factors affecting the performance of construction projects available in the latest literature. Most of the studies focused on the design stage, cost and quality factors.

Table 1. Summarized CSFs according to their reference from the previous studies.

Factor	[19]	[20]	[21]	[22]	[23]	[24]	[13]	[25]	[26]	[27]	[28]	[29]	[30]	[3]	[31]	[32]	[12]	[33]
Clear Vision And Scope	.	-		-	-	-	-					-	√			√	√	√
Experience	-	√					√	√					√				√	
Communication	-	√		√	√	-	√		-			-	√	√	√			
Sufficient Time Given To Design	√	√		√	√	√	√					√						
Teamwork							-							√	√	√		
Change Order								√			√						-	
Coordination													√					
Safety	√											√	√				√	
Project Record							√								√			
Quality	√	√				√	√		√			√	√					
Cost	√	√					√	√	√								√	

(Table 1) contd.....

Factor	[19]	[20]	[21]	[22]	[23]	[24]	[13]	[25]	[26]	[27]	[28]	[29]	[30]	[3]	[31]	[32]	[12]	[33]
Project Bidding Method												-	√					
Reputation, Performance, Honesty			√									-						
Staff Experience	-	√					√	√					√				√	
Financial Issues	-	-		-							-			-			-	
Resolve Conflicts, Troubleshooting	-	√					√					√	√	-				
Time										√			-	-				
Capability, Control Of Subcontractors			√										√		-			
Collection Of Tools And Techniques	-												√	-			√	
Size		-					-			√			√				√	-
Project Type												√					√	-
Legal Environment	-	-				√	√										√	
Environmental Factors	√	√				√	√										√	
Fluctuation						√												
Availability Of Water Networks, Electricity (Modified)																		
Material Shortage						√												
Closure Of Crossing						√												

Qatar's role in alleviating the imposed blockade on Gaza Strip was not marginal. The Qatari projects have become a reality for citizens in Gaza Strip. Large cities and roads have been established linking the northern Gaza Strip to the south, as well as reconstruction projects were launched in order to rebuild the destroyed infrastructure by the occupation during the aggression on Gaza in the summer of 2014. These projects achieved a qualitative leap to Gaza and contributed to easing the siege through the introduction of thousands of tons of building materials, and through the employment of thousands of workers, engineers and construction companies. This research will explore the present situation of Qatari construction projects performance and identify the critical success factors which affect these projects then suggest improvement procedures for the performance of all parties involved in the projects by focusing on the factors of success and overcome the factors of failure.

2. METHODOLOGY

In this research, a questionnaire survey (quantitative approach) was used to collect the factual, perceptive, and attitudes of the respondents [34, 35]. Based on the literature review and a pilot study, 62 main critical success factors which affect the success of Qatari grant construction projects in Gaza Strip were studied. The factors were categorized into 5 groups, according to the pilot study.

2.1. Research Population

Four populations were targeted in this research. The first population is Qatari committee, which includes eight engineers who supervise and follow up all the projects in the Gaza Strip. The second population is Consultant offices, which include 40 off site engineers, were distributed on four joint venture consultant offices. The zone of works was the south area. The third targeted population was the ministry of public works and housing which include nine engineers for south area. The last population was contracting companies' engineers that include 56 site's and offices engineers were distributed to seven contractors company, most of them from the south area. These categories of the staff were considered in this study to assist in identifying the critical factors affecting the Qatari-Grant construction project success and identifying the most significant ones.

2.2. Sample Size

The objective of sampling is to provide a practical means of enabling the data collection and processing components of research to be carried out whilst ensuring that the sample provides a good representation of the population.

Statistical equations were used in order to calculate the sample size for each population of contractors and subcontractors, Eq. (1) equation was used to determine the sample size of the unlimited population [34].

Sample size of the unlimited population is determined as follows in Eq. (1) [34].

$$nf = \frac{ns}{1+\frac{ns}{p}} \quad (1)$$

Where nf is the final sample size

P is the size of the population

Total population is consisted of 8 Qatari committee engineers, 40 consultant offices engineers, 10 ministries of public engineers and 56 contracting company's engineers.

$$ns = \frac{t^2 * (p)(q)}{e^2} \quad \textbf{(2)}$$

The definitions of all variable can be defined as the following:

In Eq. (2) (p) (q) is the estimate of the variance, suggest p = q = 0.5 for dichotomous variables where the population, reasonably, is expected to be divided equally.

t = t Value (*e.g.* 1.96 for 95% confidence interval). e = Maximum error of estimation (0.074).

The sample size for the population can be calculated from the previous equations as follow (Eq. 3):

$$ns = \frac{1.96^2 * (0.5)(0.5)}{0.074^2} = 175$$

n:Qatari committee engineering staff = $\frac{175}{1+\frac{175}{8}} = 8$

n:consultant offices engineers = $\frac{175}{1+\frac{175}{40}} = 33$

n: ministry of public works and housing = $\frac{175}{1+\frac{175}{100}} = 9$

n: contracting company's engineers = $\frac{175}{1+\frac{175}{56}} = 42$

The targeted sample, which was selected according to equation 1 are 8 for Qatari committee, 33 for consultant offices, 9 for the ministry of public works and housing and 42 for contracting companies. Table **2** shows total population, calculated sample size, distributed questionnaire, number of respondents and response rate.

Table 2. Sample size and response rate of the study populations.

Response Rate	No. of Respondents	Distributed questionnaire	Calculated Sample Size	Total Population	Population Category
88%	7	8	8	8	Qatari committee Eng. Staff
86%	30	35	33	40	consultant offices Eng.
100%	10	10	9	10	ministry of public works and housing Eng.
89%	46	52	42	56	contracting company's Eng.

For the first population of Qatari committee engineering staff, the selected sample represented all engineering units. For the second population of consultant offices engineers, the selected sample represented all classification categories of consultant offices at Gaza strip. For the third population of the ministry of public engineers, the selected sample represented all engineering units for four zones at Gaza strip, while the last population of contracting company, the selected sample represented all classification categories under grade one and specialist in construction building in Gaza strip (G.S.).

2.3. Research Location

The research was done in G.S and aimed the Qatari committee engineering staff, consultant offices engineers, the ministry of public housing, and contracting company's engineers distributed all over Gaza Strip.

2.4. Data Collection

The method that was used in collecting data in this research was the questionnaire. The questionnaire is easy to distribute, collect, analyse and its accuracy can be tested and validated through the means of different statistical methods and formulas (*e.g.* Cronbach's coefficient of internal consistency and reliability test).

2.5. Questionnaire Design

Based on the literature review and after interviewing experts who are interacting with the topic at different levels, everything that may help in attaining the analysis objectives were accumulated, examined and formalized to be suited to the study survey and after many phases of brainstorming, talking to, amending, and researching, a questionnaire was originated.

The questionnaire included the type of multiple-choice questions. The variety of these questions is designed first to meet up with the research objectives, also to gather all the required data that can support the conversation, results and advice in the study. The questionnaire directed to recognize the critical factors influencing the Qatari Grant construction project success, and identifying the most important ones.

The questionnaire made up of two sections to perform the purpose of the research. For every section, all related factors within earlier studies were gathered and reviewed. From then on, the factors were erased, improved, merged or picked. Also, some new factors were added in line with the results of the pilot research.

The following is a detailed description of the questionnaire content.

A. **Section 1:** Included basic information about the population of the Qatari committee engineering staff, consultant offices engineers, the ministry of public housing engineers and contracting company's engineers.
B. **Section 2:** Was about factors affecting the success of the Qatari residential building in the Gaza Strip, which is divided into five groups. The 1st group contains factors relating to design and preparation of tender documents. Factors related to the owner were the 2nd group. Factors related to the contractor were the 3rd group. Factors related to the project were the 4th group, while the external factors were the 5th group. This section aimed to achieve the first, second and third objectives that intend to Isolate and classify the factors affecting the construction project's success based on their significance and contribution. To compile a list of factors affecting the project success concerning their significance and relevance, and to clarify the misjudgement regarding some factors leading to construction project's failure at GS, many pieces of literature were used to select the factors in this study. Previous studies considered seven groups of factors, but in this study five groups of factors were finally selected after the pilot study as shown in Table **3** below:

Table 3. Factors affecting the success of the Qatari residential building in the Gaza Strip.

Factors from Literature		Selected Factors After Pilot Study
1. Factors related to the design and preparation of tender documents		
Vision, goal	Modified	The project has a clear vision and goal
Experience	Modified	Sufficient experience of the designer
Communication	Modified	Communication between the designer and the producer during the design period
Time	Modified	Sufficient time given for the designer to design and prepare project drawings
Teamwork	Merged	Teamwork and the involvement of all parties in the design phase
Change order	Modified	The avoidance of changes made during design period and attention to detail.
Coordination	Modified	Coordination of all official parties (Qatari Committee, Ministry of public housing and Consultant...)
Safety	Merged	The designer's awareness of security and safety precautions during the implementation and design phases to minimize risk
Project record	Modified	The use of previous reports on similar projects
Quality	Modified	An emphasis on quality during design
The use of latest software and design codes	Selected	The use of latest software and design codes

(Table 3) contd.....

Factors from Literature		Selected Factors After Pilot Study
Training	Merged	Training courses provided for design staff to brief them on technical modernization and encourage increased awareness of building technologies
Not relating exterior material selection to climatic conditions	Modified	Selecting of exterior finishing material not relating to climatic condition
Not considering the local climatic condition	Modified	Ignore the effect of local weather conditions at the building site for the design of the external shapes
Time	Added	The ability to accurately estimate the required time to complete the project
Cost	Modified	The ability to determine project cost with high accuracy
Client satisfaction	Added	Assurance that all parties are satisfied with the design
Communication	Modified	Communication with local and international markets to understand the use of modern products and industries
–	Added	Focus on the use of national and local products for rapid implementation
2. Factors related to the owner		
Experience	Modified	Sufficient experience with the owner and his team
Project bidding method	Modified	Reliance low price bidding
Reputation, performance	Merged	Consider the criteria of reputation and pre- performance in addition to the degree of classification of the contractor among the criteria of submission
Training	Modified	Training and the continuous technical progress of the owner's team
Coordination	Modified	Ability to coordinate and enjoy the spirit of teamwork
–	Added	Follow the designs up-to-date
–	Added	The cost of the project is provided to the taxpayer and a regular payment mechanism is established
Project contract mechanism	Added	The adoption of contracts suited to the nature of work
3. Factors related to the contractor		
experience	Modified	Sufficient experience with the contractor
Staff experience	Modified	The presence of highly qualified technical staff
Financial issues	Modified	The availability of sufficient funding for the contractor to carry out business
The contractor is aware of technical specifications	Merged	The contractor is aware of technical specifications required for business and their high-quality implementation
Resolve conflict troubleshooting	Modified	The ability to resolve conflicts
Client satisfaction	Added	The contractor cares about the satisfaction of all parties
Training	Modified	Workshops and periodic training sessions are held for staff working in the company
Time, time overrun	Modified	Commitment to implementing actions within the time required
Clear vision	Modified	A clear vision and future plans to implement the business
Coordination	Merged	Ability to control and coordinate on-site The good reputation and honesty of the contractor
Capability, control of subcontractor	Modified	The incorporation of subcontractors of reputable and excellent quality
Safety	Modified	The attention of the contractor's plans to security and safety during implementation
Collection of tools and techniques	Modified	The contractor's availability of modern equipment
	Added	The presence of contractor stores
4. Factors related to the project		
Project size	Merged	Project size and business required
–	Added	Project Location (packed or serviced)
Project type	Modified	Project Nature (Traditionnel -Récursives-Unique)
Cost	Modified	The cost of the project
5. External factors		
legal environment	Modified	The existence of binding laws in the town where the work is to be carried out
Project scope	Added	Awareness of the importance and purpose of the project
Collection of tools and techniques	Modified	The abundance of modern technological equipment
environmental factors	Modified	The consideration of various environmental, social and cultural factors
–	Added	Decreasing the project's susceptibility to instances of instability
Fluctuations	Merged	Awareness of the economic fluctuations and declines of the country
–	Added	Availability of water networks, electricity and sewage near the site
Material shortage	Modified	The owner's ability to coordinate the entry of external materials for the contractor
Closure of crossings	Modified	Continued opening of crossing points
–	Added	Non-monopolization of materials.
–	Added	Bank policies adopted within the country

(Table 3) contd.....

Factors from Literature		Selected Factors After Pilot Study
–	Added	Ease of importing and coordination of materials
–	Added	Ease of obtaining financial dues from donors
Fluctuation	Modified	Clear expectations of currencies and materials
–	Added	Procedures and factors of decision-making within the Qatari committee
–	Added	The unification of the bidding price for all contractors
–	Added	Requirement of significant administrative expenses
–	Added	Communication with governmental institutions and knowledge of the conditions and requirements

Experts were asked to examine the questionnaire and confirm the validity of the questionnaire issues and its own relevance to the study objective and present their advice. Generally, they decided that the questionnaire will be reliable to attain the goals of the analysis. Important remark and ideas were accumulated and examined carefully. All of the suggested remarks and improvements were discussed with the study's supervisor before considering them.

The questionnaire was provided with a cover letter explaining the purpose of the study, the way of responding, the aim of the research and the security of information in order to encourage a high response.

Cronbach's coefficient of internal consistency and reliability test was also used. The Relative Importance Index (RII) technique has been widely used in construction research for measuring attitudes with respect to surveyed variables. Several researchers [36 - 42] used the RII in their analysis. The respondents were asked to rate the identified interface problems on a five-point Likert scale (1, for the strongly disagree to and 5, for the strongly agree). Based on the survey response, an RII was tabulated using the following equation (Eq. 4):

$$RII = \frac{\sum w}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n}{5\ N} \quad \textbf{(4)}$$

Where W is the weighting given to each factor by the respondent, ranging from 1 to 5, (n1 = number of respondents that strongly disagree, n2 = number of respondents that disagree, n3 = number of respondents that are neutral, n4 = number of respondents that agree, n5 = number of respondents for strongly agree). “A” is the highest weight (i.e 5 in the study) and N is the total number of samples. The relative importance index ranges from 0 to 1.

3. RESULTS AND DISCUSSION

This part shows the results of the 93 respondents of the questionnaire; (contractors, consultants, the ministry of housing, Qatar committee). The questionnaire was divided into five groups as follow:

1- Factors related to design and preparation of tender documents.
2- Factors related to the owner.
3- Factors related to the contractor.
4- Factors related to the project.
5- External factors.

3.1. Factors Related to the Design and Preparation of Tender Documents

Results from Table **4** indicated that CSF **(The project has a clear vision and goal)** was the highest loading factor with a mean equal “4.76” and relative importance index ” 93.48%” and P-value equals 0.000 which is smaller than the level of significance α= 0.05. It can be concluded that the respondents agreed to this factor as a very important factor. This is due to the difficulty to build a project without knowing its goal and what it will be used for and view of perspectives. That is related to a variety of elements including technical, financial, educational and social issues and it must be a thorough understanding of the scope of the project to avoid disputes and conflicts, which is possible to occur if the scope is not clearly defined. This result is supported by [12], in which, they stated that success as the degree to which project goals and expectations are met, also it’s not far from the result of [32], they ranked, that project scope and objectives as the second loaded factor. In addition, it is matched to [43] in which, they ranked scope of a project as the third factor affecting the project success.

Table 4. Means and test values for "Factors related to design and preparation of tender documents".

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
The project has a clear vision and goal.	4.67	0.560	93.48	28.227	0.000	1
Sufficient experience of the designer.	4.60	0.616	91.91	24.418	0.000	2
Sufficient time given for the designer to design and prepare project drawings.	4.29	0.678	85.84	17.990	0.000	3
Teamwork and the involvement of all parties in the design phase.	4.19	0.737	83.82	15.253	0.000	4
An emphasis on quality during design.	4.10	0.640	82.02	16.221	0.000	5
The ability to accurately estimate the required time to complete the project.	4.09	0.778	81.80	13.214	0.000	6
Coordination of all official parties; (Qatari Committee, Ministry of Public Housing and Consultant...).	4.01	0.859	80.22	11.101	0.000	7
The ability to determine project cost with high accuracy.	4.00	0.769	80.00	12.273	0.000	8
The designer's awareness of security and safety precautions during the implementation and design phases to minimize risk.	3.97	0.982	79.33	9.281	0.000	9
The avoidance of changes made during design period and attention to detail.	3.93	0.876	78.65	10.038	0.000	10
Communication between the designer and the producer during the design period.	3.91	1.018	78.20	8.430	0.000	11
Communication with local and international markets to understand the use of modern products and industries.	3.90	0.892	77.98	9.502	0.000	12
Assurance that all parties are satisfied with the design.	3.78	0.889	75.51	8.230	0.000	13
Training courses provided for design staff to brief them on technical modernization and encourage increased awareness of building technologies.	3.69	0.806	73.71	8.021	0.000	14
Focus on the use of national and local products for rapid implementation.	3.64	0.869	72.81	6.951	0.000	15
The use of latest software and design codes.	3.62	0.873	72.36	6.681	0.000	16
The use of previous reports on similar projects.	3.37	0.981	67.42	3.564	0.001	17
Total	3.99	0.384	79.71	24.190	0.000	

The second-high factor loaded CSF in this component was **(Sufficient experience of the designer)** with a mean equal "4.6", with relative importance index "91.91%", and P-value 0 .000, which is smaller than the level of significance α= 0.05. This is clear since an experienced designer is working on a high level of responsibility to gain valuable design to meet design goals and to gain satisfaction from all parties; and this is matched to [44]. Also, it is close to [25], who concluded the importance of the experience effect on quality and the output of the project. In addition [45], ranked the designer experience as the fourth loaded factor. Besides, Gudiene *et al.*, (2013) [12] concluded that experience is the most important factor.

The third high factor loaded CSF in this component was **(Sufficient time given for the designer to design and prepare project drawings)** with a mean 4.29 and relative importance index "85.84%", and P-value 0.000, which is smaller than the level of significance α= 0.05. This is because no one can deny the great importance of time in implementing projects. Giving the designer enough time to design gives the opportunity to get a more precise design, avoids change orders, facilitates the best design and cost estimation of the project with high accuracy.

Finally, it is included that the lowest important factor in this survey for this group is **(The use of previous reports on similar projects)** with a mean 3.37, with relative importance index "67.42%", and P-value equals 0.000 < 0.05. This is due to the conditions experienced by the sector of contracting in Gaza strip, such that the closure of the crossings and fluctuation in prices at large differences, which makes it difficult to rely on the price of the previous project or the time and productivity in which the previous project was implemented in the presence of significant differences, also because of the reasons that may arise and lead to the suspension of the project.

Generally, the results for all factors of the first section (Factors relating to design and preparation of tender documents) show that the average mean equal 3.99, relative importance index equals to 79.71% > "60.0%" and value of t-test equals 24.190 > critical value = 1.99, and the p-value equals 0.000 < 0.05. The null hypothesis H_0 is rejected, as a result the null hypothesis is rejected and the alternative hypothesis is accepted. That means there is a relationship between factors related to design and preparation of tender documents and the success of construction projects at significant level $\alpha \leq 0.05$.

3.2. Factors Related to the Owner

Results from Table **5** indicated that CSF **(The cost of the project is provided to the donor and a regular payment mechanism is established)** was the highest loading factor with a mean 4.33 and relative importance index

"86.52%", and P-value equals 0.000 which is smaller than the level of significance α= 0.05. The availability of funding and the regularity of payment affects greatly on project success since the delay in payment leads to delay in work and sometimes leads to interruption of work. In addition, when the institution pays for the contractor regularly, the Contractor pay for sub-contractors and workers on a regular basis and work is proceeding as planned without delay and vice versa in the case of late payments.

Table 5. Means and test values for "Factors related to the owner".

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
The cost of the project is provided to the donor and a regular payment mechanism is established.	4.33	0.750	86.52	16.669	0.000	1
Sufficient experience with the owner and his crew.	4.21	0.910	84.27	12.574	0.000	2
Consider the criteria of reputation and pre- performance in addition to the degree of classification of the contractor among the criteria of submission.	4.20	0.756	84.04	14.993	0.000	3
Follow the designs up-to-date.	4.03	0.761	80.67	12.823	0.000	4
Ability to coordinate and enjoy the spirit of teamwork.	4.02	0.797	80.45	12.097	0.000	5
Reliance low price bidding.	3.97	0.665	79.33	13.711	0.000	6
The adoption of contracts suited to the nature of work.	3.84	0.987	76.85	8.051	0.000	7
Training and the continuous technical progress of the owner's team.	2.94	1.317	58.88	-0.402	0.688	8
Total	3.94	0.434	78.88	20.524	0.000	

The second-high factor loaded CSF in this component was **(Sufficient experience with the owner and his crew)** with a mean 4.21 and relative importance index "88.76%", and P-value equal 0.000 which is smaller than the level of significance α= 0.05. It can be concluded that the respondents agreed to this factor as a very important factor. This is due to the impact of owners' experience on the quality and performance of work. This result is complied with [25], in which they concluded that the impact of owner experience on the performance of the project is very strong especially on project cost, client satisfaction and on project duration. In addition, this is matched to the result of [12], who ranked experience of the owner team as the first loaded factor.

The third-high factor loaded in this component was **(Consider the criteria of reputation and pre-performance in addition to the degree of classification of the contractor among the criteria of submission)** with a mean of 4.2 and a relative importance index of "84.04%", and P-value equals to 0.000 which is smaller than the level of significance α= 0.05. This is due to the importance of reputation, performance and degree of classification on the quality and the implementation of the work. This result complies with the result of [46], they concluded that reputation is one of the most important factors that lead to company's success. Besides, Mbugua *et al*., (1999) [33], concluded that performance is one of the four most important critical success factors.

The lowest factor according to relative importance index was **(Training and the continuous technical progress of the owner's team)** with a mean of 2.94 and a relative importance index of "58.88%", and P-value equal 0.000 which is smaller than the level of significance α= 0.05. This is due to the fact that the Qatari projects that were implemented in Gaza Strip are traditional projects. In addition, the closure of the crossings and the siege imposed on Gaza Strip reduces the opportunity to travel and training abroad to train and gain experience. This result disagreement with [24], in which they listed that training is an important factor for the effect of it on project success in terms of quality.

For general the results for all factors of the second section (Factors related to the owner) show that the average mean equal 3.94, relative importance Index equal 78.88% > "60.0%" the value of t-test equal 20.524 > critical value = 1.99 and the p-value equal 0.000 < 0.05. The null hypothesis H0 is rejected, as a result the null hypothesis is rejected and the alternative hypothesis is accepted. That means there is a relationship between factors related to the owner and the success of construction projects at significant level $\alpha \leq 0.05$.

3.3. Factors Related to the Contractor

Results from Table **6** indicated that **(sufficient experience with the contractor)** was the highest factor with a mean of 4.58 and a relative importance index of "91.69%", and P-value equals to 0.000 which is smaller than the significance level $\alpha < 0.05$. The contractor's experience in carrying out the work and his prior performance in the execution of the works in similar projects greatly affects on the success of the projects and this is matched to [44], and it's close to [25], who concluded the importance of the experience affecting quality and the output of the project. Also, Saqib *et al* ., (2008) [45] listed in their research that designer experience has the fourth loaded factor.

Table 6. Means and test values for "Factors related to the contractor".

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
Sufficient experience with the contractor.	4.58	0.496	91.69	30.155	0.000	1
The presence of highly qualified technical staff.	4.44	0.722	88.76	18.785	0.000	2
The availability of sufficient funding for the contractor to carry out business.	4.37	0.774	87.42	16.701	0.000	3
The good reputation and honesty of the contractor.	4.31	0.684	86.29	18.127	0.000	4
The contractor is aware of technical specifications required for business and their high-quality implementation.	4.29	0.815	85.84	14.963	0.000	5
The attention of the contractor's plans to security and safety during implementation.	4.21	0.959	84.27	11.937	0.000	6
The incorporation of subcontractors of reputable and excellent quality.	4.16	0.705	83.15	15.476	0.000	7
A clear vision and future plans to implement the business.	4.15	0.806	82.92	13.422	0.000	8
Commitment to implementing actions within the time required.	4.11	0.859	82.25	12.222	0.000	9
Ability to control and coordinate on site.	4.01	0.746	80.22	12.786	0.000	10
The ability to resolve conflicts.	3.91	0.748	78.20	11.473	0.000	11
The contractor's availability of modern equipment.	3.89	0.790	77.75	10.604	0.000	12
The contractor cares about the satisfaction with all parties.	3.69	0.847	73.71	7.630	0.000	13
The presence of contractor stores.	3.64	0.932	72.81	6.480	0.000	14
Workshops and periodic training sessions are held for staff working in the company.	3.52	0.893	70.34	5.458	0.000	15
Total	4.09	0.435	81.71	23.535	0.000	–

The second-high factor loaded in this component was **(The presence of highly qualified technical staff)** with a mean of 4.4 and a relative importance index of "88.76%", and P-value equals to 0.000, which is smaller than the level of significance α= 0.05. The existence of strong and efficient management and the presence of a technical staff with sufficient experience and knowledge of the site facilitates the work. This result is matches the work of Mortaheb *et al*., [25], who ranked engineers experience as one of the most important factors that has a strong impact on project's cost. Also, Sanvido *et al*., (1992) [44] gave the existence of qualified staff a high rank.

The third-high factor loaded in this component was **(The availability of sufficient funding for the contractor to carry out business)** with a relative importance index of "87.42%", and a P-value equals to 0.000 which is smaller than the level of significance α= 0.05. The presence of sufficient funding for contractor affects significantly the success of projects, where the availability of fund is very necessary for the payment of labors, subcontractors, administrative expenses and all requirements of site and any delay in payment will affect negatively on work progress and may lead to stopping the work.

The lowest factor according to the relative importance index is **(Workshops and Periodic Training Sessions are held for staff working in the company)** with a mean equal to 3.52 and a relative importance index of "70.34%", and a P-value equals to 0.000, which is smaller than the level of significance α= 0.05. This is due to the fact that the Qatari projects in which implemented in Gaza Strip are traditional projects. In addition, the closure of the crossings and the siege imposed on Gaza Strip reduces the opportunity to travel and training abroad to gain experience. This result disagreement with [24] in which they listed that training affects the project success in terms of quality.

In general, the results for all factors of the third section (Factors related to the contractor) show that the average means equals 4.09, relative importance index equals 81.71% > "60.0%" the value of t test equals to 23.535 > critical value = 1.99 and the p-value equals 0.000 < 0.05. The null hypothesis H_0 was rejected, referring to the relationship between factors related to the contractor and the success of construction projects at significant level $\alpha \leq 0.05$

3.4. Factors Related to the Project

Results from Table **7** indicated that **(Project size and business required)** was the highest factor with a mean of 4.17, and a relative importance index of "83.37%", and a P-value equals to 0.000 which is smaller than the level of significance α= 0.05. The higher size of the project the greater experience of the contractor, gaining good reputation, better rating, more crews and relations with subcontractors and finally more interest. This is matched to [27] in which they said, that the most important factor depends on procurement criteria, is project size. In addition, Gudiene *et al*., (2013) [12] concluded that success factors are varying and depending on project size, scope and complexity and they

ranked project size factor in the top ten factor in their study.

Table 7. Means and test values for "Factors related to the project".

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
Project size and business required.	4.17	0.711	83.37	15.507	0.000	1
Project Nature (Traditionnel-Récursive-Unique).	3.99	0.715	79.78	13.046	0.000	2
The cost of the project.	3.74	0.846	74.83	8.265	0.000	3
Type of project (new construction, restoration and maintenance).	3.69	0.684	73.71	9.451	0.000	4
Project Location (packed or serviced).	3.56	0.976	71.24	5.428	0.000	5
Total	3.83	0.498	76.58	15.716	0.000	–

The second-high factor loaded in this component was **(Project Nature (Traditional-Recursive-Unique))** with a mean of 3.99, and a relative importance index of "79.78%", and P-value equals to 0.000 which is smaller than the level of significance α= 0.05. If the contractor does not have experience in implementing similar projects, he will gain experience from this project and improve his classification and add new staff with expertise in these areas, traditional projects are easy to implement where it is easy for subcontractors to perform their tasks in duplicate. On the contrary, if the projects are non-recurrent and unique, they need more time to implement. It is difficult, but the nature of the Qatari projects was almost traditional projects, so it was easy in the implementation, this result is matched to [47], they ranked project complexity as the highest factor.

The third-high factor loaded in this component was **(The cost of the project)** with a mean equal "3.74" and relative importance index "74.83%", and P-value equal 0.000 which is smaller than the level of significance α= 0.05. The higher value of the project the greater profit margin and the greater volume of work and better contractor's classification.

The lowest factor according to relative importance index is **(Project Location (packed or serviced))** with relative importance index "73.71%", and P-value equal 0.000, which is smaller than the level of significance α= 0.05. The presence of the Qatari projects in suitable places with services has had an impact on their success, but if they are in hot zones, the work will be delayed.

In general, the results for all factors of the fourth section (Factors related to the project) show that the average mean equals 3.83. Relative importance Index equals 76.58% > "60.0%" the value of t-test equals 15.716> critical value = 1.99 and the p-value equal 0.000 < 0.05. The null hypothesis H_0 is rejected, as a result the null hypothesis is rejected and the alternative hypothesis is accepted. That means there is a relationship between factors related to the project and the success of construction projects at significant level $\alpha \leq 0.05$.

3.5. External Factors

Results from Table **8** indicated that **(continued opening of the crossing points)** was the highest factor with relative importance index of 91.46%, and a P-value equals to 0.000, which is smaller than the level of significance α= 0.05. It can be concluded that the respondents agreed to this factor as a very important factor because Gaza Strip is suffering from a severe siege imposed from twelve years ago; and this caused heavy losses for all sectors in Gaza Strip. This has affected the Qatari projects, this blockade of crossing points has great influence because of the frequent closure of the crossings that lasted entry construction materials, which led to the high prices, because of monopoly. It led to large losses to contractors and delayed projects. This result is matched to the result of Enshassi *et al*., (2009) [24] who concluded that the closures that lead to material shortage are the most important factors since these directly affect the project performance and if resources are not available as planned through project duration the project will suffer from the problem of time performance.

Table 8. Means and test values for "External factors".

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
Continued opening of the crossing points.	4.57	0.638	91.46	23.275	0.000	1
Ease in obtaining financial dues from donors.	4.30	0.714	86.07	17.231	0.000	2
The owner's ability to coordinate the entry of external materials for the contractor.	4.28	0.783	85.62	15.429	0.000	3
Non-monopolization of materials.	4.25	0.802	84.94	14.676	0.000	4

(Table 8) contd.....

Factor	Mean	Std. Deviation	%of Relative Importance Index	t-value	P-value	Rank
Ease of importing and of materials	4.25	0.758	84.94	15.522	0.000	4
clear expectations of currencies and materials.	3.92	0.842	78.43	10.318	0.000	5
Decreasing the project's susceptibility to instances of instability.	3.83	0.856	76.63	9.164	0.000	6
The abundance of modern technological equipment	3.82	0.847	76.40	9.136	0.000	7
The existence of binding laws in the town where the work is to be carried out.	3.81	0.890	76.18	8.572	0.000	8
Availability of water networks, electricity and sewage near the site.	3.80	0.855	75.96	8.800	0.000	9
Procedures and factors of decision-making within the Qatari committee.	3.78	0.926	75.51	7.896	0.000	10
Communication with governmental institutions and knowledge of the conditions and requirements.	3.75	0.957	75.06	7.423	0.000	11
Awareness of the economic fluctuations and declines of the country.	3.74	0.747	74.83	9.370	0.000	12
Ease of bank policies adopted within the country.	3.60	0.888	71.91	6.324	0.000	13
Requirement of significant administrative expenses.	3.54	1.023	70.79	4.973	0.000	14
The unification of the bidding price for all contractors.	3.52	0.931	70.34	5.239	0.000	15
Awareness of the importance and purpose of the project.	3.51	0.990	70.11	4.818	0.000	16
The consideration of various environmental, social and cultural factors.	3.36	1.090	67.19	3.113	0.003	17
Total	3.87	0.474	77.35	17.268	0.000	

The second-high factor loaded in this component was **(Ease in obtaining financial dues from donors)** with relative importance index of 86.07%, and a P-value equals to 0.000 which is smaller than the level of significance α= 0.05. It is concluded that respondents agreed to this factor as a very important factor for the great importance in influencing the success of the projects where delayed payments for the contractor has significant impact on the conduct of business because the delay of payments lead to delay payments of sub-contractors and this lead to stop their work sometimes and thus delay projects. In addition, delay payments sometimes lead to the recourse of the contractor for loans from banks, which cost excess cost of interest.

The third-high factor loaded in this component was **(The owner's ability to coordinate the entry of external materials for the contractor)** with relative importance index of 85.62%, and a P-value equals to 0.000 which is smaller than the level of significance α= 0.05. One of the most important reasons that affected the progress of Qatari projects is the coordination of the materials, as the ability to coordinate the Qatar Committee for Materials through Rafah crossing led to the rapid completion of projects.

The lowest factor according to relative importance index is **(The consideration of various environmental, social and cultural factors)** with relative importance index of 70.34%, and a P-value equals to 0.000, which is smaller than the level of significance α= 0.05. This result is due to the fact that Gaza Strip does not have floods, earthquakes or volcanoes that hampering work.

The results for all factors of the fifth section (External factors) show that the average means equal 3.87, relative importance index equal 77.35% > "60.0%", the value of t test equal 17.268> critical value = 1.99 and the p-value equal 0.000< 0.05. The null hypothesis H_0 was rejected, as a result the null hypothesis is rejected and the alternative hypothesis is accepted. That means there is a relationship between external factors and the success of construction projects at significant level $\alpha \leq 0.05$.

CONCLUSION

The main finding of the research per objectives based on the opinion of the respondents as follows:

The study found that the most important groups that affect the success of Qatari Project are: factors related to the contractor, factors relating to design and preparation of tender documents, factors related to the owner, external factors and factors related to the project.

The most important factors that affect the success of Qatari Project according to the respondents are as follows: clear goal of the project, sufficient experience of the designer, sufficient experience of the contractor, closure of the crossing points, the presence of highly qualified technical staff, the availability of sufficient funding for the contractor to carry out business, the cost of the project is provided to the taxpayer and regular payment mechanism is established, the good reputation and honesty of the contractor, and delay in obtaining finance from donors, sufficient time given for the designer to design and prepare project drawings.

The study found that the most important factors that prevent to access to a successful project are: short time for the design period, no clear vision of the project, unavailability of competent staff, relying on low price and negligence the criteria of reputation and previous performance of contractor in bidding stage, complicated payment method, contractor financial problems and inability to coordinate for materials.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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