The International Journal of Construction Management (2012) Vol. 12 No.2, 65-79

ANALYSIS OF CONTRACTORS PERFORMANCE IN GAZA STRIP CONSTRUCTION PROJECTS

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Abstract
The construction industry has acquired a poor reputation in performance issues. Project success is dependent on, amongst other factors, the performance of the contractors. The aim of this paper is to identify and evaluate the main factors affecting the performance of construction projects in the Gaza strip. Sixty questionnaires were randomly distributed to contractors and 46 questionnaires were received (77% respondent rate). Sixty three factors were identified and categorized into ten groups. The level of importance of these factors were measured and ranked by their importance index from the contractors' perspectives. The most important factors were average delay arising from closures and materials shortage, availability of resources as planned through project duration, leadership skills of the project manager, escalation of material prices, availability of personnel with high experience and qualification and quality of equipments and raw materials in project. It is recommended that construction organizations have a clear mission and vision to formulate, implement and evaluate their performance.

Keywords
Performance, contractors, construction and management

INTRODUCTION

The construction industry has acquired a poor reputation for being unable to deliver projects on time, within budget, and with the required quality. Project success is dependent on, amongst other factors, the performance of the contractors. The construction industry is complex by its nature because it contains a large number of stakeholders as clients, contractors, consultants, shareholders and regulators. It has been suggested that clients should monitor and control contractors' performance on regular basis (Birrell, 1988). The performance of the construction industry is also affected by national economies.

In 2006, many projects in Gaza finished with poor performance due to a variety of factors such as obstacles by client, non-availability of materials, road closures, amendments to design and drawings, additional work, decision delays, handing over delays, variation orders, amendments to the Bill of Quantity (BOQ) and delay in receiving drawings (UNRWA, 2006). In addition, political, economic and cultural issues contributed to the failure of projects performance in the Gaza strip. (UNRWA 2006, 2007).

Key Performance Indicators (KPI) can be used for benchmarking purposes, and can be a key component of any organization's move towards achieving best practices. The objectives of this paper are to identify the factors affecting the performance of construction projects, to determine contractors' perceptions towards the relative importance of the key performance indicators in Gaza Strip construction projects, to identify the most significant key performance indicators of construction projects in the Gaza strip and to formulate recommendations to improve performance of construction projects in the Gaza Strip.

LITERATURE REVIEW

Project performance can be measured and evaluated using several performance indicators that could be related to various dimensions such as time, cost, quality, client satisfaction, client changes, business performance, and health and safety (Cheung et al. 2004; DETR, 2000). Time, cost and quality are, however, the three predominant performance evaluation dimensions. Cost and time performance has been identified as a pervasive concern in the construction industry worldwide (Okuwoga, 1998). Dissanayaka and Kumaraswamy (1999) used different representation values to evaluate time and cost performance such as project characteristics, procurement system, project team performance, client representation's characteristics, contractor characteristics, design team characteristics and external condition.

Brown and Adams (2000) studied a new approach to the measurement of the effect of Building Project Management (BPM) on time, cost and quality outputs using 15 `cases' derived from UK data. The evaluation undertaken demonstrates that BPM as it is presently implemented in the UK fails to perform as expected in relation to the three predominant performance evaluation criteria of time, cost and quality. Reichelt and Lyneis (1999) found that project schedule and budget performance are controlled by the dynamic feedback process. Those processes include the rework cycle and feedback loops which create changes in productivity and quality, and effects between work phases (Kuprenas, 2003).

Cho et al. (2009) analyzed the overall relationship between project performance and project characteristics. The study deduced the overall causal relationship and the degree of influence between 17 project characteristics and five project performance indices. Tabassi and Bakar (2008) used a combination of literature review and a questionnaire survey to explore the execution of construction workers training and motivation methods in human resources management practices by the survey respondents' companies and their effects on the companies' performances. They exposed some barriers in the training and motivation of the construction workers and provide solutions for the government and companies in Iran.

Yeung et al. (2009) conducted comprehensive and systematic research studies focusing on developing a comprehensive, objective, reliable and practical performance evaluation model for partnering projects in construction. They stated that a Partnering Performance Index (PPI), which is composed of seven weighted Key Performance Indicators (KPIs), has been developed to measure, monitor, improve, and benchmark the partnering performance of construction projects in Hong Kong. The purpose of KPI is to identify and compare the existence of particular patterns between different projects and enterprises (Karim and Marosszeky, 1999). Ugwu and Haupt (2007) developed and validated key performance indicators (KPI) for sustainability appraisal using South Africa as a case study. It uses four main levels in a questionnaire to identify the relative importance of KPI. The main indicators were economy, environment, society, resource utilization, health and safety and project management and administration.

Wegelius-Lehtonen (2001) proposed a new framework for measuring construction logistics by using two-dimensions in order to improve productivity. Samson and Lema (2002) noted that the characteristics of emerging performance measurement indicators need analysis of both the organization and environment such as nature of work, global competition, quality awards, organizational role, external demands and power of information technology. Chan and Kumaraswamy (2002) proposed specific technological and managerial strategies to increase speed of construction. They posited that effective communication, fast information transfer between project participants, better selection and training of managers, and detailed construction programs with advanced available software can help to accelerate the performance. Stewart and Mohamed (2003) emphasized the importance of a structured evaluation framework to evaluate the value IT adds to the process of project information management. Low and Chuan (2006) stated that project performance can be determined by two common sets of indicators. The first set is related to the owners, users, stakeholders and the general public who look at project performance from the macro viewpoint. The second is related to the developers, non-operators and contractors who look at project performance from the micro viewpoint. Cavalieri et al. (2007) provided a comprehensive view of benchmarking and performance measurement service for the evaluation and comparison of scheduling techniques.

Cheung et al. (2004) identified seven main key indicators for performance as time, cost, quality, client satisfaction, client changes, business performance, and safety and health. Chan and Chan (2004) observed that accurate construction planning is a key determinant in ensuring the delivery of a project on schedule and within budget. They noted that there is an increasing global concern about benchmarking best practice measures of construction time performance (CTP) for use by clients, consultants and contractors in the construction industry. Luu et al. (2008) presented how benchmarking approach can be applied to evaluate and improve the construction project management. A conceptual research framework was generally developed to perform a benchmarking study of the project management performance (PMP) from the contractor’s viewpoint. Kim et al. (2009) developed a structural equation model (SEM) to predict the project success of uncertain international construction projects. They stated that construction projects are frequently exposed to serious external uncertainties such as political, economical, social, and cultural risks.

Navon (2005) stated that a number of research efforts to fully automate project performance control of various project performance indicators have been carried out in recent years. Iyer and Jha (2005) found that the factors affecting cost performance are project manager's competence, top management support, project manager's coordinating and leadership skill, monitoring and feedback by the participants, decision making, coordination among project participants, owners' competence, social condition, economical condition and climatic condition. Coordination among project participants was the most influential factor on cost performance of projects. Love et al. (2005) examined project time-cost performance relationships by using project scope factors for 161 construction projects that were completed in various Australian States. They found that gross floor area and the number of floors in a building are key determinants of time performance in projects. They added that cost is a poor predictor of time performance.

Faridid and El-Sayeh (2006) reported that shortage of skilled manpower, poor supervision and poor site management, unsuitable leadership, and shortage and breakdown of equipment among others contribute to construction delays in the United Arab Emirates. Hanson et al. (2003) examined causes of client dissatisfaction in the South African building industry and found that conflict, poor workmanship and incompetence of contractors to be among the factors which negatively impact project performance. Mbachu and Nkando (2007) established that quality and attitude to service is one of the key factors constraining successful project delivery in South Africa. The performance of contractors in Zambia is apparently below expectation; it is not uncommon to learn of local projects that have not been completed or significantly delayed. This poor performance of many local contractors has huge implications in terms of their competitiveness (Zulu and Chileshe 2008). In Palestine, many local construction projects report poor performance due to many evidential project-specific causes such as unavailability of materials, excessive amendments of design and drawings, poor coordination among participants, ineffective monitoring and feedback, and lack of project leadership skills apart from the ever-important macro-level political and economic factors (UNRWA, 2006 & 2007).

METHODOLOGY

A questionnaire survey was used to study the attitude of contractors towards the factors affecting the performance of construction projects in the Gaza Strip. Sixty-three factors were considered in this study and were listed under ten groups based on literature review and local experts. These groups give a comprehensive summary of the main KPI. The main groups considered were time, quality, productivity, client satisfaction, regulatory and community satisfaction, people, health and safety, innovation and learning, and environment. Sixty questionnaires were randomly distributed to contractors. Forty-six questionnaires were received (77% respondent rate). The respondents were asked to indicate, based on their local experience, the level of importance of each one of the identified 63 factors of performance on a five-point Likert scale according to not important, slightly, moderately, very, and extremely important. The respondents were experienced construction project managers, site engineers/office engineers, and organizations' managers (with average experience of 25 years in the construction industry).

The relative importance index (RII) technique was used in this study to determine contractors' perceptions of the relative importance of the various KPI. This simple but effective technique has been widely used in construction research for measuring attitude with respect to surveyed factors (Shash 1993; Naoum 2007; Abdul-Hadi 1999). The relative importance index was computed as follows (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007):

$$RII = \frac{\sum W}{A \times N}$$

Where:

- W is the weight given to each factor by the respondents and ranges from 1 to 5
- A = the highest weight = 5
- N = the total number of respondents

The target group in this study was contractors. According to the Palestinian Contractors Union in Gaza strip, there were 120 contractor organizations. Kish (1965) showed that the sample size can be calculated as following equation for 94% confidence level:

$$n = n' / [1 + (n'/N)]$$

Where:
- N = total number of population
- n = sample size from finite population
- n' = sample size from infinite population = S^2/V^2; where S^2 is the variance of the population elements and V is a standard error of sampling population. (Usually S = 0.5 and V = 0.06)

- So, for 120 contractor organizations:
- $n = n' / [1+(n'/N)]$
- $n' = S^2/V^2 = (0.5)^2/(0.06)^2 = 69.44$
- N = 120
- $n = 69.44 / [1+(69.44 / 120)] = 46$

This means that the questionnaire should be distributed to 46 contractor organizations in order to achieve 94% confidence level.

The questionnaire was validated using criterion-related reliability test which measure the correlation coefficient between the factors affecting the performance of construction projects in one field and the whole field, and structure validity test (Spearman test). The first test was the Criterion-related validity test (Spearman test) which measures the correlation coefficient between each paragraph in one field and the whole field. The second test was the structure validity test (Spearman test) that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one filed and all the fields of the questionnaire that have the same level of similar scale.

To test the criterion-related validity test, the correlation coefficient for each item of the group factors and the total of the field was achieved. The p-values (Sig.) were less than 0.01 for all results, so the correlation coefficients of each field were significant at $\alpha = 0.01$, so it can be said that the paragraphs of each field were consistent and valid to measure what it was set for.

The field structure validity was assessed by calculating the correlation coefficients of each field of the questionnaire and the whole of questionnaire. The results of the test indicated that the p-values (Sig.) were less than 0.01, so the correlation coefficients of all the fields were significant at $\alpha = 0.01$, so it can be said that the fields were valid to be measured for what it was set to achieve the main aim of the study .

Chronbach's alpha is used here to measure the reliability of the questionnaire between each field. The normal range of Chronbach's coefficient alpha value between 0.0 and + 1.0. The closer the Alpha is to 1, the greater the internal consistency of items in the instrument being assumed. The formula that determines alpha is fairly simple and makes use of the items (variables), k, in the scale and the average of the inter-item correlations, r:

$$\alpha = \frac{k\,r}{1+(k-1)r}$$

As the number of items (variables) in the scale (k) increases the value α becomes large. Also, if the intercorrelation between items is large, the corresponding α will also be large. Since the alpha value is inflated by a large number of variables then there is no set interpretation as to what is an acceptable alpha value. A rule of thumb that applies to must situations is:

$0.9 \le \alpha \le 1.0$	Excellent
$0.8 \le \alpha < 0.9$	Good
$0.7 \le \alpha < 0.8$	Acceptable
$0.6 \le \alpha < 0.7$	Questionable
$0.5 \le \alpha < 0.6$	Poor
$0.0 \le \alpha < 0.5$	Unacceptable

The Chronbach's coefficient alpha was calculated for each field 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 obtained values of Chronbach's Alpha were in the range from 0.707 and 0.879. This range is considered high; the result ensured the reliability of each field of the questionnaire. Chronbach's Alpha equaled 0.962 for the entire questionnaire which indicates an excellent reliability of the entire questionnaire. Thereby, it can be said that the questionnaire was valid, reliable, and ready for distribution for the population sample.

RESULTS AND DISCUSSION

Table 1 summarizes the computed RIIs and their ranks as perceived by contractors.

Table 1: Summary of RII and Ranks for Factors Affecting The Performance of Construction Projects

Performance Factors	RII	Rank within Group	Overall Rank
(1) Cost factors			
Material and equipment cost	0.813	5	16
Project labor cost	0.739	8	37
Project overtime cost	0.617	14	55
Motivation cost	0.609	15	58
Cost of rework	0.587	16	62
Cost of variation orders	0.662	11	46
Waste rate of materials	0.639	13	51
Regular project budget update	0.743	7	35
Cost control system	0.765	6	32
Escalation of material prices	0.889	1	4
Differentiation of currency prices	0.874	2	5
(2) Time factors			
Site preparation time	0.596	9	61
Planned time for project construction	0.765	5	30
Percentage of instructions delivered late	0.774	4	29
Time needed to implement variation orders	0.693	7	43
Time needed to rectify defects	0.639	8	50
Average delay in claim approval	0.765	5	30
Average delay in payment from owner to contractor	0.839	3	11
Availability of resources as planned through project duration	0.904	2	3
Average delay because of closures and materials shortage	0.943	1	1
(3) Quality factors			
Conformance to specification	0.822	3	13
Availability of personnel with high experience and qualification	0.865	1	6
Quality of equipment and raw materials in project	0.861	2	7
Participation of managerial levels in decision making	0.800	4	21
Quality assessment system in organization	0.743	5	34
Quality training/meeting	0.674	6	44
(4) Productivity factors			
Project complexity	0.761	3	33
Number of new projects / year	0.630	5	53
Management-labor relationship	0.796	2	22
Absenteeism rate throughout project	0.743	4	36
Sequencing of work according to schedule	0.804	1	20
(5) Client Satisfaction factors			
Information coordination between owner and project parties	0.809	3	19
Leadership skills of project manager	0.904	1	2
Speed and reliability of service to owner	0.822	2	13
Number of disputes between owner and project parties	0.720	4	40
Number of reworks	0.627	5	54
(6) Regulatory and community satisfaction factors			
Cost of compliance to regulatory requirements	0.604	4	59
Number of non compliance to regulation	0.614	3	56
Quality and availability of regulatory documentation	0.653	2	48
Neighbors and site conditions problems	0.707	1	41

Table 1: Summary of RII and Ranks for Factors Affecting The Performance of Construction Projects (cont'd)

Performance Factors	RII	Rank within Group	Overall Rank
(7) People factors			
Employee attitudes in project	0.795	3	23
Recruitment and competence development between employees	0.809	2	17
Employees motivation	0.791	4	24
Belonging to work	0.849	1	8
(8) Health and Safety factors			
Application of Health and safety factors in organization	0.787	1	25
Ease to reach to project site	0.774	2	28
Reportable accidents rate in project	0.600	4	60
Assurance rate of project	0.635	3	52
(9) Innovation and learning factors			
Learning from own experience and past history	0.818	2	15
Learning from best practice and experience of others	0.822	1	12
Training the human resources in the skills demanded by the project	0.787	4	26
Work group	0.787	5	27
Review of failures and solve them	0.809	3	17
(10) Environment factors			
Air quality	0.671	2	45
Noise level	0.613	4	57
Waste around the site	0.649	3	49
Climate condition on the site	0.707	1	41

Table 2 illustrates the top significant factors affecting the performance of construction projects in the Gaza Strip. Average delay because of closures and materials shortage was the most important performance factor with RII of 0.941. This is peculiar due the political situation prevailing in the Gaza Strip, which incidentally was highlighted by the World Bank (2004) and UNRWA (2006).

Table 2: The Top Significant Factors Affecting the Performance of Construction Projects

Factors	RII	Rank
Average delay because of closures and materials shortage	0.943	1
Leadership skills of project manager	0.904	2
Availability of resources as planned through project duration	0.904	3
Escalation of material prices	0.889	4
Differentiation of coins prices	0.874	5
Availability of personnel with high experience and qualification	0.865	6
Quality of equipment and raw materials in project	0.861	7
Belonging to work	0.849	8
Cash flow of project	0.848	9
Liquidity of organization	0.839	10

People group was highest ranked (RII=0.812) by the contractor respondents (see Table 3). This group was the most important for contractors because it was related to competence development of employees and affected productivity, cost, and time performance of contractors. Iyer and Jha (2005) noted that the people group affects project performance as a consequence of participants' attitudes, commitment to the project, employees' motivation and competence development.

Table 3: Summary of RII and Ranks of Major Groups Affecting The Performance of Construction Projects

Performance Group	RII	Rank
People	0.812	1
Innovation and learning	0.804	2
Quality	0.794	3
Client Satisfaction	0.779	4
Time	0.769	5
Productivity	0.747	6
Cost	0.726	7
Health and Safety	0.699	8
Environment	0.660	9
Regulatory and community satisfaction	0.646	10

The following is a brief discussion of the ranking of factors in groups as shown in Table 1.

Cost Factors Group

Escalation of material prices was ranked first as escalation of material prices affects the liquidity of contractors and project profit margins. Continuous closures of the Gaza Strip lead to rapid shortages of construction materials and escalation of construction material prices. Differentiation of currency prices has been ranked by the respondents as second highest. This factor is very important for contractors because this factor affects contractors' profit rate and cost performance.

Cash flow of project was ranked third, which is not surprising as most of contracting firms in the Gaza Strip suffer from major cash flow problems. This result is in line with Samson and Lema (2002) who found cash flow as a significant factor for evaluation and measurement of construction contractors' performance. Liquidity of organization was ranked fourth highest. This result is in line with those of Samson and Lema (2002) as liquidity of the organization is very important for evaluation of project budget and cost performance. However, Ugwu and Haupt (2007) are not in agreement with our results. This might be owing to different economic and political situations.

Time Factors Group

The average delay because of closures and materials shortage ranked the highest among the time factors. This factor is unlikely to be experienced by most countries to the degree that contractors in the Gaza Strip have to endure.

Availability of resources as planned through project duration was ranked the second highest. If resources are not available for contractors as planned through project duration, the project suffers from problem of time and cost performance. This result concurs with Samson and Lema (2002). However, Iyer and Jha (2005), and Ugwu and Haupt (2007) are not in agreement with this finding, probably due to different locational, political and economic situations.

Average delay in payment from owner to contractor was ranked third highest. Delay in payment by owner to contractor may lead to disputes and claims, thus affecting the overall project performance. Percentage of instructions delivered late was ranked fourth. Contractors cannot proceed with construction work instructions without timely payment. Planned time for project construction which was ranked fifth concurs with Cheung et al. (2004) and Iyer and Jha (2005).

Quality Factors Group

Of the quality factors, availability of personnel with high experience and qualification was the top-most ranked variable, which concurs with Samson and Lema (2002), Cheung et al. (2004), and Iyer and Jha (2005). In the Gaza Strip, the majority of site managers are civil engineers with good work experience but with little training or education in management.

Quality of equipment and raw materials in a project was ranked second highest. Contractors must implement their projects according to the required specification. Conformance to specification which was ranked third is in agreement with Iyer and Jha (2005). Participation of managerial levels in decision-making was ranked fourth. Quality assessment system in organization was ranked fifth. Quality assessment system in organization is rarely implemented by contractors in the Gaza Strip. Ugwu and Haupt (2007) agree with this result as this factor was also found not to be important for contractor performance in South Africa. Conversely, Samson and Lema (2002) and Iyer and Jha (2005) found this factor to be significant for contractor performance in Tanzania and India respectively.

Productivity Factors Group

Sequencing of work according to schedule was highest ranked among the productivity factors. Management-labor relationship was ranked second highest. Management-labor relationship can foster strong coordination and motivation between labor level and managerial level. This leads to high productivity and project timeliness. This finding supports Samson and Lema (2002) results but not Iyer and Jha (2005).

Project complexity was ranked third highest. The degree of project complexity is related to experiences required for implementation and skills needed to construct a project. The absenteeism rate throughout a project was ranked fourth highest. Absenteeism throughout project implementation affects on-site productivity. This finding is in agreement with Samson and Lema (2002) and Iyer and Jha (2005). The number of new projects/year was ranked fifth highest. The number of new projects/year rarely affects a contractor's performance. This is because experiences and skills depend on the number of executed projects.

Client Satisfaction Factors Group

Among the client satisfaction factors, leadership skills of the project manager were ranked highest. This finding echoes the finding by Cheung et al. (2004) and Iyer and Jha (2005). Speed and reliability of service to the owner was ranked second, followed by information coordination between owners and project parties and number of disputes between owners and projects parties. The latter finding concurs with Samson and Lema (2002) and Iyer and Jha (2005). The number of reworks was ranked last.

Regulatory and Community Satisfaction Factors Group

Neighbors and site condition problems were ranked highest among the regulatory and community satisfaction factors as construction projects in the Gaza Strip usually suffer from this problem. This finding contradicts Iyer and Jha (2005) who found this factor to be not important.

Quality and availability of regulatory documentation was ranked second while number of events of non-compliance to regulation was ranked third. The greater the number of non-compliance events to regulation, the more dissatisfied are the regulators and community. This result is in agreement with Samson and Lema (2002). Cost of compliance to regulatory requirements was ranked fourth highest.

People Factors Group

Belonging to work was top ranked among people factors, which concurs with the finding by Iyer and Jha (2005). Belonging to work usually improves the contractor's productivity and performance on the project. Recruitment and competence development between employees was ranked second highest while employee attitudes in the project ranked third. The latter finding agrees with Iyer and Jha (2005). Employees' motivation was ranked last.

Health and Safety Factors Group

Application of health and safety factors in organization was top ranked among the health and safety factors, which echo the findings of Cheung et al. (2004), and Ugwu and Haupt (2007). Ease to reach project site was ranked second, assurance rate of project third and reportable accident rates in project last.

Innovation and Learning Factors Group

Learning from best practice and experience of others was the highest ranked among innovation and learning factors, which echoes the finding of Samson and Lema (2002). Learning from own experience and past history was ranked second. Learning from own experience and past history can improve and develop contractors' performance of current and future projects. Review of failures and solving them was ranked third. Review of failures and solving them enhance a contractor's performance and satisfy the owner. The last finding supports the observation by Samson and Lema (2002).

Training the human resources in the skills demanded by the project was ranked fourth. Contractors should train their employees with different and improved skills in order to implement different and complex types of projects. Iyer and Jha (2005) noted that training the human resources in the skills demanded by the project is not important for contractors because of poor motivation and learning systems in Indian construction projects. Work group was ranked last.

Environment Factors Group

Climate condition on the site was ranked highest among the environment factors which contradicts the finding by Iyer and Jha (2005). Air quality was ranked second highest. This finding agrees with that of Cheung et al. (2004) and Ugwu and Haupt (2007). Waste around the site, which was ranked third, supports Cheung et al. (2004). Noise level was the lowest ranked factor.

CONCLUSION

The construction industry is considered as an important sector in the world as it develops and achieves the goals of society. The performance of the construction industry is affected by clients, contractors, consultants, stakeholders, regulators, national economies and others. The aim of this paper is to identify and rank the local factors affecting the performance of construction projects according to their relative importance in the Gaza Strip.

According to local contractors, the average delay because of closures and materials shortage was the most important performance factor as it was ranked first among all factors. Construction projects in the Gaza strip suffer from complex problems because of closures and material shortages. These problems can be considered obstacles to performance of projects. The most important factors were escalation of material prices, availability of resources as planned through project duration, average delay because of closures and material shortages, availability of personnel with high experience and qualification, quality of equipment and raw materials in a project and the leadership skills of the project manager.

The people group was ranked by the contractors respondents in the first position because contractors observed that competence development of employees and belonging to the work strongly affect productivity, cost and time performance of contractors. It is recommended human resources be developed in the construction industry through proper and continuous training programs. Therefore, a training needs assessment study is recommended as a future study in order to identify required training programs and courses to improve construction performance.

In addition, it is preferred to develop and improve the managerial skills of engineers in order to improve performance of construction projects. All of that can be implemented by offering effective and efficient training courses in scheduling, time, cost, quality, safety, productivity, information systems and management of human resources. These courses will lead to more successful performance through construction projects such as availability of resources as planned through project duration, availability of personnel with high experience and qualification, proper quality of equipment and raw materials used in project. In addition, a training system will improve construction time performance.

It is necessary for construction organizations in the Gaza Strip to evaluate both market share and liquidity before implementation of any construction project because of the difficult economic situation in the Gaza Strip. A special study about the relationship among market share, liquidity and performance of contractors is required. That will assist organizations to perform projects successfully and strongly. It is recommended that there be a new approach to the contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors. It is necessary to establish a new study to identify proper industry regulations and appropriate mechanism for contractors' enforcement. In addition, a structured methodology and technique should be identified to overcome the effect of local political and economic situations on the performance of construction projects in the Gaza Strip.

Construction organizations are recommended to evaluate project overtime throughout project construction in order to enhance and improve time and cost performance of projects. Planned time for project implementation should be more suitable for practice because of the difficult political and economic situation in the Gaza Strip. Time needed to implement variation orders and to rectify defects should be estimated and scheduled without effecting project time completion. Having regular meetings among project participants can also enhance performance. Construction organizations should have different incentive systems in order to improve overall performance. In addition, they should have continuous safety training and meetings in order to apply safety factors and achieve better performance.

Contractors should not increase the number of projects that cannot be performed successfully. In addition, contractors should consider political and business environment risk in their cost estimation in order to overcome delays because of closures and material shortages. There should be adequate contingency allowance in order to cover increase in material cost. Proper motivation and safety systems should be established for improvement to productivity performance of construction projects in the Gaza Strip. More applications of health and safety factors are necessary to overcome problems of safety performance.

Contractors are recommended to minimize the waste rate throughout project implementation in order to improve cost performance. They should be more interested in conformance to project specifications to overcome disputes, time and cost performance problems. Quality materials should be used by contractors to improve cost, time and quality performance. This can be done by applying quality training sessions and meetings which are necessary for performance improvement. Contractors are recommended to be more interested in sequencing of work according to schedule. In addition, contractors should have a cost engineer on their projects to control cost successfully.

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