

Factors Affecting on the Performance of Contractors in Constriction Project: Bagdad, Iraq

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Abstract

This paper investigated contractor's performance in Iraq. Determination and ranking the factors that affecting on the contractors' performance in construction projects are done. A field survey of 45 Iraqi contractors work in construction contracting companies (general and private sector) was under taken using structured questionnaires. The most effective factors on the contractor's performance were obtained using Relative Importance Index (*RII*). The work revealed that: cash flow of project, average delay in regular payments, contractor experience, design team experience, and site preparation time are the major factors influence on contractor's performance in construction project.

Key words: Contractor performance, Performance, Construction project.

1. Introduction

A lot of factors influence the Iraqi contractors performance in construction sector. Among these strong factors that are commonly reported in the construction sources are: inappropriate management of time, contractors poor experience, injured workers, customers vacillations, repeated change-orders, imprecise estimation, insufficient planning and preparations, scheduling which is not regular, missing materials, non-payment of workers' wages, shortage of new equipment and technology, price fluctuations, labors scarcity, projects complexity, regulatory inadequacies, risk mismanagement, waste and unsuitable materials..etc. Those factors are enlarged with negligible usage of construction projects management software and non-existence of all kinds construction equipments. A performer is a person or a number of individuals who gather to achieve a list of goals [1]. Swansonin [2] depicted performance as the valued productive result of systems that may be measured according to production attributes, time, cost, quality, and quantity. Another definition for performance based on demonstrates the action that integrates skills and knowledge to get a suitable result is given by [1]. As the performance can be considered the measure of skills and knowledge in order to achieve and fulfill organizational goals and clients' needs; thus, the capability of the contractors in bringing together the correct technical and trained work-force is highly important to the general performances of the contractors on their specific projects.

In return the technical staff, and skilled workers together with unskilled work-force have a great impact on the efficiency of the construction projects [3][4].

2. Literature Review

Contractor performances have been studied by many researchers. Fugar and -Baah [5] investigate the building construction projects delays in Ghana, they concluded that the untimely payment, credit inaccessibility and price fluctuations were the essential reasons for construction delays. Amoah *et al.* [6] studied the main factors that impact of the operational performance for small-scale building contractors (“SSBC”) in the country of Ghana with the use of a beneficial sampling approach; it found that the insufficient contractors’ performances was because of low capitalization and “managerial inadequacies”. Also Ahadzie [7] held a discussion about the performance of contractors on the “Kumasi Metropolitan Authority’s” projects in the country of Ghana. Many factors were measured and the performance of the contractors affected by “poor project documentation, excessive bureaucratic conditions, and over-reliance on casual labor”. Nyako *et al.* [3] held a study about the existence of artisanal skills in the construction industry of the Kumasei in the Ashantei Region of the country of Ghana; They showed that the lack of skilled work-force was a problem which adversely affected contractors performances. Whereas Ofori *et al.* [8] discussed the health and safety measures that are applied in the construction industry in Ghana. Further study can be seen via studies [9] [10] [11].

3. Methodology

We designed the structured questionnaires taken into consideration theoretical frames work informations and pre-studies. The questions designed to collect the data covering issues related to the objectives of the study as well as it is made up of close ended Multichoice types of questions for the facilitation of categorizing and analyzing. It is made up of 2 parts. The 1st part included 4 questions: the name of the contracting firm, academic qualification, and years of experience and sector type, while the 2nd part focus on sorting to the address influencers that affected the effectiveness of contractors on construction projects with the use of a Likert scale between (1 and 5) that determined the effective factors on the contractors performance in projects. Analyzing the collected data to get the needed results and determination of the groups factor which impacts contractors performance are done by using relative importance index which is given as [12][13][14].

$$RII = \frac{\sum_{i=1}^N W_i}{A \times N} \quad (1)$$

In which W_i the weights of every one of the factors given by respondents and it was in the range of (1 - 5), ($A=5$) the largest value of weight and finally N refers to the respondents number.

4. Data Analyzing and Discussions

In this part, we find the study results of different groups consisting of 30 influencers that mentioned in the questionnaire have been discussed in details. The

factors were divided into five groups have the following titles: 1st Contractors related factors, 2nd the cost factor, 3rd time factor, 4th quality factor, 5th external factor. such that for every one of the groups the respondents have been requested to rank the main pain factors that impact on contractors' performance in construction projects in Iraq as "very Significant affect", "Significant affect", "Moderately affect", "Comparatively affect" and "Little affect".

4.1 Contractor Related Factors Affecting on the Performance of Contractor

When we asked the respondents for the ranking of the impact of influencers that are included under the contractor related factors group. The "relative importance index *RII*" and rank of the factors that affect the performances of contractors on construction projects is determined as in Table 1.

Table 1: The Relative Importance Index and Rank of Contractor Related Factors

No.	Contractor related factors	<i>RII</i>	Rank
1	Contractor experience	0.8978	2
2	Cash flow of project	0.9378	1
3	Leadership style	0.7911	6
4	Unavailability of modern equipment	0.8489	3
5	Motivating skills of the project team leaders	0.7644	8
6	Size of labor	0.7422	9
7	Budget progress monitoring	0.8089	5
8	Project team leader adaptability to changes in the project plan	0.7733	7
9	Site managers abilities	0.7022	10
10	Project team leaders commitment to meet cost, time and quality	0.8133	4

According to Table 1, the cash flow was given rank first with *RII* (0.9378). This result is not surprising since the most Iraqi contractors firm faced cash flow problems. This factors was ranked by [15] as the third factors, hence it has a major effect on a contractor's performance. Contractor experience was ranked second place with *RII* (0.8978) asit has been concluded due to a lack of contractors with experience in that country. Bekoe *et al.* [16] stated that 53 percent of respondents in the research they made,

said stated that local contractors were short of experiences and the necessary technical experience for the execution of high construction projects.

4.2 Cost Factors Effect on the Performances of Contractor

In this subsection we asked the respondents to rank the impact of influencers listed below the cost factors group. Hence the *RII* and rank of such influencers which affected the performances of contractors on construction project are listed in Table2.

Table 2: The *RII* and Ranks of Cost Influencers

No	Cost factors	<i>RII</i>	Rank
1	Accurate and reliable budget estimate	0.8444	2
2	Escalation of material price	0.8311	3
3	Excessive variation orders	0.8533	1
4	Reworks	0.8044	4
5	Proper planning and scheduling of works	0.7555	5

In Table 2, excessive variation orders were ranked firstly with *RII* (0.8533). This factor affects contractor's performance directly during the execution stage of project. While this might not be an issue in some of the jurisdictions; it's typically a big deal in Iraq, this finding coincides with [17] conclusion that excessive variation orders influenced contractors' performance. Accurate and reliable budget estimate ranked secondly with *RII* (0.8444). This influencer is significant for contractors since it affected construction performances in time and cost [13].

4.3 Time Factors Affecting on the Performance of Contractors

The respondents in this discussion have been requested to rank the impact of factors that are listed under the time factors group. So the *RII* and rank of the influencers that affect the performances of contractors on construction projects is obtained as in Table 3.

Table 3: The Relative Importance Index and Ranks of Time Factors

No.	Time factor	<i>RII</i>	Rank
1	Site preparation time	0.8909	2
2	Coordination of contractors work in a timely manner	0.8089	4
3	Timely decision making	0.8267	3
4	Average delay in regular payments	0.9318	1
5	Unavailability of resources	0.8044	5

Table 3 exemplifies the time factors, which act on the contractor's performance. Average delay in regular payments was ranked firstly with *RII* of (0.9318). Research results agrees with research result under taken by [12] which also identified Average delay in regular payments as the most critical time performance factor. Site preparation

ranked secondly by contractors with *RII* (0.8909). This factor affects contractor's performance directly during the project. Akomah and Jackson [12] discussed this factor in their study and ranked 1st that means site preparation is important to a contractor's performance.

4.4 Quality Factors Affecting on the Performance of Contractors

The respondents in this investigated have been requested for the rank of the impact of influencers that are listed below the quality factors group. So the *RII* and rank of the influencers that affect the performances of the contractors on construction projects are obtained and listed in Table 4.

Table 1: The *RII* and Ranks of Quality Factors

No	Quality factors	<i>RII</i>	Rank
1	Design team experience	0.8978	1
2	Delay in producing design document	0.8044	3
3	Adequate service test records	0.8533	2
4	Adequate material test records	0.7244	5
5	Excessive errors or omission	0.76	4

Through Table 4 contractors ranked design team experience firstly with *RII* of (0.8978). On the other hand, the shortage of those qualities be a cause of inaccuracies, design errors, omissions and as a result, degradation of the contractors' performances in addition to increasing their operational costs as stated by [10]. Adequate service test records were ranked secondly with *RII* equal to (0.8533). Akomah and Jackson[12] are of the view that adequate service test records improve quality and performance of a project.

4.5 External Factor Affecting on the Performance of Contractors

The respondents in this subsection have been requested for ranking the impact of influencers that are listed below the "external factors" group. The results of the *RII* and rank of the influences that affected the performances of contractors on construction projects are shown in Table5 as below:

Table5: The *RII* and Ranks of External Factors

No.	External factors	<i>RII</i>	Rank
1	Physical conditions	0.7733	2
2	level of technological advancement	0.3824	5
3	Economic influence (economic climate)	0.8222	1
4	Government policy (political influence from higher authority)	0.7644	3
5	weather conditions	0.7067	4

Table 5 ranked economic climate (economic influence) as the 1st external factor and *RII* (0.8222). Since economic climate affect strongly on the cost and delivery of the project and in return impact negatively on contractor's performance the contractors

ranked this factor as the most important factor. Dadzie *et al.*[17]reported a similar finding. Physical conditions ranked secondly with *RII* of (0.7733). This finding coincides with results submitted by [18] who found that the physical conditions influenced contractor performance and construction quality.

4.6 Major Factors Affecting the Performances of Contractors in Construction Projects

From Table 6 Cash flow of the project ranked first with *RII* (0.9378) which means that this factor has the largest effect among the rest performance factors. This result agrees with [19] investigation that identified the inability of contractors concerning securing sufficient working capital as a fundamental issue in the industry of building and construction. Average delay in regular payments ranked secondly with *RII* of (0.9318) among 30 factors. Because of its effect on time and expenses performance of the project, this factor is important for contractors. This result agrees with [12] who described high inflationary innovations as a factor that impacted the contractors' performances in a negative way. Contractor experience and design team experience were both ranked third with *RII* of (0.8978). These factors were important for these respondents because bad experience of contractor and design team adversely influenced on quality performance and contractor performance. Dadzie *et al.* [18] deduced that the respondents in their opinion rareness of contractor and design team experiences and the necessary technical experience to carry out construction projects of high quality. Site preparation time was ranked fourth most factors that effective on contractor performance with *RII* of (0.8909).

Table 6: The Major Factors that Affect the Performances of Contractors

No	Major factors	<i>RII</i>	Rank
1	Cash flow of project	0.9378	1
2	Average delay in regular payments	0.9318	2
3	Contractor experience	0.8978	3
4	Design team experience	0.8978	4
5	Site preparation time	0.8909	5

5. Conclusions

In this article we described various factors influence on contractor's performance in constructions projects in Iraq. The main factors was reported by the survey respondents including cash flow of projects, Average delay in regular payments, contractor experience, Design team experience, and site preparation time, are the essential factors that influence performance of contractors on construction projects. Cash flow problems were considered as an essential problem which needing proper treatment by both the clients and the contractors. The minimization of this issue will require strict commitment by clients to payment agreements in contracts and finance disciplines and honesty on the contractors' side. The client's demand for goodness can't be replaces by anything from the contractors' side; it was a requirement that must have been done at any of the costs for giving them fulfilled results. Payment to the contractors by their clients have to be delivered on a timely manner in order for the contractors to stick to their time performances due to the fact that any delaying in payments may be harmful to the

progressing of the projects. On the other hand, contractors have to prefinance projects prior to reimbursing them, it would be advisable for the contractors liaising on a timely manner with the bankers in order to financial support for enabling them of meeting the obligations that fall on them according to their contracts. Moreover, the contractors have to deploy suitable cash flowing forecast and make their spending wise. Contractor experience and design team experience must pay proper attention in order to meet client's requirements, those factors are of high importance due to the fact that they strongly influence the quality performance of contractor's on construction project. Site preparation time affect directly contractor's performance through the project due to the fact that clauses that relate to possessing the site aren't normally carried out. Contractors are obligated of regular upgrading to themselves and to their employees for the sake of achieving high standards throughout the process of production. which could be performed via attending training classes and the organization of meetings concerning quality control in addition to training workers. Furthermore, contractors have to continuously assess their quality systems for the sake of identifying quality gaps that could influence the quality in a negative way. Client's choice is made depending on quality and performance. Thus, contractors have to be creators in their work and always looking for a new knowledge that makes their performance better. Which may be satisfied via learning from industry leaders, who regularly take courses and investing in researches.

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العوامل المؤثرة على أداء المقاولين في المشاريع الإنشائية: بغداد، العراق

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الخلاصة:

حققت هذه الدراسة أداء المقاولين في العراق. تهدف هذه الدراسة الى تحديد وتصنيف العوامل المؤثرة على أداء المقاولين في المشاريع الانشائية واجري المسح الميداني للمقاولين العراقيين البالغ عددهم (خمسة واربعون مقاول) من الذين يعملون في شركات المقاولات الانشائية (في القطاعين الخاص والعام) باستخدام الاستبيانات المنظمة ، وقد تم استخراج اهم العوامل المؤثرة على أداء المقاولين باستخدام مؤشر الاهمية النسبية (RII) حيث كشفت الدراسة ان التدفقات النقدية للمشروع ومعدل التأخير في الدفعات المنتظمة وخبرات المقاولين وخبرات فريق التصميم ومدته تحضير الموقع هي العوامل الرئيسية التي تؤثر على أداء المقاولين في المشاريع الانشائية.

الكلمات المفتاحية: أداء المقاولين، الأداء، المشاريع الانشائية.