

The Effective Factors on Quality in the Jordanian Construction Projects

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Abstract

This study aims to improve the quality of management of Jordanian construction projects by providing the owners, the contractors, the projects managers and designers with the necessary information. The study tries to assess and evaluate the effective factors on the quality management of the contractors and the owner via comparing all perspectives and covering the most important 12 affecting quality factors. The study uses survey methodology applying questionnaires and an interviews to collect data from the owners of Jordanian construction firms. The researcher has distributed 83 questionnaires (41 contractors and 42 owners of construction firms). Descriptive analysis was used to meet the study objectives. The results of this survey were used for the most important factors according to contractors and owners view : see the Relative Importance Index (RII). The study reveals that the most important factors are raw materials, equipment, contract, workers in the projects and the manner of implementation of the project. The study hypothesis is :There is a correlation between the owners and contractors in the perception and relative importance of quality influencing factors.

Keywords: Quality, Quality Management, Construction Projects, Relative importance index (RII).

Introduction

Today, quality improvement is the biggest challenge facing the projects in all over the world generally, and in the Hashemite Kingdom of Jordan particularly. This challenge comes as a result of many complicated factors. One of the most important of these factors is the lack of quality measurement methods. In near future, quality management will be more critical issue. Thus, it is very necessary to identify the quality standards and the effective factors. Quality is the responsibility of all staff in any project due to quality is the responsibility of all and can't as well as it is a critical component for customer satisfaction.

Quality is "conformance to requirements"(Crosby,1979) this definition assumes that the specifications and requirements have already been developed. Crosby believes that quality is not comparative (high quality or low quality) but it should be judged as "conforms to requirements or does not conform to requirements".

In construction industry there are a number of problems related to the bad quality control, such as, project planned delivery times are often not on time (being late), projects often need a larger budget than planned or agreed by the owners, suffering from poor skilled and lack experienced workmanship. Defecting in construction may be over costs with some errors, re-construction could happen, so the result will be delay in project delivery and increase in the final costs.

Quality assurance is a very complex and difficult process especially in construction projects. Each project has a special case in specifications, manner of implementation and designing.

Therefore this study aims to identify the effective quality factors in construction projects in Jordan.

Previous studies:

(Joy , 2014) Identified the most important factors that known by the consultants and contractors are materials, standards and codes, cost problems, labors.

(Chan and Tam, 2000) They concluded that the quality performance factors agreed by client are the project managers, project implementation, project management procedures and specifications of the project area.

(Abdel-Razeq, 1998) identified that the most important factors affecting quality before the construction stage are design and planning, establishing and system improving for the control and assurance quality, the standard living and financial status of staff, the total estimated project cost, consultants and projects ,suitable classification and categories of contractors, and staff awareness.

(Shively ,1990) identified the certain procedure that consulting companies carry out for quality assurance. According to this study results taking more care in the following actions such as goals and objectives, structural and administrative structure, public relations practices, appropriate working environment, specialist and technical employee, specialist advancement and staff improvement, project acceptance and proposal review assure quality highly.

There are many effective factors on quality of a building construction projects, the factors are: the site plan, the experience for all site team, design documents specifications, machines, materials, quality, and management systems for labors, the quick reply from the project owner, and the political conditions which is also among the factors effecting quality (Amer, 2002).

Study objective:

The study objectives are to evaluate the factors that influence on quality of construction projects from the view of owners and contractors. To present suitable and acceptable advises for improving the quality of construction projects leading to efficient planning quality and practices.

Study Methodology:-

The study uses a descriptive quantitative method to answer the research questions and test the study hypothesis since this approach depends on numeric data and serve the main study aim to classify, count and explain the features which are observed during the study in statistical models.

Study Sample:

Two types of community were targeted; project owners community and the registered contractors in the Jordanian Constructions Contractors Association, including engineers and managers at different positions.

The sample consists of 83 persons from project owners and contractors.

Table below shows the distribution of study sample.

Table (1)
Sample Distribution

Sample	No. of Respondents
Contractors	41
Project owners	42
Total	83

Data Collection Method:-

In this research the survey was conducted by combination of interviews that were used to fill the questionnaire and clarifying it. This research is based on two sources to obtain the data:

First source is the secondary data:

1. Foreign books and references that deal with the same subject of this thesis.
2. Articles, magazines, previous research and dissertations of master.

Second source is the primary data:

Using the survey questionnaires as a main tool to collect the information from the two targeted community of the study (owners and contractors).

Questionnaire Design:-

The research tool in this study is questionnaire.

The main part in this questionnaire is to measure the influence degree of factors on construction projects quality.

Target study sample were asked to rate answer for 12 main effective factors on construction projects quality. The study used an interval scale for the answers (large, medium, few and ineffective).

Data Analysis Techniques:-

The study used analysis technique within the Relative Importance Index method (RII) to find out the perception of owners and contractors about the main quality factors. This analysis technique was used to summarize existing data patterns and interpreting the analysis results.

The formula of (RII) was computed as (Joy, 2014):

$$RII = \frac{\sum W}{AN}$$

RII : The index of Relative Importance

W : weight constant ,for the factor s(its value from 1 to 4)

A : Highest weight

N : Total of respondents

Study results:

Following tables shows the rank of effective factors depending on the opinions of contractors and project owners that have been concluded by this study.

Table (2)
Summary of Relative Importance Index and Rank of the Effective factors Depending on the Opinions of Contractors

Number	Effective Factors	RII	Rank
1	Equipment	0.863	1
2	Raw materials	0.860	2
3	Contract	0.848	3
4	Workers in the project	0.845	4
5	The manner of implementation of the project	0.838	5
6	Systems and software used for quality control and public safety	0.823	6
7	Design	0.815	7
8	The nature of project	0.748	8
9	Match specifications and standards	0.735	9
10	Cost	0.728	10
11	Training courses and meeting in the field of quality	0.725	11
12	The main contractor	0.710	12

Table (3)
Summary of Relative Importance Index and Rank of the Effective Factors Depending on the Opinions of Owners

Number	Effective Factors	RII	Rank
1	Raw materials	0.865	1
2	Contract	0.855	2
3	Equipment	0.853	3
4	Workers in the project	0.850	4
5	The manner of implementation of the project	0.833	5
6	Systems and software used for quality control and public safety	0.828	6
7	Design	0.820	7
8	The nature of project	0.738	9
9	Match specifications and standards	0.740	8
10	Cost	0.720	10
11	Training courses and meeting in the field of quality	0.710	12
12	The main contractor	0.715	11

The tables above shows that the most influential factor on quality of Jordanian construction projects.

According to the point of view of the contractors the equipment, raw material, contract ,workers in the project , the manner of implementation of the project and systems and software used for quality control and public safety strongly influence quality in construction project.

The owners support the contractors view, observing that the owners and contractors approximately have the same opinion towards ranking of most quality factors.

This result is attributable to the owners and contractors care about the same degree of quality of construction works, as they work under the same conditions. In addition, quality is everyone's responsibility and lead to the interests of all parties in construction projects.

Conclusion:-

The study concluded that considering the effective quality factors that affect on construction projects leads to improve quality and upgrade the lowest time and effort, achieving quality in construction projects has economic consequences such as reducing construction costs by eliminating the cost of correcting defects and errors, reducing the costs of implementing some of the rejected work, meeting client satisfaction and comfort , reducing maintenance costs during the period of use, increasing the economic life of the constructions , achieving operators' confidence , increasing their share in the labor market and enable them to compete strongly.

The study also concluded that quality management is based on customer needs and requirements accurately, providing a secure environment, availability of decent working conditions for achieving objectives and requirements with the lowest cost and time through quality assurance at every stage of the construction process.

The study reassure what have been concluded by some previous study that quality of construction projects is measured through customer expectations (the comparison between what they expect and what they realize)

In construction projects which implemented by companies that do not contain a special quality section, where it does not have a system of quality management. Quality of used materials are examined by contractors

through an examining commission for materials in engineering laboratories. Quality of work during implementation stages, receipt or refusal of delivery based on the expertise of engineers overseers with no clear criteria and procedures governing quality and the lack of a quality manual which is reflected negatively on the application of quality system.

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