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ASSESSING THE LEVEL OF UNDERSTANDING OF CONTRACTORS REGARDING THE WORKERS' PRODUCTIVITY IN CONSTRUCTION INDUSTRY

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Abstract: Productivity of workers is important to enhance the completion of the project within the required time and quality. Majority of the project elements and activities are based on labour performance. Construction activities are recognized as labour-intensive as it rely more on human efforts. Contractors have duties to handle the work in it best way for increasing the quality and decreasing time and also cost. Frequently, at construction sites it is observed that contractors do not pay attention to the productivity of workers and its effect on the overall productivity. Usually they do not measure labour productivity in the construction projects and also they cannot compare productivity rates in the construction sites. The aim of this study is to assess the level of understanding of contractors regarding the workers' productivity in construction industry of Iran. The data is collected through questionnaires and interviews. The data is analysed using Average Index and SPSS. From the study, the level of understanding of contractors regarding the workers' productivity in construction industry is "Understand". The contractors understand the impact of productivity on cost, time and quality.

Keywords: *Productivity, labour-intensive, labour productivity*

1. Introduction

Productivity is one of the most significant factors influencing the overall performance of any organizations (Kim, G, et al 2013). In construction projects, which are mostly labour-based and involve basic hand tools and equipment, labour costs consist 30 to 50% of overall project costs (Enshassi et al 2007). This means that labour productivity is one of the key management factors to complete a project successfully.

Because the construction is a labour-intensive industry, the significance of this effect not only affirms the concern over its labour productivity, but it can also be discussed that labour power is the only productive resource, therefore construction productivity is chiefly depended on human attempt and performance (Jarkas, A. M., & Bitar, C. G. 2011).

Believe it or not the construction workers have a key role in advancing the construction process. They are people who have existed from the first step of implementation until the project closing. On the other hand they influence directly to the main indicators of each project which are time, cost and quality. Hence the construction mangers ought to be required to consider and investigate more in order to enhancing the construction workers productivity.

Typically construction projects create different challenges for the people in charge. Among those challenges we can name material, equipment, finances, and labours the most important factors. The labour or human being has been considered as the most vital resource in the construction activities and considered as the most important factor too. Different construction managers should know essential needs of the construction workers. On the other hand, construction workers should have sufficient skills for handling different needs of the construction managers too. So, construction managers should have enough knowledge regarding the motivation of their workers. During the current study, researchers attempted to find out whether the Iranian contractors understand or believe the definition and concept of productivity in the construction projects or not.

In different construction sites usually contractors do not pay attention to the productivity and its effect on the productivity to enhance it. In developing countries usually different people in charge are not focusing on the productivity and its efficient impacts on the site. Usually they are not measuring labour productivity in the construction projects and also they cannot compare productivity rates in the construction sites. On the other hand it is very important to know different methods for measuring productivity in the construction sites. Furthermore by considering the productivity in the construction activities, usually we can reduce costs of the project as well as its duration and we can enhance quality significantly. Due to the importance of the labour productivity in the construction sites different studies about this issue has been found on the internet and other online data bases which were conducted usually in western countries. Regarding the concept of labour productivity not many studies could be found in the context of eastern and especially developing countries. According to the needs of research in this area of study, researcher attempt to conduct a study about labour productivity in the construction sites of a developing country. Hopefully results of the study seem to be efficient for different people in charge in this field to use the data of the current study for improving the construction labour efficiency.

2. Literature Review:

2.1 Productivity:

Usually productivity in the construction sites refers to the completion of construction work at unit rates with more economical price in comparison with the less average less compared to those published in estimating handbooks. When a manager says that productivity was good on this job and bad on that or good in this area and bad in that, the reference is usually to how costs on that job tracked in comparison with either estimate for the project or the unit man-hours usually allotted to the particular item of work, based on company historical cost data.

There are two definition of productivity that relate to construction, one that defines productivity in terms of the moment of work produced and one that defines productivity in terms of dollar value of the work produced (Schexnayder and Mayo,2004). Productivity is output per worker-hours of effort. Contractors prefer the work –output-related because they can make changes to affect the worker-hours of effort. They can change crew size or change the mix of equipment, so they prefer the work-output-related definition. At the same time, they recognize that in reality

they are dealing with dollar output because all outputs relates to the amount the owner will be billed. Schedules are developed in crew days or worker-hours, so it is natural to define productivity as units of output in relation to effort. The government measures the country's productivity in dollar output per worker-hour or total cost per unit of output (Schexnayder and Mayo,2004). Either definition is acceptable. The following formula is:

$$\text{Productivity} = \frac{\text{Units of output (or output dollar value)}}{\text{Worker hour}}$$

2.2 Motivation:

Motivation: Similarly, motivation is characterized as a combination of influences that causes the craftsman to want to do the job as quickly as possible consistent with safety and quality goals while cooperating, on a larger scale, with his fellow craftsman in execution of the project as a whole.

Motivation as a concept is somewhat more abstract than productivity. Many industrial psychologists maintain that a manger can only create a climate; craftsman must motivate themselves. As used herein, motivation is characterized as the group of influences (climate being one of them) that cause craftsman to want to perform a given task. Motivation to do something is present in everyone, to some degree, all the time.

The term motivation is derivation of the Latin word of movement, movere (Latham, 2007). That is an important driving force to every employee to move or perform to achieve the set goals or targets.

Motivation is defined as the willingness of individuals and groups, as influenced by various needs and perceptions, to strive toward a goal. In organizations with enlightened management, there is an attempt to integrate the needs and goals of individuals with the needs and goals of the organization. Motivation is also defined as the process that impels a person to behave in a certain manner in order to satisfy highly individual needs (Newstrom, 2007).

Motivation is "the set of processes that determine the choices people make about their behaviours". Therefore there is a series of processes to motivate the particular individuals in terms of influencing their behaviours or attitudes in working which are significantly interrelated to the working performance of the works according to equation that showing the importance of motivation introduced by Maier (1955). Job

$$\text{Performance} = \text{Ability} \times \text{Motivation}$$

Note that there are many psychologists or professors have conducted studies and produced theories of motivation on the behaviours of people especially tile in work to avoid arising of frictions from human relationships in an organization unnecessarily.

3. Methodology

Based on the literature review which has been done by the researchers of the current study, the researchers attempted to assess the level of understanding of contractors regarding the workers' productivity in construction industry. To this aim, the researchers have been conducted a survey study among different people in charge with construction activities which are mostly contractors. By collecting the required data from the participants, different factors which had higher mean index have been identified as the main problematic factors for construction activities in the context of Iran. To this aim the prepared questionnaire that has been designed from the literature review of the study has been distributed among 85 people in charge with construction management activities 53 questionnaires were received duly answered.

As it has been mentioned earlier, the questionnaire of the current study has been designed based on the literature review. In order to examine reliability as well as validity of the questionnaire, researchers have been factor analysis and also Cronbach's Alpha, which will be explained in the following section.

3.1 Aim & objectives

During the current study, researchers investigated about the labour productivity in the construction of a developing country, Iran; to this aim they have the following objective:

To assess the level of understanding of contractors regarding the workers' productivity in construction industry of Iran

3.2 Reliability & Validity of the questionnaire

In order to check the reliability and also validity of the study, researchers conducted a pilot study before the implementation of the main study. To this aim, a sub-sample of 11 participants have been selected for conducting the pilot study. For examining the reliability of the study, Cronbach's Alpha analysis has been run while for examining the validity factor analysis has been implemented. The results of the pilot study will be presented in this section.

Cronbach's Alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Table1. Reliability analysis index

According to the Field (2009), when the reliability number which has been extracted through the SPSS software is $\alpha \geq 0.9$, the reliability of the questionnaire is excellent, while it is $0.8 \leq \alpha < 0.9$, the reliability is good, while it is $0.7 \leq \alpha < 0.8$, the reliability is acceptable, while it is $0.6 \leq \alpha < 0.7$, the reliability is questionable, while it is $0.5 \leq \alpha < 0.6$, the reliability is 0.5 $\leq \alpha < 0.6$ and finally when it is $\alpha < 0.5$, the reliability is unacceptable.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.994	.995	11

Table 2. Analyzing the reliability of the questionnaire

As it has been shown in the table 2, the Cronbach's Alpha of the study is 0.994 and based on the Field (2009), the reliability of the questionnaire is excellent.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.79
Bartlett's Test of Sphericity	Approx. Chi-Square	289.69
	df	15
	Sig.	0.00

Table 3. Factor analysis of the questionnaire of the study

According to the above table Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.79. Usually as this measure goes closer to 1 the validity of the test seems better. When the KMO is near 1, a factor or factors can probably be extracted, since the opposite pattern is visible. Therefore, KMO "values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.89 and 0.9 are great and values above 0.9 are superb" (Field, 2009). The KMO amount of our questionnaire is .790 and we can conclude that the validity of our questionnaire is good.

4. Findings of the study

Regarding the objective of the current study, researchers attempted to ask participants ideas about the assessment level of understanding of contractors regarding the workers' productivity in the construction industry. Based on the obtained data from the participants, the five items with the highest mean index were: Impacts of labour productivity on quality, Impacts of labour productivity on cost, impacts of labour productivity on time, positive impacts of labour productivity and key role of labours in construction. The percentage of answering to each item as well as the mean index of each factor has been presented in Table 4.

Items		Percentage					M.I
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Be aware of definition of productivity	1.9%	17.0%	18.9%	34.0%	28.3%	3.70

2	Be aware of definition Labour Productivity	3.8%	15.1%	17.0%	35.8%	28.3%	3.70
3	Key role of labours in construction	5.7%	9.4%	13.2%	41.5%	30.2%	3.81
4	Be familiar factors affecting Labour Productivity	7.5%	7.5%	13.2%	49.1%	22.6%	3.72
5	Measuring Labour Productivity	3.8%	9.4%	18.9%	49.1%	18.9%	3.70
6	Belief of improving Labour Productivity as a positive impact	7.5%	9.4%	13.2%	43.3%	26.4%	3.72
7	Possibility of enhancing Labour Productivity	9.4%	5.7%	18.9%	30.2%	35.8%	3.77
8	Positive impacts of Labour Productivity	5.7%	9.4%	13.2%	41.5%	30.2%	3.81
9	Impacts of Labour Productivity on "Time"	5.7%	7.5%	11.3%	35.8%	39.6%	3.96
10	Impacts of Labour Productivity on "Cost"	3.8%	11.3%	15.1%	32.1%	37.7%	3.89
11	Impacts of Labour Productivity on "Quality"	5.7%	9.4%	13.2%	32.1%	39.6%	3.91

Table 4. Results of the survey

5. Conclusion:

According to the recent studies regarding to the performance of construction projects, a majority of scientists and construction management researchers all around the world have found that the labours' productivity has a direct impact on the progress of construction projects. In addition, the construction is one of most labour-intensive industries which consists the high percentage of overall project costs. Subsequently, it is critical to investigate the labours' productivity concepts and its impacts on time, cost and quality of projects. In order to achieve this aim the researchers assessed the level of understandings of contractors regarding the labours' productivity in the context of Iran. From the study, the level of understanding of contractors regarding the workers productivity in construction industry is "Understand". The contractors understand the impact of productivity on cost, time and quality.