

Labour Productivity In Construction Projects

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Abstract – Today, Labour productivity is of serious concern to the Nations' contractors. In response to this, the project intends to find the actual Labour productivity in site and investigates Labour productivity factors in Construction projects. The contractor is responsible for the coordination and control of construction operations so that the project will be conducted at an optimal level of productivity. Specifically, it is known that productivity is related, in part, to the following variables: Management (Proper Planning, Scheduling and Control); Labour (Union agreements, absenteeism, turnover, delays, availability, level of skilled craftsmen, and use of equipment); Government (regulations, social characteristics, environmental rules, climate, and political ramifications); contracts (Lump-sum, unit cost, and cost plus fixed fee); owner characteristics; and financing. It is hoped that the information presented will assist the industry in planning for projects.

Keywords - Labour Productivity, Construction, Management, Supervisors.

INTRODUCTION

The study involves the following set of processes namely literature review, On-site measurement of Labour Productivity, Questionnaire Survey and conclusion in a step-by-step process explained in detail in the following chapters. The study has been divided into two parts, with a motive to make a practical as well as a statistical study to know the current productivity through on- site measurement and questionnaire survey.

SYSTEM MODEL

- a) To find out the Labour Productivity in the site
- b) To find out the factors affecting the Productivity
- c) To suggest the ways to increase the Productivity

PREVIOUS WORK

Numerous studies have been conducted previously to identify the multitude of individual factors that impact construction productivity. One of the first of these related efforts was a United Nations (1965) study that reported how substantial improvements in Labour productivity can be achieved through repetitive site operations. Other early work was conducted by Borchering and Oglesby (1974) and Maloney (1981), who examined the effects of craft motivation on construction Labour productivity. The impact of material management practices, delivery methods, and fabricators on productivity has been examined extensively by others (Thomas et al. 1989, 1999; Thomas and Sanvido

2000; Horman and Thomas 2005).). The loss of productivity as a result of scheduled overtime has also been examined repetitively (BRT 1980; Oglesby et al. 1989; Thomas and Raynar 1997). Thomas and Napolitan (1995) and Hanna et al. (1999) quantified the impact of change orders on construction productivity. Diekmann and Heinz (2001) examined the influence of support personnel, drawing, equipment, and material buffer strategies on productivity in the piping and electrical trades. This brief review of previous research on specific productivity factors is not meant to be exhaustive since such an effort would require greater liberties than can be afforded to a single manuscript. Instead, the review is meant to acknowledge that the factors addressed in our research were by and large already known, but the theoretical relationships that exist among the factors have largely been based on the opinions of either the previous researchers or a few selected industry professionals.

PROPOSED METHODOLOGY

On-site measurement

This has been done by taking 2 different projects in different places. The measurement of labour productivity is carried out for 8 different items of works and they are Excavation, Concreting, Bar bending, Shuttering, Brickwork, Wood work, Plastering and Painting. These 8 works has been chosen because these works involve more than 90 percent of the total cost in any construction project. Minimum of 3 observations to a maximum of 11 observations have been made to different items of works underlying above. After observing the productivity of all the 8 items of work, it has been compared with the productivity in All India Schedule of Rates – 2014

Questionnaire Survey

The second part of this study is the questionnaire survey to obtain results regarding the same scope, but from the practical experience of Site-Engineers who are a part of the process. Around 83 factors have been taken into account for the survey, which are obtained from literature survey, observation from sites and discussion with Site-Engineers. If the questionnaire had been prepared with all the 83 factors, then, it would be difficult to attain the actual result. So, as a first stage, it was decided to filter the less important factors through response from 10 site-engineers. After this stage, there was 14 factors and

these 14 factors have been taken into account for the formation of questionnaire. These 14 factors have been analysed for Chance of occurrence and Impact. This has been sent to 100 site-engineers out of which 57 replied. With these response, the factors have been ranked, analysed and suitable conclusions has been evolved to achieve the optimal Labour Productivity in Construction Projects.

EXPERIMENTAL RESULTS

Labour Productivity has been measured in two different sites, one in Thanjavur and another in Chennai, and the combined values of both the values are mentioned in the table

Description	No. of Observations	Labour Productivity (On- site)	Labour Productivity Schedule of Rates - 2014	Unit	Efficiency
Excavation	3	2.38	3.14	C u. m	75.79
Concreting	9	10	11.32	C u. m	88.33
Bar Bending	4	320	350	K g	91.43
Shuttering	4	17.8	12.5	S q. m	142.33
Brick Work	11	1.22	1.258	C u. m	96.97
Wood Work	3	0.18	0.18	C u. m	100
Plastering	6	50	40	S q. m	125
Painting	3	40	60	S q. m	66.67

Factors have been collected from various research papers and from discussions with site engineers of various sites. Initial filtering has been done and a survey has been conducted to find out the factors most affecting the labour productivity. After the survey conducted, SPSS Software was used to test the reliability of the sample. Then, the recurring and impact factor has been taken into account and a score was allotted based on the survey conducted and the factors has been ranked on the score allotted to the respected factor. The factors ranked are as follows.

S.No.	Factors	Final	Rank
2.	Lack of communication among site management people	517.9	1
2.	Lack of Construction knowledge for Supervisors	498.6	2
3.	Non – Availability of skill training	480.6	3
4.	Non – Availability of material	479.7	4
5.	Not providing Incentives and Compliments for good performance	477	5
6.	Differen languages spoken by workers	470.2	6
7.	Inadequate instruction provided	468.9	7
8.	Shortage of personal protective equipment	463.4	8
9.	Difference in Salary paid by various Sub- Contractors	458.3	9
10.	Lack of proper resource allocation	457.7	10
11.	Equipment repairs	454.6	11
12.	Material storage area too far from workplace	450.9	12
13.	Non – Availability of drawings at the time of execution	449	13
14.	Poor quality power tools	405.6	14

From this table, it is inferred that Lack of communication among site management (1) people plays a vital role in improving the Labour productivity and poor quality power tools (14) is comparatively insignificant out of these 14 factors

CONCLUSION

In construction projects, the contractors used to think that

the labour productivity is to be maximum to complete the project in short duration. But, at the same time, due to speedy execution of work, occurrence of error is high and if that happens, considerable amount of money and time will be wasted to set right the error. So, it is important for the labour productivity to be optimal. In our project, we have measured the labour productivity in 2 sites and the factors affecting the productivity have been listed. The works that are above the nominal productivity can be brought down to optimal productivity by doing those works with more accuracy. Apart from that, the productivity of works that are low have to be improved. For that, a survey has been conducted based on questionnaire survey. The results of the questionnaire survey show that Lack of communication among site management people is the prominent reason for the reduction in productivity. Factors such as Lack of construction knowledge for Supervisors and Non - Availability of skill training are the other reasons that affect the productivity. Hence, it is concluded that these factors have to be kept in mind while executing a construction project to achieve the optimal labour productivity

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AUTHOR'S PROFILE

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