

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES IMPROVING CONSTRUCTION MANAGEMENT PRACTICE WITH THE LAST PLANNER SYSTEM

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ABSTRACT

In India, the construction practices is operated in traditional way. Traditional construction processes have been always related with inefficiencies, poor management in terms of site management (Resources and materials), waste management, time, and cost overruns. Due to which, at times the expectations of end users and customers are not achieved. The Last Planner System is a very important and systematic method that influences the achievement of lean construction. This paper includes comparative study of last planner system which is a technique of lean construction to traditional construction management. This paper summarizes the detailed study of lean construction based on literature survey done over the lean and traditional management on construction project. Lean construction is a relatively new construction management philosophy which has evolved from Lean manufacturing principles. The challenge now lies in implementing it in the developing countries. The Last Planner system is a production planning system designed to produce predictable work flow and rapid learning in programming, design, construction and commission of projects. The essence of Lean Construction is to increase in efficiency by elimination of non value adding activities.

Keyword: Master schedule, Look-ahead schedule, Weekly workplan, Percent planned complete, Make work ready planning..

I. INTRODUCTION

Lean Construction emerged as a new management discipline from the manufacturing philosophy and ‘Lean’ was first identified by Toyota in Japan (Ohno, 1998; Koskela *et al.*, 2002). Taiichi Ohno Toyota’s chief engineer was the main pioneer and promoter of lean thinking for Toyota. He drew so much attention with this new philosophy and it became popular, this made Toyota gain advantage over its competitors and rivals by eliminating both hidden and obvious wastes (Ohno, 1998). Planning and control in Lean Construction is practically achieved through the implementation of the Last Planner System (LPS). LPS has been argued to be the most developed practical use of Lean construction (Alarcon and Calderon, 2003; Thomas *et al.*, 2003). It addresses variability of workflow and reliability of planning, it offers the promise to make assignments ready while supporting short term planning and minimizing non-value adding work. It makes projects more predictable, minimises buffers, reduces uncertainties, encourages collaborative planning, creates reliable work plans and decreases workflow variability (Ballard *et al.*, 2009; Gonzalez *et al.*, 2010; Mossman, 2013).

Last Planner System (LPS) is a system of production control that emphasizes the relationship between scheduling and production control to improve flow of resources (Ballard, 2000; Fewings, 2013). The Last Planner is the person for operational planning, that is, the structuring of product design to facilitate improved work flow, and production unit control, that is, the completion of individual assignments at the operational level (Ballard, 2000). People, information, equipment, materials, prior work, safe space and safe working environment are the seven flows required to come together at the workplace to enable construction transformation to flow. The Last Planner System (LPS) manages all seven flows by building relationships, creating conversations, and by securing commitments to action at the right level at right time throughout the process (Mossman 2008).



II. LITERATURE REVIEW

Usama Hamed Issa (2013) stated that many construction projects involve different risk factors which have many impacts on time-overrun. This study suggests and applies a new approach for reducing risk factors and its effect on time using lean construction process. Assessing the effect of using the new tool like Percent Expected Time-overrun (PET) and the other is Percent Plan Completed (PPC). The very important risk factors are also identified and evaluated, while PET quantified at the starting stage of the project and during the project execution stage a quantification model used for time-overrun quantification.

Mohd Arif Marhani et al. (2013) proposed that sustainability through Lean Construction Approach. The aim of this research is to give the basic fundamental concept of Lean construction and highlight the main barriers of its implementation process. A wide and extensive literature reviews conducted by retrieving articles related from journals ranging from the year 1992 to June 2012. From the various review of literature search, it identified that Lean construction ability in improving the project performance especially in reducing site waste, construction stipulated time and overall cost of the construction, improving quality of the projects and environmental as whole.

Ojo et al (2014) established a qualitative approach to analyze barriers in implementing green supply chain management in Nigeria. The results revealed the following barriers: lack of public awareness, lack of knowledge and environmental impact, poor commitment by top management, lack of legal enforcement by government, lack of resources, lack of sustainable practices, lack of market, and lack of information sharing, lack of demand. He stated that the teaching techniques of lean construction and project management training programs conducted for motivating the research scholars and practitioners. It was also concluded that the success of the training Course is reflecting the opportunities for improvement identified between editing and publishing, made possible through the feedback collected from participants.

Raghavan et al. (2014) proposed implementing the Lean Concepts on Indian Construction Sites. Construction industry in India has been on a rapid growth path lately and increasing efficiency and profitability has been a key concern. IIT Madras, an educational institution, had recently taken up a program as a challenge to give training and implementation of Lean construction process in few trial projects through seminar halls and webinar based training course, reporting in technical formats, monitoring and motivating by site visits and carrying out reviews regularly. Construction sites encouraged to adopt the Last Planner System technique and to use other Lean tools in-depth help from the Faculty. It was also concluded that by implementing the lean concept and practices in Indian construction projects; will cut the overall project time and will improve the project planning and scheduling.

III. IMPLEMENTATION OF LAST PLANNER SYSTEM

This tool in simple words can be taken to be an assimilation of the above mentioned tools. It also has a number of other features which are explained below. The main objectives of a production control system like the Last Planner System are as follows

- Manage and mitigate the variability.
- Assignments and schedules should be sound regarding their prerequisites.
- The completed assignments should be monitored.
- Causes for failure to complete the planned work should be investigated and removed.
- There should be a workable backlog for each crew and production unit.
- The prerequisites of upcoming assignments should be made ready.
- The traditional push based construction process model should be incorporated with pull techniques
- Traditional project control focuses on hierarchical decision making and thus the decision making process lies in the hands of few and often decision makers are unaware of the ground realities. Decision making powers should be well distributed among the project team.

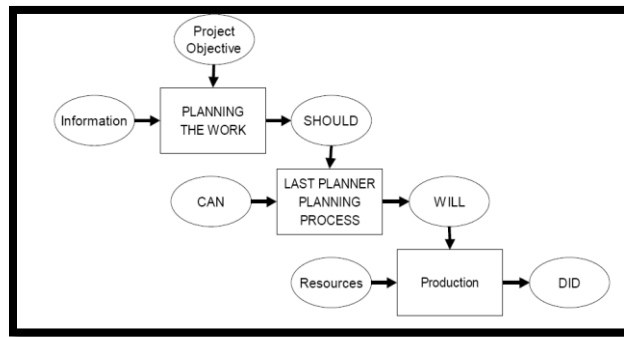


Figure.1 Last Planner system

IV. MODEL DEVELOPMENT

The following are the basic step which is involved in the development of a model. The Flow chart of Last planner system is shown in the figure

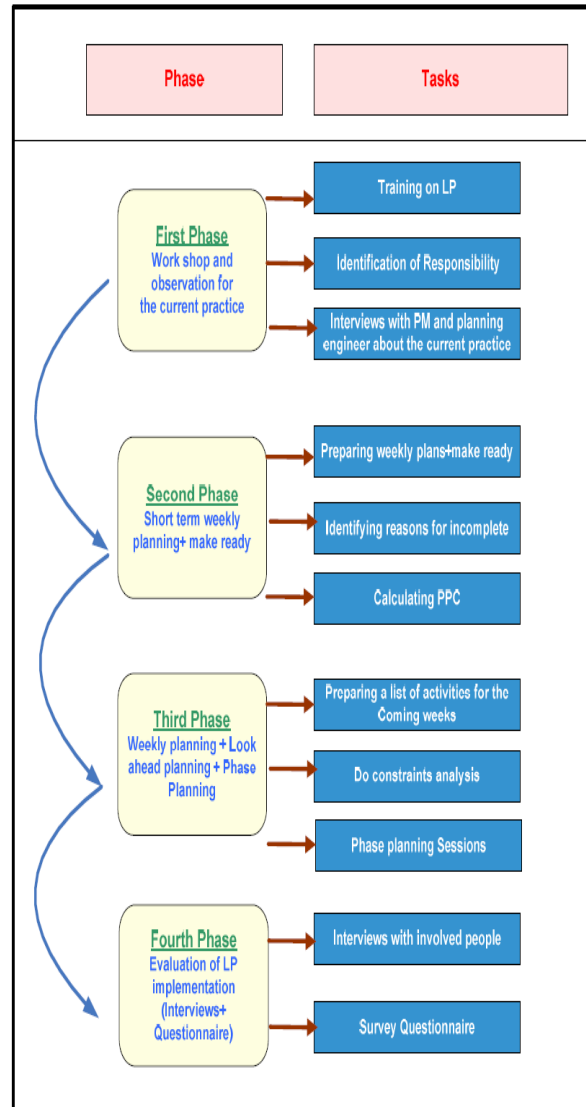


Figure.2 Model Development of Last Planner System

V. CONCLUSION

The last planners system could be an appropriate tool to help solve problems which arise at site during execution, minimizes delays, optimize the resources, and reduced the project cost. Present study describes how a Last planner system is prepared and the case study demonstrates an application in which the Last planner system enabled the user to validate proposed construction estimation.

The purpose of using Last planner system for construction simulation is to assist project planners to better understand the construction process and predict the accurate future costs.. This shows that the Last planner system can be used for this purpose and site is a key to implement the Last planner method. The specific conclusions derived from the following study are as follows:

- Personal commitment of last decision makers (last planners).
- Coordination of the last planners through regular meetings.
- Use of a basic indicator called planned tasks completed as planned (PPC).
- Obtained weekly results.
- It has been seen that the Last planner system was successful in reducing the construction complexities during execution of the project.

VI. SCOPE OF FUTURE WORK

An accurate planning can increase the productivity of construction activities, improve the utilization of resources. A comprehensive forecast of costs, planning are the main preliminary factors for successful construction management. The Last planner system can be successively use by planning engineers to make the project schedules more predictable and increases the chances that work will flow and projects will be completed on time.

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