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## Applying Value Stream Mapping For Improving Productivity in Construction

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#### ABSTRACT

Remarkable productivity improvements are observed in manufacturing industry which encouraged the emergence of lean thinking into construction industry. Poor management, output variability, labour intense work, interior work conditions and insufficient quality are the potential problems in construction industry which prevent implementing lean techniques. In this report productivity measurements for different activities like rebar installation, formwork installation and concrete pouring for column and slab processes are evaluated accordingly using output/input ratio. Value stream mapping (VSM) is used to analyse the lead times, work in progress levels (WIPs) and non-value added time. From the current state VSMs of bar-cutting/bending and column processes we have significant lead times, idle times Improvements are done by identifying the wastes and eliminating them and reducing the non-adding value.

Keywords—Lean thinking, Productivity in Construction, Value Stream Mapping (VSM), Waste, Variability.

#### 1. Introduction 1.1 GENERAL

Construction management is very vital for any construction project to complete in scheduled time and without any cost overruns. Lean construction practice is growing tremendously in modern construction and in most of the projects lean construction techniques are applied. There is an analogy between construction and manufacturing industry, obviously with some similarities and differences. Lean construction techniques are first developed in the manufacturing industry, later it became subject of interest in the construction industry. Unfortunately, translating lean concepts from manufacturing to construction is not automatic because of the unique characteristics of the construction industry, in addition to the geographical diversity among projects. Now, due to the lot of research happening in construction

industry lean construction techniques are effectively used in the construction to tackle some of the issues in the construction management. Lean based models are developed in order to evaluate the productivity of building construction processes, there by optimize the resource allocation and delivering the project in scheduled time without any cost overruns.

#### 1.2. Motivation

India has showed an exceptional economic growth in recent years. To sustain this growth good infrastructure is a prerequisite. As a result of this a large number of construction projects have been undertaken. These are divided into few very large projects, some medium scale projects and many small construction projects. The Indian construction industry is one of the fastest growing construction industries globally and it is the second largest employer in India. It gives employment to around 35 million people in India. The share of the construction industry in India is about 8% of its GDP. Productivity has for many years been an issue for the construction site. The lack of research on cost and time escalation in building construction industry in India brought about the need for this study. Poor planning and management of resources in construction is a huge factor for the productivity issues and delays in projects. In recent years, low productivity in construction industry was identified as the main problem of India's economy. Productivity can be a key determinant of a nation's future living standards and represent the competitiveness of the industry. Low productivities in the construction industry cause great concern for the government and policy makers. Productivity in construction industry in general can be measured at 3 levels that are at site/project, firm and industry. The three concepts related to productivities are LP (labor productivity), MFP (multifactor productivity) and TFP (total factor

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