



## Adoptability of Lean Construction Techniques in Pakistan's Construction Industry

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Received 04 July 2018; Accepted 03 October 2018

### Abstract

There is a philosophy in the construction industry to reduce the cost of a project by reducing construction waste and improving productivity. With lower expenses, lean construction emphasizes the cost of the project at a minimum cost. Globally, the philosophy has gained a wide range of popularity in the construction sector. The Lean Construction has helped practitioners with several tools and techniques to implement at different stages of a construction project. Following global trends, this study has investigated lean practices in Pakistan. With the potential advantages experienced by its implementation in Pakistan's construction projects and the level of implementation of various types of tools and techniques has been analyzed. To achieve the goal, the study had tried to capture construction projects in which four shareholders are being represented, which are clients, consultants, contractors and material suppliers. Overall 34 completed questionnaires were collected and then analyzed. The results of the analysis have indicated that pull approach, standard of work, time consuming, visualization tools, the integrated project delivery methods and the quality failure in safe limits are common lean techniques which are being implemented to the local construction industry. While there are major benefits of waste reduction, client satisfaction, better communication, visual control and proper task management to build appropriate work are the key benefits of lean construction.

*Keywords:* Lean Construction; Lean Tools and Techniques; Lean Benefits; Waste Reduction; Pakistan.

### 1. Introduction

The construction industry is a growing industry on a global level [1]. Fundamental part of economy of many parts of the world depends upon this industry. The 70 % growth of this industry was forecasted by the 'Construction 2025' industrial strategy report published by UK Government in between 2013 and 2025. Several threats as environmental pollution, waste production and energy consumption are however associated with this industry [2]. Besides this, managerial issues, escalations, time and cost overruns are always being intimidations to this trade. Lean Construction, being an emerging solution to this menace is briefly discussed in context of Pakistan in this study.

Implementation of lean techniques at the operational level, integrated delivery stages, strategic decision, leadership decisions, transformational change, and at the site for management of construction and other utilities is defined as lean construction [3]. Lean construction has been an important topic amongst researchers all over the world and is considered as an approach or concept that should be introduced, specifically to increase productivity by reducing waste in the construction process. As stated by [4], Lean construction (LC) as a philosophy and a set of principles was introduced in

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 <http://dx.doi.org/10.28991/cej-03091162>

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