A TOOL TO ASSESS AND IMPROVE THE CONSTRUCTION WORKER PRODUCTIVITY

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Sri Lanka

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DECLARATION

I declare that this research "A tool to assess and improve construction workers' productivity" has been carried out solely by me and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference or acknowledgment, the work presented is entirely my own, and to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where the acknowledgment is made in the text.

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Names of the supervisor: Dr. C.S.A Siriwardana

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ABSTRACT

Construction workers are the basic unit of the construction industry. The behaviour of construction workers is considered variable, which impacts on worker productivity. Therefore, obtaining the highest levels of performance is crucial to be competitive in the construction industry. The scarcity of skilled workers, increase of many high-rise building projects and changes in the economic and political conditions aggravated the need of seeking strategies to improve the performances of construction workers.

In the construction industry, contractors attempt to improve the workers' productivity with the aim of profit. Few frameworks which are connected were developed using different kind of research techniques. Firstly the existing productivity measurement techniques were thoroughly studied.

Furthermore frequent and critical errors and reworks in the building construction, causesof delay, factors affecting sub-contractor performance were identified and studied. In this study, the main focus is to setup relevant assessment frameworks to assess the productivity of Sri Lankan construction sites. To have a complete productivity assessment, a new framework was put forward considering an Initial and Detailed Assessment.

The initial assessment was developed to get a relative measure of productivity according to the external conditions other than labour and management. As the first step, critical factors that affect productivity were identified. Then, a few surveys were carried out to categorize and weight the factors. Detailed Assessment will be fulfilled on the basis with Activity Analysis to investigate root causes and improvements for the poor performance. It will mainly focus on sub-contractor performance on progress, direct work percentage and. worker performance benchmarking.

Further errors and rework reduction framework and sub-contractor assessment framework was connected to detailed assessment. Developed sub-contractor assessment is mainly a factor based assessment. It is reinforced with onsite data to cross check the performance and assessment value. Activity analysis results, crew wise errors and rework amount, attendance records and other available management records in different divisions in the site are connected to the sub-contractor assessment process

Analyzing the nature, frequent areas, and trends was identified as a key to minimize the repetitive errors. In a large construction site mainly high rise building construction projects most of the towers are having typical floors. In the framework which is a major part in detailed assessment, possible errors and reworks were identified under three main stages structural, masonry and finishing.

Finally, the developed frameworks are incorporated into a template which can easily be plugged into a web tool. An initial version of the web-tool ("Enhancer"- enhancer.lk) was developed. The "Enhancer" tool can analyse the performance using a set of developer productivity tools. The tool can suggest best practices according to the inserted data and information. Furthermore, it can work as a helping hand for productivity improvement.

The developed productivity improvement framework was implemented in a building construction project in Sri Lanka, and it was able to contribute to the productivity improvement process. Additionally, six presentations and knowledge and research finding sharing sessions were successfully carried out and received very good feedback from the experts who were in the audience.

Keywords: Productivity, Sri Lankan, Construction, Productivity, Workers, Activity Analysis, Sub-contractors, Performance improvement

DEDICATION

This whole work which I have carried out is dedicated especially to my mother and father

And to,

All the construction workers around the world,

who sacrifice their heart and soul

to build a better world for all of us.

Also

Sri Lankan people who, sponsor for the entire education system from every rupee they earn, without knowing the people who get the benefits for all of those!

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During the period of data collection, I was assigned to the Havelock City Phase III project. General Manager of Projects Mr. A.R. Rodrigo and Senior Project Manager Mr. Piyathunaga for guiding us within the research period. As a General Manager, Mr. A.R. Rodrigo personally looked after about the research works. My heartiest gratitude all the Site Managers, Engineers, staff members and skilled and unskilled laborers who gave their valuable support to make this study a success.

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