

## **1.0 Introduction**

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Construction contractors are continually searching for ways of eliminating waste and increasing profit with the continuous decline in profit margins and increased competition in construction projects (Mastroianni and Abdelhamid 2003). Although numerous approaches have been developed to improve efficiency and effectiveness of construction processes, lean construction techniques offer the promise to minimize, if not completely eliminate, non value-adding work.

Since the early 1990's, the construction research community has been analyzing the possibility of applying the understanding construction as production. The International Group for Lean Construction (IGLC) has made significant contributions to the formulation of theoretical foundation for lean construction by abstracting the core concepts of lean production and applying them to the management of construction processes.

Paez et al. (2005) indicated that the nature of the operation, planning, and execution are the key categories that emphasize the differences between manufacturing and construction. Due to these fundamental differences between construction and production processes, the tools of lean production can't be directly used to manage construction processes and a new set of tools is required. The Last Planner system of

production control, introduced in 1992, which emphasizes the relationship between scheduling and production control, is the most completely developed lean construction tool (Ballard 2000).

Howell (1999) indicated that lean construction is similar to the current practices in the construction industry; both practices pursue better meeting customer needs while reducing waste of every resource. However, the difference between the current practices and lean construction is that lean construction is based on production management principles, and it has better results in complex, uncertain, and quick projects.

Nevertheless construction organization have integrate some form of lean system in day to day operation at macro level however knowledge is not fully conceptualize with Lean Construction still in the early stage of development.

The Lean Construction Tools such as Last Planner, increased visualization, daily huddle meetings, first run studies, 5s process, fail safe for quality and safety, and other systems will be explore and evaluate to better improve local construction industry operational performance in term of Quality, Time and Cost.

## **1.2 Purpose of Study**

The purpose of this study is to provide a better understanding towards Lean Construction Principle and to establish Systems and Tools in minimizing, if not completely eliminate, non value-adding work, increasing profit and deliver what the customer needs.

In other word, Lean Construction Principle, Systems and Tools will be explore and evaluate to improve efficiency and effectiveness of construction operation, planning and execution. The study explore method to improve flow of information, material and people by discovering and rediscovering waste and ways to minimize, if not completely eliminate, thus increase profit and deliver customer needs.

Acknowledging and recognizing different type of non value-adding work at various stages of construction process would mean requiring different set of Lean Construction System and Tool to effectively minimize waste.

Lean Construction Systems and Tools are explored and evaluate for effective implementation and improvement in operational performance to achieve desirable result otherwise risk failure that defeat its purposes.

### **1.3 Significance of Study**

The construction industry plays an important role in any country's economic development. It establishes the infrastructure required for socioeconomic development while being a major contributor to overall economic growth. Construction output is referred to as growth-initiating and growth-dependent (Drewer, 1980). As development progresses, the construction industry needs to satisfy the expansion and changes in construction demand.

The construction market is constantly changing in a business environment that increasingly requires greater client focus, better value for money and construction that is on time and on price. Globalisation has create markets and economies that are interlinked and interdependent with labour becoming much more mobile and goods and services being sourced from all around the world.

Many countries are undertaking radical reviews of their construction sector looking at continuous improvement, client satisfaction, use of technology, innovative processes and procurement, improving safety and health on sites, and employment practices.

Competitiveness needs to be sustainable if long term economic targets are to be met. Sustained competitiveness can only be achieved if all facets of economic, technological, environmental and social growth are taken into consideration.

Ignoring any one of these may affect a nation's potential to improve its competitiveness over time.

Thus lean construction techniques offer the promise to minimize, if not completely eliminate, non value-adding work to improve operational efficiency and effectiveness of construction process, deliver what customer needs and thereby achieve sustainable competitiveness.

## **1.4 Research Problem**

Lean Construction is a philosophy based on the concepts of Lean Manufacturing. It is about managing and improving the construction process by eliminating waste and increasing profit to deliver what the customer needs.

The manufacturing industry has seen dramatic improvements in productivity and quality, while reducing cost and lead times however the construction industry has not seen such positive results thus improvement opportunities are in demand. Both these industries involve the management of complex operations and strive to deliver a quality product in the shortest feasible time possible, moreover in each of these industries it is important to save money and stay competitive.

Given these similarities, we migrate the Lean Manufacturing Principles into construction process and simultaneously explore and evaluate the Systems and Tools to improve operational performance in term of Quality, Time and Cost.

## **1.5 Research Objectives**

This research advocates on the application of Lean Manufacturing Principles, Systems and Tools from the manufacturing into the Malaysian construction industry to improve operational performance.

Enlisted below the objective of this research:

- Objective 1: To migrate the Lean Manufacturing Principles, Systems and Tools into the construction process.
- Objective 2: To explore suitable Lean Construction Systems and Tools for the Malaysian construction industry.
- Objective 3: To evaluate the influence of Lean Construction has on operational performance in term of Quality, Time and Cost in Malaysian construction industry.

## **1.6 Outline of Study**

### Chapter One - Introduction

Introduce to the current development of lean construction, the problem and purpose of study and how it affects the development of a country. The purpose of this study is further redefine into specific research problem and thus research objective.

### Chapter Two - Literature Review

Elaborate on the history of lean production, Lean Manufacturing Principles, Systems and Tools.

### Chapter Three - Research Methodology

Explain the research method used for development of hypothesis, selections of measures, data collection procedure and data analysis technique in order to derive finding.

### Chapter Four - Research result

Data gathered are presented using appropriate charts for easy understanding.

### Chapter Five - Conclusion and recommendations

Findings are conclude and recommendations for future research are made in lieu of current limitation.