

Concept of lean construction projects construction essay



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Lean construction project is very different compared to traditional construction project management where Lean approach aims to maximize performance for the customer at the project level, set well-defined objective clearly for delivery process, design concurrent product and process and applies production control throughout the life of project (Howell, 1999).

Construction is a key sector of the national economy for countries all around the world, as traditionally it took up a big portion in nation's total employment and its significant contribution to a nation's revenue as a whole. However, until today, construction industries are still facing numbers of contingent problems that were bounded to be resolved since the past time. The chronic problems of construction are well known such as Low productivity, poor safety, inferior working conditions, and insufficient quality. (Koskela, 1993) and the phenomenon of the poor performance and conditions in construction had long been witnessed and recorded by academics and practitioners throughout the world regardless in developed countries e. g. England (Eaton, 1994) or in developing countries e. g. Chile. (Serpell et al., 1995)

Nowadays, increasing foreign competition, the scarcity of skilled labour and the need to improve construction quality are the key challenges faced by the construction industry. Responding to those challenges imposes an urgent demand to raise productivity, quality and to incorporate new technologies to the industry. A lack of responsiveness can hold-back growth, and to development of the needed infrastructure for the construction industry and other key activities in the country. (Alarcón, 1994). <http://www.scribd.com/doc/37230963/Lean-Construction>(lps left)

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Pertaining to the challenges faced by the construction industry, numerous researches and studies had been carried out for the past decades to identify the causes to the construction problems and some of them had went on to suggest and recommend solutions to rectify those identified problems. The early phase of these studies mainly focused on the “ end” side of the construction process with the introduction of new technologies and equipment to speed up the construction process and improve overall productivity. It was only until late 1980s where a new construction improvement movement was being initiated by looking into the “ mean” side of the construction process-related problems in a more holistic and structured way based on the philosophy and ideology of lean production. With the lean construction paradigm, construction industry had started to be reviewed and evaluated in the possibilities of implementing these new lean perspectives of production concepts in the construction processes to optimise the overall construction performance on construction stage as well as design stage. However, in construction, there has been rather little interest in this new production philosophy. (Alarcón, 1994) This matter laid on whether or not the new production philosophy has implications for construction and will give any significant impacts on the productivity improvement.

According to the scholars and researchers in Lean Construction, the new construction production philosophy is laid on the concepts of conversion and flow process. Therefore, performance improvement opportunities in construction can then be addressed by adopting waste identification/ reduction strategies in the flow processes in parallel with value adding

strategies with the introduction of new management tools and with proper trainings and education programs. Unfortunately, these new lean construction concepts especially those on wastes and values most of the times are not well understood by construction personnel. Particularly, waste is generally associated with waste of materials in the construction processes while non-value adding activities such as inspection, delays, transportation of materials and others are not recognised as waste. (Alarcón, 1995) As the result of that, the productivity of construction industry cannot be fully optimised due to the narrow interpretation on the concept of waste current adopted. In this case, substantial education programs need to be arranged for all related parties involved in order to implement the new process improvement strategies successfully throughout the construction process cycle.

According to Ballard & Howell (1998), construction covers a spectrum ranging from slow, certain, and simple project to quick, uncertain and complex project. Meanwhile, Koskela (1992) stated that construction is unique in the sense of it is one-of kind nature of projects, site production and temporary multi-organization. However, failure of establishing a good management system in construction project will lead to many problems that would cause cost of project increases, late completion of project and low quality which finally reduce the profit of the contractor. In order to overcome this problems, lean thinking or lean construction is been introduced in this construction sector.

According to Howell (1999), lean construction is one of the new philosophies that been implemented by Toyota in their manufacturing process which now <https://assignbuster.com/concept-of-lean-construction-projects-construction-essay/>

applied to the construction industry in order to smoothen the construction project and increase the contractor's profit by eliminating waste. This supported by Ballard and Howell (1998) whom also stated the same facts that lean thinking in construction concerned in waste reduction.

Generally, lean approach breaks the construction project to smaller parts of activities which will be defined clearly the start and end date for completion of each activity with an appointed person to keep on monitoring the all the activities to be completed according schedule. (lean construction 19/11)

2. 2 Types of waste

In most cases, construction managers do not know or recognize the factors that produce waste nor have they measurement of their importance. It can be said that most of the factors are not easily visible. Thus the identification of these factors and their causes, and the measurement of their importance is useful information that would allow managers to act in advance to reduce their negative effect. In construction industry the waste comes from the flow activities, conversion activities and management activities.

Before sharing examples of lean application in construction, it is useful to identify the seven types of waste readily found in construction:

1. Defects:-This includes wrong installations, fabrication defects, errors in punch lists and not meeting required codes. Rework in construction is rarely measured.

These are products or services that do not conform to the specification or Customer's expectation, thus causing Customer dissatisfaction.

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2. Overproduction of goods:-This happens when material is fabricated too early and/or stockpiled in the warehouse or at the job site. Estimating and bidding jobs that are not won is a form of this waste. Printing more blueprints or making more copies of a report than needed is overproduction.

Overproduction occurs when operations continue after they should have stopped. The results of overproduction are;

Products being produced in excess of what's required

Products being made too early

Excess inventory carrying costs

3. Transportation:-This waste occurs when material is moved around the shop, loaded on the truck or trailer, hauled to the job site, unloaded and then moved from the lay-down or staging area to the installation point.

This is unnecessary motion or movement of materials, such as work-in-process (WIP) being transported from one operation to another. Ideally transport should be minimized for two reasons;

It adds time to the process during which no value-added activity is being performed.

Handling damage could be incurred

4. Waiting:-Examples include when a crew waits for instructions or materials at the job site, when a fabrication machine waits for material to be loaded and even when payroll waits for the always-late timesheets.

Also known as queuing, waiting refers to the periods of inactivity in a downstream process that occur because an upstream activity does not deliver on time. Idle downstream resources are then often used in activities that either don't add value or result in overproduction

5. Over-processing:-This waste includes over-engineering, for example, the need for additional signatures on a requisition, multiple handling of timesheets, duplicate entries on forms, and getting double and triple estimates from suppliers.

This term refers to extra operations, such as rework, reprocessing, handling or storage that occurs because of defects, overproduction or excess inventory.

6. Motion:-These “ treasure hunts” happen when material is stored away from the job or when workers look for tools, material or information. This waste also occurs in the office or job-site trailer when looking for files, reports, reference books, drawings, contracts or vendor catalogs.

To move and add value is called work. To move and not add value is called motion. Motion, then, means moving without working, moving and adding cost”

7. Inventory: – This includes uncut materials, work-in-process, and finished fabrications. Some contractors claim that they have no inventory because they job-cost all material. While this may work for accounting, if the material is not yet installed and isn't being used by the customer, it's waste. This waste includes spare parts, unused tools, consumables, forms and copies,

employee stashes and personal stockpiles. One could argue that the unfinished facility is inventory and is waste until operational.

This refers to inventory that is not directly required to fulfil current Customer orders. Inventory includes raw materials, work-in-process and finished goods. Inventory all requires additional handling and space.

http://www.leaninnovations.ca/seven_types.html

2. 3 Causes of waste:-

1. Controllable causes associated to flows

(a)Resources

Materials: lack of materials at the work place; materials are not well distributed; inadequate transportation means.

Equipment: non availability; inefficient utilization; inadequate equipment for work needs.

Labour : personal attitudes of workers; stoppage of work

(b) Information

Lack of information

Poor information quality

Timing of delivery is inadequate

2. Controllable causes associated to conversions

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(a) Method

Deficient design of work crews

Inadequate procedures

Inadequate support to work activities

(b) Planning

Lack of work place

Too much people working in reduced place

Poor work condition

(c) Quality

Poor execution of work

Damage to work already finished

3. Controllable management related causes

(a) Decision making

Poor allocation of work to labor

Poor distribution of personnel

(b) Supervision

Poor or lack of supervision