



'Lean for Profit' Lean Construction means Performance Improvement & Increased Profitability for Construction Industry

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Construction projects are notorious for delay, cost overrun and quality issues. Typically we experience delay in decision making in terms of design, material finalization, statutory approvals, execution methodology etc and less execution works are happening during the early stages of projects. Whereas the final lap of projects will be super active with more information clarity, approvals and people struggle to complete 50-60% works within 10-20% of time left to commission or handover the project. Studies show that around 60% of activities in construction projects get completed after multiple due date changes, several reminders and cost escalation. The 'firefighting' (last minute rush) to complete the projects' leads to work stress, further scarcity of right resources, low productivity, poor quality of works (which may lead to rework or client dissatisfaction) and cost overrun in many -projects.



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The seven inefficiencies (7 wastes) in Construction Projects

All stakeholders including Clients and Contractors loose time and money due to major inefficiencies like rework due to various reasons like quality issues or change in design etc & delay/waiting for approval or any inactivity due to incompleteness of previous works etc which are referred and classified as 'Waste in Construction' by Lean Construction studies and research.

Other wastes or inefficiencies part of '7 wastes in construction' are:

- **Over processing** – Unnecessary steps like reprocessing, double handling or double checks in purchase order, bill payment or quality check due to lack of trust add no value to construction works. Over processing without improving the performance leads to delay and end up in defective works.)
- **Over production** – Completing works in advance faster than it is really required due to lack of prioritization, leads to the situation like works are awarded to a contractor earlier than required when site is still waiting contractor to start immediate other works or details for tomorrow is not available where we have drawings available for next month works)
- **Motion** – Keep moving around add no value to work. People looks busy working 10-12 hrs but less effective & low production due to poor planning or lack of coordination or inefficient work methodology.
- **Transportation** – Unnecessary movement of material (Its common in projects that many materials reach site will undergo several shifting (minimum 2-3 times) before it gets consumed in projects)
- **Inventory** – Excess and shortage of inventory creates problem in construction projects. Additional stocks create space problem and monetary challenges but shortage will stop the work progress. Just in time may not work immediately in Indian projects and projects required to go for an optimal stock based on the pace of execution, site accessibility, storage provisions and availability of materials. Most of the organizations have procurement policies covering this aspect but proper material request to receipt of sufficing quantity of quality product within required time at site is still a concern for many project managers.

Ultimately such inefficiencies causing crisis and chaos in projects forcing people to spend minimum 30 % of their daily time to do follow ups and resolving repeated problems arising due to such crisis situations. Also the uncertainties in project sites are at peak and our study shows that around 50% daily activities in project sites are unplanned in nature because of inefficiencies.

This makes our sites, professionals and labors less productive and cause underutilization of resources including project leaders. On an average the utilization of labor and machineries are around 33% during the 50-80% of project time and we can see project in charges standing as supervisors to get the work done during critical activities. Our professionals are busy today resolving last week’s problem instead of planning and making ready the work for tomorrow. The situation can be improved by developing management skills of our supervisors, engineers and project managers.



What is Lean Construction?

Lean construction is a combination of tool and techniques adapted from Lean manufacturing principles as a result of research and by consolidating best practices from industry. The construction refers to the complete cycle of project from concept to commissioning, not just execution, and also gives sufficient importance to maintenance to salvage or recycle aspects of projects. So the Lean Construction concept is beneficial for Clients, Contractors, Designers, Suppliers, end users etc.

The Toyota Production System influences the Lean Construction to identify the production nature of project and conceptualize to manage selected activities with production mindset. The Lean Construction can ensure smooth flow of information, material and resources to complete activities ensuring value delivery at every stage of project improving collaboration, performance and productivity.

Application of Lean Construction

Lean construction tools and techniques are implemented in many organizations and practicing in several Indian & International projects. The 26th Annual Conference on Lean Construction by IGLC (International Group for Lean Construction) was conducted in Chennai, in July 2018. Several research papers with case studies were presented by Indian and International experts shows the greater adoption of these concepts in construction industry. Last Planner System® by Lean Construction Institute and Value Stream Mapping (VSM) are found highly effective and popular among Lean Construction tools.

Last planner system®(LPS) is a collaborative, commitment-based planning system that integrates should- can- will- did Planning [Should – shows the mandatory nature to deliver project scope within time, cost and quality, Can – identify the bottlenecks to be removed for possible future works, Will- represent habit of making ready before giving committing the work & Did- daily works are evaluated as Done or Not Done instead of % of completion] with constraint analysis, weekly work planning based upon reliable promises, and learning based upon analysis of PPC (plan percent complete) and reasons for variance. It will ensure the involvement of the person who is responsible to execute the work (known as Last Planner) to plan and make ready for successful completion than current way of 'push planning'.

The system facilitate people to closely monitor the day-to-day commitments, enable people to learn lessons from daily failures and take appropriate controlling measures in the upcoming planning cycle. The LPS strengthen the project manager and his teams to better understand the expectation of people whom they report and need of team members who execute the work. The Last Planner System is bringing the agility in construction projects without diluting the overall control on deliverables.

Value stream mapping (VSM) enable the professionals to tackle non-value adding activities/ waste / inefficiencies in construction projects. Project management processes like drawing approval, procurement order etc and execution activities which are repetitive in nature like slab cycle in a building construction, column erection cycle in pre-engineered projects, toilet completion in apartments etc can be improved using Value Stream Mapping.

Value stream mapping analyze the '7 wastes' or inefficiencies in current way and define future state for series of events to take the service or work from its beginning to the end customer. Usually we observe around 50-60% non-value adding activities in our construction processes, which can be reduced or

eliminated by using the VSM method. Reduction of 15 days drawing approval cycles to 5 days is an example of VSM's capability to reduce the time period.

Lean Construction is more about developing a culture of self-realizing the area for improvement, establishing a practical approach to implement best practices and continuously improving the capability and skills of people, processes as well as organization ability to deliver projects within the expectation. Tools and techniques like 5S, Target Value Design, A3 reporting, Big Room, Choose By Advantage (CBA), PDCA, Root Cause Analysis and Continuous Improvement concepts are widely used as part of Lean Construction practices.

Increasing Importance and Acceptance of Management Concepts.

Management concepts like Lean Construction is getting greater acceptance in construction projects. Management skills cannot substitute the technical capability of professionals but it can improve the performance and accelerate their career growth. Application of management concepts like Project Management, Requirement Management, Collaborative Partnering, Lean Construction etc will help our projects to ensure better coordination, collaboration and communication in our projects. Incorporating the Lean and other concepts in to current way of managing projects will significantly improve the time, cost and quality performance of projects.

Implementing simple best practices from management concepts and following it in a systematic & structured way will facilitate projects to achieve 15-25% improvement within 2-3 months period. Management concepts including Lean Construction can reduce the project duration, optimize the cost and improve the quality when implemented across the organization. Improving the management skills of people, optimizing the processes and establishing a high performing organization require strategic planning and long term commitment from management.

Author's Bio

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