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**Executive Summary**

Projects, nowadays, are becoming increasingly complex owing to decreased delivery durations and complex design. Historic and current project management methods rely on imperfect assumptions and try to reduce uncertainty rather than trying to find a solution for problems. Larger delivery times, such as in current project management methods, offer a wider window where imperfections and errors may get introduced in the system. This, however, can be reduced with smaller delivery cycles leading to quicker deliverables. Nonetheless, current methods may work well for certain small projects with low complexity.

Lean Project Delivery Systems (LPDS) and current project management methods have striking differences in terms of culture and thinking, management ethos and organizational design, decision making, processes, expertise and shared knowledge, risk assessment and management and attitude towards the customer etc..

The next sections of this report will elaborate more on the above differences as a comparative assessment of advantages and disadvantages of current project management methods and LPDS.

## 1. Introduction

Project Management is defined as the art and the act of assembling people to systematically achieve a shared goal. The primary difference between current project management methods and LPDS is introduced in the design phase itself. LPDS puts a lot of focus on the design phase at, pretty much, the beginning of the project development cycle. LPDS works towards harnessing the team expertise and talent with more collaboration and knowledge transfer as opposed to current delivery methods that promote individual rewards and recognition. LPDS enables a complete shift from a control and command oriented environment, in current methods, to an encouragement and support oriented environment.

LPDS works towards improving the system for the customers rather than fixating on a contractual work format as that in current methods. This thought-process enables a system based more on customer demand (and contribution with continual feedback and improvements) in comparison to a silo-based and hierarchical system created by the current delivery methods. LPDS involves a collective risk management approach where responsibilities are shared. On the other hand, in current methods, risk management is at an individual level.

The following report will shed more light on the application of LPDS principles, theory, processes and tools that can be applied to current project management practices. It will further analyze and compare the advantages and disadvantages of LPDS and current project delivery methods.

## 2. Key Findings

The key findings of this report have been differences in the thinking and methodology of LPDS as compared to current methods, where the focus shifts to “making things happen” in LPDS as opposed to “monitoring results” in current methods. In LPDS, performance optimization and cost effectiveness is considered and calculated at the project level rather than at an activity level as in current project management methods.

## 3. Lean Project Delivery Systems (LPDS)

Lean Delivery System is a model that works towards creating a collaboration of people, processes, systems and practices to optimize performance and in turn value of the product for the client by harnessing the talent, experience and knowledge of the participants. The outcome of LPDS is performance maximization and waste reduction.

### 3.1 Theory and Principles

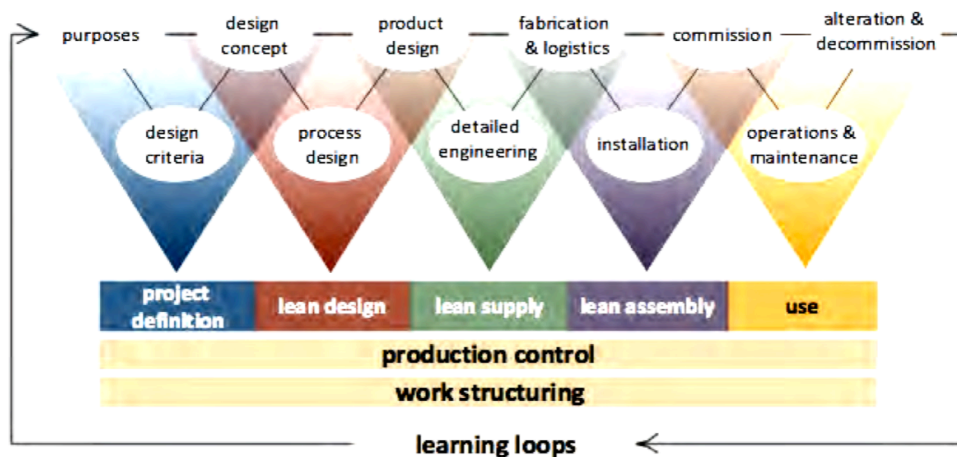
The basic principles of production systems design can be summarized as follows:

- Increased control over the system.
- Structure the process to attain value.
- Align production with customer needs and purpose.

It is these basic principles that are modified based on a number of philosophies and researches to achieve the desired result. Modifications may include changing the processes, including digital aids and means, getting the team structure right or enforcing a culture change on the production floor.

The Lean Project Delivery model considers a project as the smallest unit in system to gauge performance or cost effectiveness. LPDS has a firm focus on collaboration and conversation between various phases. LPDS aims at attaining value in a project efficiently and through processes that are repeatable and reliable.

Figure 2 (Alan Mossman 2008) shows the triads of Lean Project Delivery Systems (LPDS). It illustrates a series of phases as overlapping triangles.



**Figure 2:** The Lean Project Delivery System™ (source: [www.leanconstruction.org](http://www.leanconstruction.org))

### 3.2 Processes

LPDS processes are segregated into four phases consisting nine modules, such that preceding phases overlap with the succeeding phases. The four phases are as below:

#### 3.2.1 Project Definition

The aim of this phase is to define project goals and values through conversation involving all stakeholders and representatives of each phase (design, production, sales etc.) of the project life cycle, taking into account the means to achieve the same.

#### 3.2.2 Lean Design

During this phase the team works towards developing the product and process design together. Decisions are deferred to the last responsible moment such that alternatives can be explored for development and in design. A set based strategy is used in creating a set of designs within the constraints.

#### 3.2.3 Lean Supply

This phase lays emphasis on details engineering, fabrication and delivery. It, primarily, has two aims:

- Demand review in accordance with engineering specifications, and

- Lead supply time reduction by details design and scheduling and introduction of floats, that act as buffers.

### **3.2.4 Lean Assembly**

This phase starts with material delivery and extends till the product is completely manufactured. Continual flow during the installation process ensures maximum value of the product delivered.

## **3.3 Tools**

Some tools that enable the adoption of LPDS principles in a project environment as are follows:

### **3.3.1 Last Planner Method**

This method has a three phase approach

- Drop activities in look ahead screen for constraints,
- Reject defective assignments,
- Monitoring based on percentage of work completed and providing feedback.

### **3.3.2 Pull Scheduling**

Only the work that needs to be done to enable the succeeding activity is completed. It aims reducing lead supply time.

### **3.3.3 "One Operator, Many Processes"**

This approach aims at producing multi skilled labour that can handle machine operation, perform quality checks and housekeeping jobs.

## **3.4 Value Delivered and Waste Reduction**

LPDS has two main outcomes - Attaining value and Waste reduction. The process of involving the customer in the project definition phase helps define the value involved for the customer within the constraints of the operating and manufacturing means. All feedback received is noted and discussed as a learnings in forthcoming projects.

LPDS principles encourage root cause analysis of potential and current problems so that they can be eliminated from the production cycle and avoided in the future. The practice of producing in smaller volumes ensures that losses are restricted to a small batch only and not the entire product line. Over the time this strategy reduces cost and time required in the activity. This time can then be utilized in assessing new technologies and methods that would make the production better.

### **3.5 Advantages**

LPDS challenge the long held belief of there being a trade-off between time, cost and quality in delivering high quality, cost-effective deliverables in the accepted time frame, through the advantages listed below.

#### **3.5.1 Adaptive Planning and Design**

The customer is kept in loop throughout the entire product cycle. Customers' interests are properly aligned in the production system. Continuous feedback and improvements across the production system means the product and the process are designed. This allows the production system to evolve and grow with the changing technologies and equipment during the production cycle to optimize performance.

#### **3.5.2 Performance Optimization and Waste Reduction**

Decisions are finalized until the last responsible moment which gives more time to the develop and explore alternatives which boost performance and reduce material and effort waste. This leads to profit maximization within the agreed upon time duration for the project.

#### **3.5.3 Team as a whole**

Lean methodology relies heavily on coordination through a pull based mechanism which assures continual flow. It is extremely essential for all phases in the production cycle to collaborate with each other. The team as a whole works towards optimizing performance of the system rather than working in. This inculcates an environment where knowledge and learnings on the floor are shared systematically.

#### **3.5.4 Decentralized Decision Making**

This means the whole team is entrusted with the information of the state of the production system and downstream players are involved in upstream decisions. The participants have the authority to take action on those decisions without running for approvals from higher management silos. This also helps in potential risks being identified and managed collectively.

### **3.6 Disadvantages**

#### **3.6.1 Inefficient for Small, Low Complexity Projects**

LPDS has proven effectiveness in complex and large projects, however, it fails its purpose in projects that have simple processes involved and are of small durations of time. Such durations are small enough not to allow any adaptive planning. Thus, investing in a lean approach would incur larger costs and reduce the profit margins.

#### **3.6.2 Conflicts During Decision Making**

Decentralization of decision making may cause conflicts among the participants as the number of participants increases. It could also lead to situations where participants with less experience on the floor are being entrusted with taking big decisions that they may not entirely understand the complications of.

#### **3.6.3 Supplier management**

LPDS depends on continual flow and pull based mechanism to ensure continuous production and waste reduction. However, external factor such as suppliers may hinder the performance if not managed properly. LPDS expects the suppliers to be co-operative and reliable in terms of being able to deliver components frequently and in small lots.

### **4. Current Project Management Methods**

Current Project Management Methods have a number of advantages, which when applied to certain scenarios, like those in a small project with a very low level of complexity, or to a completely contractual setup, would prove beneficial and cost effective over LPDS. Few of the most important advantages are as below:

#### **4.1 Advantages**

##### **4.1.1 Command and Control Strategy**

A small group of managers assign tasks and assess the delivery and performance. This introduces authority and control over the delivery process and the deliverables.

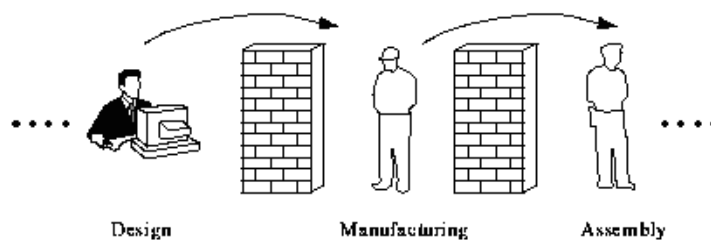


#### 4.1.2 Individual Rewards

Individual performance is regarded higher than team performance as a part of the current methods. This increases focus on individual growth and creates an environment of highly specialized workers.

#### 4.1.3 “Over-the-wall” Approach

Since the team works in silos, a group of individuals is responsible for a select activity. Thus, leading to an over-the-wall structure. This leads to creation of “semi-teams” that are highly specialized in their respective tasks.



**Over The Wall Engineering**

**Figure 1: Over The Wall Engineering**

Figure 1 (Lokesh Gutpa) shows the a visual of over-the-wall engineering and the silos so created

## 4.2 Disadvantages

Apart from their many advantages, current project management methods also have their set of disadvantages that go against their adoption in complex and long term projects.

### 4.2.1 Performance Optimization at Activity Level

Performance optimization is undertaken at the activity level. In most cases, it leads to an overall reduction in the performance of the project as a whole. It also brings in the culture of “my-bit” in the individuals working in a particular activity, thus reducing team level interaction and collaboration.

**4.2.2 Schedule Driven and Centralized**

Current project management methods are highly centralized. The delivery is schedule driven to co-ordinate work rather than on a continuous feedback and flow method. This introduces wasteful iterations and increases the cost and effort of design.

**4.2.3 No Continual Feedback**

The customer is expected to completely define all the requirements at the very beginning of the project life cycle. Thus, there is no room for continuous feedback and improvements. For example, if there is a project that has a timeline of 6 months, there would be no scope of incorporating new technology or methods in the delivery cycle since the design has already been finalized.

**4.2.4 Customer Unaware of Status Till Delivery**

The customer has no idea of the state of the deliverable since the requirement gathering phase till the project life cycle completes. Thus, giving zero visibility to the customer on the deliverable product during the build phase.

#### 4. Conclusion

Based on the above report, it can be concluded that either method is beneficial in its own way provided it is applied to the correct eco-system.

However, as the complexity of projects increases, LPDS becomes a more and more viable option for customers since it operates at the project level, however current project management methods suit simple and small duration projects better as they operate at an activity level.

Current methods rely heavily on participants operating in silos and decision making being a separate task reserved for the management team as opposed to LPDS, where the team is entrusted with decision making based on continual feedback.

LPDS ensures that the customer interests are kept aligned during the production cycle, thus being more sensitive to changing requirements, whereas current methods work on an extremely contractual approach without scope of change during the production phase.

In LPDS, team success is tied to project success rather than being individually pursued as is seen in current methods.

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