
**MANAGEMENT OBJECTIVES OF LEAN MANUFACTURING
IN MATERIAL HANDLING OPERATIONS**

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ABSTRACT

Regardless of industry, one of the key processes of manufacturers is material handling. A great deal of waste can often be found in the material handling processes of manufacturers. The operational management teams of firms are often tasked with the hurdle of reducing this waste to meet business goals and meet customer demand. Many times, techniques such as lean manufacturing are mandated as the methods by which operational groups must reduce this waste and create improvement opportunities, but a specific roadmap to define the objectives of the operational group is not provided. The goal of this research is to develop a methodology that will provide management groups with a tool to assist in defining the objectives of lean manufacturing implementations. The central focus of the methodology is to identify waste and prioritize solutions based on the business goals of the organization.

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INTRODUCTION

Modern manufacturing facilities are faced with escalating challenges in the world market. The globalization of firms that produce manufactured goods has forced firms to re-evaluate the goals and the expectations of their managerial teams. One area that is of increasing concern in manufacturing is material handling. As the need to meet growing demand and greater customer expectation drives organizations, the need to monitor and manage the flow of materials through processes becomes increasingly important.

Material handling is defined, simply, as moving material. This is the popular perception that many hold, but in fact material handling includes much more than simply moving material. For a significant number of manufacturers, material handling can account for more than one-half the total cost of manufacturing. The flow, movement, and storage of materials in the manufacturing processes of firms often require a great deal of resources, both employees and equipment.

Material handling is also regarded as being a non-value added function that is still necessary for the successful completion of the manufacturing process and can have a marked effect on the ability of a firm to meet managerial . The cost generated by material handling systems can be reduced if steps can be taken to improve these systems. Productivity and the incidence rate of injuries, specifically lost time injuries, can also be improved by positive changes to material handling systems.

Lean manufacturing is based on the elimination of waste from the processes, both value added and non-value added, used to produce goods and services. There are five primary elements to consider when implementing lean manufacturing holistically; manufacturing flow, organization, process control, metrics and logistics. Feld has defined these elements and the specific tools that can be attributed to each of these elements.

LEAN MANUFACTURING IN MATERIALS HANDLING

Lean manufacturing is a tool that many companies focus on for continuous improvement of processes. Long term strategies as well as short term goals of these firms involve implementation of lean manufacturing to eliminate waste and boost performance. However, many of these companies only undertake the initial strategic move of defining lean manufacturing as a philosophy and never provide functional roadmaps to daily operations teams for the implementation of lean manufacturing indicates that the time and resources to

sustain lean manufacturing are often not provided by top management to operational management teams.

One of the key areas where a sustained lean manufacturing implementation can have great affects on the performance of a company is material handling. However, not sustaining such an implementation and not approaching the implementation holistically can lead to incomplete solutions that may actually generate additional waste instead of eliminating existing waste. Finc lean manufacturing applied to material handling should encompass all available lean manufacturing tools, consist of a complete view of the technique, and not be an extension or single facet of a lean manufacturing implementation. Management should look at the problem completely and consider all key concepts and techniques. This systems approach is necessary, regardless of the focus of the lean manufacturing implementation, be it either the social or technical.

FIVE KEY STEPS FOR IMPLEMENTING LEAN MANUFACTURING

- **Develop a plan for every part**
- **Build the purchased parts market**
- **Design delivery routes**
- **Implement pull signals, and**
- **Continuously improve the system**

METHODOLOGY

The methodology used to determine management objectives of lean manufacturing in a material handling system of a machine cell involves several steps. These steps begin with management input to determine what the goals of the business unit are and what the goals of the operational group have been defined to be. A lean manufacturing assessment must be conducted to determine the potential locations of waste reduction. Development of a lean manufacturing strategy will help determine how lean manufacturing assists in the overall implementation strategy and how the potential solutions can be prioritized for selection and implementation.

The definition of management objectives of lean manufacturing are determined as a result of the prioritization and comparisons of possible solutions and the overall strategy. The implementation of lean manufacturing tools and solutions development assists in determining how the implementation of the tools and solutions will fit into the process and how several concepts can be followed as guidelines to help ensure the success of the implementation.

Finally, the solution is implemented and monitored through selected metrics to gauge continuous improvement and reinforce objectives and goals of both the work cell and business unit.

Management Input

Management input includes the objectives of the organization as defined by higher management as well as the business objectives of the operational groups and teams. The primary goal of the operational management group is to define the specific tasks, processes, and resources that will be used in the production unit to meet the business goals defined by higher management. The key focus, regardless of what tool is implemented, is meeting the goals of the operational group so that the higher level goals of the organization can be reached and customer needs met.

Lean Assessment

Once the business unit goals of the operational group have been defined, a lean manufacturing assessment must be undertaken to determine where areas of opportunity exist for improvement.

With material handling being the focus of this research, the lean manufacturing assessment should focus on the way that materials flow through the processes of the organization and how this material flow affects what is expected of the operational group. The assessment must be done while keeping in mind that the focus of any lean manufacturing implementation is the removal of waste from the system. Material handling is generally considered as a non-value added activity that must be done in order to move product. Any improvements in these systems will help to eliminate waste.

Development of Lean Strategy

The development of a lean manufacturing implementation strategy that is in line with operational group objectives is very important. The development of this strategy will show how lean manufacturing tools are tied into business unit objectives and thus lead to the definition of managerial objectives of lean manufacturing.

Definition of Management Objectives

Once the solutions and their affects on the business goals of management have been prioritized, the decision to move forward with an implementation can be made. The selected solution will have a set of steps or processes that must be carried out for successful implementation. The process steps of the solution, their completion, and the series of metrics

selected to measure them are management's objectives of lean manufacturing in regards to material handling systems of the selected cell. These objectives of lean manufacturing are based on the operational management group and what they must accomplish to meet the greater goals.

Selection of Lean Tools

The selected solution should be developed using all available lean manufacturing tools. Both the equipment used as well as the process involved in material handling should be examined to determine the best steps when applying these tools to the area that has been selected to element waste. It is most beneficial when a holistic approach is used.

Solution implementation and monitoring

This is the final step of this process.

CONCLUSIONS

The manufacturing environment has had many tools available for the act of process improvement. Lean manufacturing has proved to be one of the most successful tools that manufacturing facilities can employ. However, this tool is often mandated by higher level management as a way to reduce waste from manufacturing systems without a specific road map to carry this out on a case by case basis. Providing this road map is the responsibility of operational management units.

The objective of the research was to develop a methodology that would assist management in defining their objectives of lean manufacturing. In the case of this research, the methodology would be applied to reduction of waste in the material handling system of a machine tool cell at a petroleum drill bit manufacturer.

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