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## SIX SIGMA METHODOLOGIES TOWARDS IMPROVING INDUSTRIAL COMPETITIVENESS

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### **Abstract**

*Lean Six Sigma concepts and methodologies are based on a highly sustainable approach that gets easily integrated with the existing work processes within an organization. It requires the involvement of employees at all levels within an organization. The deployment of Six Sigma programs can initiate a culture shift within an organization that helps in eliminating waste within the production process.*

*This paper discusses importance of Lean Six Sigma methodologies in enhancing quality and productivity of manufacturing systems. This paper also highlights various essential requirements of six sigma.*

**Key Words:** *Design for Six Sigma, Customer Satisfaction, Product Relevance, Data Authenticity, Effective Logistics.*

### **INTRODUCTION**

Six Sigma is a series of systems that focus on implementing quality measurement strategies based on data and statistical analysis to enhance operational performance. Its features of Measure, Analyze, Improve and Control have the potential of regulating work with proper standards irrespective of the size of the organization or the project under execution. Lean Six Sigma helps in ensuring future success of an organization by radically improving quality and reducing waste. It also allows employees within an organization to design and develop new business processes that will help in making drastic improvements to the organization's performance.

### **KEY CONCEPTS OF SIX SIGMA**

Six Sigma is a highly disciplined process that helps us focus on developing and delivering near-perfect products and services. Six Sigma key concepts are as stated below:

<b>Concept</b>	<b>Characteristics</b>
Critical to Quality	Attributes most important to the customer
Defect	Failing to deliver what the customer wants
Process Capability	What your process can deliver
Variation	What the customer sees and feels
Stable Operations	Ensuring consistent, predictable processes to improve what the customer sees and feels
Design for Six Sigma	Designing to meet customer needs and process capability

## **DESIGN FOR SIX SIGMA (DFSS)**

Design for Six Sigma (DFSS) process starts with the collection of critical data and information related to customer needs and expectations as applicable to the basic design or nature of a given product or service. The data, most of which is usually based on human emotions, is then classified, analyzed, processed and quantified in order to make it usable for the design and development of the targeted product or service. Once comprehensive needs and expectations have been identified, DFSS then tries to integrate those in the targeted product or service design. DFSS is a continuous process because customer needs, requirements and expectations are things that keep changing with time. . The DFSS process stops only when a new product or service achieves its targeted goals - and when it may not be possible to make any more productive quality improvements.

## **VARIOUS APPROACHES FOR ENSURING CUSTOMER SATISFACTION**

All business activities are customer centric. Even the best product may not sell if it possesses useless value for the customers. The following criteria should be considered with special attention.

**\*\* Adjusting Process Capability to Customer Requirements:** The need for adjusting the process capability is basically considered in DMAIC without putting significant burden on the cost. This begins with estimation of financial impact, feasibility studies of the technicalities involved and market uptake.

**\*\* Customers Experience of Defects and Costs:** Customers have a different perspective about quality and cost. The variation in satisfaction levels across different market segments and regions needs to be analyzed as a first step towards reaching goals.

**\*\* Controlling Process Variations:** The uncertainties of processing are the variation that needs to be tackled as a critical step in achieving the 3.4 defect threshold.

Uncertainties arise mainly due to a huge number of key elements in a process, outdated process steps and lack of control.

**\*\* Hitting the Finish line:** A marginal amount of expenditure is made for Six Sigma implementation and the long cycle for the results to show can unsettle even the strongest organizations. Finishing the task, despite allotment of huge funds, accessibility to knowledge base, depends primarily on the commitment level of senior leadership and a dedication to customer satisfaction.

**\*\* Product Relevance:** The relevance of any product to the customer stems from its utility, cost and quality. It consistently produces a high level of performance despite huge variations in manufacturing and customer needs. Anything not adding value will not get customer attention.

**\*\* Removing Roadblocks:** The roadblocks for implementing six sigma sometimes are within the organization, such as trans-jurisdictional roadblocks which sometimes threaten the effective implementation of Six Sigma.

## **ESSENTIALS REQUIREMENTS OF LEAN SIX SIGMA**

Basic essentials requirements of a Lean Six Sigma implementing in manufacturing firms are:

### **\*\* *Cycle Time Management***

Reducing long cycle times are a reflection of inefficient manufacturing processes and excessive non-value-added costs. The focus is on eliminating the root cause of extended cycle times, rather than devising short-term solutions.

### **\*\* *Data Authenticity***

It is necessary to concentrate efforts on gathering genuine data relevant to the needs and requirements of a particular Lean Six Sigma improvement initiative.

### **\*\* *Effective Logistics***

Lean Six Sigma stresses building a simple yet effective logistical platform that helps in reducing inventory-carrying costs, while improving efficiency at the same time.

### **\*\* *Linear Production Model***

A production model to be configured should be flexible so that the production can be decreased or increased according to seasonal variations, without affecting the quality of the end product.

### **\*\* *Managing Performance***

Lean Six Sigma implementation projects require team effort. The project manager should continuously try to motivate team members to contribute their efforts towards

the achievement of common Lean Six Sigma goals and objectives.

### **\*\* *Production System***

Lean Six Sigma lays stress on employing sequential production techniques, rather than depending on the obsolete shop scheduling production technique. Small and medium sized enterprises can also derive the same benefits from this new production methodology.

### **\*\* *Timely Decisions***

To make the most of what the market has to offer, manufacturing firms need to be proactive in making essential strategic decisions, such as when to downsize and when to start recruiting. A timely decision is one of the main factors that make the difference between a lost opportunity and increased profitability.

## **CONCLUSIONS**

Lean Six Sigma not only eliminates the defects, but also improves the speed of a process and thereby reduces waste by eliminating non-value added steps in a business process. Globalization and instant access to information, products and services continue to change the way our customers conduct business. Today's competitive environment leaves no room for error.

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