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Six Sigma – An Advancement In Management System

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Review Article

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ABSTRACT

Though the processes are performing well in industries these days, but their efficiency and quality of output are not meeting high expectations, the most well-known way of doing so is to use "Six Sigma". Six Sigma was proposed by Motorola in the 1970's based on the concept of variability on "Germ Theory of Management" of Semmelweis. It forms a profound relation to concept of "process capability"-a process that will produce no more than 3.4 defective parts per million [yield of 99.5%]. Most companies will operate at around 1 to 2 sigma [yield between 31-69%]. In simple words, it resolves the problems of poor quality and increased production costs. In Six Sigma, each step in production is a process. It is used to determine the key variables and relate them to the improvement goals. It is not a stand-alone methodology, but as a part of an overall Business Strategy.

INTRODUCTION

Six sigma is a statistical term used to measure the performance of products and process against customer requirements"- Brian K. Nunnally and John S.McConnell i.e., a step in the process operating at six sigma level produces only 3.4 defects per million opportunities. Six sigma is a disciplined project oriented statistically based approach for reducing variability, removing defects and eliminating waste from products and transactions [1-11].

WHAT IS SIX SIGMA?

It can be defined as a statistical measure that serves/ is employed to measure variation.

Full Six Sigma equals 99.9997% accuracy vs. Methodology for improving key processes [12-21].

It can also be termed as A "tool box" that is equipped with management and quality tools for problem resolution.

A business philosophy focusing on continuous development

A systematically framed process for structured data analysis [22-39].

EVOLUTION

Three generations of six sigma implementations are as follows:

1st Generation: Focusses on defect elimination and basic variability reduction. It is primarily used in manufacturing.

Ex: used by Motorola

2nd Generation: Focusses on variability reduction and defect elimination and cost reduction and improves the product design. Ex: General electricity.

3rd Generation: Focusses on six sigma, creating value throughout organization [40-57].

KEY ELEMENTS

People - Includes champions, executive leadership, master black belts, black belts, black belts, green belts, yellow belts.

Process - Based on PDCA (plan, do, check and act).

Technology - Includes large number of pre-existing tools to support statistical analysis aspect. E.x., process analysis, data collection, variation analysis etc [58-69].

DEVELOPMENT AND IMPACT

It involves five step solving approach:

- Define
- Measure
- Analyze
- Improve
- Control

It is used by process capability analysis, measurement systems, control charts, capability studies, experiments and basic tools [70-89].

There are 3 keys of success which was invented by Snee & Hoerl in 2003

- Top management, commitment and involvement
- Use of top talent
- Supporting infrastructure

It gives quality, eliminates waste, reduces cost, creates new products and services, develops future leaders and helps companies grow [90-100].

DESIGN FOR SIX SIGMA

- DMAIC- Define, Measure, Analyse, Improve, Control.
- DMADV - Define, Measure, Analyse, Define, Verify.

ADVANTAGES

1. Variability in product quality is reduced
2. Process accuracy and precision are improved
3. Customer's confidence in the company' products increases
4. Possibility of defects are reduced to a small level
5. Profitability of company increases
6. Reduces costs.

CONCLUSION

It eliminates waste, Long cycle time, waiting times between, value added work, scrap, excess inventory and can also include rework.

Variability results due to scrap and rework.

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