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Research paper on Six Sigma: A conceptual study

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Abstract
The topic is most important for the companies which are aware about the best quality in products and process. The Six Sigma (6σ) is a set of techniques and tools for process improvement. It was introduced by American engineer Bill Smith while working at Motorola in 1980. Jack Welch made it central to his business strategy at General Electric in 1995. A six sigma process is one in which 99.99966% of all opportunities to produce some feature of a part are statistically expected to be free of defects.
Six Sigma strategies seek to improve the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes. It uses a set of quality management methods, mainly empirical, statistical methods, and creates a special infrastructure of people within the organization who are experts in these methods. Each Six Sigma project carried out within an organization follows a defined sequence of steps and has specific value targets, for example: reduce process cycle time, reduce pollution, reduce costs, increase customer satisfaction, and increase profits.
The term *Six Sigma* (capitalized because it was written that way when registered as a Motorola trademark on December 28, 1993) originated from terminology associated with statistical modeling of manufacturing processes. The maturity of a manufacturing process can be described by a *sigma* rating indicating its yield or the percentage of defect-free products.

Keywords: six sigma, quality improvement, standard, evaluation, defect correction.

1. Introduction

Six Sigma doctrine asserts:

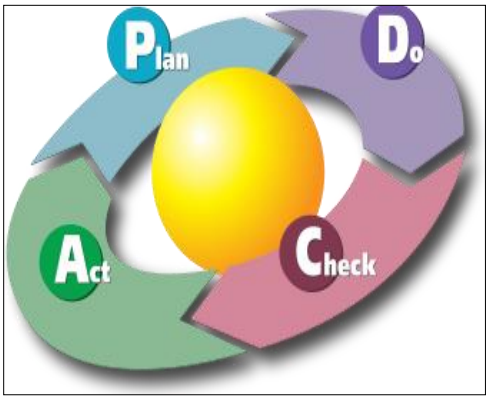
- Continuous efforts to achieve stable and predictable process results (e.g. by reducing process variation) are of vital importance to business success.
- Manufacturing and business processes have characteristics that can be defined, measured, analyzed, improved, and controlled.
- Achieving sustained quality improvement requires commitment from the entire organization, particularly from top-level management.

2. Features that set Six Sigma apart from previous quality-improvement initiatives include:

- A clear focus on achieving measurable and quantifiable financial returns from any Six Sigma project.
- An increased emphasis on strong and passionate management leadership and support.
- A clear commitment to making decisions on the basis of verifiable data and statistical methods, rather than assumptions and guesswork.

The term "six sigma" comes from statistics and is used in statistical quality control, which evaluates process capability. Originally, it referred to the ability of manufacturing processes to produce a very high proportion of output within specification. Processes that operate with "six sigma quality" over the short term

PDCA (plan–do–check–act or plan–do–check–adjust) is an iterative four-step management method used in business for the control and continuous improvement of processes and products. It is also known as the Deming circle/cycle/wheel, the Shewhart, the control circle/cycle, or plan–do–study–act (PDSA). Another version of this PDCA cycle is OPDCA. The added "O" stands for *observation* or as some versions say: "Observe the current condition." This emphasis on observation and current condition has currency with the literature on lean manufacturing and the Toyota Production System. The PDCA cycle, with Ishikawa's changes, can be traced back to S. Mizuno of the Tokyo Institute of Technology in 1959.



Source: https://en.wikipedia.org/wiki/PDCA#/media/File: PDCA_Cy cle.svg

Fig 1: The PDCA Cycle The Fig 1.0 explains the various processes of PDCA Cycle in the organization all the steps are very important and required to be followed to get total quality effect.

3. Six C's of Total Quality Management in the Companies

The Total Quality is possible only when all the concerned parties take active part in improving and marinating the quality of the service or the product.

Following are the important to maintain the quality.

1. Commitment
2. Culture
3. Continuous Improvement
4. Cooperation
5. Customer Focus
6. Control

The commitment from all the employees is required and it plays important role to maintain the quality. Culture good manners values are also part of quality improvement for service and product quality.

1. Advantages of Six Sigma Process

Like any business-management concept, Six Sigma has advantages and disadvantages. Companies that successfully adopt Six Sigma can see profits rise; companies that try it and fail may lose ground. Supporters say the benefits to Six Sigma processes make it more than worthwhile:

- Spotting the potential for defects before they occur, then eliminating them, is cheaper than fixing problems after they happen.
- Six Sigma's analysis of your company processes is data-heavy, making it easy to spot problems and solve them promptly.
- Six Sigma is about continuous improvement rather than a one-time fix. If your initial solutions for improving processes don't work out, Six Sigma professionals are prepared to move on to the next.
- Even if you never hit the 99.99966 percent defect-free rate, striving for it will make your products or services much better.
- Six Sigma is proactive, which is good for customers. You can spot and fix problems ahead of time rather than reacting after customers make complaints.
- Six Sigma can save money by reducing returns.

2. Disadvantages of Six Sigma

Despite the undeniable benefits, critics say businesses should keep in mind the flaws with Six Sigma before jumping on the bandwagon.

- Six Sigma is about quality improvement, not cost reduction. Improving quality and eliminating defects can cost money in the form of increased overhead and added investment in machinery.
- Achieving Six Sigma often requires better equipment, improved testing systems, more quality checks and tighter tolerances. This can consume a lot of resources.
- The statistical analysis necessary for Six Sigma requires a commitment of resources, too.
- If you commit to Six Sigma and your competitors don't, your products or services will become higher quality, worthy of a higher price. Some customers, however, may prefer cheaper products over quality.

Before launching Six Sigma, weigh the pros and cons for your company. If, say, you manufacture cancer drugs or space shuttle parts, your customers may be very happy to pay top dollar for defect-free products. If you're selling pens or scissors, customers will probably make price a higher priority.

4. Conclusion

The Six sigma is very important aspect for modern companies and industries which have to be used and implemented to keep the share and profit of the company at higher level. Quality is most important part of any product or service in the present situation of competitive market. The compromise on any quality activity will directly affect the companies standing in the market. So the Six Sigma pays a major role in making best of the situation or market share. The Authors have done the decent contribution by creating awareness about this important topic to the readers and concerned parties.

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