

Six Sigma Methodology: An Overview

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Abstract — Six Sigma is an effective methodology for reducing variance, lowering costs, improving product and process quality, and ultimately increasing customer satisfaction. This study can help managers build action plans for Six Sigma deployment and also motivate managers who do not already use Six Sigma to start using it in their organizations.

Index Terms — Six Sigma, Methodology, Performance

I. INTRODUCTION

It is a management technique that employs effective statistical tools to improve enterprise processes in order to achieve excellence in products, outputs, and operations as well. As a result, many businesses seek for ongoing Six Sigma deployment. Six Sigma mainly focuses on customer satisfaction through continuous improvement. Six sigma methodology improve overall business performance.

II. LITERATURE

The literature on Six Sigma is primarily centered on organizations that have already adopted Six Sigma. Although various studies discuss the faults and limitations of Six Sigma programmes (Kumar et al., 2009), there is no specific research on why organizations do not even begin Six Sigma implementation. This study identifies the most often utilized Six Sigma project types as well as the challenges associated with Six Sigma applications as seen by its practitioners.

III. THE DMAIC SIX SIGMA METHODOLOGY

DMAIC is an abbreviation for Define-Measure-Analyze-Improve-Control. This strategy is based on the Deming cycle of process improvement. It is the process of improving many various elements of the organization. The DMAIC cycle comprises of five interconnected stages (Sin et al., 2015):

Define Phase

The key goal of this stage is to ensure that the actions that should be taken to fix the problems are aligned with the organization's priorities. It begins with recognizing the

problem that requires a solution and concludes with clear evidence of managerial supervision. There are numerous methods for identifying a project for improvement. The Pareto diagram is a good tool for narrowing down the problem (Shankar, 2009).

Measure Phase

The measurement stage is concerned with acquiring information on the processes that will be improved. It focuses on the information required to better understand all organizational processes, customer expectations, supplier specifications, and the identification of potential issue areas. The primary goal of the measure phase is to gather and analyze data that will be used in the control phase to demonstrate differences and assess progress that will be presented to management. It is also necessary to evaluate the measuring system and ensure that all data is verifiable and captured correctly (Shankar, 2009).

Analyze Phase

Various techniques and procedures are employed at the analyze stage to identify root causes, as well as analyze the data. This phase is required to define process capabilities, clarify goals based on real data obtained in the measurement phase, and begin root cause analysis, all of which have an impact on process variability. The ability of the process to meet the requirements of consumers is measured by calculating process capability, which is defined as "sigma" of the process.

Improve phase

The purpose of this stage is to gather the essential information in order to establish and develop an action plan to improve the organization's operating, financial elements, and customer relationship concerns. The action plan's potential solutions should be presented and implemented in this phase.

Control Phase

The control stage verifies the quality of the improved process to determine whether the changes introduced during the improved stage are sufficient and ongoing. Control systems like statistical process control should be used. The procedure must be constantly monitored. Control charts are used in the control phase to determine whether or not the process is controlled.

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III. CONCLUSION

Six Sigma is becoming increasingly popular among organizations across a wide range of industries. It primarily focuses on improving manufacturing processes, which leads to increased firm profitability. The usage of DMAIC, which is one of the quality improvement strategies employed in the Six Sigma concept, can increase effectiveness while adequately reacting to emerging problems.

REFERENCES

- [1] Sin, A. B., Zailani, S., Iranmanesh, M. and Ramayah, T. (2015). "Structural equation modelling on knowledge creation in Six Sigma DMAIC project and its impact on organizational performance", *International Journal of Production Economics*, vol. 168, Iss. C, pp. 105-117.
- [2] Shankar, R. (2009), "Process Improvement Using Six Sigma A DMAIC guide", Wisconsin: ASQ Quality Press.