

Critical Success Factors of Implementation of Six Sigma in an Auto Ancillary Unit

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Abstract

This paper attempt to study the critical success factors of Six Sigma in an auto ancillary unit to observe the gaps between Six Sigma theory and execution, and to understand the primary drivers for business process improvements. The paper focus on basic concepts of Six Sigma and success factors, that seems to be consistent among Six Sigma organizations. The exploratory research has been carried out to understand the factors related to success of six sigma in an auto ancillary unit. The executives and employees from the industry, where six sigma has been deployed as quality initiative were contacted to make the result of study more general and applicable to all business units. The major success factor turned out to be the Top management leadership and their visible support, followed by the customer management system.

Keywords:

Six Sigma, Success factors, Process Improvement

Introduction

Six Sigma is a business management strategy, originally developed by Motorola, that today enjoys wide-spread application in many sectors of industry. (Greg. 2002). The manufacturing industries as well the service sector in India are placing greater emphasis on six sigma deployment to improve operational efficiencies. Although many research has been done on various quality systems like ISO, TQM, TPM etc but Six Sigma being new concept, very less work has been carried out, thus for any organization looking to deploy six sigma, it is important to understand the vaious key success factors. The best answer to the question – what are the critical success factors for six sigma success in business organization can be given by the professionals who have the first hand experience in deploying six sigma in their business areas. This study has made the attempt document the key success factors based on the experience of the working professionals and six sigma consultants.

Six Sigma attempt to identify and remove the causes of defects in manufacturing and service processes. It uses various quality

management methods and statistical tools and develops a special trained team of people within the organization ("Black Belts" etc.) who are experts in these methods (Harry, 1998). Implementation of Six Sigma project follows a pre - defined sequence of steps and has project targets.

Six Sigma Quality Management System

Six Sigma Quality Management asserts that –

- Continuous efforts are put to get stable and predictable process results (i.e. reduce process variation) are of vital importance to business success (Sharma, 1997).
- Manufacturing and Service processes have characteristics that are measured, analyzed, improved and controlled. (Gupta, 2003).
- Top management and their support play's an important role in achieving sustained quality results.

The major difference with Six Sigma and other quality improvement (Negi, Gaur, 1999) initiatives include –

- Clearly defined measurable and quantifiable financial returns.
- Stress on strong management leadership and support.
- A Six Sigma typical organization of "Champions", "Master Black Belts", "Black Belts" etc. to guide and implement the Six Sigma approach. (Denecke, 1998).
- Decision making on the basis of verifiable data, rather than assumptions and guesswork.

The term "Six Sigma" derives from a field of statistics known as process capability studies. Originally, it referred to the ability of a process to produce desired output within specification. Processes that operate with "six sigma quality" are assumed to produce defect levels less than 3.4 defects per million opportunities (DPMO) (Tennant, Geoff 2001). Six Sigma's aim is to improve all processes to the level of 3.4 DPMO quality or better.

Critical Success Factors

The most frequent questions being asked by the management professionals, when comes for Six Sigma are:

- The important factor that affect working of Six Sigma.
- Factors responsible for its successes in business organization

- Major reasons of failure of six sigma deployment

These are the most frequent questions, but there is no easy answer to each one of them. As achieving or aiming a business toward Six Sigma is never been a short lived effort and not only about producing services and products, it's about creating culture that continue to meet customer and market requirements. This requires organizational ability to constantly observe the changes in the marketplace. This is one of the challenges with Six Sigma implementation, to measure a business' current performance of its processes against the dynamic customer requirements, while creating the internal abilities to response to changing marketplace conditions. Doing this well requires aligning organizational capabilities inside the company (leadership, strategy, people, and technology) to give Six Sigma efforts the momentum and staying power they need to succeed. (Kaplan and Norton, 1993).

Research Methodology

To study the critical success factors of six sigma in an automobile unit; based at Gurgaon. An exploratory research has been carried out. The questionnaire was prepared in consultation with Six Sigma consultants and top management of business responsible for deployment of six sigma in their organization and questions were phrased. The samples were mainly selected from trained six sigma professionals of the company and employees of company from various functions. A total of 150 questionnaires were distributed. The resulting sample size was 138. The questionnaire was made in two sections, section A captured the details of the respondent like age, qualification, if they are trained in six sigma or not, gender etc. Section B of the questionnaire captured the response on factors related to six sigma success in their organization. The respondents were asked on a Likert scale to indicate their level of agreement with statements about their Six Sigma on a scale of "1: strongly disagree" to "5: strongly agree", their response was calculated for mean value and sorted out for ranking of the factors.

Research Survey Results

The qualification of the respondents were

Engineers (BE/ B Tech/ M Tech)	- 52 %
Management (MBA)	- 28 %
Finance	- 6%
Others	- 4 %

Critical Factors for Success of Six Sigma in Organization

Table 1

S No	Factors	Mean Score	Rank
1	Top management leadership & their visible support	3.99	1
2	Customer management support by organization	3.92	2
3	The education and training of six sigma system	3.54	3
4	Process management of six sigma	3.47	4
5	Selection of project champion and green belt	3.42	5
6	Use of correct data and information for decision making	3.42	5
7	Measurement and Analysis system (MSA)	3.38	7
8	Linkage of Six Sigma projects to corporate Strategies	3.35	8
9	Clear accountability and responsibility of project team for project deliverables	3.30	9
10	Supplier management system	3.30	9
11	Implementation of project tracking system	3.24	10
12	Proper scoping of projects	3.10	11
13	Quality tools training and awareness	2.86	12
14	Implementation of Six Sigma in all functions	2.56	13
15	Financial tracking before project closure	2.44	14
16	Benchmarking of best practices	2.21	15
17	Alignment of Six Sigma with other QMS	2.20	16
18	Reviews of projects by top management	2.10	16
19	Communication of Six Sigma progress	1.86	17
20	Time limit for completion of project	1.65	18

Analysis and interpretation

- The highest ranked statement is “**Top management leadership & their visible support**”, Top management should act as key driver in continuous improvements, communicate to employees about organizational goals, and establish an environment for supporting organizational & employee learning.
- Second important factor revealed out is “**Customer management support by organization**”, Processes needed to be established in order to monitor customer satisfaction levels, to receive customer feedback, and to resolve customer concerns. Although their exist a process for taking customer feed back, but this is limited only to external customers, internal customer feed back system is not being structured in most of the organization.
- **The education and training of six sigma system** should provide continuous courses to employees for equipping them with quality-related knowledge and problem-solving skills.
- **Process Management of six sigma** that identifies, improves, and monitors the key business processes has a positive impact on Six Sigma QMS success
- **Selection of project champion and green belt** play a vital role in execution part of the project as green belt is essentially to be domain expert and

champion should be assertive to be able to remove the road blocks during the projects, their roles become critical.

- **Use of correct data and information for decision making** should be developed to establish and calculate the process performance and capabilities on key output indicators.
- **Measurement and Analysis system (MSA)** is an integral part for success of six sigma implementation. Many agreed that their measurement system were challenged during six sigma implementation and to the great surprise to them, many of the measurement system had GRR errors (Gage Repeatability and Reproducibility Error), and corrective actions taken for improving the measurement systems.
- **Linkage of Six Sigma projects to corporate Strategies** – the linkage with top management vision and business objectives and down below to executive yearly performance key result areas (KRA) is essential ingredient towards the successful implementation of six sigma initiative.
- **Clear accountability and responsibility for six sigma project team to project deliverables** is important to build the team and clearly defining the role and responsibility of each team members help in faster execution of the projects.
- **Supplier management system** where the main criteria for selecting suppliers are based on quality aspects has a positive impact on Six Sigma QMS success. Processes need to be built in order to monitor the quality performance levels of suppliers.
- **Implementation of project tracking system** is essential to understand the progress of six sigma projects execution against the plan and also the sustenance of the completed projects.
- **Adequate scoping of projects:** Scoping defines the boundaries of the project deliverables, it is important to make the scope adequate to keep the project team focused.
- **Quality tools awareness:** Six Sigma need lot of statistical tools and techniques and this need a special training to the users.
- **Implementation of Six Sigma in all functional areas:** Typically six sigma is deployed initially for bottom line improvement and production, inventory, cash management, etc functional area get priority. Although Six sigma has application in

all functions like HR, Materials, Environment, Maintenance etc.

- **Financial concurrence before project closure** is a typical approach of management during the initial stage of deployment, where top management is more interested to certify the financial gains.
- **Benchmarking System** should be capable of collecting market and competitors' information. The process of benchmarking information collection needs to be evaluated to ensure its effectiveness.
- **Clear Prioritization of Six Sigma with other QMS** Integrating all QMS viz ISO 9000, ISO 14000, TQM, TPM should be integrated in one roof, as their integration will help in avoiding duplication of jobs and records keeping.
- **Reviews by top management** A regular periodic review by top management keep the focus of entire organization on timely completion of project with quality deliverables.
- **Communication of Six Sigma progress :** A very important aspect for the business organization having two or more locations, proper communication of six sigma progress helps the entire units updated about the projects undertaken at other units and even many problem solved at some other units may be replicated to reduce the time.
- **Time limit for completion of project** Although based on case to case basis, but normally for a DMAIC process typically six month time is sufficient enough to complete the six sigma projects. As the organization mature in six sigma journey, the project completion lead time is reduced significantly.
- Applying “**paste & copy**” concept without considering the practical status of the concerned organization.

5.0 Conclusion

Six Sigma is a very powerful management strategy for improving business operations and their operational efficiencies. Largely focused on bottom line improvement initially but has larger coverage area in all functional areas. The feed back, received from the professional who have witnessed the deployment of six sigma and those who are advocating the six sigma as consultants, revealed once again that top management commitment is very much critical in making the deployment successful, top management has to act as key driver for continuous improvement. Customer

focus is all about the theme advocated by the six sigma, it puts the emphasis on external customer but also equal importance to internal customers, the six sigma consultants integrate the internal processes with customer's definition, as per them the next process is the customer for the previous process. The team management is very important ingredient for success of six sigma initiative. The belt system in the initiative makes the systematic integration of team. The green belt brings the domain knowledge, team members put the ideas into action in work place and black belt integrate the knowledge of change management, statistics with business knowledge and the entire team make the efforts to solve the business problems for achieving operational excellence.

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