



## KEY FOR IMPLEMENTATION OF SIX SIGMA IN INDIAN INDUSTRIES

**PRAKASH PRALHAD CHAUDHARI**

Department of Mechanical Engineering, Government Polytechnic, Thane, Maharashtra, India - 400612

Corresponding Author: Email- [ppchaudhari1@yahoo.co.in](mailto:ppchaudhari1@yahoo.co.in)

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**Abstract-** Implementing any quality improvement initiative requires knowledge of critical success factors for its successful implementation, along with the knowledge of the initiative itself. It is experienced that complete implementation of Six Sigma and its sustenance is difficult. Organizations need to know critical success factors which make the implementation successful. Experts have identified critical success factors for successful implementation of Six Sigma in different types of industry in different locations.

This paper presents the findings of an initial survey conducted in Indian industries. This will help organizations in making right preparations for successful implementation of Six Sigma.

**Keywords-** Critical Success Factors (CSFs), Methodology, Preparations, Six Sigma, Successful Implementation.

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### Introduction

The ultimate goal of any business activity is to earn profit or raise wealth. Even if the sole aim of an activity is to provide service to people, like purely government services, there should be monetary surplus so as to continue and expand the horizon of the service- especially in a highly populated country like India. It is experienced that there are errors in medical prescriptions, there are considerable numbers of accidents, delays in loan processing, impure water supplies, interrupted- irregular electric supply, major but neglected areas like nonproductive seeds causing much less agricultural products etc. All these and such issues call for improvement in quality. Six Sigma methodology is an effective, reliable solution to these and many such problems.

What is important is effective implementation of Six Sigma methodology. For the effective implementation of Six Sigma projects, organizations must understand the critical success factors that will make the application successful. Critical Success Factors (CSFs) are the key drivers or elements that are necessary for the successful implementation of any methodology or philosophy.

### What is Six Sigma ?

Six Sigma can be defined as a business improvement strategy used to improve business profitability, drive out waste, reduce

costs of poor quality and to improve the effectiveness and efficiency of all operations so as to meet or even exceed customers' needs and expectations [1].

'Six Sigma' is a management innovation methodology to produce virtually all products or services that are defect free based on the process data by improving business processes and thereby satisfying customer and employee and reducing costs. In short 'Six Sigma' is several things

A statistical basis of measurement: 3.4 DPMO,

A philosophy and a goal: as perfect as practically possible,

A methodology, A symbol of quality, A vision, A metric [2].

### Why should Six Sigma be Implemented ?

If implemented effectively, Six Sigma succeeds in providing benefits like Defect reduction, Cycle time reduction, Cost reduction, Improved customer satisfaction and retention, Product or service development, Market share growth, Productivity improvement, Cultural change [3], Employee satisfaction, growth and retention, Higher net income

### Methodology

A) CSFs for effective implementation of Six Sigma were identified from two sources. First source was case studies and experts'

views from literature available. Second source was the findings from the personal interviews of different level personnel from Indian industries. B) Three questions for each CSF were formed and the respondents were requested to respond in a mode suitable to them, either in written form, or by e-mail. Where allowed and possible, the response was collected through personal interviews. The response was obtained using 5 point Likert scale. 1=Least important, 2= Less important, 3= Important, 4= Very important, 5= Crucial. The response was analyzed to rate the CSFs as per their importance by averaging the responses.

The industries chosen were of varied types like ISPAT, RIL, Rallis, RCF, Bajaj, Mhindra and Mahindra, Exide, Owens Corning and so on. The target respondents were from different levels of Six Sigma who had participated in implementing Six Sigma. The target respondents were Quality Directors / Chief Executives / Officers/ Managing Directors / Project Manager s/ Quality Manager s / Black Belts / Green Belts.

**Findings**

CSFs for successful implementation of Six Sigma identified from the literature and the personal interviews of different level personnel from Indian industries are ]

**Management commitment and continuous support :** Six Sigma must be taught to senior managers. Once they study and understand the logic and outcome of Six Sigma methodology, using their expertise and experience they can devise the plan and arrange for the needed preparations and provide continuous support to the team. It is observed that, in the initial period of implementation the enthusiasm is up to very high level. However, afterwards it is not so.

**Cultural change:** *Six Sigma initiatives* require the right mindset and attitude of people within the organization at all levels. Companies that have been successful in managing change have identified that the best way to tackle resistance to change is through increased and sustained communication, motivation and education. It has been observed that there is a lack of same high level desire to be actively involved in the Six Sigma activities.

**Organization infrastructure:** Certain organization characteristics need to be in place i.e. highly desirable to have communication skills, long term strategy and teamwork skills. Interpersonal skills and team building need to be given more importance in Indian industries

**Training and education:** This is the most desired, crucial factor in India. It is critical to impart 'What', and 'Why' and the 'How' of Six Sigma as early as possible which if completely understood all will automatically help motivate all to ' Actually doing it'. Training should be provided from top management to down through hierarchy.

**Project management skill:** Six Sigma is a project driven methodology. It is again observed that most of the projects on Six Sigma fail or are discontinued from the middle stage due to lack of proper project management skills, setting and keeping ground rules, determining the meeting's roles and responsibilities. Champions, BBs, GBs should consider the key elements of project management, time, cost, etc

**Project prioritization and selection:** Projects are selected in such a way that they are closely tied to the business goals. Ask questions when you evaluate Six Sigma project. It is learnt from the

responses of the practitioners, that especially in case of process industries, implementing Six Sigma is difficult. But judicious selection and prioritization of projects makes it simpler.

**Understanding Six Sigma techniques:** Indian industries need to develop methodologies required for effective implementation Six Sigma to suit their needs, instead of following directly those used by some other countries or big industries in India. There is no standard methodology and organizations must select the most appropriate tools and techniques applicable to them.

**Linking Six Sigma to business strategy:** Six Sigma projects make business processes profitable while tracking variability, which leads to high scrap rate, high rework rate, low productivity etc. It is therefore required to align every project and the business strategy. Six Sigma projects and other activities link to customers, core processes and competitiveness.

**Linking Six Sigma to the customer:** The most important element in any ball game is the 'ball'. And the ball in any business activity is the 'customer'. Six Sigma should begin with and end with customer. Project should begin with the determination of customer requirements. Important issue is selection of (CtQs) characteristics; quantitatively in the starting phase of Six Sigma methodology. Quality function deployment and Pacific Bell's customer care are powerful technique. In service industries the customer requirements are often ambiguous, subjective and poorly defined. Manufacturing industries seem to BE lacking in completely satisfying the customer in the context of after sales service.

**Linking Six Sigma to human resources:** Some studies show that 61% of the top performing companies link their rewards to their business strategies, while lower performing companies create minimal linkage. Across all GE business no one is promoted without the full Six Sigma training and completed project. This in itself is an impressive behavior driver & BBs are required to prove that problems are fixed permanently. Six Sigma doers in the Indian industries seem to have more pressure of work which perhaps leads to non completion or continuity in doing the projects.

**Linking Six Sigma to suppliers:** (GEA) General Electric Appliances: - the concept that 'everybody plays' created special challenges. You cannot be a Six Sigma company without your suppliers participating in the 'Culture Change' GE Suppliers are treated as extensions of factory and are trained along with employees for Six Sigma. Under Six Sigma philosophy one way to reduce variability is to have few suppliers with high Sigma performance capability levels. Not many of Indian industries can provide complete training for all of their employees, perhaps due to the financial constraints, what so ever may be the reasons, and cannot have complete involvement in the training process .

The response as per five point Likert scale is tabulated and represented in the Fig. 1 and Table 1

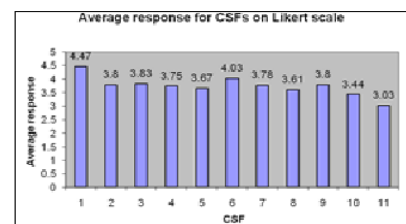


Fig. 1- Average response for CSFs on Likert scale

Table 1- Average response for CSFs

Sr. No.	CSF	Average response
1	Management commitment	4.47
2	Cultural change	3.80
3	Organization infrastructure	3.83
4	Training and education	3.75
5	Project management skills	3.67
6	Project prioritization and selection	4.03
7	Understanding Six Sigma techniques	3.78
8	Linking Six Sigma to business strategies	3.61
9	Linking Six Sigma to the customer	3.80
10	Linking Six Sigma to human resources	3.44
11	Linking Six Sigma to suppliers	3.03

One question for each of the other two important CSFs was asked. All the respondents were not ready to leave their present job for a small amount of rise in the salary, say 10%. 60% respondents had the opinion that there should be small goals in steps for effective implementation of Six Sigma in Indian industries.

### Conclusion

This is a preliminary survey which has revealed that there is a group of industries who are adopting TPM and like methodologies and feel that they should not go for Six Sigma. However, if properly implemented they can overlap and give manifold advantages.

It is also evident that management commitment and continuous support is the most crucial factor having an average response of 4.47. As explained project prioritization and selection is the second most crucial factor with an average of 4.03. All others except the two are having the averages 3.61 to 3.83, which rate them as very important. Though linking Six Sigma to human resources and suppliers have lower scores they should be given due importance because they are still important as per the scale. No employee is ready to leave the present job, but because of less availability of Six Sigma people, industries were ready to pay considerably more and there was a problem of retention of such persons, at least a few months ago; (before recession).

The average scores show that the CSFs identified, quite resemble the actual situations in the Indian industries.

Implementing Six Sigma will be effective by long term strategy to achieve the long term goals of the industries and all types of business activities. What is required is a holistic approach with complete preparation considering the criticality of the CSFs of Six Sigma. The effectiveness of Six Sigma can be further enhanced by using Knowledge Management. [4]. Six Sigma needs to be further studied from the combined perspective of Knowledge Management, Goal Theory and Theory of Constraints. It can be said that effective implementation of Six Sigma is thus possible in India, the only requirement is to have an earnest mission of satisfying and further delighting the customer [5].

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