

Concept and Financial Impact of Six Sigma on Indian Banking Industry

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Abstract-Six Sigma was introduced by two engineers Bill Smith and Dr. Mikel J Harry in 1980s while they are working with Motorola. It is a set of tools and techniques which are used for improving the process. Six Sigma is a disciplined, data-driven approach and a methodology for eliminating defects in any process – from manufacturing to transactional and from product to service. The Six Sigma methodology can help to reduce the defects, amount of wasted time and resources, as well as the cycle time to complete a process. In reference to the service sector, it helps to improve the quality of the services rendered. Many financial companies have started to implement Six Sigma, in India, Private Banks are engaged in Six Sigma and they have found this to be profitable for them. This paper is an attempt to understand the concept of Six Sigma and its financial impact on Indian banking industry. The researcher also tells about the benefits of Six Sigma when it is applied to Indian banking industry.

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I. Introduction

Six Sigma was first implemented in the manufacturing sector and got great success in terms of money and customer satisfaction. Sigma is a statistical term that means deviation from mean i.e. how far a process deviates from the mean. For the process to be six sigma certified the defect rate must be 3.4 defects per million opportunities and process yield should be of 99.99966%. The methodologies used for improving the process, minimizing the defect is DMAIC (Define, Measure, Analyze, Improve and Control).

In an organization there are champions who will be sponsoring the Six Sigma project which will mentor and select six sigma change agents like Master black belt, Black belt, Greenbelt to identify a process, collect the data, measure the existing process, analyzing the process for identifying the defects or data because of which variation is occurring from the mean, improving the process by fixing the problem and controlling it in future. Another methodology in Six Sigma for making a new process free from defects is DMADV (Define, Measure, Analyze, Develop and Verify).

After the unprecedented success in manufacturing sector, this concept was adopted by service sector like Banking to minimize the defects, improve the operational efficiency and most importantly to increase the customer satisfaction as it helps the banking sector to grow and lead. Six Sigma methodologies has been successfully implemented by Indian banks like HDFC, ICICI, Kotak Mahindra bank partly or fully to improve the service delivery and customer satisfaction. Customer satisfaction can be achieved by reducing the time taken to complete a process which can be done by reducing the defects and errors in that process. Six sigma tools and methodologies will help in minimizing the defects, reduce the process time, increase customer satisfaction and reduce the cost of the process which will increase the operational efficiency and profit of Indian Banks.

Six sigma concepts works on DMAIC and DMADV methodologies for improvement of existing processes and designing of new processes.

DMAIC methodology consists of five phases:-

1. **DEFINE:** It is the first phase of six sigma improvement process. In this process, the leaders form the team, begin to understand the need of the process and the customer of the process.
2. **MEASURE:** In this phase it is being measured that how a process is currently performing. Also in this phase data is collected, reviewed and the reliability of data is checked.
3. **ANALYZE:** The data which is already being collected is being examined closely by performing the process analysis and also it is visually inspected using charts and graphs for visual indication of problems in the process.

4. IMPROVE: In this, the best solution is being found out and implemented to fix the problem defined in first phase.
5. CONTROL: In control phase, they begin to document exactly how they want to pass the improvement on to the people who will work within that improved process.

DMADV methodology is used for designing a new process which is defect free:

DEFINE	It consists of:
	-Initiating the project
	-Determining the project scope
	-Managing the project
MEASURE	It consists of:
	-Identifying customers and their needs
	-Determine the corresponding output measures and their target values and tolerances
ANALYZE	It consists of:
	-Identifying and prioritizing system function
	-Develop and optimize a design concept
	-Examining the design concept as to its capacity to meet customer requirements
DEVELOP	It consists of:
	-Generating and selecting concept
	-Optimizing and making design robust
	-Meeting specifications
	-Avoiding design failures
VERIFY	It consists of:
	-Validating that the design is acceptable
	-Confirm expectations
	-Expand deployment

Below is the six sigma table which is showing the defect rate and yield as per the sigma level:

Sigma level	Defect rate	Yield
2	308,770DPMO	69.10000%
3	66,811DPMO	99.33000%
4	6210DPMO	99.38000%
5	233DPMO	99.97700%
6	3.44 DPMO	99.99966%

PROCESS SIGMA TABLE

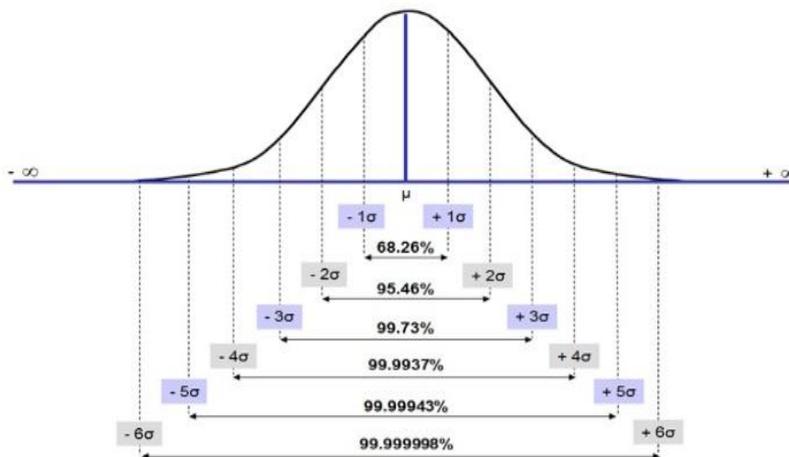


Fig. 1 Six Sigma Curve

The defects per million opportunities (DPMO) is calculated by:-

$$DPMO = \frac{\text{Number of defects} * 1,000,000}{\text{Number of opportunities/unit} * \text{Number of units}}$$

Number of units signify the sample size or the units tested during the process.

II. Literature Review

To start with our paper on the topic impact of six sigma on Indian banking industry we referred analyzed and studied some books, Journals and research papers related to this topic. Subir Chowdhury (2001) in his book said that never before a business initiative has transformed corporations so dramatically. There are several advantages of six sigma like improved productivity, reduced costs, and improved profit margin. The

Power of Six Sigma will help you to think not only as an organization but also as individual seeking benefits for the company.

Ricardo Banael, Antony Jiju (2002) discussed the various success factors of Six Sigma. Originally it is introduced as a quality performance measurement by Motorola in 1986. Six Sigma has evolved into a statistically oriented approach to process and product quality improvement. This paper reviews the critical success factors for the effective implementation of six sigma projects in the organization.

Kevin Linderman, Roger G. Schroeder, Srilata Zaheer, Adrian S. Choo (2003) discussed their understanding about Six Sigma as a goal-theoretic perspective. Six Sigma is a phenomenon that is gaining wide acceptance in the industry. Academic research of Six Sigma requires the identification and the formulation of useful theories related to the phenomenon. This paper can work as a foundation for the development of scientific knowledge about Six Sigma.

Young Hoon Kwak, Frank T. Anbarib (2006) in their paper discussed the key features, obstacles, and shortcomings of the six sigma. They examined the evolution, benefits, and challenges of Six Sigma practices and identifies the key factors influencing successful implementations of Six Sigma project. For effective implementation of Six Sigma cultural changes should be taken into consideration by any organization.

F. Javier Lloréns-Montes, Luis M. Molina (2007) in their paper an analysis is made of the relation between the general and specific topics of management and the Six Sigma approach. This study has led us to suggest that there is a great deal of similarity in the prescriptions of Six Sigma and management theory. Furthermore, we analyze various processes and practices of Six Sigma that help towards an improvement in organizational effectiveness. The conclusion that can be drawn from this research is that, in order to reach its goals, the implementation of a Six Sigma program needs to change the way in which employees behave at work. Six Sigma must alter how people actually behave at work and, to this end, various behavioral and work processes are key to achieving these aspirations. Implications are discussed with regard to performance management processes in organizations.

Stoiljkovic Vojislav, Milosavljevic Pedja and Randjelovic Sasa (2010) concluded that with the help of Six Sigma philosophy and DMAIC model bank has improved quality of its processes and also shortened time period needed for credit approval.

Sharma Aditi and Dr. Chowhan Sudindher Singh (2013) suggested that various institutions in India should provide the training of Six Sigma to its employees and let them achieve various Belts which will work towards the achievement of such a level of error-free performance, so that it can reach that level of excellence where its profits, its loyal customers far exceed its competition.

Kumar R. Dhakshayani (2014) concluded that the use of lean 6 Sigma applications has proved to be a boon to many banks in offering top quality services to their customers in an efficient and enhanced manner. Banks that employ lean 6 Sigma applications enjoy an edge over their competitors and mark a huge success even in the highly competitive banking world. Banks that don't apply lean sigma approach fail to make significant progress and lag behind in the competition.

Athawar V.S. and Dr. Lunge H.S. (2016) concluded about the competitive advantage that Six Sigma can offer to the banking sector. In order to grow the financial sector, it is essential to implement the Six Sigma methodology. Ratio analysis has proven, that implementing Six Sigma in the banking sector has increased the growth of financial sector by reducing cycle time in all areas to meet the customer expectation.

After reading all these literature we found that implementation of Six Sigma gives the competitive advantage to the banks. This implementation not only improved the operational efficiency of banks but also the reduction in turnaround time (TAT).

III. Research Objectives

1. To study the concept of Six Sigma.
2. To find out the benefits of Six Sigma when applied to the Indian banking industry.
3. To analyze the financial impact of Six Sigma on the banking industry.

IV. Research Methodology

A well-defined research methodology is very useful for any kind of research. In this section, the area of the study, the elements of the study which are HDFC Bank and Bank of Maharashtra and the time period of the study are explained. Secondary data has been collected for the study.

COLLECTION OF DATA

In this study, secondary data is used to analyze the Ratios. This data is collected through internet by searching the websites of HDFC Bank and Bank of Maharashtra and their annual reports of the year 2013, 2014, 2015, 2016 and 2017 are used.

V. Hypothesis

H0: There is no significant impact of Six Sigma on banks.

H1: There is significant impact of Six Sigma on banks.

VI. Data Analysis and Interpretation

Ratio Analysis of major public sector bank, Bank of Maharashtra which is not engaged in Six Sigma and major private sector Bank, HDFC bank which is engaged in Six Sigma is carried out: -
Bank of Maharashtra

RATIO	Mar 2017	Mar 2016	Mar 2015	Mar 2014	Mar 2013
Current	0.05	0.04	0.02	0.02	0.03
Net Profit Margin	-11.37	0.77	3.55	3.22	7.90
Quick Ratio	5.85	6.64	9.11	7.13	13.65

SOURCE: Bank of Maharashtra Annual Report 2013, 2014, 2015, 2016, 2017

HDFC Bank

RATIO	Mar 2017	Mar 2016	Mar 2015	Mar 2014	Mar 2013
Current	0.06	0.07	0.04	0.06	0.06
Net Profit Margin	20.86	20.29	21.11	20.59	19.24
Quick Ratio	11.50	10.55	10.03	10.74	11.14

SOURCE: HDFC Bank Annual Report 2013, 2014, 2015, 2016, 2017

The current ratio measures the degree of liquidity which helps the bank in performing better. The current ratio of HDFC bank is more than Bank of Maharashtra which signifies that HDFC is performing better than Bank of Maharashtra. Net profit Margin measures the degree of profitability and from the above table it is being clearly seen that there is a large difference between the net profit margin of HDFC Bank and Bank of Maharashtra. The Quick ratio indicates short-term liquidity. It measures the ability to meet the Bank short-term obligation with its most liquid assets. In the following table, it is clearly stated that HDFC bank has a high quick ratio that means liquidity position of Bank is better.

Therefore, the alternate hypothesis proves to be correct i.e. there is a significant impact of six sigma on banks. Calculating these ratios means that one who is engaged in six sigma is providing benefits to the banking sector and itself getting more benefit.

VII. Benefits

- Enhancing the satisfaction of internal and external customers.
- Reduction in the number of complaints.
- Reducing the errors in various Banking Processes.
- Increasing the operational efficiency of Banks.
- Reduction in the turnaround time (TAT) for
- Various Banking processes like account opening, issuing of Credit cards, etc.
- Increase in the customer satisfaction and the number of new customers.
- Reduction in rework in processing customer application.
- Improved accuracy of branch banking process.
- Reduction in number of defects in existing process.
- Development of a new defect free process.
- Reduction in the cycle time to process a loan application (Both mortgage and personal loans)

VIII. Limitations

1. The major limitation faced during the research was the availability of time and money.
2. As the data collected is secondary data so it is possible that data may lack authenticity.
3. Ratio analysis is performed only on two banks and taking only three ratios, so the research can be generalized to two banks only.
4. The customer base of HDFC bank is more than Bank of Maharashtra which may affect the ratios.
5. There can be other factors also which may affect the financial position of banks.

IX. Conclusion

In this research paper, it is observed that six sigma can provide an advantage to the banks using it and make them successful in this competitive environment. It not only helps the bank in reducing the cycle time of

various process in banking but also helps in making a new defect-free processes. Most of the banks in India are implementing the concept of six sigma to enhance their operational efficiency and effectiveness. The banks which are using this concept are in more profitable condition than those which are not using it. Most of the banks which are using this methodology has made this as a part of their integral quality management and are successful than those who had not implemented this methodology. Ratio analysis also proves that implementing six sigma in banking sector increases the growth of this sector and also helps in improving customer satisfaction.

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