



"SIX SIGMA IN INFORMATION TECHNOLOGY COMPANIES" A FINANCIAL PERFORMANCE COMPARATIVE STUDY IN BANGALORE

Dr. Nirmala. M*

Rajesha. S**

*Assistant Professor, Canara Bank School of Management Studies, Bangalore University.

**Research Scholar, Canara Bank School of Management Studies, Bangalore University.

Abstract

Six Sigma is a methodology implemented by most of leading organisation all over the world. The Motorola Company explained the hidden truth of quality success in their organisation; whole world gave full attention and listen to the magic word "Six Sigma". Till the 1995 Six Sigma was implemented in manufacturing industries only, now the Six Sigma is implemented in all sectors including Information Technology industry, which is rapidly growing and contributing more revenue to the Indian GDP. This study is focusing on the financial performance of Six Sigma implemented IT companies and comparing with other IT company's financial performance based in Bangalore.

Key Words: Six Sigma, Information Technology, Financial Performance and Comparative Analysis.

Introduction

Six-sigma has been a powerful and successful tool in manufacturing industries to reduce rate of rejects and to enhance productivity from the time of origin. The service industries are diversified and the features are different from manufacturing industries. The proper implementation of Six Sigma within the Information technology sector will go a long way in making things easy for professionals to incorporate the principles as part of their everyday work routine. The application of Six Sigma in the IT service sector has resulted in changes in methodologies and tools. Process improvement managers must transform programs to suit their industry needs and experts must tailor the tools for successful deployment.

Indian Information Technology Industry

Information technology industry is the emerging and important industry Indian and all over the world. The Indian Information Technology industry represents one of the most successful industries showing consistent rapid growth. In a report, 'Perspective 2020: Transform Business, Transform India', the export revenues of Indian IT industry will touch US \$ 175 billion by the year 2020. The domestic sales revenue will also contribute US \$ 50 billion by the year 2020. Therefore, we can say that the industry is shining and will continue to do so as well. Bangalore based IT companies are selected for this research because, Bangalore is got name of silicon city and as well IT hub. It made to take the Bangalore as the geographical area for this research. Bangalore employs 35% IT professional in India.

Objective of the Study

- To know financial performance of the Six Sigma implemented Information technology companies
- Compare the financial performance of Six Sigma implemented IT companies with other IT companies.

Scope of the Study

The practice of Six Sigma in India is in the infant stage due to lack of awareness and education. Six Sigma is implemented in most of the large organisation especially in manufacturing and production. This study is focusing on the information technology industry which is rapidly growing and contributing more to Indian and world GDP. Comparing the financial performance of Six Sigma practicing IT companies with non-practicing IT companies is the ambit of the study.

Review of Literature

Prakash Pralhad Chaudhari (2012) Critical Success Factors (CSFs) are Management commitment , Cultural change ,Organization infrastructure ,Training and education ,Project management skills , Project prioritization and selection , Understanding Six Sigma techniques ,Linking Six Sigma to business strategies ,Linking Six Sigma to the customer ,Linking Six Sigma to human resources ,Linking Six Sigma to suppliers. It is also evident that management commitment and continuous support is the most crucial factor, project prioritization and selection is the second most crucial factor and all others are rate as very important.

Miroslav RUSKO & KRÁLIKOVÁ (2011) This paper explains few key concepts of Six Sigma as Critical to Quality are Defect, Process Capability, Variation and Stable Operations and Design for Six Sigma. The fundamental idea of Six Sigma is that if performance is improved, quality, capacity, cycle time, inventory levels, and other key factors as reduction waste,



energy sources and environment will also improve. Thus, when these factors are improved, both the provider and the customer experience greater satisfaction in performing business transactions.

Evren Aksoya and Murat Dinc,men (2011): In this paper author proposed a new theme called Knowledge Focused Six Sigma (KFSS). Organizations, which decide to initiate a Six Sigma programme, need to acquire and internalize the programme knowledge, in addition to creating, using and sharing the knowledge created through improvements. Paper speaks about the intellectual capital it will gain by practicing Knowledge Focused Six Sigma (KFSS) such as human capital, relationship capital, and organizational capital, process capital and innovation capital.

De Runtz & Meier (2010): This is research paper sought on the Comparison of like Factors Important to Successful Six Sigma Implementation between Requirements for Six Sigma Success, Six Sigma Program Success Factors and Six Sigma Implementation. Author found few elements to follow for easy and effective implementation of Six Sigma in an organisation such as Top-Down Support, Dedicated Resources, Employee Incentives, and Essentials of Training, Project Alignment and Communication Processes and Common metrics used to assess Six Sigma results i.e. Cost avoidance, Cost reduction, increased capacity, Retained revenue, Revenue growth and Risk management.

Research Gap

Many studies are carried on the Six Sigma implementation, factors influence on successful implementation of Six Sigma, critical factors of Six Sigma implementation, challenges and reasons for failure of implementing Six Sigma in an organization and benefits from Six Sigma. Initially Six Sigma is implemented in manufacturing and production, later on Service organization including IT sector also implemented Six Sigma methodology. No study has done on the comparative of Six Sigma practicing and non-practicing companies especially with IT companies. So this study is aiming to make an attempt to compare the financial performance of six sigma practicing IT companies with six sigma non-practicing IT companies.

Research Methodology

After reviewing some of the articles on the Six Sigma Concept, realised that this methodology is being used and applied by the quality managers majorly in the manufacturing and production companies. To gain more knowledge on this topic met few number of quality managers in the manufacturing companies. As result of discussion with quality managers came to know the Six Sigma expertise level and the significance of experts. Black belt experts are the key persons who runs the projects and responsible for the entire outcome. Frequent communication with Six Sigma black belt experts came to know that, Six Sigma is implemented in huge companies only. Due to the high cost and long duration of Six Sigma implementation it is not offered to medium and small size companies. Most of the companies have failed to implement Six Sigma in their organization due to nature of long duration of outcome and costly of hiring and maintaining the Six Sigma project team. So chosen top 50 Information technology companies as per the report of National Association of Software and Services Companies (NASSCOM) in Bangalore city.

Sampling Technique and Size

Snowball sampling technique is chosen for this study for Six Sigma practicing companies. It is a non-probability sampling technique. This sampling technique is used due to the sample selected for the research is not so open to access and hidden populations which are difficult to access. Practicing of Six Sigma in their organization is confidential and uses as competitive strategy. Systematic sampling technique is used for selecting the companies for the research study. Both practicing and non-practicing companies of six sigma concepts in Human Resource Management are selected using the systematic technique like top 50 IT companies, 10 year establishment and which is having more than 2000 workforce. 20 companies were selected for the research out of which 5 companies from the Six Sigma practicing and 5 companies from Six Sigma non-practicing companies which fulfil the parameter.

Table 1: Selected Sampling Companies

S. No	Six Sigma Practicing Companies	S. No	Six Sigma Non-Practicing Companies
1	Genpact	1	3I Infotech Ltd
2	HCL Technologies Limited	2	Accel Frontline Ltd
3	Hex Aware Technologies Limited (Htl)	3	3d Geometric Ltd
4	Infosys Ltd	4	Alcatel-Lucent
5	ITC Infotech	5	Infinite Computer Solutions



Table 2: Six Sigma Practicing IT Company's Financial Performance (Annual revenue in Rs/ Crore)

Year	2011	2012	2013	2013-14
Genpact	2403.39	2606.93	2689.37	2742.54
HCL	2524.58	2517.72	2791.81	1972.51
Hexaware	858.54	984.65	888.61s	1037.38
Infosys	24,501.00	29,757.00	36,059.00	42,092.00
ITC Infotech	16041.79	18810.98	22313.25	26313.16

Table 3: Six Sigma Practicing IT Company's Financial Performance (%)

Year	2011	2012	2013	2013-14
Genpact	0.00	8.47	11.90	14.11
HCL	0.00	-0.27	10.59	-21.87
Hexaware	0.00	14.69	3.50	20.83
Infosys	0.00	21.45	47.17	71.80
ITC Infotech	0.00	17.26	39.09	64.03
Average	0	12.32	22.45	29.78

Interpretation: The above chart result shows that all Six Sigma practicing companies achieving positive growth in their revenue from last 3 years, except HCL Company. HCL showing negative growth in the year 2012 & 2014 and Infosys Company achieved high rate with 21.45%, 47.17% & 71.80% of growth compare to other companies. This shows that Six Sigma practicing majority of the companies achieving positive results and contributing more in the industry growth.

Table 4: Six Sigma Practicing IT Company's F Individual Company Performance vs. Industry Performance (%)

Year	2011	2012	2013	2013-14
6 Sigma Practicing Co. Avg	0.00	12.32	22.45	29.78
Genpact	0.00	8.47	11.90	14.11

Interpretation: The table shows that Genpact Company performance rate running by 8.47%, 11.90% and 14.11% against the Six Sigma (SS) practicing company's performance 12.32%, 22.45% and 29.78% in the year of 2012, 2013 and 2014 respectively. It shows that this company performance individually is growing and having good competition with Six Sigma practicing companies' performance.

Table 5: Hindustan Computers Limited (HCL)

Year	2011	2012	2013	2013-14
6 Sigma Practicing Co. Avg	0.00	12.32	22.45	29.78
HCL	0.00	-0.27	10.59	-21.87

Interpretation: The above table shows that HCL Company performance rate running by -2.7%, 10.59% and -21.87% against the Six Sigma (SS) practicing company's performance 12.32%, 22.45% and 29.78% in the year of 2012, 2013 and 2014 respectively. It shows that HCL Company in the year 2012 achieved negative performance, in the year 2013 achieved positive results again in the 2014 it was negative performance from the company. Comparing with Six Sigma practicing companies' performance rate it is too poor performance.

Table 6: Hexaware

Year	2011	2012	2013	2013-14
6 Sigma Practicing Co. Avg	0.00	12.32	22.45	29.78
hexaware	0.00	14.69	3.50	20.83

Interpretation: The above table shows that Hexaware Company performance rate running by 14.69%, 3.50% and 20.83% against the Six Sigma (SS) practicing company's performance 12.32%, 22.45% and 29.78% in the year of 2012, 2013 and 2014 respectively. It shows that this company performance rate was good in 2012, reduced in 2013 and again gained hike in 2014. Hexaware Company done well with SS practicing companies' performance rate in 2012 by exceeding the SS practicing companies' performance rate.



Table 7: Infosys

Year	2011	2012	2013	2013-14
6 Sigma Practicing Co. Avg	0.00	12.32	22.45	29.78
Infosys	0.00	21.45	47.17	71.80

Interpretation: The above table shows that ITC InfoTech Company performance rate running by 17.26%, 39.09% and 64.03% against the Six Sigma (SS) practicing company's performance 12.32%, 22.45% and 29.78% in the year of 2012, 2013 and 2014 respectively. This company almost maintained the double time of performance growth rate individually. This company performance rate exceeds the Six Sigma practicing companies' performance rate in all the 3 years. It shows the consistence and continued success of the company performance.

Table 8: Six Sigma Non-Practicing IT Company's Financial Performance (Annual revenue)

Year	2011	2012	2013	2013-14
3I Infotech Ltd	2,910.89	2,918.71	2,998.15	2,845.42
Alcatel-Lucent	31.4	28.17	30.17	28.53
Accel Frontline	195.21	188.66	197.07	239.06
3d Geometric Ltd	230.59	207.46	247.83	323.34
Infinite Computers	282.44	297.15	436.64	453.26

Table 9: Six Sigma Non-Practicing IT Company's Financial Performance (%)

Year	2011	2012	2013	2013-14
3I Infotech Ltd	0.00	0.27	3.00	-2.25
Alcatel-Lucent	0.00	-10.29	-3.92	-9.14
Accel Frontline	0.00	-3.36	0.95	22.46
3d Geometric Ltd	0.00	-10.03	7.48	40.22
Infinite Computers	0.00	5.21	54.60	60.48
Avg of Non Practicing Companies	0	-3.64	12.42	22.35

Interpretation: The above chart result shows that 3i InfoTech ltd & Alcatel-Lucent of Six Sigma non-practicing companies achieving negative growth in their revenue from last 3 years, whereas Accel Frontline, 3D Geometric ltd & infinite computers companies showing the positive growth and performance. The infinite computers having the high performance rate and Alcatel-lucent showing the least performance rate. The overall Six Sigma non-practicing companies' performance was negative in 2012 with only -3.64 and achieved positive results with 12.42 & 22.35 in the year 2013 and 2014 respectively.

3I Infotech Ltd

Table 10: Six Sigma Practicing IT Company's F Individual Company Performance Vs Industry Performance (%)

Year	2011	2012	2013	2013-14
6 Sigma Non Practicing Co. Avg	0	-3.64	12.42	22.35
3I	0.00	0.27	3.00	-2.25

Interpretation: The above table shows that 3I Company performance rate running by 0.27%, 3.0 %and -2.25% against the Six Sigma non-practicing companies overall performance rate, -3.64%, 12.42% and 22.35% in the year of 2012, 2013 and 2014 respectively. 3I company performance shows the inconsistency in the performance rate. 2012 down, 2013 bit development and 2014 again fall in to negative performance. It was also lack behind comparing to Six Sigma non-practicing companies overall performance rate.

Table 11: Alcatel-Lucent

Year	2011	2012	2013	2013-14
6 Sigma Non Practicing Co. Avg		-3.64	12.42	22.35
Alcatel- Lucent		-10.29	-3.92	-9.14

Interpretation: The above table shows that Alcatel-lucent Company performance rate running by -10.29%, -3.92 and -9.4 against the Six Sigma non-practicing companies overall performance rate, -3.64%, 12.42% and 22.35% in the year of 2012, 2013 and 2014 respectively. In all the 3 years performance it was showing the negative performance rate. It shows the very



poor and inconsistency in the company performance as well comparing with Six Sigma non-practicing companies overall performance rate.

Table 12: Accel Frontline

Year	2011	2012	2013	2013-14
6 Sigma Non Practicing Co. Avg		-3.64	12.42	22.35
ACCEL FRONTLINE		-3.36	0.95	22.46

Interpretation: The above table shows that Accel frontline Company performance rate running by -3.36, 0.95% and 22.46% against the Six Sigma non-practicing companies overall performance rate, -3.64%, 12.42% and 22.35% in the year of 2012, 2013 and 2014 respectively. This results shows that this company performance was poor in the 2012 and 2103. In 2014 it was able to achieve some sort of development in the company performance as well when comparing with Six Sigma non-practicing companies overall performance rate.

Table 13: Geometric

Year	2011	2012	2013	2013-14
6 Sigma Non Practicing Co. Avg		-3.64	12.42	22.35
Geometric		-10.03	7.48	40.22

Interpretation: The above table shows that Geometric Company performance rate running by -10.03%, 7.8 and 40.2% against the Six Sigma non-practicing companies overall performance rate, -3.64%, 12.42% and 22.35% in the year of 2012, 2013 and 2014 respectively. This results show that it was negative performance of Geometric Company in 2012, after it was positively development in the company performance. It was also good performance rate in 2014 comparing with the Six Sigma non-practicing companies overall performance rate.

Table 14: Infinite Computers

Year	2011	2012	2013	2013-14
6 Sigma Non Practicing Co. Avg		-3.64	12.42	22.35
Infinite Computers		5.21	54.60	60.48

Interpretation: The above table shows that Infinite computers Company performance rate running by 5.21%, 54.60 and 60.48% against the Six Sigma non-practicing companies overall performance rate, -3.64%, 12.42% and 22.35% in the year of 2012, 2013 and 2014 respectively. This is one company which achieve continues improvement in company performance as well comparing with Six Sigma non-practicing companies overall performance rate. Infinite computers stands in the first place in performance achievement among all the other Six Sigma non-practicing companies overall performance rate.

Table 15: Comparative Chart of Six Sigma Practicing and Non-Practicing Selected IT Company's Financial Performance from 2012 to 2014

Year	2011	2012	2013	2013-14
Avg of Six Sigma Practicing Companies	0	12.32	22.45	29.78
Avg of Non Practicing Companies	0.00	-3.64	12.42	22.35

Interpretation: The above table and chart shows that the Six Sigma practicing IT companies achieved high rate of performance compare to Six Sigma non-practicing companies. Six Sigma practicing companies performance rate running by 12.32%, 22.45% and 29.78%, whereas Six Sigma non-practicing companies growth rate running by -3.64%, 12.42% and 22.35% in the years of 2012, 2013 and 2014 respectively.

Findings

- Six Sigma practicing companies achieving constant and continues positive performance in their business.
- The Six Sigma practicing companies overall performance rate is also continuously improving and showing the future potential and growth of Indian IT industry.
- Infosys Company achieving great success among the Six Sigma practicing companies, ITC InfoTech stands in the second place in performance achievement.
- Infosys is the market leader followed by the ITC InfoTech in the Indian IT industry as per revenue performance.
- HCL Company achieved least performance among the six Sigma practicing companies.



- 3I InfoTech ltd & Alcatel-Lucent of the Six Sigma non-practicing companies are running under the poor performance.
- Accel Frontline, 3D Geometric ltd & infinite computers companies are showing development in their performance among Six Sigma non-practicing companies performance.
- Infinite Computer Company having high rate of performance achievement among Six Sigma non-practicing companies overall performance rate.
- Comparing between the Six Sigma practicing and Six Sigma non-practicing companies performance from last 3 years, it is found that Six Sigma practicing companies achieving high and continuous growing performance than the Six Sigma non-practicing companies.
- It was also found that the Six Sigma non-practicing IT Company's also achieving positive results, but comparing to the Six Sigma practicing companies it is low in rate. It implies that Six Sigma is having positive impact on companies performance and respect to the six sigma non- practicing companies it is also implies that there other elements which contributing to the company's performance other that Six Sigma.

Conclusion

Six Sigma is accepted and implemented all over the world as the best process improvement methodology. Better implement and monitoring will result with huge savings to the implemented companies. Six Sigma practicing Information Technology companies showing best financial performance comparing to Six Sigma non-practicing Information Technology companies. It implies that Six Sigma is having positive impact on companies' financial performance. Six Sigma non-practicing IT Companies also achieving positive results, but it is in low rate comparing to the Six Sigma practicing companies. Therefore it is conclude that, Six Sigma is definitely play major role in companies' financial performance and but also there are other factors also play a identifiable role in companies' financial performance improvement.

References

1. Prakash Pralhad Chaudhari (2012): "Key for Implementation of Six Sigma in Indian Industries". Journal of Information and Operations Management ISSN: 0976-7754 & E-ISSN: 0976-7762, Volume 3, Issue 1, pp-203-205.
2. Miroslav Rusko and Ruzena Kralikova (2011): "Application of Six Sigma methods to EMS design", Research papers faculty of materials science and technology in trnava slovak university of technology in Bratislava 2011 number 30.
3. Evren Aksoya and Murat Dinc,men (2011): "Knowledge Focused Six Sigma (KFSS): A methodology to calculate Six Sigma intellectual Capitals". Total Quality Management Vol. 22, No. 3, March 2011, 275-288.
4. DeRuntz & Meier (2010): "An Evaluative Approach to Successfully Implementing Six Sigma" Technology Interface Journal/Spring Special 2010 selected paper from the Proceedings of the IAJC-IJME 2008 Conference Volume 10 No. 3 ISSN# 1523-9926.

Web Sources

1. www.nasscom.com
2. www.geometricglobal.com
3. www.accelfrontline.in
4. www.alcatel-lucent.com
5. www.genpact.com
6. www.infinite.com
7. www.hcl.com
8. www.hexaware.com
9. infosys.com
10. <http://www.itcinfotech.com>