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Service sectors growth in India: can integration of Lean Six sigma be a solution?

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ABSTRACT

Service sectors such as banking, healthcare, hospitals, retail etc in India are facing an immense pressure from customers in providing the services at a faster rate with a greater quality. At present, service sectors are increasingly becoming a customer centric service provider. Integration of Lean and Six Sigma is a kind of quality and time enhancing strategy that can help service sectors to win the customer loyalty and growth. However, Lean Six Sigma itself is only not enough to meet the rapidly increasing competition, but also, the integration between Lean Six Sigma and the knowledge management is very important. The study examines the achievable benefits by the use of knowledge management and also gives the critical analysis of the impact of Lean Six Sigma in service sectors and the customer satisfaction by providing the products and services at the best quality within the least time (customer available time). The article provides “5 I” (5 I – Identify, Investigate, Improve, Implement and Impart) approach with Lean and Six Sigma combination and the tools and techniques to improve the efficiency and effectiveness of the services and products that provide. In this article “5 I” approach explains the use of tools and methodology to be adopted to streamline the process and also to improve the quality in the output. The 5I approach with the tool box explained in the article interim will help in growth of service sectors in India in achieving effectiveness and efficiency. It also provides the customer satisfaction by providing the services faster, greater quality and lesser cost.

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Introduction

All over the world, service sectors are facing serious issues, wherein the quality of the products and services is decreasing and delivery, service time, as well as, costs are increasing day by day. The current challenging economic environment has put the considerable stress on these sectors to decrease the costs and sustain the greater level of customer satisfaction. Service sectors in present competitive environment need to be innovative as well as build quality products and services in the least time. Like manufacturing sector, improving the quality and service time has become a serious consideration, as quality and service improvement is an effective approach in attracting and retaining customers for a long time. Quality improvement programs like Total Quality Management (TQM), Six Sigma, Re Engineering, and Benchmarking are employed by different organizations. However, Lean Six Sigma is relatively effective strategy to improve the business performance through minimizing the inaccuracies and inconsistencies in the overall process. Core processes are poorly designed and characterized by unnecessary duplication of services, long waiting time, and delay in the process. Costs are exploding and waste, rework and defects are identified as an important contributor to the increase in expenditures towards the running the business. As a result, service sectors consistently do not succeed in meeting the customer needs, leaving the customers dissatisfied.

As a result these sectors need an effort to reduce the costs and enhance customer satisfaction, to attract the same number or preferably more number of customers. Delivering the more

quality and faster service when revenues are going down is the major challenge. In this article its demonstrated how implementing the Lean Six Sigma can help service sectors to enhance quality, service time and to reduce costs. Thus, to compete, it is imperative to improve the operational efficiency and effectiveness. Improving the operational efficiency and effectiveness includes quality improvement, cycle time reduction, productivity improvement, waste reduction, process variation and the elimination of rework. The service sectors need to eliminate the operational inefficiencies, not just to gain competitive advantage, but even to avoid competitive disadvantages and to stay in the business.

To improve the efficiency and effectiveness there are some methods to be followed which are described in this article. Before explaining the use of these methods in service sectors, it is worthwhile to discuss the differences between the industry and services. These are:

1. Products are highly tangible in manufacturing, services and service delivery process are less so
2. Production flows are transparent in the manufacturing industry and less transparent in the services, and same holds for the problems and irregularities
3. Finally, the customer is less involved in the production/manufacturing process than the services.

The fact that services are not always tangible and the process performance in services is not usually transparent could be seen as an impediment to apply Lean Six Sigma. On the other hand, Lean Six Sigma offers advanced methods for making the

process performance measurable and some of the thinking tools explicitly deal with making the production flows visible and transparent. In the first place we have introduced the Lean Six Sigma, an improvement programme developed and then implementation of Lean Six Sigma in services

Schroeder, R. G., Linderman, K., Liedtke, C. and Choo, A. S. (2008) and Zu, X., Fredendall, L.D. and Douglas, T.J. (2008) support the contention that Six Sigma uses a structured method. Schroeder et al. (2008) suggest this approach is one of the four elements of the Six Sigma definition. Zu et al. (2008) identify and empirically verify that Six Sigma's structured improvement procedure is one of the key three practices which are critical for implementing Six Sigma in organizations. The structured method, DMAIC, provides companies a *metaroutine* to follow in order to solve problems and improve processes (Schroeder et al., 2008). In alignment with these ideas, Zu et al. (2008) argue that the Six Sigma structured improvement procedures provide teams a methodological framework to guide them in the conduct of improvement projects. Specifically, Six Sigma applies an approach to managing improvement activities, which is represented by Define–Measure–Analyze–Improve–Control (DMAIC) (see figure 2.2). In this regard, Linderman et al. (2003) suggest that although the DMAIC method is similar to the problem-solving steps of the classic Plan–Do–Check–Act cycle (PDCA model) and that the tools used in Six Sigma are not new, the novelty of Six Sigma is that it specifies quality management tools and techniques to use within each step. Six Sigma places emphasis on integrating specific tools into each step of the method, which makes Six Sigma unique (Schroeder et al., 2008). Further, DMAIC involves different specialists and organizational members at different steps in the method. Schroeder et al., (2008) highlight that there is greater clarity regarding the role and scope of work in each step with DMAIC than within the structures of other quality management methods. Linderman et al. (2003) pointed out that Six Sigma could be implemented to the processes of producing manufacturing goods, business trade, executive management, and services. Recent research papers include improving operational safety (Cournoyer et al., 2010), reducing amount of waste (Edgardo et al., 2006), improving quality for surveillance cameras to diminish related excess costs (Huang et al., 2010), enhancing the assembly efficiency of military products (Cheng 2005), increasing customer loyalty in the banking sector for Bank of America and Citigroup ((Rucker, 2000; Roberts, 2004), reducing patients' waiting time and length of stay (Mandahawi et al., 2010; Bisgaard and Does, 2009; Yu and Yang, 2008), reducing length of stay for Ophthalmology Day Case Surgery (Mandahawi et al., 2010), reducing lead-time (Al-Araidah et al., 2010), enhancing staff satisfaction (Dickson et al., 2009), reducing clinical errors (Raab et Al., 2006), process improvement for both the radiology department and medication administration process (Lloyd and Holsenback, 2006), and process design of compressor-housing machining process (Sokovic et al., 2005). Others include (Desai, 2006; Krishna et al., 2008; Jain and Lyons, 2009; Schon, 2006; Su and Chou, 2008; Woodward et al., 2007; Miller, 2003; Yu and Yang, 2008; Mari, 2007; and Ali, 2004). The research findings suggest that lean projects implemented in the hospital environment are most similar to the corresponding industrial projects: they are usually characterised by RIE (rapid improvement event) type development efforts implemented with the involvement of employees in the areas affected by the development, with the

participation of the leadership, with the support of experienced external or internal experts, by cross-functional groups. (Radnor et al., 2006; Spear, 2005).

Lean Six Sigma (LSS) Approach

Lean Six Sigma is a programme that can help manufacturing and service providers to achieve conflicting goals. Lean Six Sigma (LSS) is an integration of Six Sigma and Lean Manufacturing, both quality improvement programme for the industry and services. Lean and Six Sigma are highly complementary, Six Sigma provides an integrated improvement approach that increases the quality by reducing the variation defects and costs and Lean adds tools that increases process throughput by eliminating wastes.

Six Sigma: "Six Sigma is an organized, parallel-meso structure to reduce variation in organizational processes by using improvement specialists, a structured method, and performance metrics with the aim of achieving strategic objectives" - (Schroeder et al., 2008, p.540)

Lean: "Lean Production is an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability." (Shah and Ward, 2007, p.791).

Lean Six Sigma: LSS is the application of Lean techniques to increase speed and reduce waste and process complexity, while employing processes to improve quality and focus on the voice of the customer"(Brett and Queen, 2005, p.10).

Six Sigma complement traditional quality management to enhance business performance,

Lean is a very successful system focused on problem solving, waste elimination, efficiency and change for good. Lean and Six Sigma were regarded as separate and distinct quality improvement programme in the mid 90's. Presently they are integrated and the LSS practice observed and recognized globally.

Growth of Efficiency and Effectiveness using LSS Approach

Lean Six Sigma has been defined as "a defined approach that synthesizes the use of established tools and methods". The tools and methods of the Lean Six Sigma practitioner encompass the tool sets of both Lean production and Six Sigma. Lean and Six Sigma at the Caledonian Business School of Glasgow Caledonian University, concludes that "LSS is disciplined and systematic methodology of Six Sigma combined with the speed and agility of Lean (methodology) will produce greater solutions in the areas of business and operations excellence". The principle of Lean Six Sigma is "the activities that cause the customer's critical-to-quality issues and create the longest time delays in any process, offer the greatest opportunity for improvement in cost, quality, capital, and lead time". Although Lean and Six Sigma focus on different improvement goals, the reduction of waste and process variation, a thorough analysis of each method shows that the methods complement each other.

7 wastes which are attacked in LSS include Defects, Overproduction, Waiting, Non Utilization of Resources or Talent, Transportation, Inventory, Motion, and Extra Processing. The theories guiding Lean and Six Sigma methodologies are different but complementary. While Lean concentrates on identification and elimination of WASTE, and Six Sigma seeks to reduce variation in the process. Lean assumes waste removal will speed up the process thereby improves the business performance.

The below table describes the differences between of Lean and Six Sigma

Issues/Problems/Objectives	Six Sigma	Lean
Focuses on customer value stream	N	Y
Focuses on creating a visual workplace	N	Y
Creates standard work sheets	N	Y
Attacks work-in-progress inventory	N	Y
Focuses on good house keeping	N	Y
Process control planning and monitoring	Y	N
Focuses on reducing variation and achieve uniform process outputs	Y	N
Focuses heavily on the application of statistical tools and techniques	Y	N
Employs a structured, rigorous and well planned problem-solving methodology	Y	N
Attacks waste due to 7 wastes (DOWNTIME)	N	Y

Six Sigma assumes that process variation causes problems and more number of failures and defects and by reducing the variation will improve business performance. The synergy of applying both Lean and Six Sigma Methodologies is simultaneous. Lean Six Sigma attacks both flow and variation as depicted in Fig1.

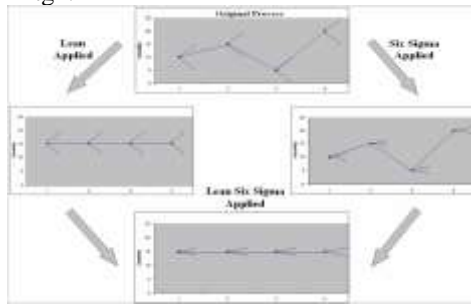


Fig 1: Integration of Lean and Six Sigma Approaches Approach and Execution of Lean Six Sigma

LSS is a strategic effort that will address the company's critical business needs. As a part of the process improvement, focus is laid on performance measurement and opportunity identification. The problem solving approach is divided into different stages. The first stage is to address the possible gaps in the process and the second eliminating complexities and increasing process velocity. This is possible using the LSS execution. The execution of LSS includes the approach of 5 streams as depicted below. LSS approach improves both efficiency and effectiveness of the process as shown in Fig 2. 5 I Approach includes,

Identify: Candidate project will be identified and then define the project charter with goals.

Investigate: In investigate the team will start collecting the data and assess the amount of variation in the process along with the different value adds and non value adds in "As-Is" process.

Improve: Identify the Kaizen's improvements in "As-Is" process and provide improvement plans (To-Be Process).

Implement: Implement the improvement plans for "To-Be" process.

Impart: Give away the project with the future plan with the control plan.



Fig 2: LSS System and "5 I" Life Cycle

Identify	Investigate	Improve	Implement	Impart
1. Project Selection 2. Problem Statement 3. Goal Setting 4. Team Formation 5. Project Charter 6. Project Plan 7. Project Scope 8. Project Budget 9. Project Risk 10. Project Communication 11. Project Monitoring 12. Project Reporting 13. Project Review 14. Project Closure 15. Project Handover 16. Project Evaluation 17. Project Feedback 18. Project Improvement 19. Project Sustainability 20. Project Success	1. Data Collection 2. Data Analysis 3. Data Interpretation 4. Data Presentation 5. Data Conclusion 6. Data Recommendation 7. Data Action 8. Data Monitoring 9. Data Reporting 10. Data Review 11. Data Closure 12. Data Handover 13. Data Evaluation 14. Data Feedback 15. Data Improvement 16. Data Sustainability 17. Data Success	1. Brainstorming 2. Root Cause Analysis 3. Fishbone Diagram 4. Pareto Chart 5. 5 Whys 6. Flowchart 7. Process Map 8. Control Chart 9. Histogram 10. Scatter Plot 11. Regression Analysis 12. ANOVA 13. T-Test 14. F-Test 15. Chi-Square Test 16. Z-Test 17. P-Test 18. Q-Test 19. R-Test 20. S-Test	1. Implementation Plan 2. Implementation Strategy 3. Implementation Timeline 4. Implementation Resources 5. Implementation Risks 6. Implementation Monitoring 7. Implementation Reporting 8. Implementation Review 9. Implementation Closure 10. Implementation Handover 11. Implementation Evaluation 12. Implementation Feedback 13. Implementation Improvement 14. Implementation Sustainability 15. Implementation Success	1. Control Plan 2. Standard Work 3. Training Plan 4. Communication Plan 5. Project Review 6. Project Handover 7. Project Evaluation 8. Project Feedback 9. Project Improvement 10. Project Sustainability 11. Project Success

Fig 3: Lean Six Sigma "5 I" Tool Box

In order for Lean Six Sigma to be effective and to last long, there, must be a paradigm shift – change in thoughts, actions and tools. It is a cultural change which supports the idea of business focusing on the customer, key processes, and steps to continuously deliver that satisfies the existing customers and adds new customers.

Lean Six Sigma Projects at Banking and Hospitals

In the present article tried to capture the areas where Lean Six Sigma can be implemented. Below are two examples.

Example 1: Long waiting times and overcrowded emergency rooms or causalities

The emergency rooms or causalities in the most of the hospitals face three serious and persisting problems. Firstly, patients complain about the duration of the entire treatment. Secondly, employees complain about the limited space in the emergency rooms and causalities. Finally, employees experience a high work load, partly due to the fact that emergency rooms and causalities are overcrowded on the peak times. These three major problems can be addressed using the Lean Six Sigma (5 I Approach). The LSS approach will provide the opportunity to improve the system as a whole and improves the process throughput and quality. It is possible only after analyzing the entire treatment process. In the first place, one can reduce the amount of work in process and then speed up the average completion process. Since the lead time starts the moment patient enters the system and demands the service there remain a reason to reduce the work in process. Reduction lead time also reduces the effort put by employees and the defects rate will also come down.

Example 2: The reduction of the number of defects in the process of issuing new loan

Most of the banking institutes are facing immense problem and high rate of errors in the process of issuing the new loan. The errors detected internally results in a significant amount of rework. This, in turn results in a substantial increase in operational costs. More over there is a high rate of customer dissatisfaction due to more number or errors and customer needs to consult banker more number of times. This has the need to improve efficiency and effectiveness of the process, which is possible by implementing Lean Six Sigma approach.

Conclusion

This article provide the integration of Lean and Six Sigma with the new approach of “5 I” which concludes that methods, tools and techniques of LSS (5 I Approach). The approach has greater impact on quality improvements and performance in various service sectors. Although, the experience of LSS in service sectors is new, however its impact over these sectors is very significant. The study enlightened the concepts of 5 I approach of LSS through its various definitions and highlighted importance of LSS in service sectors. The article also provide the implementation of 5 I approach in service sectors which will leads to numerous benefits, few are lead time reduction, reduction in errors, reduction in variation in the process, processing time, training plan, waste elimination and transparency of the process. However, 5 I approach alignment with knowledge management can produce better results in service sectors. Applying knowledge management along with 5 I tools and techniques plays an important role in enhancing the quality of operations.

The future papers will provide the details of how 5 I approach can be implemented in the service sectors such as banking, insurance, healthcare, NGO's, retail, hotels, real estate, etc, where the products and services are not tangible.

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