



Integrating lean and six sigma Approaches to enhance the performance of service sector (An applied study)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَمَا تَوْفِيقِي إِلَّا بِاللَّهِ
عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ
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هود - آية 88

Dedication

To my beloved Mother and father

Whom I owe everything

I dedicate this effort to you

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ABSTRACT

Six Sigma is a business improvement strategy that aims to improve process performance using a structured methodology that identifies and removes the causes of defects in manufacturing and business processes, while implementing the lean concepts attempts to remove wasteful activities from those processes. In practice, the Six Sigma approach and the Lean approach are combined and often viewed as one integrated approach, where the approach of Lean Six Sigma simultaneously removes wasteful activities from a process

This thesis reviews the concepts and implementation of Lean approach, Six Sigma approach, and the integrated concept of Lean Six Sigma, with emphasis in service organizations using applied study in hospital. This thesis summarizes the critical success factors for implementing Lean Six Sigma within hospital and reducing the wastes.

Lean six sigma approach can be used by service business units and service providers to improve the success of Lean Six Sigma implementation.

Chapter 1

Introduction

1-1- Introduction:

Due to globalization and expansion of technologies in market all over the world , companies shall deal with continuous improvement of various operational effectiveness in order to compete in market through using new methodologies like lean accounting , total quality management ,just in time ,six sigma, kaizen and target costing models **(Ofileanu, 2015)**. So Companies today are enforced to save money and resources if they need to compete in globalized markets. Due to changes in customer demands, companies must improve their processes and approach them in different ways.

Companies focus on producing products with zero defects ,while maintaining targeted inventory levels. On the other hand the service sector focuses on providing the customer timely and accurate services continuously . Companies to compete in market should not only focus on producing different products and the most efficient service , but also have to focus on cost reduction . **(Duarte et al., 2012)**

while Lean tries to develop a practical or theoretical linkage between quality and speed **(Dahlgaard et al., 2006)** Lean is a systematic methodology to reduce complexity by identifying and eliminating sources of waste in the process; waste that causes a lack of flow. In simple terms, Lean looks at what we should not be doing and aims to remove it.

A rapid growth in improvement methodologies, such as lean thinking and six sigma have been used in many companies and recognized a successful implementation of either lean or six sigma over the last decades.

The lean concept concentrates on reducing all the non value adding activities and wastes in the whole supply chain to achieve high quality, producing products at reasonable cost, and achieving the highest reputation and profits at the same time.

Six Sigma concentrates on reducing variation of the processes through using statistical tools to reduce them while Lean focuses on waste reduction by focusing on customer inputs.

Lean and Six Sigma are common in some points that both focus on satisfying customers by using different tools to do that, both effect peoples mind . lean and six sigma create a culture of continuous improvement and develop the process efficiency.

Lean and Six sigma target different improvements, each of them use their own unique characteristics to reach this, where Six Sigma is a systematic methodology which focuses on variation reduction, measuring defects and improving quality of the product. Six Sigma can help companies to reduce cost, increase profits, keep current customers and create new customers as well improve the company competitive position.

In the market customers demand high quality at low prices and least company profit margins this seems to be struggling especially in the economic crisis. Therefore waste elimination is important for all companies in order to reduce costs and to use resources efficiently. Variation reduction keeps processes accurate and steady.

Quality is not about making things without errors but making product or service meet customer perception regarding quality or value. For more effective and efficient strategy, organizations have to adopt Lean Six Sigma (LSS).

In recent years, merging the concept of Lean and Six sigma as an improvement methodologies develops Lean Six Sigma (LSS) approach (**Long Yeh et al.,2011**)

Lean Six Sigma combines both lean accounting and Six Sigma to remove the eight kinds of wastes: defects, inventory, waiting time, extra processing, unused talent, transportation, motion, and overproduction, to improve performance by removing these wastes. It is proved to be an effective way of improving the quality of processes and products in a wide range of industries and services as well

Lean Six Sigma increases the company's revenue by eliminating process that increase the cost and add no value to the quality.

Basically lean Six Sigma develops the efficiency of any organization by increasing customer's satisfaction.

Lean Six Sigma involves employees in the improvement process throughout all levels of production this makes each person see how he reflects to the organization's success.

In this thesis, the researcher will discuss the history of Lean and Six Sigma, and the integration between them, and show their effect when applied in the healthcare service.

The integration between Lean and six sigma enhance the performance of healthcare sector by reducing the number of defects, such as patient waiting time, medical reports issued, unnecessary medical costs. Moreover ensures that healthcare department achieve continuous improvements increasing service quality through providing accurate results rapidly to diagnose and care patients. (**Selim et al.,2014**)

1-2-Research Problem:

Despite the seek of the organization to improve its performance, many service sectors in Egypt are lacking the implementation of new techniques like LSS.

Companies lack applying lean six sigma approach ,fear of trying new models and fear of the results they just focus on one of the tools whether lean or six sigma separately despite what studies proves what each one miss.therefore companies face different kind of wastes because measures and standards used are not at the level of accuracy .

1-3-Research Objectives:

The main objectives of the study are

1-The Use DMAIC(Define , measure , analyze , improve , control) methodology to explain each of the phases of the methodology and all the tools required to improve the hospital waiting time and service duration successfully .

2- Determine the variation in process with the use of statistic tools. Define waste improvements through using Lean tools as Value Stream Mapping and other improvements in the process without using new resources

3- Clarify how Lean Six Sigma methodology can change quality and make continuous improvement that help companies to improve their processes .

1-4-Research Importance:

- Applying lean six sigma approach will result in enhancing the performance of the organization through cost reduction ,time reduction , increasing revenues ,achieving higher quality levels and customer satisfaction .
- LSS approach will help organizations that desire to apply lean six sigma,to understand and measure the performance of Egyptian service sector progress before and after implementing a model of lean six sigma approach and its financial impact.
- The study will try to focus on the financial impact to complete the drawbacks of the previous studies taken in Egyptian healthcare sector regarding using lean and six sigma separately or when combining the two approaches .

1-5- Research Hypotheses:

H 1 There is no difference in hospital performance before and after LSS approach

H 2 There is no significant role of LSS approach in enhancing the hospital performance.

H2_1 There is no significant role of LSS approach in enhancing the hospital performance from the employee perspective.

H2_2: There is no significant role of LSS approach in enhancing the hospital performance from the patient perspective.

H2_3: There is no significant role of LSS approach in enhancing the hospital performance from the financial department perspective.

1-6-Research Methodology :

The study will be divided into 2 parts:

- **A Theoretical part** :In this part the lean and six sigma concepts will be discussed separately, then going through the merge between lean and six sigma where lean six sigma methodology will be illustrated depending on reviewing the periodicals, books, thesis, Egyptian , Arabic and foreign ones that discussed lean and six sigma in all the sectors .

-**Applied study part** : the researcher applied study ,would be conducted to determine the results through two techniques to assure and measure the real effect of lean six sigma methodology in the selected well known X hospital In healthcare service department.

First – the researcher works on Collecting data for the emergency department and laboratory department in X hospital before and after applying lean six sigma methodology in each department for both waiting time and service duration comparing 2 years results, and its effect on the financial statements. Where data of the independent variables and dependent variable will be collected by using data which is prepared by the hospital and disclosed in their financial reports .

Second- through questionnaire, three questionnaires were designed:

1. The first one was for the employees of the “financial department” in the hospital.
2. The second was for the employees in the hospital.
3. The Third was for the patients who treated with outpatient clinics before and after application Lean Six Sigma.