

“Challenges and Opportunities of Lean and Six Sigma for Saudi Industries”

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Abstract

These days' companies are trying to integrate lean with six sigma because both of them together give high impact and quick hit projects. The conditions of TQM and six sigma in Saudi Arabia are not that good and companies are still reluctant to apply or use this in their cases. This study intends to analyze the situation of TQM and six sigma in Saudi Arabia. TQM has been accepted in Saudi Arabia but six sigma is under consideration. There are very few organizations that have applied six sigma and lack of implementation occurs only because of lack of proper training, lack of tools and recourses.

Introduction

According to Juran, Ishikawa, and Deming, Total Quality management has four important parts and they are quality, people, organizations and the role of senior management. A fundamental premise of TQM is that the cost of poor quality is much higher than the cost of developing processes that produce high quality products and services. The second part is about treating employees of a company. It is necessary that all the tools and technologies must be provided to employees so that they can train themselves and compete with the other people. Doing this will help employees in building trust and they will be motivated to improve their performance.

The third and fourth part are also important as they will the organization as a whole and as well as with the senior management.

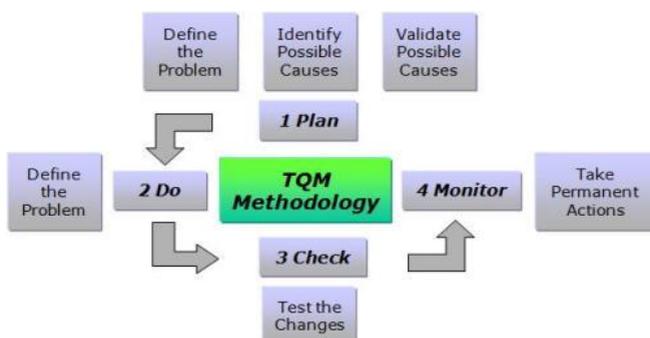


Fig1: TQM Methodology

Scope

This paper will only talk about the condition of TQM and six sigma in Saudi Arabia. It will look at several reasons because of which TQM and six sigma is not implemented on a large scale in Saudi Arabia.

Objectives

Some of the objectives of this paper are as follows:

- To explore how TQM and lean six sigma can help industries.
- How TQM and six sigma has developed over years.
- What are the main points of six sigma and TQM that can benefit any industry?
- How Six sigma and TQM are implemented at different stages of development?
- Explore reasons for none-acceptance of TQM and six sigma in Saudi Arabia.
- What are the benefits of using six sigma and TQM in Saudi Arabia?

Literature review

In the global marketplace there is a huge competition among companies to at the top and many of them have adopted total quality management in order to remain at the top. TQM is a management philosophy that seeks to integrate all organizational functions to focus on meeting customer needs and organizational objectives (Hashmi, 2000-2004). Some researchers (Hackman and Wageman, 1995) are of the opinion that TQM is a way to bring organizational change in terms of quality, customers, employees, organizational production, and the role of senior management. There are different views on Total quality management. For instance, Landy and

Conte, 2004 are of the opinion that TQM focuses on quality, customer demands and expectations and not on increasing production.

There are benefits of Total Quality Management but that doesn't mean that it can be applied to any situation or company. TQM failed in Kodak because of the way it was applied. Organizational improvement can occur through TQM introduction only when organizational members' behaviors change (Ehigie and Akpan, 2001).

There are many similarities and differences between Total Quality Management, Lean and Six sigma. Motorola was the first company to launch a six sigma program in the mid-1980s (Rancour and McCracken, 2000). According to Magnusson et. al. (2003) Six sigma is a business process that allows companies to drastically improve their bottom line by designing and monitoring everyday business activities in ways that minimize waste and resources while increasing customer satisfaction by some of its proponents.

As far as major components of six sigma implementation are concerned, they are management involvement, organization, infrastructure, training and statistical tools (Henderson and Evans, 2000). There are two major methodologies in six sigma, one for already existing processes and one for new processes.

Lean is about controlling the resources in accordance with the customer's needs and to reduce unnecessary waste. According to NIST (2000), Lean is a systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection. In terms of similarities between TQM, Lean and six Sigma, TQM is more about plan, do study and act. Six Sigma involves defining, measuring, analyzing and improving. Lean involves understanding customer value, value stream, analysis, flow, pull and perfection.

In order to apply TQM, lean and six sigma techniques in an automobile company some degree of adaptation is required because not one method can be successful for others. If TQM, lean and six sigma techniques are successfully and fully applied in an industry one cannot see the expected benefits. Some of the benefits of lean production are:

- Right processes will produce right results

- When root problems are continuously solved, it leads to organizational learning and development.
- Developing people and pattern adds value.
- Some of the lean tools are:
 - Keep the items that are needed.
 - Straighten- which means there is a proper place for everything
 - Shine-Cleanliness
 - Standardize: Develop systems and procedures to maintain and monitor the first three S.
 - Sustain the new level of performance.

Problem Statement

The rate of implementation of six sigma is less than 32% in Saudi Arabia. Though during last two decades Saudi firms have adopted ISO-certification, business process reengineering, Total quality management and Kaizen but it seems that after all the implementation, the growth has come to a standstill. In the previous section we have already looked at many benefits because of six sigma and TQM.

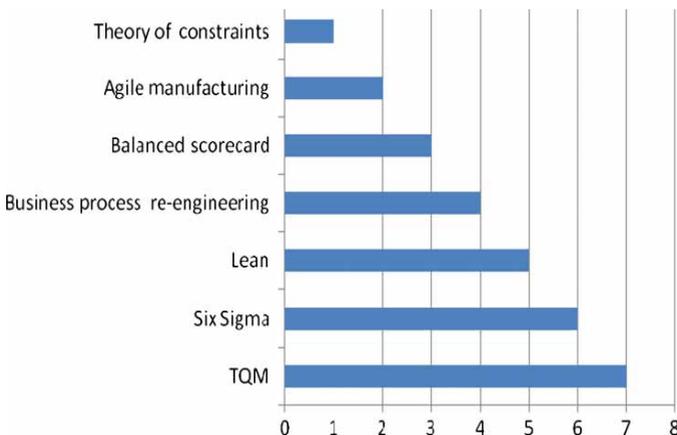
TQM Application in Saudi Arabia

Many firms in Saudi Arabia do not implement six sigma in their organizations because of the following reasons.

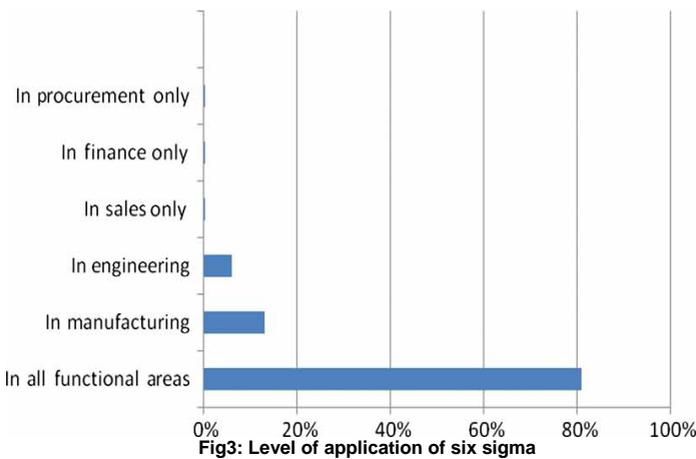
- They fear that the implementation of six sigma might increase bureaucratization and everything will be statistically controlled.
- There will be a lack of time for work.
- Because of lack of knowledge of six sigma, implementation strategies and implementation after-effects organization fear that such an implementation will not only require cost and energy but also effect their business in a wrong way.
- Implementation of six sigma will also involve huge costs.



As far as TQM is concerned, it is definitely a popular program in Saudi Arabia but organizations are still reluctant to implement six sigma in their organizations. The figure below shows the popularity of TQM in Saudi Arabia firms.



There are some firms who have applied six sigma but again the level of implementation is very low and this is evident in the following graph.



Six Sigma application in Saudi Arabia

Six sigma involves management, organization, infrastructure, training and statistical tools. In six sigma there are two major improvement

methodologies, one for existing process and the other for new processes.

The methodology for existing process can be explained in five phases and that are:

- **Define:** The products or areas or processes that needs to be improved. Also decide who will do the improvement. For instance who will be in the hiring committee of a company? Decide other people who will be involved with the project and maps can be created for a better understanding of the areas that need to be improved and the improvement process.
- **Measure:** Identify the factors that influence the processes to a great extent and understand how those factors can be measured.
- **Analyze:** Analyze the factors that needs improvement.
- **Improve:** Design the solution that is most effective for the improvement of the process.
- **Control:** Verify that implementation is successful and it is also important that the improvement stays with the passage of time.

We have already talked about the benefits of Six sigma but still many find that it is very difficult to implement this in real organizations. So it is necessary to know the reasons for such a difficulty in implementation. According to the research by Alsmadi all, the firms which participated in the survey gave following reasons for the failure to implement six sigma in Saudi Arabia and this can be easily seen in the following table.

Six Sigma Geographical Distribution

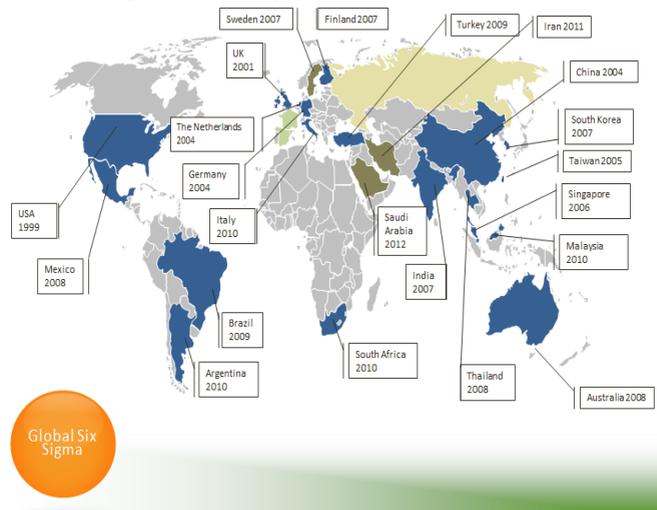


Fig4: Six Sigma Geographical Distribution

Benefits of Six Sigma

Six sigma is a relatively new concept as compared to TQM. TQM definitely has the ability to improve the quality of products but Six sigma can deliver better results than TQM. There are several reasons because of which six sigma is better than TQM. Some of them are as follows:

- Six sigma is based on continuous quality improvement whereas TQM is mainly concerned with quality of products.
- In Six sigma the number of defects is less than 3.4 defects per million.
- It is equivalent to SPC
- If an organization uses six sigma can reduce the operational costs by focusing on reducing the number of defects.
- It also helps in cycle time reduction.
- Cost savings is more in Six sigma as compared to TQM.
- One of the best benefits of Six sigma is that it identifies and eliminates costs that is of no value to the customers and customer does not have to pay anything for this elimination.
- Six sigma is based on the philosophy of DMAIC.

Continuous Improvement

As far as lean manufacturing is concerned, there are five basic principles involved with it and they are

- Understanding customer value: We all have different perceptions of values hence it is understand what the perception of value for customers is.
- Value stream analysis: After the values have been identified, it is important that we should know the business processes that adds to customer values. If an action is not contributing to the value mentioned above then it is necessary that it should be deleted or modified.
- Flow: regular flow through the production or supply chain must be achieved.
- Pull

- Perfection

Conclusion

It is important that apart from making companies in Saudi Arabia realize that Six Sigma and TQM are important for the development of company, it is also important to provide them with proper training and guidance so that implementation can be done in a proper way. The figure given below gives an idea of the benefits of implementation and how it can be properly implemented in Saudi Arabia.

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Quality Management, Lean Manufacturing, Optimization, Strategy, Project Management, Supply Chain Management, Public Relation, and Global Leadership. He is an active member of SAE, IIE, ASQ, ASME, LEI, IEOP, and SME. He was a president of the Saudi Student Union at LTU, President of Arab American Association of Engineers and Architects (AAAEA), he received an Exemplary Leadership Award, Best leader of the year from Lawrence Technological University, and Outstanding Leadership Award from Saudi Arabian Cultural Mission, Saudi Embassy at Washington D.C.

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Biography

Ahmed Aljabr is a president of IEOP Society-KSA Chapter, as quality engineer and Six Sigma Mater Blackbelt Certified. his experience span most industries and operational areas including working in different successful project with International Automotive Components (IAC) to install a solar photovoltaic panel system within their facility from the design to the installation and after build process, Whitlam Label Company (WLC) to layout the travel distance to minimize the non-value added transportation time on their factory, and work with Shiloh Industries Inc. through a Six Sigma project with an annual cost savings of over \$500,000, figured how the process was mapped, characterized, analyzed, improved and controlled, and explore which tools were used to quantify the amount of variation within the process as well as the cost of that variation. He is an expert in the areas of Lean Six Sigma, Continues Improvement,