Lean Six Sigma- a Challenge for Organizations Focused on Business Excellence

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Business environment, being in a constant change, needs a quick adaptation to global market requirements. Applying Lean Six Sigma is not only key to survive in a global market, but also provides the necessary resources which are redirected to business development.

It is found that organizations have many different approaches regarding improvement but they all share the same goal which is to increase theirs customer satisfaction. The findings suggest that improvement is most effective when a holistic view is used which address improvement in all organizations processes using a successfull excellence model such as Lean Six Sigma.

Key words: *quality, continuous improvement, business transformation, process improvement, performance measures.*

JEL Classification: *M16, M21*

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1. Introduction

A change, whether in information technology systems or manufacturing processes, can make people quiver at the thought of having to do things other than the ordinary. Some managers sweat at the thought of re-learning software, some front-line workers dread the extensive training required to run a new distribution computer system or manufacturing process, and some mid-level managers hate coordinating completely new training sessions or process schedules. Resistance to change at all levels in an organization surrounding Lean and Six Sigma improvement projects can be extremely high.This change contributes to problem that can be solved by using tools such as rapid improvement projects and kaizen statistical analysis; in other words, Lean and Six Sigma (Burge, 2008).

Business environment has changed drastically and will continue even more in the future (Sion, 2009). To obtain that competitive advantage for organizations, Lean Six Sigma may assist them by creating, improving continuously it's processes, but also by implementing new organizational structures and processes which bring that added the organization has need to differentiate from its competitors on market (Petcu et al., 2010). The competitive advantage is a source for sustainable success of the organizations. Sustainable success of an organization is achieved through the ability to meet the needs and expectations of its customers and other stakeholders in the long term and balanced (Sava et al., 2010).

2. The Lean Six Sigma approach

Lean Six Sigma is a business strategy and methodology that increases process performance resulting in enhanced customer satisfaction and improved bottomline results.

Lean Six Sigma is needed because organizations and individuals need a methodology for improvement and problem solving. Processes do not get better by themselves. In fact, if not improved on some periodic

basis, processes deteriorate over time. We know this because of the second law of thermodynamics which states that things become more variable if not interfered with (Snee, 2010).

The integration of Lean and Six Sigma aims to target every type of opportunity for improvement within an organisation. Where as Six Sigma is only implemented by a few specific individuals within a company, Lean levels the empowerment and education of everyone in the organisation to identify and eliminate non-value adding activities. The integration of the two methodologies attempts to provide empowerment even at the higher-level process analysis stages, so that employees have true ownership of the process. If the two are actually implemented in isolation, the outcome can result in neither being done effectively; constrained by one another's needs in the organisation. Again, it could even create two subcultures within the organisation, competing for the same resources (Pepper et al., 2010).

Whenever these approaches are contemplated to encourage a culture of innovation and creativity, they can be termed as a part of the mindset. Various techniques are also part of implementing these philosophies to support automated decision making and in developing better benchmarking and performance management standards. In retrospect, many attempts have been addressed in the literature to enhance the performance of manufacturing firms through implementation of Lean and Six Sigma; however, their effective implementation are time consuming due to scarcity of knowledge (Tiwari et al., 2008).

3. Case study- Identify the benefits and limitations of implementing Lean Six Sigma methodology

3.1. Research objectives

The main objective of this study was to identify and analyze the impact that has on organizations the implementation of an excellence model such is Lean Six Sigma as well as their ability to use it in order to establish the benefits and limitations of its implementation.

The secondary objectives of the study were as follows:

• Identify and analyze the ways in which Lean Six Sigma projects are perceived by the organization and the measures taken for their integration into the organization's objectives.

• Identify and analyze how the success or failure of Lean Six Sigma implementation can influence customer satisfaction.

3.2. Research hypothesis

(H1) Lean Six Sigma projects are in line with the organization vision and objectives.

(H2) The success or failures of Lean Six Sigma projects have an impact on organization reputation.

(H3) The aim of implementing Lean Six Sigma methodology is increasing customer satisfaction and improving employee activity.

3.3. Research methodology

A cross-sectional survey was conducted to investigate the implementation of Lean Six Sigma methodology and organizational culture in order to determine the benefits and limitations of its implementation. The initial study was done based on a review of the literature in this field. New measures were developed to assess how

Lean Six Sigma is been implemented by reviewing practitioners publications and academic research.

The study focused on the organization's objectives and goals, linking Lean Six Sigma methodology with the customer expectations and the impact on the organization.

The instrument used in this study is represented by a questionnaire, developed in order to obtain information on those mentioned in the paragraph above. It contained 18 questions about the implementation of Lean Six Sigma methodology and 6 questions about the respondent. The questionnaire was composed of questions with multiple answers as well as the single answer questions. Responses were evaluated both by using Likert scale from 1 to 5, where 1 means "totally agree" and 5 "totally disagree", and also by other assessment methods.

A database was achieved with organizations that have already created a reputation in implementing business excellence models. The companies' addresses have been collected from various associations and most directly from corporate sites. Before sending the email with the questionnaire, companies were contacted by email in order to identify the person responsible on Lean Six Sigma within organisations. In this study, the attention has been focused on large organizations because there is a higher probability that they are involved in Lean Six Sigma projects.

It was chosen this method to create a favorable and easily accessible framework for the respondent. The questionnaire was sent to 70 organizations selected from the database created in February-March 2011. Data collection was performed in April resulting in a response rate below 10%.

Respondents have included those in a position to operations managers, managers responsible with quality and continuous improvement and certified masters with Six Sigma belts.

Most of the respondent organizations are working in manufacturing (60%), computing (15%), transport (12%) and only 10% in services.

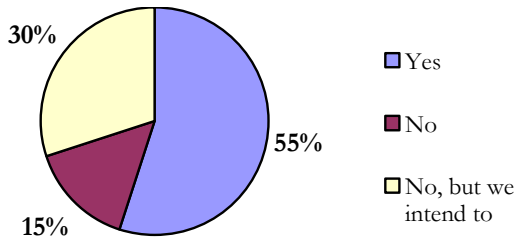
According to a survey by Rigby and Bilodeau (2007) Six Sigma belongs to the top 25 management tools and is used by 40% of companies throughout all industries worldwide. However, the reasons for applying Six Sigma and the scope of its implementation seem to vary significantly among companies. Motwani et al. (2004) investigated the effect of different implementation practices of Six Sigma. At General Electric, for example, Six Sigma is seen as "an all-encompassing quality initiative". The Dow Chemical Company regarded customer loyalty and leverage as two key factors on top of the DMAIC cycle. Their main goal was an increase in productivity (Heckl et al., 2010).

3.4. Results presentation and analysis

(H1) In order to test hypothesis one, the questionnaire included five questions about the organizations' objectives and goals which are or not directly related to the excellence model implementation. Thus at one of the question "Has Lean Six Sigma been designed regarding the organizations' vision and mission?" the distribution of responses can be seen in Figure 1.

Figure 1

Design Lean Six Sigma according to organization vision



Source: Figure prepared based on data collected through the questionnaire

Another key point for testing the first hypothesis was to identify the annual budget allocated by the organization to implement Lean Six Sigma. 81% of respondents answered that there is an annual budget allocated for Lean Six Sigma projects and only 19% responded that the organization has not allocated any budget for such projects.

Considering the answers to these questions we can not say with certainty that the implementation of Lean Six Sigma excellence model fit with the objectives and vision of the organization, but the fact that a significant proportion responded that this is taken into account and 81% admitted that they allocated a annual budget for Lean Six Sigma projects can be concluded that this kind of continuous improvement projects aimed at gaining attention from managers increasingly higher.

(H2) In order to test the second hypothesis, four questions were achieved within the questionnaire to see if the success or failures of Lean Six Sigma projects have had an impact on the organization reputation and whether it considers that the excellence model implementation is a long-term improvement approach which should be integrated into the organizations' objectives.

Regarding the impact of Lean Six Sigma projects have had on the organization reputation, 40% of respondents believe that the projects have had an impact on the organization reputation, 25% responded negatively, while 35% of respondents answered that they not yet assess this.

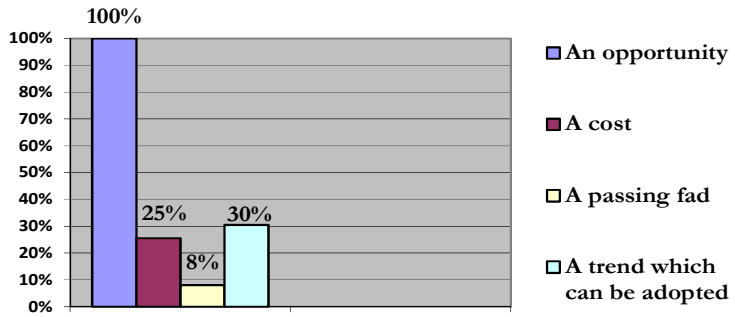
At the question "Do you believe that Lean Six Sigma is a sustainable long term business improvement approach for your organization?", 65% of respondents answered positively, only 6% responded negatively, while 29% answered that they are considering it and that it falls among the organization objectives the integration of Lean Six Sigma in the organization's long-term improvement.

In order to testing the second hypothesis was achieved a multiple choice question which aimed to identify how Lean Six Sigma projects are perceived by the top management of the organization. Thus, all

respondents confirmed that Lean Six Sigma methodology is seen as an opportunity within the organization and only 25% of them identify it as a cost, as can be seen from Figure 2.

Figure 2

The way Lean Six Sigma is viewed by the organization



Source: Figure prepared based on data collected through the questionnaire

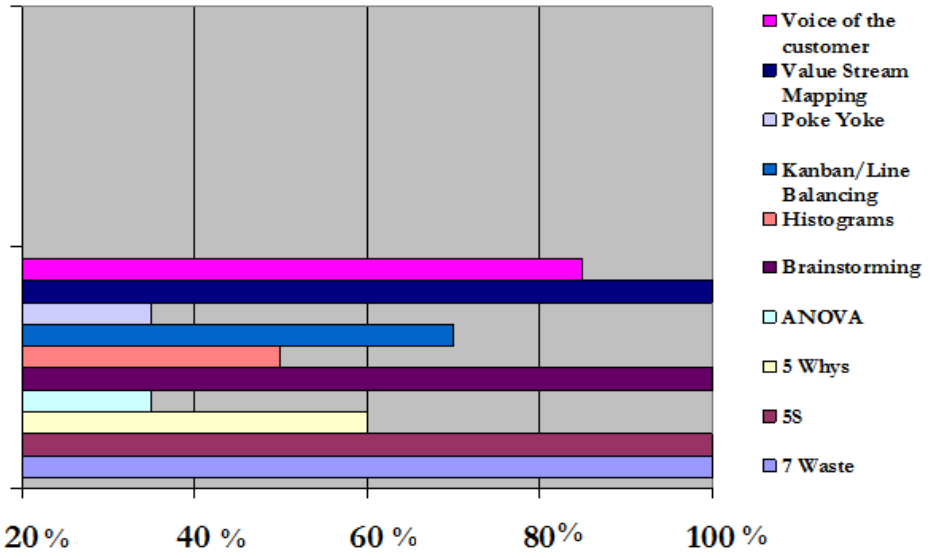
Regarding the impact of Lean Six Sigma projects have on the organization reputation, the answers can not confirm with certainty that the benefits or failures of the Lean Six Sigma implementation have an impact on the organization, because more than half of responding organizations agree with this, while 35% of respondents have not evaluated its importance.

(H3) In order to test hypothesis three, six questions were formulated and addressed to organizations in order to identify if by implementing Lean Six Sigma the organization has improved its processes and has increased customer satisfaction. Another objective of these questions was also to identify what is the level of involvement of employees in Lean Six Sigma projects. The results showed that less than 23% of employees are involved in Lean Six Sigma projects.

Among the most used methods and techniques used by the implementation teams, the results showed that all the respondent organizations have used in Lean Six Sigma projects: value stream mapping (VSM), the 5S, seven types of waste, brainstorming, while histograms or ANOVA method were used less (below 50%).

Figure 3

Lean Six Sigma methods and techniques



Source: Figure prepared based on data collected through the questionnaire

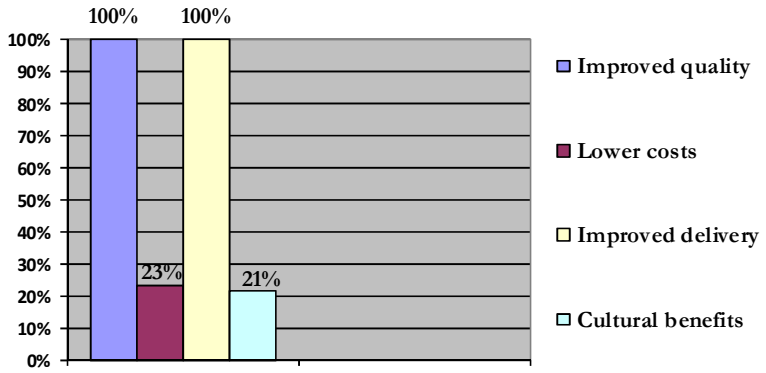
Regarding the processes improvement and increasing customer satisfaction through the excellence model, we used questions like "Do you belive that by implementing Lean Six Sigma the processes within the organization were greatly improved, customer satisfaction have increased?". Responses were assessed using Likert scale from 1 to 5,

where 70% of respondents answered affirmatively and only 30% negatively.

In order also to test the hypothesis three the questionnaire included a question with significant relevance related to the benefits achieved from Lean Six Sigma projects. It was used a multiple choice question, so that all respondents recognized like a benefit the fact that they improved quality and delivery and the distribution in terms of percentage can be seen in Figure 4.

Figure 4

Types of benefits achieved by using Lean Six Sigma



Source: Figure prepared based on data collected through the questionnaire

However, more than half of respondents don't report that by Lean Six Sigma projects they have achieved all its stated objectives, especially those relating to cost reduction. Regarding the organizations that have noticed the cultural benefits from implementing the excellence model, they have not fully met its objectives.

Conclusions

Lean Six Sigma approach it ensure by its means tested, that the entire value chain processes are optimized and remain at high levels through implementation of a sustainable improvement concept within organization.

Lean Six Sigma approach is a complex methodology because includes also a cultural dimension. This implies that managers should focus their attention on informal levers of market orientation and not only on formal management practices. In addition, the implementation of a Lean Six Sigma project is designed to evaluate also activities that are particularly relevant to the market and customer orientation. This provides to management which operates in a specific business environment and deal with operational issues, relevant implications on improving processes within the organization.

Acknowledgement

This article is a result of the project POSDRU/88/1.5./S/55287 „Doctoral Programme in Economics at European Knowledge Standards (DOESEC)". This project is co-funded by the European Social Fund through The Sectorial Operational Programme for Human Resources Development 2007-2013, coordinated by The Bucharest Academy of Economic Studies in partnership with West University of Timisoara.

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