

EXPLORING SIX SIGMA - LEAN SIX SIGMA: A LESSON FOR FOOD INDUSTRY

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Abstract

Purpose: *The potential of this study is to investigate issues regarding potential application of Lean six Sigma in Food Industry. The approach is based on a study case (10 Food Production Center, that already implements other quality techniques with commune parts with Lean Six Sigma). The paper explore in an analytical manner, the factors that can influence the implementing on the system in Food Industry with focus on the Quality Culture.*

Materials and Methods: *The study is based on an exploratory method with a qualitative approach based on interviews with Managers. Other secondary data were collected through Audit Reports Analysis.*

Results and Discussions: *The study could be a tool to investigate the potential application of Lean Six Sigma for Food Industry. Are some factors like Leadership, Organizational Culture, Training, Teamwork, Customer Satisfaction and Technical Systems, that can affect the implementation of Lean Six Sigma?*

Limitations: *Food Production Centers explored in the study, does not applying Lean Six Sigma, but they are applying other quality techniques (ISO systems), that contains commune parts with the potential system. Also, the interviews were conduct with the top management level.*

Conclusions: *The study is trying to create an overview regarding the potential application of Lean Six Sigma for Food Industry.*

Key words: *Food industry, Quality Culture, Quality Techniques, Lean Six Sigma*

INTRODUCTION

Today business environment is characterize by change, complexity, customer demands, competitive pressure, cost impact , different from yesterday business requirements which where quality, productivity with reduced cost and faster product development cycle time and the organizations must meet present business goals and objectives (Thawani, 2004).

Quality is one of the most important topics that interest the companies. Was perceive like a tool to bring competitive advantage or customer satisfaction for service companies.

Our research is focusing on Food Industry – 10 Food Production Centers for our exploratory study. For this field health and customer satisfaction is one of the most important issues.

This study is an exploratory research that wants to a tool to investigate the potential application of Lean Six Sigma for Food Industry. Are some factors like *Leadership, Organizational Culture,*

Training, Teamwork, Customer Satisfaction and Technical Systems, that can affect the implementation of Lean Six Sigma. According to a previous study Davison and Al-Shaghana (2007), an organization with a quality orientated culture will utilize significant factors of Six Sigma or will adopt the concept.

The research is orientated for 10 individual Food Production Centers. The proprieties are certified with ISO standards but Six Sigma or Lean Six Sigma is not applied in none of the organization. According to Dedhia (2005), ISO 9000 Standard and Six Sigma have the same purpose: reducing costs and enhancing customer satisfaction.

On the study cases, will try to find the similar principles and practices of ISO Standards and Lean Six Sigma and to point out if the organizations with a strong Quality Culture are more open to implement the new system.

According Green (2006), Six Sigma is a new interpretation of TQM, and all the required

features of TQM are found in correct application of Six Sigma.

According to Todorut et al., (2009), Six Sigma is a model of improving other quality management practices and is a complementary relation among other managerial systems like ISO 9000, Kaizen techniques, TQM and Total Productivity Maintenance as a result of the growth of the economic performance. Table 1 presents the correspondence between Six Sigma and ISO 9000:2000, which is relevant in our study case.

The topic of research will be to investigate if organizations that have a quality orientated culture (they already have some principles and tools connected with Six Sigma- see Table 1) are more likely to adopt Lean Six Sigma.

The Rationale of the Research will cover gap in literature about how Food Industry may apply Lean Six Sigma.

The Method of the Research is based on an exploratory method with a qualitative approach - interviews with Managers. Other secondary data were collected through Audit Reports Analysis.

MATERIAL AND METHODS

Methodology used is an exploratory one. Study if the organizations have an appropriate “quality culture” to implement Lean Six Sigma. A qualitative approach will be used for primary data and will be collected from interviews with organizations managers to find out about Quality Culture Dimensions in organizations, strategy, new approaches and willing to adopt new trends like Lean Six Sigma. Also some secondary data will be used.

Primary data were collected by conducting face-to-face in-depth interviews with managers at a variety of managerial levels and involved employees since this method provides more value, quality, depth, and efficiency (Palmerino, 1999) and it is more likely accepted by the top management in comparison to answering survey questionnaire (Coldwell, 2007), quoted in Psychogios et al. (2012). Secondary data were collected through quality ISO reports audit with a focus on the specific criteria’s with Lean Six Sigma commune parts.

Table 1 - Correspondence between Six Sigma and ISO 9001:2000.

(Adapted from Isaic- Maniu, A., Vodă V., 2008)

The Principle of the Quality Management	Correspondence
<i>The attention focus over the consumer</i>	Six Sigma indicates the way of alignment of the organization’s objectives to the consumer’s requests, through measuring the obtained performances as a succession of the attention focus over the user.
<i>Leadership</i>	The superior management involves actively in the realization of the Six Sigma projects, in what concerns the assurance of the financial support and the necessary training.
<i>The involvement of the interested factors</i>	The Six Sigma projects are thus conceived to assure the involvement of all the interested factors; the program includes the training assurance for the use of work techniques and the development of team work.
<i>The process approach</i>	The Six Sigma project identifies analyses and assesses the organization’s processes concerning the improvement of the activity.
<i>The systemic approach</i>	The Six Sigma projects are based on the interaction among people and processes that are connected in an inter-dependent system; this system assures the getting of performances, improved by following some measurable objectives.
<i>The long-term improvement</i>	The organizations which adopt the Six Sigma strategy are aware of the fact that the quality of their products must be improved continually, this being the main factor for success in the conditions of a high competitiveness.
<i>The management based on facts in taking decisions</i>	The Six Sigma teams focus their attention on collecting and analyzing data, on their base formulating opinions and arguments which assure a unitary understanding and allow the substantiation of decisions.

The interview questionnaire was a semi-structured one with open-ended questions, and consisted of four major parts.

First part collected general information regarding the position of the respondent in the organizations' hierarchy and the relation to quality management system and the new Lean Six Sigma's framework to get some ideas about a possible implementation

The second part covered more specific questions regarding different Critical Factors of Lean Six Sigma for a possible implementation.

The third part concentrated on a series of other issues and/or factors that according to research participants were critical in Lean Six Sigma's implementation. These consisted of questions that tried to explore if there are some new organization- or industry-specific factors that influence implementation such as, working mentality, previous experience in quality management program (e.g. ISO systems already implemented), quality-driven management processes (e.g. performance management, training, etc.).

The fourth part obtained information about the difficulties faced and lessons learned during implementing and deployment ISO standards and analyzing the commune parts with Lean Six Sigma's projects.

RESULTS AND DISCUSSIONS

Research findings are based on the primary data collected during Managers interviews. Some of the findings were based on Critical Factors analyzed.

All the above Lean Six Sigma policies and practices adopted and developed recently by the company can be reflected in its strategic vision that is highly oriented into customer's expectations, dependability and professionalism. In addition, as it is argued below, a strong and committed leadership as well as a supportive organizational culture seem to play a significant role in the company's attempt to introduce promising quality management models.

Nevertheless, it seems that still the company needs to deal with a series of issues constraining the full integration of Lean Six Sigma. Some of the interviews are linked to particular Critical Factors emerged from the literature. According to the managers of our sample all of them played a significant role in a possible application of Lean Six Sigma.

The first factor identified is related to the quality-driven culture. There is a wider recognition of the necessity of total quality programmes from the top-management. The generic quality awareness has been observed in all managers, who supported the view that quality assurance is critical for the Food Industry. As expected the most informed manager about Lean Six Sigma was the quality assurance responsible one. He claimed that one of the most important organizational-cultural aspects of the company is the well-trained personnel. Therefore, as the majority of the managers claimed, it is critical a quality-oriented system to be integrated in all the organizational aspects, from the top to the bottom of the organization, involving all the people employed in every single position. This attitude confirms, at least, a top-down quality driven culture within the case under examination, which is also substantial to Lean Six Sigma adoption.

A quality-driven culture can be also confirmed through the emphasis on continuous training. The quality assurance manager, for example, has been trained on management models in order to enhance his knowledge and to be aware of the new trends in quality assurance techniques. This seems to be a general practice within the organization, since a lot of other managers responded positively when they have been asked about their involvement in training programmes. Although, according to a lot of our interviewees' opinion, training always is an expensive and difficult procedure for the company, there is a strong belief that it is absolutely necessary for Food Industry, especially when this training are directly linked with Food Quality and Food Safety .

Training is also important when there is a need for application of technical aspects of Lean Six Sigma. There are a wide number of rules and

procedures regarding Quality Assurance and Food Safety. The emphasis on technical approaches and application of systems confirms once again a quality-driven culture that is based on the rationale that actual quality improvement will come through a given attention to details.

The attention to detail can be also concluded from the frequency of the meetings taking place in order to solve potential problems and/or to take decisions regarding operations. These meetings support the view that decision making is mainly team-oriented. For instance, since safety is an important element of quality assurance within the company, a specific team has been established. This team is called the Food Safety Committee, which is responsible for Food Quality and Hazard Analysis. Moreover, there is a lot of teamwork observed in other operations processes. The application of team-oriented behavior within the organization needs a strong leadership that links the human with the operations' side of the company. The leadership aspect can widely be observed in all of interviewees' responses. Moreover, the same person is responsible to decide upon immediate actions in case of crisis (Food Defense). The importance of leadership can be further supported by the fact that there is a strong effort by employees and managers to correct the majority of mistakes occurred and are related to human behavior. A strong leadership from the middle and top of the organization attempts to reduce the possibility of waste which is basic on similar to the notion of Lean Six Sigma, since it tries to convince them apply procedures and techniques in order to guarantee a level of quality.

The research evidence also demonstrates a quality-driven organizational strategy that aims to bind quality improvement initiatives with strategic efforts. For example, the whole strategy of human resources and operations departments is not designed to negative reinforce, but to improve and to avoid other unnecessary mistakes and costs provoked by employees. This is strongly related to an organizational culture of continuous improvement that is also reflected in Lean Six Sigma philosophy. In addition, a strategic oriented aspect adopted with Lean Six

Sigma concept, can be observed in the performance evaluation of employees. The strategic emphasis on quality improvement can also be seen by company's effort to satisfy customers. Therefore, as Lean Six Sigma methodology requires, the marketing tries to define quality outcome according to what customers need. Furthermore, the decisions associated with customers' satisfaction are highly related to marketing research.

The resemblance with Lean Six Sigma represents the actual statistical analysis driven from demand where consumers drive the need and then the processes involved provide the solution. Beyond the above positive Critical Factors, there is a group of negative ones have been emerged from the analysis of interviews.

The first negative factor is related to the lack of clear awareness of Lean Six Sigma with the additional belief that is just another statistical tool. Although, there was a wider familiarity and recognition of the necessity of total quality programmes, at the same time there is a limited awareness and familiarity with the use of Lean Six Sigma from the management of the organization.

The limited awareness and the high implementation cost seem to support management's skepticism whether Lean Six Sigma is appropriate in Food Industry in general and for studied company in particular.

Another critical factor negatively-related to Lean Six Sigma is that of resistance of employees. According to their view, this system depends on statistics and standardized procedures that some people may find non-motivating.

CONCLUSIONS

The present study has attempted to address issues related to the implementation of Lean Six Sigma, by understanding its Critical Factors.

The main outcome of this study is to offer an overview of the current quality culture and policies with the purpose to study the possibility for implementing a new level of quality procedures – Lean Six Sigma Methodology.

The study represents an empiric overview regarding Quality Culture in Food Industry. During the study based on research methods and literature review we want to present information's regarding Quality Culture Dimensions in organizations, with a particularly definition for Food Industry where Quality and Safety of the product for customer health and satisfaction is the most important performance valuation.

Throw the application of Lean Six Sigma in Food Industry, we want to improve quality and have a safer product for a healthier consumer, and based on research- the organization with a Strong Quality Culture are more willing for this new step in evolution.

As an empiric overview, the study results may not be generalized but could represent a starting point for future study with the application of Lean Six Sigma also for other Food Industries.

Limitations of the study were that the explored organizations are not applying Learn Six Sigma, but they have the potential for this new approach.

A lot of previous research evidence on Lean and Six Sigma has shown that both of them could be implemented successfully in the manufacturing and service sectors. It has been proven over that last twenty years that these practices can achieve dramatic improvements in cost, quality, and production time by focusing on process performance. Strategic management orientation is one of the most important ingredients in the recipe of change. Teamwork, training and the use of the appropriate tools and techniques can contribute dramatically (Taghizadegan, 2006; Amar and Davis, 2008) in case of an implementation. A quality-driven culture will facilitate the translation of the company's strategy into operational goals (Pyzdek, 2004) with the help of the new methodology. Since Lean Six Sigma attempts to increase quality, decrease defects, reduce variation, and increase efficiency of the system as a whole, all employees coming from all organisational levels should be involved. Beyond the arguments above regarding the wider possible application of such a framework, there is no doubt that more

research is needed. Future research should focus on the exploration of the application of the above framework in specific industries and sectors, namely manufacturing, retail. Finally, a critical point on the future research agenda would be the quantification of each one of the dimensions of the framework. This would enhance a wider survey that could provide rich evidence towards the support of such a model, for implementing the new methodology Lean Six Sigma.

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