
SIX-SIGMA APPLICATION FOR THE HOTEL INDUSTRY

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Abstract

The paper addresses a complex subject: Six Sigma methodology and its application in the hotel industry. As research on this topic is relatively scarce, the article presents the results of a survey addressed to Romanian hotels, highlighting the level of knowledge and implementation of Six Sigma, Quality Management Systems (QMS) and the main reasons for implementing QMS (including Six Sigma). Moreover, the paper presents the factors influencing the implementation of QMS (including Six Sigma). The results are interesting, as they offer empirical evidence on a rarely addressed subject for the hotel industry that has constantly been on a quest for reducing costs and gaining customer satisfaction.

Keywords

Six-Sigma, hotel industry, reducing waste, customer satisfaction

JEL Classification

L20, L83, Z31.

Introduction

Today's world is characterized by terms such as change, accelerated evolution, technology, and globalization. Businesses must take into account these milestones in order to develop. However, at least one aspect seems unchanged for the overwhelming majority of managers: the desire to perform or gain profits as high as possible. With regard to changes, one can point, without being mistaken, to a more visible element in recent decades, namely the interest in customer satisfaction. Consumers of both goods and services have become the center of managers' concern, gaining real power and becoming more and more "vocal". The truly understanding of customers' needs and requirements turns into a powerful weapon on today's competitive markets. In this context, a series of methods and strategies appear or are developed, aimed to track people and processes, create useful tools, generate solutions and contribute to increasing business efficiency.

1. State of research on the Six-Sigma methodology in the hospitality sector

The hotel industry, part of the service sector, is about people, with people and for people. Its success depends on the relationships that are created between them (the employees, on one hand, and the clients, on the other hand). These relations must generate smiles, appreciation, fulfillment, loyalty, the willingness to share the experience. In this case, several methods have emerged, exploiting the relations in the industry in a scientific manner. Developed in

the manufacturing sector, the Six Sigma and Lean Management concepts are also found in the hospitality sector. Although there are approximately 20 years since the first application reported for the hotel industry in the literature – by Starwood Hotels in 2001, examples are considered relatively few in general (Rauch et al., 2016). Before seeing how these concepts apply for the hospitality industry, one needs to understand their origins.

Thus, Six Sigma (6σ) is linked to two names: Gauss and Smith, the first being a mathematician and the latter Motorola's second engineer. Famous by the curve named by him, Gauss contributes two decades after his passing to the foundation of one of the most effective ways to solve quality issues (MSG, 2018). Six-Sigma is a permanent battle against defects, aiming to reduce them to 3.4 cases out of a million. Other visions on the concept refer to: a strategy based on statistics and optimization techniques (Erdogan & Canatan, 2015) or one of the most popular business practices used today (Pavel & Sârbu, 2014). Despite the criticism of overlapping with Quality Management, Zu et al. (2008) argue the details that differentiate the two, by identifying three practices related to the implementation of this methodology: Six Sigma Role Structure, Six Sigma Improved Procedure, Six Sigma Focus on Metrics.

A complex definition, developed following a thorough research of the literature on the subject as well as a series of interviews with managers from companies that apply the method is the one belonging to Schroeder et al. (2008, p. 540): „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.”

Lean Management has as central goal reducing losses in the production process. As a result, it improves quality and lowers costs. The method implies flexibility, agility and adaptability, all in order to reduce losses. Based on Henry Ford's concerns of producing not just a good product, but a better and better one, Lean Management has emerged as a way to improve performance in the 1980s, at Toyota. In this company, the team led by Womack defined concepts and implemented Lean Management. Subsequently, together with Jones, identified five basic principles (Womack and Jones, 2003, cited in Rauch et. al, 2016): Specify value, Identify and map of the Value Stream, Create flow, Respond to customer pull, Pursue Perfection.

In the service sector, Six Sigma is successfully implemented in healthcare and banking and, more recently, in hotels and lodging (Tan and Chakraborty, 2009). Challenges are more numerous in services due to their particularities such as intangibility, perishability or simultaneity of production and consumption. In the hospitality sector, Six Sigma is applied using a similar five-level process called DMAIC (Ramphal, 2017): Define, Measure, Analyse, Improve and Control. As for Lean Methods in the hospitality industry, they were investigated by Vlachos și Bogdanovic (2013). Their valuable study argues that Lean Methods can offer tools that can improve hotel performance, the authors indicating concrete ways of applying them in the service sector. Recently, Rauch et al. (2016) proposed several techniques previously tested by them, subsequently selecting the most appropriate ones (eg. CIP Workshops and Idea Management).

The last decade brought in the attention a new concept: Lean Six Sigma, a combination of the two methodologies described above. Lean Six Sigma is “a methodology that focuses on the elimination of waste and variation, following the DMAIC structure, to achieve customer satisfaction with regards to quality, delivery and cost. It focuses on improving process, satisfying customers and achieving better financial results for the business” (Salah et al., 2010). Thus, when Lean Management is applied in the hospitality area this occurs mostly in combination with the management system Six Sigma (Rauch et. al, 2016). An important contribution to the literature is brought by Ramphal (2017), who provides a useful model for the hospitality industry, as shown in Figure 1.

The decision to use this model can be taken as a result of the satisfaction surveys, customer complaints, diminish of market share or internal audit. Each tool can generate starting points for using Lean Six Sigma, by combining quantitative observations with qualitative aspects that can be integrated into the model. Whether it's Six Sigma, Lean Management or Lean Six Sigma, the proper use and especially the permanent use in the hotel industry can only generate what these methods target: increased customer satisfaction, reduced losses and costs and, ultimately, higher profits for the organization.

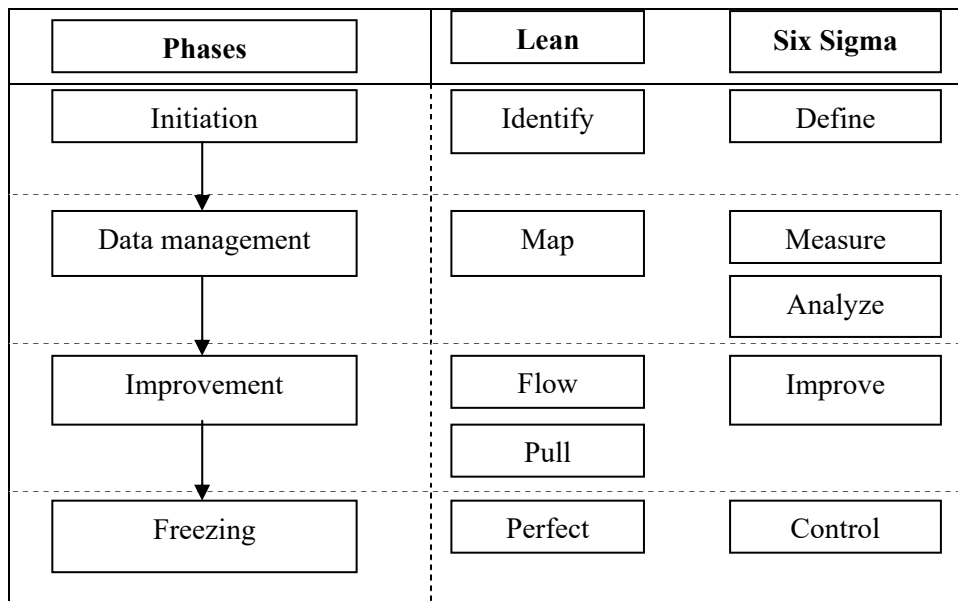


Fig. no. 1 Framework for Lean Six Sigma

Source: Ramphal, 2017, p. 10

2. Examples of Six-Sigma applications in the hospitality sector

The application of Six Sigma in the hospitality sector is still in its beginning, as the examples of organizations in this activity sector that have successfully implemented these principles are rather scarce.

Starwood Hotels and Resorts (since 2016 part of Marriott International) is reported in both media and literature (Tan & Chakraborty, 2009; Pearlman & Chacko, 2012; Rauch et al. 2016) as being the first hotel company that started to apply Six Sigma methods, in 2001. The main results of applying this methodology in this global organization consisted in a better focus on customers, stimulating service quality, enhancing innovation (for example, by creating profitable loyalty programs for guests or by creating programs that stimulated sales for additional hotel services), a higher length of stay at the hotel, improving organizational efficiency and, most important, a considerable increase in revenues. These being said, the initial \$17 million investment in training employees for Six Sigma projects proved to have a very good return on investment, as after 2001 Starwood reported much higher profits (Tan & Chakraborty, 2009). The successful implementation may be motivated by the fact that the process has been conducted by James Hyman (who had previously worked for General Electric, a company that has mastered Six Sigma techniques), appointed on the position of Vice President Six Sigma (<https://www.hospitalitynet.org/news/4007061.html>). Moreover, the fact that the giant company has chosen to create a special VP position for the person in charge with Six Sigma processes indicates the commitment and faith put into the usefulness of the method, the

CEO of the hotel group stating at that time that this action is “the most important strategic initiative since the formation of the company” (<https://www.hospitalitynet.org/news/4007061.html>).

The initial stage of Six Sigma implementation at Starwood took almost three years, the necessary time to conduct all required trainings. The process was a “top-down led” process, as managers were the first ones to be trained, afterwards training efforts being targeted towards hotel associates. Moreover, the importance of Six Sigma for the company is stressed by the fact that nowadays, all general managers of the hotels part of the group are required to have a “Black Belt” Six Sigma certification (proving they master Six Sigma tools). Starting with 2008, when the company began to encounter financial problems, Lean Six Sigma and Blue Ocean principles and tools have been adopted in order to improve the operational processes in the group’s hotels (Oakes, 2011).

Furthermore, Rauch et al. (2016) make a laudable effort of highlighting several examples of application for Lean Six Sigma in the hospitality industry, by presenting the specific cases of three other hotels that have successfully applied the method: a hotel chain in Japan and two different hotel units in the United Kingdom. The application of Lean Six Sigma principles in the three mentioned cases resulted in efficiently establishing the required number of hotel employees, ensuring a high level of service quality and – the common aspect of all Six Sigma projects – reducing operating costs.

As the investigating efforts of finding examples of Six Sigma applications in the industry conducted to suggestions that other hotel groups such as Marriott International and Wyndham Hotel Group have started to use this tool, the story of Starwood Hotels and Resorts remains the most notorious.

3. Methodology

The purpose of this research is to test the applicability of Six-Sigma tools in the Romanian hotel industry. In order to achieve this aim, a quantitative research was carried out, applying the statistical survey method, using the structured questionnaire as a tool. The present paper partially exposes the research results, answering to the following questions:

- What is the level of knowledge and implementation of the Six Sigma concept in Romanian hotels?
- Which Quality Management Systems (QMS) are used in Romanian hotels?
- What are the main reasons for implementing quality management systems (QMS, including Six Sigma)?

Therefore, the following specific objectives are addressed: a) Assessing the level of knowledge and implementation of the Six Sigma concept in Romanian hotels; b) Identifying the existence and the main reasons for implementing a quality management system within the hotel units in Romania. In order to achieve these objectives, a structured questionnaire was designed, containing 13 questions, except identification / classification questions (6) and an information field (a brief description of the Six Sigma concept). The questionnaire was conducted taking into account the basic rules on the formulation of questions (appropriate to the topic, clarity), their order in the questionnaire and the total number of variables included.

Aiming to attain the objective of the article, some of the questions in the questionnaire were interpreted and analysed as follows:

- Identification / Classification questions: respondents' age (nominal and factual variable), sex of respondents (nominal and factual variable), level of education (nominal and factual variable), position (nominal and factual variable), department (nominal and factual variable), hotel classification (nominal and factual variable),

mode of hotel operation (nominal and factual variable), seniority on the market (nominal and factual variable);

- Two closed questions – dichotomous and factual variables: knowledge of the concept, Six Sigma implementation;
- Two closed questions – nominal and factual variables: main reasons for QMS implementation (multiple choice), adoption of quality management systems;
- One closed question – scalar and opinion variable: culture of quality.

The research unit was 2 to 5-star hotels, geographically spread all over Romania. We estimate the size of the target group surveyed at 352 units, according to the latest available statistical data (National Institute for Statistics [NIS], 2018). To determine the sample, we used a non-probabilistic method: oriented sample (or rational selection). This method is considering setting up a sample observation unit by including those that are relevant in terms of information used for the investigation (Cătoiş et al., 2009). The questionnaire was distributed by e-mail to respondents – 2 to 5 star hotels. The isondaje.ro platform was used to collect the data. The total number of respondents was 180, all results being valid, an advantage of distributing the survey by new-age communication resources. Data analysis was performed using the IBM SPSS 24.0 software.

4. Results and discussion

The distribution of respondents by gender is equal (50% male, 50% female), most of the respondents are between 25 and 34 years old (65 persons, 16.1%) and 35 to 44 years old (63 persons, 35%), while 10.6% are between 18 and 24 years old, 13.9% between 45 and 54 years old, and the remaining 4.4% are over 55 years old. Most of the research participants have university studies - 67.8% (122 out of 180) or postgraduate studies - 23.9% (43 persons).

Just over a fifth of respondents hold executive positions in hotels (20.6%), the others almost 80% occupying management positions – 20% low-level management positions, 35.6% middle-level management positions, and 23.9% top-level management positions. Almost half of the respondents are working in the hotel's administrative departments; important shares were recorded also for front-office (31.1%) and marketing departments (10.6%).

Most of the units included in the analysis are classified as 4-star (45%) and 3-star hotels (33.9%), over a half have been active for over 10 years, while another 30% for at least five years. Regarding the mode of hotel operation, two thirds are operated independently, the rest being integrated into national (12.8%) or international chains (21.1%).

Starting from the basic information provided in the questionnaire, 43.9% of respondents said they knew the concept of Lean Six-Sigma. Furthermore, only 18.3% of the hotels included in the analysis were actively involved in implementing a Six-Sigma project.

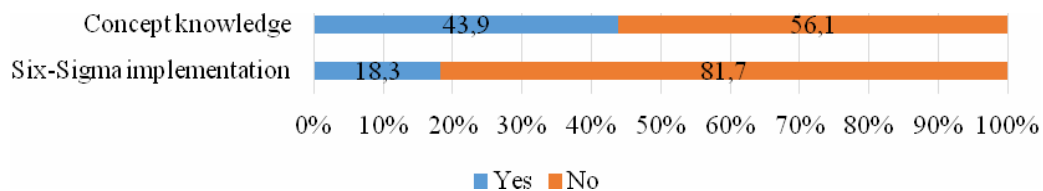


Fig. no. 2. Concept knowledge and Six Sigma implementation, %

Source: by authors, based on research results

However, over 70% of hotels have integrated quality management systems, most of them already implementing systems as ISO 9001:2008 and ISO 9001:2015 (a cumulative 42.2%)

or Total Quality Management (21.1%). Other implemented systems specified by the respondents are: operational excellence, HACCP ISO 22000-2005, Front X, CRM.

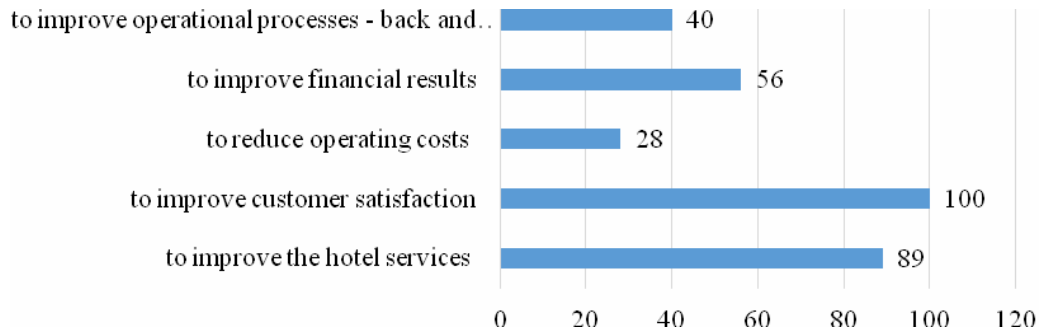


Fig. no. 3. Main reasons for implementing a Quality Management System (number)

Source: by authors, based on research results

The reasons for implementing a quality management system were, first of all, customer satisfaction (to improve customer satisfaction – 100 options) and quality of services (improve the hotel services - 89), but also financial goals (84 options, including improving the hotel's financial results – 56, reducing operating costs – 28). Furthermore, most of the respondents considered that in their hotels there has been developed a quality culture through which problems related to quality are easily achieved through a group effort (see details on Fig. 4).

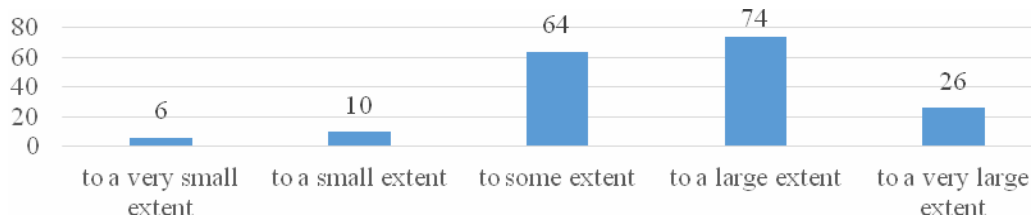


Fig. no. 4. Existence of a culture of quality in hotels (number)

Source: by authors, based on research results

These being said, the existence of statistical links between the following variables has been tested:

- *Hotel classification* (independent variable) and *Six Sigma implementation* (dependent variable);
- *Seniority on the market* (independent variable) and *Six Sigma implementation* (dependent variable);
- *Mode of hotel operation* (independent variable) and *Six Sigma implementation* (dependent variable);
- *Hotel classification* (independent variable) and *quality management system implementation* (dependent variable);
- *Seniority on the market* (independent variable) and *quality management system implementation* (dependent variable);
- *Mode of hotel operation* (independent variable) and *quality management system implementation* (dependent variable).

Table no. 1. Statistical tests' results

Variables	Six - Sigma			QMS	
	Pearson square	Chi-	Asymp. Sig.	Chi-square	Asymp. Sig.
Hotel classification	12.820		0.005	27.471	0.000
Seniority on the market	1.928		0.587	11.861	0.065
Mode of hotel operation	7.984		0.018	13.416	0.009

Source: by authors, based on research results

By comparing the significance threshold by 0.05, the probabilities attached to the Pearson Chi-square test values, the null hypothesis is rejected and the alternative is accepted as follows:

- There are statistically significant differences between *hotel classification* and *Six Sigma implementation* (Asymp. Sig.<0.05);
- There are statistically significant differences between *hotel classification* and *quality management system implementation* (Asymp. Sig.<0.05);
- There are statistically significant differences between *mode of hotel operation* and *Six Sigma implementation* (Asymp. Sig.<0.05);
- There are statistically significant differences between *mode of hotel operation* and *quality management system implementation* (Asymp. Sig.<0.05).

By comparing the significance threshold by 0.05, the probabilities attached to the Pearson Chi-square test values, the null hypothesis is accepted as follows: There are no statistically significant differences between *seniority on the market* and *Six Sigma implementation* (Asymp. Sig.= **0.587**>0.05) or between *seniority on the market* and *quality management system implementation* (Asymp. Sig.= **0.065**>0.05).

Conclusions

The quest for quality should always be one of the main aims for the organizations in the hospitality industry, especially for the highly competitive hotel sector. This paper has brought into attention a subject relatively rarely approached in literature: (Lean) Six Sigma in the hospitality industry. After conducting a research on Romanian hotels, the study conducted by the authors revealed that the concept of Six Sigma is relatively unknown for more than half of the respondents, very few Romanian hotels being active in implementing a Six Sigma project. However, over 70% of the hotels involved in the study have integrated quality management systems, aiming to improve customer satisfaction and hotel services. The study also highlights that the extent to which hotels implement Six Sigma methodology or QMS is influenced by their official classification and their mode of operation, the seniority on the market not having an impact. The article presents only a part of the results of a comprehensive study that also addressed other issues related to the implementation of Six Sigma projects in hotels, results that will be presented in an extended paper.

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