



THE ROLE OF SIX SIGMA IN HOSPITALITY INDUSTRY

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ABSTRACT

This study investigated the role of Six Sigma in Hospitality Industry specifically hotel sector, and how Six Sigma- DMAIC business model (Define, Measure, Analyze, Improve, and Control) has been adopted in the hotel business operations to bring the positive business results for example defining the problem-D, measuring the problem-M, analyzing data to explore the source of the problem-A (analysis of defects in a particular hotel operation process), improving the performance-I to eliminate the source of faults and controlling-processes-(C) to avoid the continuous problematic-monitoring the improvement within the particular hotel. Also, this article exposes how Six Sigma methodology can be used: in developing a business strategy, in developing a business Vision, in developing business Benchmark, in developing business Goal, in establishing a business Statistical Measure, and establishing a Robust Methodology throughout the hotel business operation. The theory employed in this article is constructivism theory that align together with the historical development of the idea of Six Sigma idea (MAIC) as developed by Smith in 1986 then later DMAIC as added by Welch in 2000. The result shows that the hotels which applied Six Sigma, the performance of the particular hotel were improved.

Keywords: SIX Sigma; DMAIC; TQM; Hospitality Industry; Hotel

1. Introduction

Six Sigma is a defined and disciplined business methodology to increase customer satisfaction and profitability by streamlining operations, improving quality and eliminating defects in every organization-wide range process. Six Sigma is a method that provides organizations tools to improve the capability of their business operational processes. In hospitality industry like hotels, Six Sigma help to improvement in earnings, employee morale, and the caliber of goods or services, as well as a decrease in process variation and an increase in performance that contribute to the reduction of defects. The phrase "quality Six Sigma" is used to indicate a well-controlled logical process throughout the business operation (SIXSIGMA INSTITUTE, n.d.). So, in developing quality specifications, these steps must be considered: 1. Identifying customer needs; 2. Determining the critical features and characteristics; 3. Establishing measurable performance criteria; and 4. Setting acceptable quality levels within a particular hotel (Jacobs et al., 2018).

Six Sigma was created by Bill Smith at the end of 1980s. During that time Bill was working at Motorola company which needed a quality management tool to increase business performance, that is when he came with the idea of Six Sigma. At that time, he only introduced MAIC (Measure, Analyze, Improve, Control). He spends a lot of time and energy in developing the method on what would be the future of quality management. So, after Smith developing an effective quality service model namely MAIC model, Motorola company started applying the MAIC model companywide (SSDSI Blog, n.d.). In 2000 Jack Welch came up with the idea of adding D to the MAIC model then became DMAIC (Define, Measure, Analyze, Improve, and Control) has demonstrated on the Figure 2 below:



Figure 1. Six Sigma and DMAIC Methodology Overview
 Source: https://www.sixsigma-institute.org/What_Is_Six_Sigma.php

Due to the effectiveness of MAIC business model in application, Motorola company was awarded the Malcolm Baldrige National Quality Award in 1988 for its new process management tool. This award now is commonly given to organizations that have demonstrated operational excellence in a variety of sectors such as hospitality industry (SSDSI Blog, n.d.). Subsequently the history of Six Sigma come from a long way from Motorola in mid-1980s. From the major-redesigning done by General-Electric, which presented-DMAIC strategy. The strategy together-with five-stages brands Six-Sigma as a precise and information driven technique (Antony et al., 2017). Therefore, Six Sigma business model (DMAIC) has passed into different historical background process has demonstrated on Figure1, below:

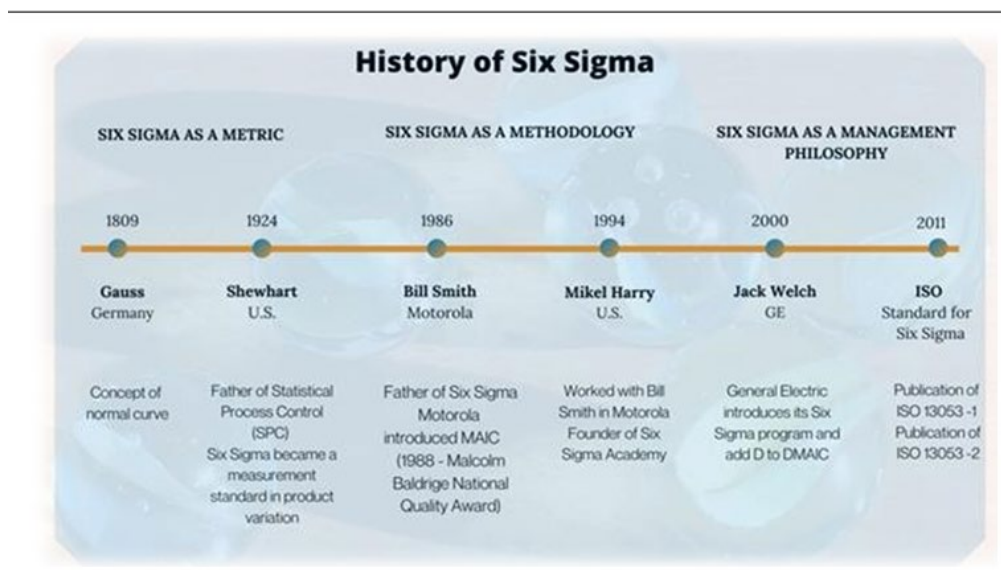


Figure 2. History of Six Sigma
 Source: <https://sixsigmadsi.com/a-brief-history-of-six-sigma/#:~:text=Six%20Sigma%20was%20created%20by,the%20future%20of%20quality%20management.>

We cannot talk about six sigma quality without discussing about total quality management (TQM). According to Jacobs et al., (2018), Total Quality-Management (TQM) is a method used to managing a business organization that focuses on creating high quality products and services that satisfy the clients’ needs and expectations. It is a management idea that its purposes are to endlessly improve the quality of products, services, and processes. TQM includes two key goals: designing products & services carefully, and guaranteeing that the organization-systems can consistently provide a clear business design (Jacobs et al., 2018). Additionally, one advantage of Six Sigma thinking, according to Jacobs et al. (2018), is that it enables hotel managers to voluntarily define a process's performance in terms of its variability and to compare several processes using a standard measure. Defects per million opportunities (DPMO) is a statistic whose computation necessitates three different kinds of data, including:

- a. **Unit**-the item produced or being serviced,
- b. **Defect**-any item or event that does not meet the customer’s requirements, and
- c. **Opportunity**-a chance for a defect to occur (Jacobs et al., 2018).

DPMO can be calculated by using a straightforward formula as demonstrated below

$$DPMO = \frac{\text{Number of defects}}{\text{Number of Opportunities for Error per Unit}} \times 100$$

2. Research Methods

In this study, the researcher will apply literature review method by reviewing different literatures from different authors to assess their views or perspectives concerning the role of six sigma in hospitality industry. This will be guided by constructivism theory. Constructivists’ models of learning center on how individuals effectively make or develop information based on their foundation, past encounters, modern encounters and social interaction or collaboration. In arrange for learning to happen effective, significantly, and lasting, learning must incorporate practical-activity, concept (information) and culture (setting) where the information is built. The constructivists’ position attests that the exchange of learning happens through association in true tasks that are secured in important settings. Since understanding is experienced through real-world encounters, authenticity gets to be basic to the individual’s capacity to utilize thoughts in fathoming a specific issue (Instructional Coaches Corner. (n.d)).



Source: <https://www.instructionalcoaches.com/portfolio/constructivism/#:~:text=The%20constructivist%20theory%20uses%20prior,to%20cognitively%20process%20new%20information>

According to Jean Piaget, learners pass over four-stages of advancement once learning modern content counting representation (grouping), adaptation, accommodation (by making-relations), and assimilation. Instructional Coaches Corner. (n.d.) agree with Piaget that learning is grounded on student foundation information, encounters, recognitions, and viewpoint in which the insights change as we develop. Piaget recommended that our-cognitive development isn't concerned on obtaining information, moderately as we gain new-knowledge, we have to be built us possess mental model of the world as Jack Smith constructed Six Sigma MAIC model to help the Global. This is often done through connecting modern learning to past encounters, discernments, foundation information and viewpoints (assimilation). Piaget seen mental development as a prepare of alteration to the world as Jack Smith created Six Sigma MAIC. The general views and knowledge or awareness of the global don't alter as an outcome of modern-information or maybe we accept new-data in the information we have already-gained (Instructional Coaches Corner, (n.d.). According Instructional Coaches Corner, (n.d.), when our existing-schema do not function, we-make alterations to the knowledge we gained so as to create-room for new-knowledge (assimilation) to alter to the new business world. Moreover, Piaget accepted that problem-solving cannot be specifically instructed or maybe individuals study problem solving through vigorous involvement and their-own disclosures to find solutions to different problems facing the business environment like how the Jack Smith with Six Sigma MAIC business model has helped to improve the business performance of different hotels (Instructional Coaches Corner, (n.d.)

3. Research Findings and Discussion

3.1 Findings

In the contemporary study Six Sigma is characterized as a profoundly restrained, organized, efficient, proactive, capable and complex problem solving, nonstop or innovation trade prepare enhancement procedure that looks for to discover and dispose of the causes of mistake of the client-characterized failures, determination of squanders in trade procedures, as well as decrease variety, by making strides the effectiveness and viability of organizational actions, as well as endeavors to reach a level of 3.4 (DPMO) utilizing colossally thorough information gathering and statistical investigation, by assembly or surpassing customers' needs and desires with the major accentuation on fiscally quantifiable bottom-line comes about (Ninerola et al., 2021). The definition attempts to be all encompassing and incorporates both factual and trade perspectives of Six-Sigma (Ramadan et al., 2023).

As a trade handle change strategy, Six Sigma has picked up significant significance within the industrial-service-segments for the last three-decades. From the starting Six Sigma has picked up importance acknowledgment in financial and healthcare-services since more transaction-connected client confronting exercises (Ninerola et al., 2021). The application of Six Sigma is therefore more difficult in the hospitality industry than it is in the manufacturing industry because of the unique characteristics of services. These challenges include intangibility, perishability, heterogeneity, and synchronization of production and utilization of hospitality products, which make the delivery of hospitality services and processes extremely difficult (Reisinger, 2001; Reid & Bojanic, 2009). Service businesses like hospitality must take into consideration commercial-process-improvement initiatives like Six-Sigma to provide distinctive-authentic and higher value customer-experiences and develop competitive-advantages (Kokkranikal et al., 2013). According to Kokkranikal et al., (2013) study findings, when the Six Sigma is effectively applied in hospitality industry, it makes hotel-wide process improvements, business transformation to directly benefit in the long term.

The well-known of processes within the hotel industry like hotels includes a huge sum of human interaction, especially between the client and service provider (Ramadan et al., 2023). The primary factor influencing customer fulfillment in hotels is the relationship between the client and the service provider. In these situations, Six-Sigma has shown that it may enhance client fulfillment by addressing the behavioral aspects of the service provider (Bhale et al., 2017). In hotel division ventures, Six-Sigma support to characterize the issue and recognize the project’s boundary by enough analyzing the method without any botch amid the DMAIC venture stages (Ramadan et al., 2023). Concurring to the study drained UAE Five-star hotels, due to this increment in client request, the hotels are encountering weight to move forward their processes to suit more clients, but with Six-Sigma application utilizing the DMAIC strategy made a difference diverse-hotel with its state-of-the-art-infrastructure, offers premium-comforts & amenities. Besides, it offers extreme-urban-relaxation to the clients through the private beach-facility. Furthermore, it provides numerous restaurants & cafes with a signature-eating out with the authentic Arabic-cuisines. Because the hotel includes conventional handicrafts worker with modern-comforts, clients desire the hotels-stay and eating out (Ramadan et al., 2023).

In the hotel sector Six Sigma is executed through a five-stage handle: Define, Measure, Analyze, Improve and Control (DMAIC) (Ramphal, 2017). The define-phase ensures that the issue and or process-selected, is connected to hotel business organizational priorities and has administrative bolster (Shankar, 2009). It is additionally around defining-venture and making-implementation. The venture must produce a substantial change in quality and client-satisfaction, and an advancement within the bottom-line where the main-operation is carried out in the hotel-sector. Finding the critical elements that must be assessed, examined, and managed in order to produce the desired outcomes is crucial. Strategic criteria, auditing reports, cost of quality, failure reports, customer complaints, competitor tracking, and other data gathered pertinent to the issues facing the specific hotel should be used in hotel operations. A value-stream map (VSM) and a Pareto chart or table can be used to conduct additional studies by looking at supplier-input-process-output-customer (SIPOC) relationships (Ramphal, 2017).

For example, Starwood Hotel and Resort, the proprietor and administrator of hotel-brands like Westin, Sheraton and numerous extravagance-hotel, is among global-first-hotel-chains to embrace the Six-Sigma ideology (Lahap et al., 2017). The main focus of Six-Sigma ideology is to discover how many absconds exist within the processes so as to eliminate the defects systematically to achieve perfection or effective results. Hotel sector is pointing to preserve competition across the global with the deliberate at the Six-Sigma level, whereas conventional trade organizations are contents combines three-MAIC and four-DMAIC sigma varieties (Pearlman & Chacko, 2022). In their concluding remarks, Tjahjono et al. (2010) identified four (4) possible streams of understanding regarding Six Sigma: a collection of quantifiable tools, an operational management ideology, a commercial culture, and a logical explanatory method. Furthermore, they highlighted that regardless of the streams, the basic objectives of Six-Sigma-still: making strides effectiveness, productivity and handle capability within the hotel business operation. So, it is the role of hospitality managers to characterize zones within the operations that require some additional improvement (Ramphal & Nicolaidis, 2018).

3.2 Discussion

The application of Six-Sigma in the Hospitality-Industry

- a. **A Business-Strategy:** By using the Six-Sigma Method, hotel corporations can manage their plan-action on an annual or quarterly basis, identifying opportunities for revenue growth, cost reduction, and process improvements across all organizational departments (SIXSIGMA INSTITUTE, n.d.).

For example, in developing the strategy to increase the sales in the hotel, the hotel manager can use DMAIC by researching and defining the problem why the sales are not raising up, then measure the size of the problem to see how much it negatively affecting the whole hotel business organization, then in collaboration with the marketing department the hotel manager can analyze different alternatives of the solutions that can help to solve the problem, then choose the most effective solution that will help to improve the situation by increasing the sales rate, finally the role of the general manager in collaboration with other departmental managers can help to control the improvement by closely and constantly monitoring the whole operations process.

- b. **A Vision:** Six Sigma Technique supports the top-management to make a vision to offer fault-free, and constructive working-place to the hotel association (SIXSIGMA INSTITUTE, n.d.). For example, Six Sigma (DMAIC) can help the hotel business corporation to define and develop a specific, measurable, attainable or achievable, relevant or realistic to the specific hotel business, as well as a time frame Vision. A SMART Hotel Business Vision.
- c. **A Benchmark:** The Six Sigma Method helps to improve process metrics. The hotel management can reapply Six-Sigma practice to advance the newly-stabilized step-by-step measures when the increased metrics have achieved stability. For example, while using Six-Sigma methodology, the cycle time for pizza delivery is reduced from 60 minutes to 45 minutes. The hotel manager may conduct an additional Six-Sigma project to advance the cycle-timing of the pizza delivery process from 45 minutes to 30 minutes as a standard once it has stabilized at 45 minutes (SIXSIGMA INSTITUTE, n.d.). To achieve this within the hotel, there must be a strong collaboration between the food & beverage manager and head of the kitchen (Chef head/Chief cook).
- d. **A Goal:** Using Six-Sigma method, hotels business-corporations may retain-strict goals for work towards-accomplishing them throughout the business cycle annually (SIXSIGMA INSTITUTE, n.d.). In a particular hotel a goal could be to improve service quality delivery through the use of more advanced reservation system technology, to increase the number of customers, or minimize the service que. The effective use of the method normally facilitates the hotels business organizations to achieve these goals timely, effectively, and successfully.
- e. **A Statistical Measure:** Six Sigma is a data driven methodology. Statistical Analysis is used to identify the source of the problem. So, Six Sigma methodology helps to calculate the process performance of the particular service in the hotel by using its own-unit recognized as Sigma-unit. This can include both back-office employees and front-office employees in the hotel to get more valid data report that will help during the decision-making process (SIXSIGMA INSTITUTE, n.d.). For example, with the effective use of hotel's website, YouTube, and social media platforms such as Instagram, Face-book, WhatsApp etc., Six Sigma methodology can help the hotel managers to collect the accurate data of hotel service users quarterly or annually.
- f. **A Robust-Methodology:** Six-Sigma is the only comprehensive approach to problem or issue solving now available in the market. So, when Six Sigma is effectively used in every hotel, it provides improvements that are bullet-proof that produce high yielding returns in a particular hotel business corporation (SIXSIGMA INSTITUTE, n.d.).



Figure 4. Six sigma in hospitality business.

Source: https://www.sixsigmainstitute.org/What_Is_Six_Sigma.php

4. Conclusion

4.1 Conclusion

In order to find and remove the primary reasons of nonconformity with hotel operations, the Six Sigma improvement plan, also known as the Six Sigma (DMAIC) roadmap, can systematically assist in examining how to define, measure, improve, analyze, and control the process. Six-Sigma methodology encompasses the following as a problem-solving approach or format preparation: defining the issue (D), measuring the issue (M), analyzing information to look into the source of the problem (A), fault analysis, improving (I) to eliminate the source of faults, and controlling or monitoring processes (C) to anticipate ongoing issues or checking within a specific hotel (Kumar et al., 2008). The DMAIC-structure allows inventive considering-solution to the issue inside the progression or service and usually the motives because (DMAIC) is very effective due to its focus on the viable utilize of factual apparatuses (Montgomery and Woodall, 2008). Subsequently, Six-Sigma profits from numerous tools-strategies that demonstrated valuable for numerous a long time in numerous areas particularly in hospitality industry through the utilization of (extend management devices, stream charts-processes, Pareto investigation, cause-impact examination graphs and control-charts, etc.) and its execution of DMAIC-method in a basic-execution enhancement demonstrate acknowledged as Define-Measure-Analyze-Improve-Control it has confirmed to be very effective in the hotel business throughout the hotel business operations (Noone et al., 2010).

4.2 Recommendation

According to the findings many business in hospitality industry such as hotels are very reluctant to adopt the Six Sigma especially the DMAIC business model, but for those hotels which have adopted Six Sigma (DMAIC business model) have testified to be very effective in the business operation because it has helped to define the specific problem that are facing the specific hotel, measure the size of the problem and its impact within the particular hotel, analyze the problem by developing different alternative solutions so solve the particular problem, choose the best solutions that will help to solve the particular problem and improve the situation, then finally control the process of the improvements. Therefore, considering the dynamic changes of technology and intangibilities of hotel business operations, I suggest that all hotel managers to consider adopting the Six Sigma (DMAIC business model) to keep improving their business operations especially in providing service quality delivery to satisfy the diversity customers 'needs and expectations. Also, when the Six Sigma is effectively applied within the hotel especially in sales & marketing and research & development departments, can lead to positive and rapidly transformation of the hotel business in quality service provision that will lead an increase of number of customers, increase of revenue, hence profitability that off course will lead to stronger, sustainable, and more business expansion.

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