



Lean implementation in Hospitality: challenges and future directions

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Abstract: Due to the pervasive influence of the coronavirus pandemic, a disturbance has occurred in many industries, including the Hospitality industry. The use of methods and tools for continuous process improvement is a constant requirement and almost every company has progressed by implementing Lean as an efficiency-oriented management system. The scope of this research is to present the impact of Lean on the Hospitality industry and its transformation after the pandemic. The research includes the analysis of the reference literature searching the Scopus database related to the application of Lean in this area. The results indicate a stagnation in the publication of research papers over the years, which coincides with the period of the COVID-19 pandemic. The increase in the number of publications in 2022 speaks of the resurgence of interest in the application of Lean Hospitality and the improvements that this approach offers. There is a lack of research on its combination with other approaches, except for Lean Six Sigma. Also, the Kaizen approach proved to be the most frequently applied Lean tool in the Hospitality industry. These publications reviewing provides insight into the Lean Hospitality challenges and identifies possible directions for future research in this area.

Keywords: Lean, Hospitality industry, literature review

1. Introduction:

In today's competitive business environment, the Hospitality industry faces increasing pressures to provide high-quality services, achieve high profitability and meet the growing demands of customers. Hospitality companies today have more and more challenges in the business environment which is becoming increasingly dynamic. These companies must respond quickly to new market needs, while facing growing competition in every single segment. That's why many authors claim that competitiveness in the Hospitality industry especially depends on innovation and optimization to achieve the same results with lower costs, which is spending the same resources for better results (Orfila-Sintes & Mattsson, 2009; Ottenbacher & Gnoth, 2005). In this context, the efficiency of operations becomes a key component of success in the Hospitality industry. However, the growing dynamism in the industry presents a major challenge, making it difficult to plan workforce and resource demand, and resulting in inefficiencies and higher costs in hiring and purchasing labor assets.

The act of simultaneously reducing costs, increasing the quality of management and improving service becomes one of the biggest future challenges for this industry, and these elements are often in contradiction with each other (Wong et al., 1999). Therefore, hospitality and tourism companies should look for the possibilities of new management models for more efficient operation (Buhalis & Law, 2008; Kandampully, 2006). Increasing prices for users is very often not an acceptable solution (Lockyer, 2005), so the processes inside the company's system must be redesigned in a more efficient way, and costs should be reduced to a minimum in order to ensure sufficient profit for future growth and innovative development (Hu et al., 2009).

One of the approaches that is increasingly applied in the industry, with the aim of improving efficiency and reducing waste, is the use of methods and tools for continuous improvement (CI). One of the most well-known CI methods is Lean, and many companies have progressed by implementing Lean as an efficiency-oriented management system and eliminating any source of waste by reducing or minimizing sources of variability (Womack & Jones, 1997; Hines et al., 2004; Shah & Ward, 2007). Lean first appeared as a production system or philosophy in the mid-twentieth century at the Japanese company Toyota, which needed to make production more flexible to serve smaller markets with a larger variety of vehicles. Toyota's efforts led to the creation of an integrated manufacturing system designed to minimize inventory levels and reduce system variability (Moyano-Fuentes & Sacristian-Diaz, 2012).

Lean methodology includes a very wide range of applications in various industries and represents a way of working within which resources are allocated and used in a certain process, whether it is a production or service process, in a rational way with minimal waste, evenly and without being overloaded (Liker, 2004). Lean, as a special management model, had its first steps and establishment in production systems and was used primarily in the elimination of waste, and over the years its use has expanded to other activities and industries. It generates more value for its customers while using minimal resources (Womack & Jones, 1997). In order to achieve this, the company must shift its focus from vertical transformations to a situation where products move from complete value streams across various functions to the customer. Therefore, this area of the Hospitality industry is interesting because it includes both production and service activities. The relationship between Lean methodology and the Hospitality industry is still in its infancy. Rauch (2016) points out that Lean in this sector is present partially, i.e. only in some departments.

Through a detailed analysis of these topics, this paper will provide knowledge on how the application of the Lean approach can contribute to the improvement in the Hospitality industry, increasing competitive advantage and achieving sustainable profitability. In addition, the research will help managers in the Hospitality industry to better understand the benefits and

challenges that the Lean approach brings, as well as to identify the key success factors for the successful implementation of this business philosophy in their company.

For the preparation of this paper, an analysis of scientific papers published in the last 5 years was done, with some additional literature that has withstood the "test of time" with its excellence. That is why the analysis of scientific papers gave an insight into the various research related to the development of this industry, the Lean methodology and the key Lean tools used. which is shown in the next chapter. In the third chapter, the literature review of Lean in the Hospitality industry is presented, while the fourth chapter presents the results and discussion of a literature analysis, followed by conclusion and research limitations in chapter five.

2. Theoretical background:

This research represents the opinions of academics about the influence of Lean and its application in the economy, and within this paper the focus will be on its application in the Hospitality industry.

2.1. Lean approach

Originally, the Lean approach was developed by the Japanese company Toyota in the mid-50s, known as Toyota production systems (TPS) led by Taiichi Ohno, later Womack and Jones (1997) in manufacturing companies in the West called Lean thinking. The Lean way of thinking focuses on eliminating waste and creating value for the customer (Leite et al., 2019). The Lean methodology represents a way of working within which resources are allocated and used in a certain process, whether it is a production or service process, in a rational way with minimal waste, uniformly and without being overloaded. The term Lean vividly explains the basic premise of the whole concept, which is to produce or provide a service with as little inventory, capital, defective products, downtime, waiting and everything that does not add value to the product or service with a simultaneous guarantee for a quality product (Prester and Kolarović, 2015). Womack and Jones (1997) define Lean as a set of management principles and techniques aimed at eliminating waste in the production process and increasing the flow of activities that, from the customer's perspective, add value to the product. Lean can improve resource productivity, reduce the amount of energy, water, raw materials and non-production outputs associated with production processes and minimize the environmental impact of production activities (Hines et al., 2004).

Liker (2004) suggests that Lean is comprehensive, equally challenging approach and must be innovative. Ohno (1988) believes that TPS - Toyota production system, was more than a simple production system since it was developed in a broad management system. Bicheno and Holweg (2009) suggest that Lean methodology should be used in order to take full advantage of the good organization of the production process. It is vital that the company in question adopts all the Lean principles that will help in finding its own solutions (Mcvay et al. 2013; Cocolicchio, 2008). A company that decides on a Lean journey must see where it is going (a future position) and where it is today (current position).

The answer to the question of what the main goal of the Lean strategy is: to meet the customer's demands for their superior quality, cost and delivery goals and to gain their trust and ensure the long-term sustainability of the company. Lean is a truly integral and holistic approach to meeting customer expectations. Traditional companies, on the other hand, take a "product" approach, design and manufacture products using existing technology, and aim for functional performance rather than operational excellence. The traditional approach is based

on the myth that volume and speed of production can achieve minimal costs of operations, but instead, it has created (Imai, 2021):

- high operating costs,
- quality problems,
- large inventory,
- long production time,
- low morale of the employees,
- difficulties in meeting delivery requests.

According to Womack and Jones (1997), there are five key principles of Lean: value, the value stream, flow, pull and perfection. Not all work of managers and employees is value-added, so waste appears in all organizations. Waste is all activities without adding value for the customer (Non-value added – NVA) and what is not considered as waste are activities that add value for the customer (Value added – VA). Taiichi Ohno defined seven typical types of waste, namely (Kato & Smalley, 2010): overproduction, inventory, defects, waiting, transportation, motion and over-processing. Underutilization of human potential, inefficient systems, wasted energy and others are frequent additions to the list. It should be noted that the original list is not perfect and was intended to serve as a way to encourage employees to provide more examples and to identify areas for improvement. For non-production employees, the waste list can be translated into relevant examples, for example, waiting for material can instead refer to waiting for documents to arrive or be processed. Waste or processing may refer to errors in documents or transactions (Kato & Smalley, 2010). The implementation of Lean methodology tools represent the company's overall effort to first of all build an organizational culture. Early applications of Lean were focused on empowered teams and continuous improvement (Kaizen) or trying to map a predefined set of tools such as 5S, SMED, Kanban, etc. Also, Just in Time (JIT) approach is the opposite of the traditional myth, with the best starting point – customer orders, not sales forecasts, producing only as many units as needed and delivering only as many as ordered by customers. These are only few methods that will be examined later in the research for their application in the Hospitality industry.

2.2. Lean approach in the service sector

Since the emergence of the Lean approach until today, its popularity has quickly spread to other public and commercial sectors. It became evident that reducing waste and creating value is not only for manufacturing applications (Allway & Corbett, 2002). After a long period of Lean application exclusively in manufacturing companies, the techniques were adapted to the service area with the same focus, to reduce waste and create value for the final customers (Radnor & Osborne, 2013). Thus, despite the differences between manufacturing and services, the service industry can also benefit from the application of Lean to increase organizational competitiveness and customer satisfaction and reduce process variability and waste. Bowen and Youngdahl (1998) argued that the logic of manufacturing should be transferred to service operations and highlighted five characteristics of Lean manufacturing developed for service operations (Perdomo-Verdecia et al., 2022):

- focus on internal efficiency and external flexibility,
- enabling value-adding process flow and implementing JIT customer acquisition,
- elimination of waste from the entire value chain of activities, from product development to product delivery,
- increased customer focus and involvement in product development and delivery processes,
- empowerment of employees and teams.

Rauch et al. (2016) created the entire ranking of the most effective and most used Lean tools in the Hospitality industry, based on four defined criteria, which are: costs and effort of implementing Lean tools, time required for visible results, defining key performance indicators and their monitoring, and longevity of implementation.

Also, it should be noted that it was only when the system became widespread and widely accepted in the industrial sector that Lean practices began to be adopted in services. According to Cuatrecasas (2002) these practices do not reach as deep or wide into services, among others, because of the difficulties encountered in standardizing operations and time, the lower degree of innovation and the need for an appropriate approach to demand management. According to Gupta et al. (2016) introducing a Lean approach to any service activity must begin with a deep understanding of certain inherent aspects of services and a strong knowledge of customer value: the thinking or philosophy behind Lean principles may not change from manufacturing to services, but Lean tools and practices must be customized. Nevertheless, Lean continues to expand and is now applied in many service sectors, including healthcare, banking, financial services and insurance, public sector services, education, food and beverage services, distribution, retail and logistics services, IT services, airlines, etc. (Perdomo-Verdecia et al., 2022), and sometimes in combination with Six Sigma.

Since the recent COVID-19 pandemic has caused an unprecedented worldwide crisis in the tourism industry, the Hospitality industry is one of the hardest hit industries, with demand, occupancy rates and revenues at a global level (Bonfanti et al., 2021). This warrants a review of the sector's services and their innovative transformation with competitive costs and profitable value-creating operations to adapt to the "new normal". Managers must design safe experiences for their customers by identifying security measures, undertaking internal work reorganization, redistributing the service space, investing in technology and digital innovation, acting on guest waiting times, providing staff with new skills and improving their communication (Bonfanti et al., 2021).

However, evidence for the application of Lean in the hospitality industry is very limited, despite Berger et al. (1989) long ago identified several Lean-related aspects as organizational characteristics of innovative Hospitality firms, including climates that encourage teamwork, sensitivity to employee needs, focus on guest needs, and continuous exploration of ideas. Indeed, many years later Vlachos and Bogdanovic (2013) still identified the application of Lean in the Hospitality industry as a new field of study and noted that the evidence was still scarce. In the current context, an approach such as Lean with its goal of being highly responsive to customer demand by reducing waste (Bhamu & Sangwan, 2014) may be one of the most attractive and valuable responses that hotels can employ to address the need to reduce waste, costs and improving customer service. Also, the new trend towards digitization is having a major impact on the development of Lean methods and tools. According to Matt et al. (2016), Industry 4.0 does not replace Lean management, but introduces new technological tools with which we rely on the principles to develop properly. Through new and advanced technologies and concepts summarized under the term "Industry 4.0", Lean principles can be realized far better and more consistently than ever before.

Because of its expansion, this research shows that many Lean methods are applicable and suitable for the Hospitality industry. To bring this closer, the authors identified the applicability and effects of the Lean approach.

3. Research methodology:

Within this chapter, the research methodology will be presented, the goal of which was to determine in which areas the use of Lean can be effective, which Lean tools are most often applied in the Hospitality industry. The search methodology includes the following steps:

1. The database of papers was obtained by searching the Scopus database with the keywords “Lean” and “Hospitality”, and 32 articles were obtained.
2. The selection of articles focused only on the Lean approach applied to the Hospitality industry. The search set was narrowed down by reviewing the abstract and keywords, and those articles that are in accordance with the topic of the paper were selected, and those articles that refer to the application of the Lean Six Sigma methodology in the Hospitality industry should not be excluded, and in this way, a database was obtained with 13 articles.
3. In further analysis, two more articles were excluded because they were neither available online nor could they be downloaded. The finally obtained database has 11 articles. In this step, it was also necessary to determine the criteria for the analysis of the obtained database of articles. The following criteria were defined:
 - Year of publication,
 - Basic approach in the article,
 - Is the article theoretical or practical,
 - Which tools were used for the articles,
 - What results are achieved in the articles,
 - Is Lean approach applied independently or in combination with another methodology,
 - Whether the article provide guidelines for future research.

The final database of articles is shown in Table 1.

Table 1. The database of the articles

Title of the article	Document type	Authors
Lean management in hotels: Where we are and where we might go	Article	Perdomo-Verdecia et al. (2022)
Critical Success Factors for Successful Lean Six Sigma Implementation in the Service Organizations.	Article	Aljazzazen and Schmuck (2022)
Employees' Perception of Lean Six Sigma Implementation to Business Performance on Low-cost Budget Hotels	Article	Prastawa et al. (2022)
Lean management in hospitality: Methods, applications and future directions	Article	Rauch et al. (2020)
Assessment of lean-green practices on the sustainable performance of hotel supply chains	Article	Hussain et al. (2019)
Exploration and prioritization of lean techniques in a hotel supply chain	Article	Al-Aomar and Hussain (2019)
Application of lean manufacturing to hospitability sector; case study, Ritz-Carlton Hotel, Riyadh-Kingdom of Saudi Arabia	Conference paper	Alhisan et al. (2019)
An assessment of adopting lean techniques in the construct of hotel supply chain	Article	Al-Aomar and Hussain (2018)
Intelligent consistency- Ethical practices of Lean Six Sigma in quality service provision in the hospitality industry	Article	Ramphal and Nicolaides (2018)
Lean practices for efficiency in the South African hospitality sector	Article	Govender and Jasson (2018)
Lean Hospitality-Application of Lean Management Methods in the Hotel Sector	Conference paper	Rauch et al. (2016)

4. Findings and results:

In this chapter, the results obtained from the analysis of the database according to the defined criteria will be presented. The histogram in Figure 1 provides an insight into the articles' publication years, where it can be concluded that in the range from 2016 to 2022, the

largest number of the articles was published in 2018, 2019 and 2022 (three works each). These results indicate stagnation in the publication of the articles in 2020 (one paper) and 2021 (no articles), which coincides with the period of the COVID-19 pandemic.

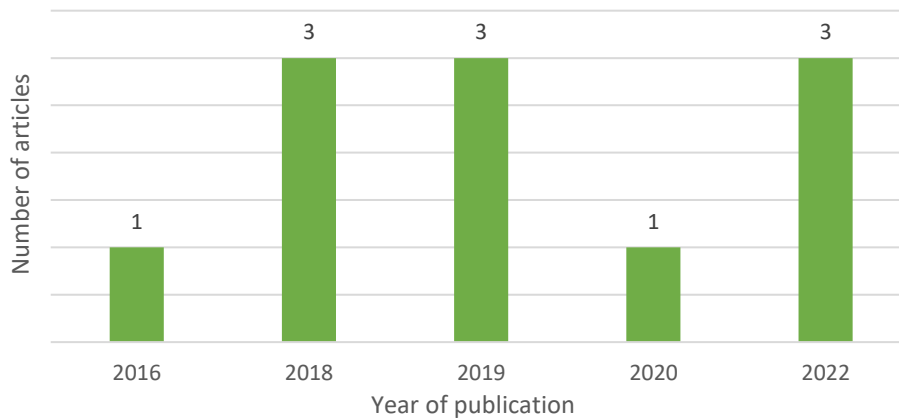


Figure 1. Distribution of articles per year

The results of the analysis according to the criterion of the basic approach in the article are shown in Figure 2. The histogram provides an insight that the largest number of articles (eight articles) refers to the application of the Lean approach in the Hospitality industry, which is in line with the topic of the article, but the articles related to the combination of Lean and Six Sigma approaches should not be ignored (three articles). A key objective of Six Sigma is to implement a measurement-based approach that focuses on process improvement and reducing deviations through the implementation of Six Sigma improvement projects (De Koning & De Mast, 2006).

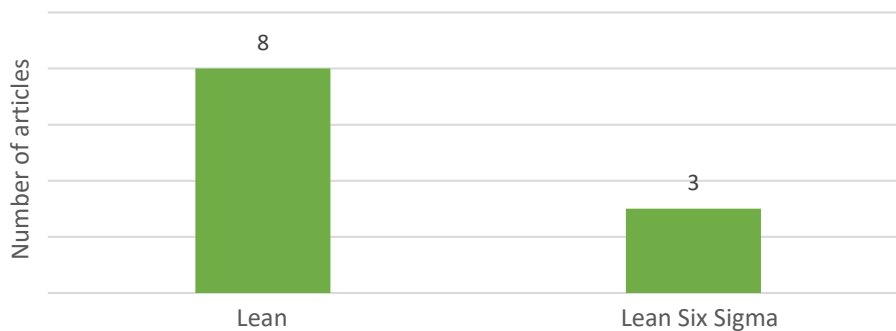


Figure 2. Basic approach in the article

Figure 3 provides insight into the ratio of the number of theoretical and practical articles (eight versus three theoretical articles). Such a relationship could be expected due to the practical articles' results, which are specific guidelines for applying Lean in the Hospitality industry for a specific company.

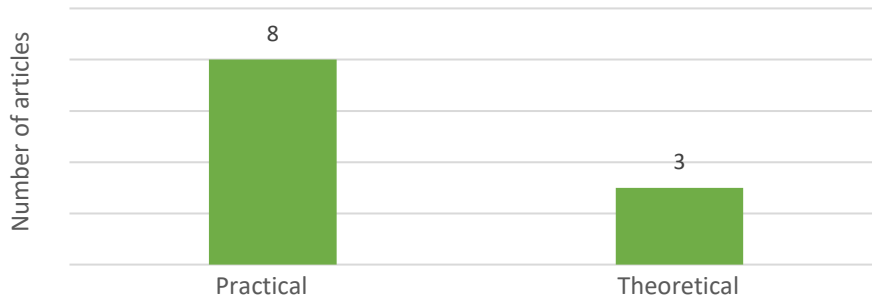


Figure 3. The ratio of the number of theoretical and practical articles

The next criterion examines the tools applied in the articles and the results are shown in Figure 4. The Kaizen approach was applied in the largest number of articles (seven articles), followed by 5S and JIT (five articles), and there are many others. The number of tools or techniques associated with Lean approach can vary significantly depending on the author.

Most cited in reviews of Lean in general (Bhamu & Sangwan, 2014; Caldera et al., 2017; Hu et al., 2015; Jasti & Kodali, 2015), and services in particular (Hadid & Mansouri, 2014; Leite & Vierira, 2015), include: Just-in-Time (JIT), 5S, Value Stream Mapping (VSM), Heijunka (Continuous production and leveling) and Reduction of setup time (SMED); and other tools such as (Bicheno & Holweg, 2016): Spaghetti diagram, Kanban, Visual Management, Kaizen, Poka-Yoke, Kanban, Standardization of work, Continuous improvement and kaizen, PDCA system and quality tools such as Ishikawa diagram, 5 Whys, Pareto analysis, and Total Productive Maintenance (TPM).

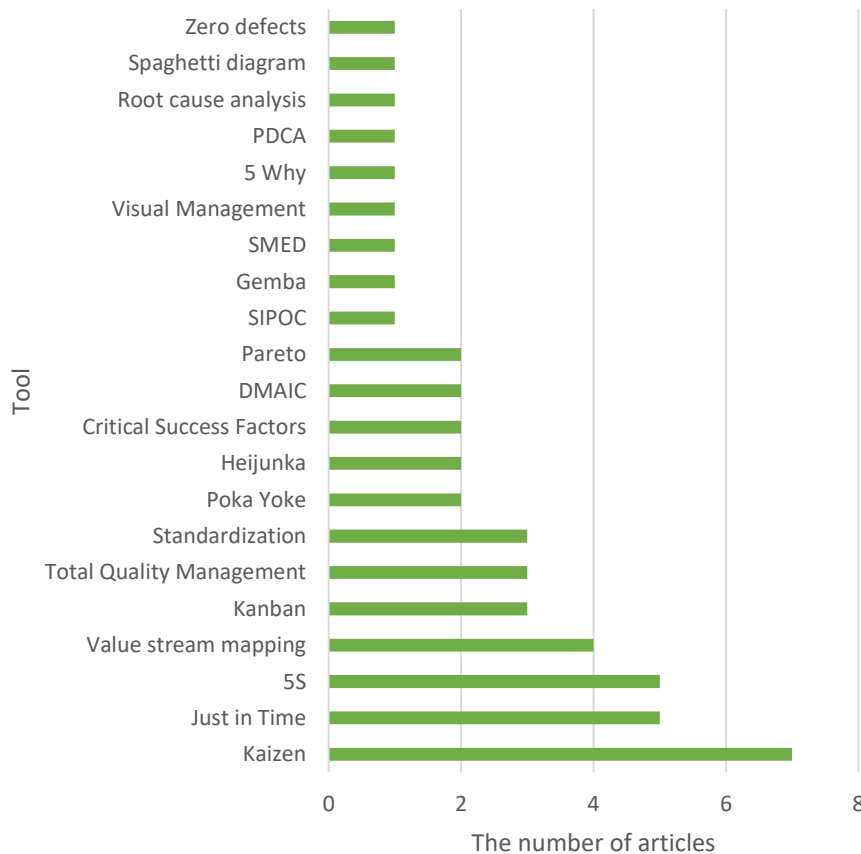


Figure 4. Applied tools according to the articles

The results achieved in the articles are shown in Figure 6. According to the results, three articles show that Lean can achieve waste reduction in processes in the Hospitality industry. Also, three articles present the differences and importance between critical success factors for the implementation of Lean Six sigma.

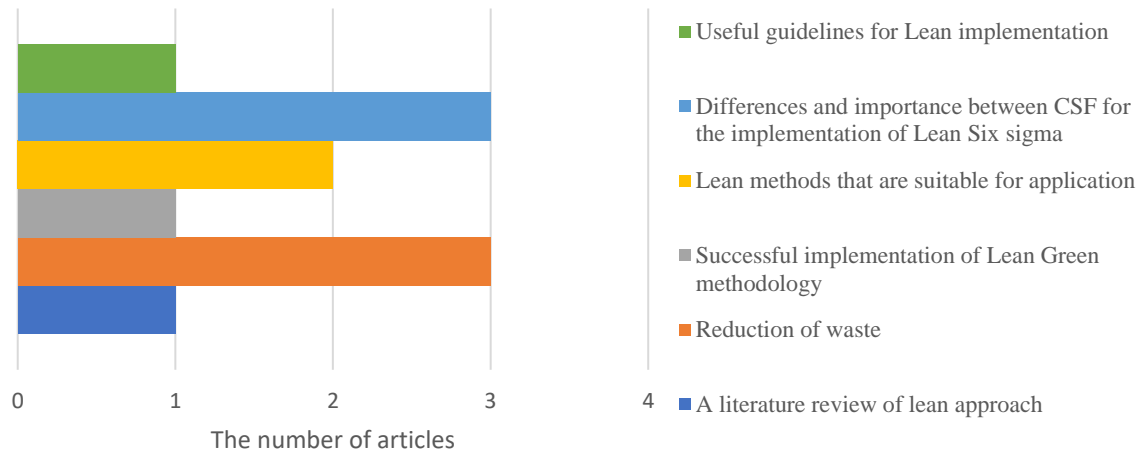


Figure 5. The results achieved in the articles

Figure 6 indicates that in the largest number of papers, Lean is applied independently (seven papers), while in three papers it is combined Lean with Six Sigma methodology, and in only one paper it is combined Lean with green management practices. As Lean practices are considered the best global business practices, especially in light of the recent global recession, initiatives to green the planet through Lean Green are becoming more widely disseminated methodologies.

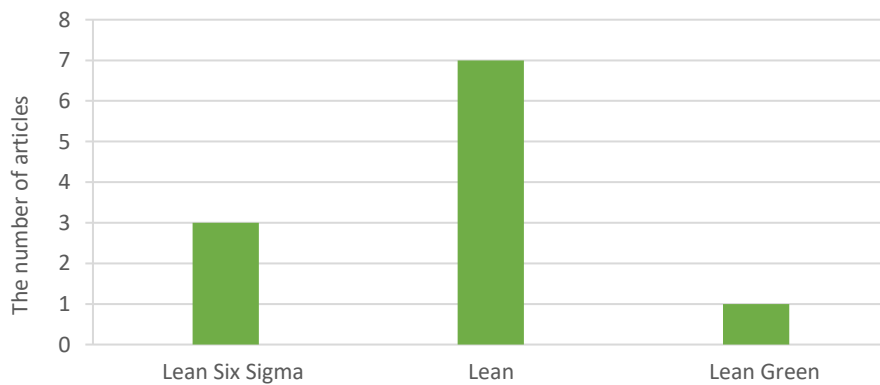


Figure 6. Applied methodologies in combination with Lean approach

And the last criterion analyzes the recommendations for future research that the articles provide. The histogram from Figure 7 shows that as many as nine articles provide recommendations, while only two articles do not. Table 2 was created in order to show the future directions that these articles from the database provide.

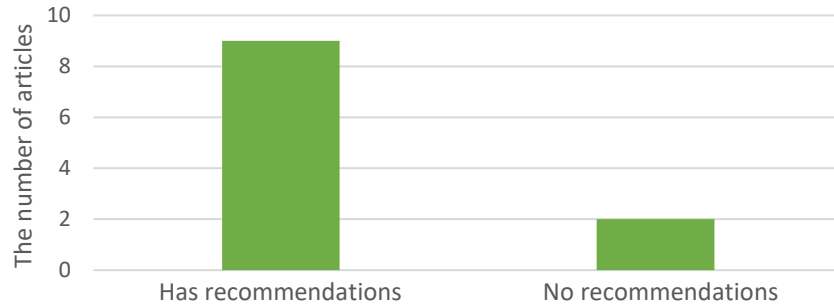


Figure 7. Recommendations for future research

Table 2. Future directions suggested by authors

Title of the article	Authors	Future recommendations
<i>Lean management in hotels: Where we are and where we might go</i>	Perdomo-Verdecia et al. (2022)	A future empirical study needs to be done to evaluate the variability of JIT principles more fully on HRM in the Hospitality sector.
<i>Critical Success Factors for Successful Lean Six Sigma Implementation in the Service Organizations.</i>	Aljazzazen and Schmuck (2022)	The researchers recommend conducting studies on the critical failure factors of LSS implementation in a Jordanian service organization for future studies. Therefore, managers of organizations will have a full picture of the factors that are important for the success of LSS implementation. Furthermore, another interesting idea is to investigate and compare the CSFs of LSS implementation in different developing countries.
<i>Employees' Perception of Lean Six Sigma Implementation to Business Performance on Low-cost Budget Hotels</i>	Prastawa et al. (2022)	Future studies can conduct comparative research on the condition before and after the implementation of LSS in low-budget hotels and determine the difference in performance between previous and future hotels with the implementation of LSS.
<i>Lean management in hospitality: Methods, applications and future directions</i>	Rauch et al. (2020)	The authors recommend that future research can be conducted on two levels. First, further research is needed in the practical adoption of Lean management methods in the Hospitality sector and the adaptation of traditional Lean principles to the specific requirements of companies. Second, further research is needed in the combination of applicable Lean methods with new digital technologies in order to achieve operational excellence through greater intelligence in hospitality processes resulting in "smart" hospitality.
<i>Assessment of lean-green practices on the sustainable performance of hotel supply chains</i>	Hussain et al. (2019)	The future research should analyze more deeply the influences of Lean and Green overlapping; more detailed studies are needed to analyze the interaction of Lean Green practices as well as the interactions of dependent aspects of 3BL sustainability.
<i>Exploration and prioritization of lean techniques in a hotel supply chain</i>	Al-Aomar and Hussain (2019)	Future research is aimed at developing models that can assess the direct impact of Lean adoption on Hospitality supply chain performance and sustainability.
<i>An assessment of adopting lean techniques in the construct of hotel supply chain</i>	Al-Aomar and Hussain (2018)	A possible future direction for this study is to identify Lean and Green practices and identify their impacts on hotel supply performance. Factor analysis can be used to identify the key factors that influence the sustainability of a hotel's supply chain. In addition, the Analytical Hierarchy Process (AHP) can also be used to prioritize the adoption of Lean practices throughout the supply chain. The combination of these methods is expected to result in the development of a comprehensive framework for the adoption of Lean and Green sustainability practices in the Hospitality industry.

<i>Lean practices for efficiency in the South African hospitality sector</i>	Govender and Jasson (2018)	Recommendations for further research are that the theoretical advantages and challenges of applying Lean be empirically examined and a comparison of Hospitality, production and health practices should be done.
<i>Lean Hospitality- Application of Lean Management Methods in the Hotel Sector</i>	Rauch et al. (2016)	The mission of the analyzed company will be to keep the 5S cycle alive. It can be noted that the expectations have been met and Lean management has additional potential for the tourism and hospitality sector in the future, so future studies can influence Lean to be more aware in tourism.

The discussion considers and answers some important questions in this paper.

- Is the service market, like the Hospitality industry, more demanding and specific?

Due to their uniqueness, services are often related to the interaction between people, which makes them complex. The quality of the service provided often depends on the skills, expertise and behavior of the service provider. Therefore, service providers must understand customer needs, manage quality, adapt to changing demands and create positive experiences in order to successfully operate in this sector. Also, clients often look for personalized services that are adapted to their individual needs. Service providers must be flexible and able to adapt their services to meet the specific requirements of each client. This may require additional efforts in market segmentation, customer needs analysis, and service delivery process adjustments. All of the above make the service market more challenging and specific compared to the product market. But Lean can overcome problems because it has lower costs and effort for implementation, and the goal of the method itself is to be simple and cheap to implement and maintain (Rauch et al. 2016).

- What is the most used Lean tool in the articles?

The results indicate that the most frequently applied Lean tool is Kaizen approach. Kaizen within the very application of Lean methodology in the Hospitality industry, at the operational level, implies changes that need to be made gradually, with incremental progress and striving for perfection (Rauch 2016).

- What improvements are achieved with Lean implementation in the Hospitality industry?

Based on the analysis of the database of works, it can be concluded that the application of Lean in the Hospitality industry can bring numerous benefits (Table 3).

Table 3. The benefits of the Lean implementation

Benefits	Explanation
Reduction of waiting time and efficiency improvement	A Lean approach can help in reducing waiting time and inconsistencies in various processes, such as guest check-in and check-out, food and beverage services, room cleaning, etc. Elimination of unnecessary movements and optimizing workflow can improve efficiency and reduce waiting for the guests.
Service quality improvement	Lean includes a focus on quality, identifying and eliminating waste, and unnecessary activities. Therefore, the implementation of Lean in the Hospitality industry can lead to improved communication between different departments, better organization of processes and reduction of waste in providing services to guests.

Inventory management improvement	One of the tools of Lean is JIT, which means that materials and resources are procured and used exactly at the moment they are needed. Applying JIT principles can help hotels reduce unnecessary excess inventory, reduce inventory costs, and minimize waste.
Work environment improvement	As 5S aims to organize the work environment, the application of this Lean tool can result in cleaner, safer and well-organized workspaces in the hotel, which contributes to improved productivity and employee satisfaction.
Better guest management	The Lean approach can help hotels improve communication and interaction processes with guests. For example, hotels can identify key guest touch points, improve service personalization, resolve problems faster, and deliver an exceptional guest experience.

- Does Lean gain importance over the years?

The largest number of articles published in 2018, 2019 and 2022 (three articles each). These results indicate stagnation in the publication of articles in 2020 (one article) and 2021 (no articles), which coincides with the period of the COVID-19 pandemic. The increase in the number of articles in 2022 speaks of the resurgence of interest in the application of the Lean approach in the Hospitality industry and the improvements that this approach offers. Also, there are all indications that the number of articles will very likely continue to grow over the years.

- What changes were caused by the impact of the COVID-19 pandemic?

Considering all the radical changes caused by the COVID-19 pandemic, new opportunities are being created for the Hospitality industry. The entire industry has been based on live channels until now, but with the advent of digital channels, an opportunity opens for an entire unused segment of this industry. After the outbreak of the pandemic, the entire Hospitality industry was threatened because the majority of the market was represented by the population from foreign countries (Madeira et al., 2012; García-Madurga, 2021). One of the characteristics of the industry itself is that it is extremely sensitive to economic cycles and market turbulence. Due to the closing of companies within this industry after the shutdown, all employees were dismissed. In addition to the decrease in the number of employees, the income generated by the entire industry has also decreased in companies. Considering all the radical changes caused by the pandemic, new opportunities have been created for the Hospitality industry, which would replace the threats and weaknesses the industry is facing.

5. Conclusion:

The processing and analysis of the literature shows the development of Lean as an approach in management methods, all through the prism of the Hospitality industry. From the initial base of 32 papers, 11 papers were analyzed, 8 of which include examples of the application of the Lean approach in this industry.

Based on the analysis of studies and research, it can be concluded that the implementation of the Lean approach can bring numerous benefits to the entire Hospitality industry. The implementation of Lean can result in reduction of waste, waiting time, the efforts of employees and costs, while increasing efficiency, productivity of employees, profit and customer satisfaction. However, it is important to emphasize that the successful implementation of the Lean approach requires strong leadership and commitment from the entire management. It also requires continuous employee involvement and training in order to develop a culture of continuous improvement. Also, the implementation of the Lean approach in the Hospitality industry can be essential for achieving a competitive advantage and long-term success.

The Lean methodology with its tools is described through the paper, where, based on research, it is shown in which spheres Lean tools are used. Practitioners should pay attention to the fact that the fourth industrial revolution should not be missed even in the Hospitality industry.

The limitation of this research is the number of articles for the analysis. Further research could extend this study with more articles including different keywords for database search. Although Scopus offer wide coverage, it is possible to increase the number of articles by searching other databases.

REFERENCES:

- Al-Aomar R., Hussain M. (2019). Exploration and prioritization of lean techniques in a hotel supply chain. *International Journal of Lean Six Sigma*, 10(1), 375-396.
- Al-Aomar R., Hussain M. (2018). An assessment of adopting lean techniques in the construct of hotel supply chain. *Tourism Management*, 69, 553-565.
- Aljazzazen, S., Schmuck, R. (2022). Critical Success Factors for Successful Lean Six Sigma Implementation in the Service Organizations. *Quality - Access to Success*, 23(188), 76 - 85.
- Allway, M., Corbett. S. (2002). Shifting to Lean Service: Stealing a Page from Manufacturers' Playbooks. *Journal of Organizational Excellence*, 21(2), 45-54.
- Berger, F., Ferguson, D. H., Woods, R. H. (1989). Profiles in innovation: Companies and leaders. *Cornell Hotel and Restaurant Administration Quarterly*, 30(2), 98-105.
- Bhamu, J., Singh Sangwan, K. (2014). Lean manufacturing: literature review and research issues. *International Journal of Operations & Production Management*, 34(7), 876-940.
- Bicheno, J., & Holweg, M. (2000). *The lean toolbox* (Vol. 4). Buckingham: PICSIE books.
- Bonfanti, A., Vigolo, V., Yfantidou, G. (2021). The impact of the Covid-19 pandemic on customer experience design: The hotel managers' perspective. *International Journal of Hospitality Management*, 94, 102871.
- Bowen, D. E., Youngdahl, W. E. (1998). "Lean" service: in defense of a production-line approach. *International journal of service industry management*, 9(3), 207-225.
- Buhalis, D. & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet: the state of eTourism research. *Tourism Management*, 29(4), 609-623.
- Cocolicchio B. (2018). *Creating your lean future State*. Quality Progress.
- Cuatrecasas, A. L. (2002). Design of a rapid response and high efficiency service by lean production principles: Methodology and evaluation of variability of performance, 80(2), 169-183.
- De Koning, H. & De Mast, J. (2006). A rational reconstruction of Six Sigma's breakthrough cookbook. *International Journal of Quality and Reliability Management*, 23(7), 766-787.
- García-Madurga, M.Á., Esteban-Navarro, M.Á., Morte-Nadal, T. (2021). CoVid Key Figures and New Challenges in the HORECA Sector: The Way towards a New Supply-Chain. *Sustainability*, 13(12), 6884
- Govender, C. M., Cashandra, J. C. (2018). Lean Practices for Efficiency in the South African Hospitality Sector. *African Journal of Hospitality, Tourism and Leisure*, 7(2), 1-14.
- Gupta, S., Sharma, M., Sunder M, V. (2016). Lean services: a systematic review. *International Journal of productivity and performance management*, 65(8), 1025-1056.
- Hines, P., Holweg, M., Rich, N. (2004). Learning to evolve: a review of contemporary lean thinking. *International journal of operations & production management*, 24(10), 994-1011.
- Hu, M.L.M., Horng, J.S., Sun Y.H.C. (2009). Hospitality teams: knowledge sharing and service innovation performance. *Tourism Management*, 30(19), 41-50.

- Hussain, M., Al-Aomar, R., Melhem, H. (2019). Assessment of lean-green practices on the sustainable performance of hotel supply chains. *International Journal of Contemporary Hospitality Management*, 31(6), 2448-2467.
- Imai, M. (2021). *Strategic KAIZEN: Using Flow, Synchronization, and Leveling [FSL] Assessment to Measure and Strengthen Operational Performance*. McGraw-Hill Education.
- Kandampully J. (2006). The new customer-centred business model for the hospitality industry. *International Journal of Contemporary Hospitality Management*, 18(3), 173-187.
- Kato, I., Smalley, A. (2010). *Toyota Kaizen methods: Six steps to improvement*. CRC press.
- Leite, H., Bateman, N., Radnor, Z. (2019). Beyond the ostensible: an exploration of barriers to lean implementation and sustainability in healthcare. *Production Planning & Control*, 31(1), 1-18.
- Liker J., K. (2004). *The Toyota way - 14 management principles from the world's greatest manufacturer*. New York: McGraw Hill.
- Lockyer T. (2005). The perceived importance of price as one hotel selection dimension'. *Tourism Management*, 26(4), 529-537.
- Madeira, A., Palrão, T., & Mendes, A. S. (2021). The Impact of Pandemic Crisis on the Restaurant Business, 13(1), 40.
- Matt D., T. R. (2016). Smart factory for SMEs: designing a holistic production system by industry 4.0 vision in small and medium enterprises (SMEs). *ZWF Zeitschrift für wirtschaftlichen Fabrikbetrieb*, 111(1-2), 52-55.
- McVay G., K. F. (2013). *Accounting in the lean enterprise*. New York: Productivity Press.
- Moyano-Fuentes, J., Sacristán-Díaz, M. Emerald Article: Learning on lean: a review of thinking and research. *International Journal of Operations & Production Management*, 32(5), 551-582.
- Ohno, T. (1988). *Toyota production system: Beyond large-scale production*. New York: Productivity press.
- Orfila-Sintes, F., Mattsson, J. (2009). Innovation behavior in the hotel industry. *Omega*, 37(2), 380-394.
- Ottbacher, M., Gnoth, J. (2005). How to develop successful hospitality innovation. *Cornell Hotel and Restaurant Administration Quarterly*, 46(2), 205-222.
- Perdomo-Verdecia, V., Sacristán-Díaz, M., Garrido-Vega, P. (2022). Lean management in hotels: Where we are and where we might go. *International Journal of Hospitality Management*, 104, 103250.
- Prastawa H., Shofia A., Bakhtiar A., Damayanti M. (2021). Employees' Perception of Lean Six Sigma Implementation to Business Performance on Low-cost Budget Hotels. *Journal of Quality Assurance in Hospitality & Tourism*, 23(12), 1-22.
- Prester, J., Kolarović, I. (2015). Are the principles of Lean production in line with good manufacturing practices in the pharmaceutical industry?. *Ekonomski pregled*, 66(3), 273-295.
- Radnor, Z. J., Osborne. S. P. (2013). Lean: A Failed Theory for Public Services?. *Public Management Review*, 15 (2), 265–287.
- Ramphal, R. R., Nicolaidis, A. (2018). Intelligent consistency - Ethical practices of Lean Six Sigma in quality service provision in the hospitality industry. *African Journal of Hospitality, Tourism and Leisure*, 7(3), 1-15.
- Rauch, E. D. (2016). *Lean Hospitality-Application of Lean Management methods in the hotel sector*. *Procedia CIRP*.
- Rauch, E., Damian, A., Holzner, P., Matt, D. (2016). Lean Hospitality - Application of Lean Management Methods in the Hotel Sector. *Procedia CIRP*, 41, 614-619.

- Rauch E., Matt D.T., Linder C. (2020). Lean management in hospitality: Methods, applications and future directions. *International Journal of Services and Operations Management*, 36(3), 303-326
- Shah, R., Ward, P. T. (2007). Defining and developing measures of lean production. *Journal of operations management*, 25(4), 785-805.
- Vlachos, I., Bogdanovic, A. (2013). Lean thinking in the European hotel industry. *Tourism Management*, 36, 354-363.
- Womack, J. P., & Jones, D. T. (1997). Lean thinking – banish waste and create wealth in your corporation. *Journal of the Operational Research Society*, 48(11), 1148-1148.
- Wong, A.O.M., Dean, A.M. & White, C.J. (1999). Analysing service quality in the hospitality industry. *Managing Service Quality*, 9, 136-143.