Lean methodologies in the global tourism sector: A literature review

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Abstract

Since the Covid-19 pandemic, the tourism sector has been severely affected with a high decrease in its activities. This sector, as well as all services, is looking for a way to adapt to the new market with new strategies and generate new value propositions in activities. Therefore, over the years, Lean Methodologies have been used as a solution for continuous improvement and to face new challenges. This research has posed the following question: What is the effect of applying the lean methodology in service operations offered by the tourism sector globally? The type of research has been developed with a systematic literature review of one hundred and twenty-six (126) articles published between 2017 and 2021. These articles were selected based on keywords related to Lean methodologies in the tourism sector. The results show that applying Lean methodologies allows for an increase in efficiency, a decrease in production and service time, a focus on the value chain, and an increase in customer satisfaction and empowerment of employees.

Keywords
Lean Methodologies, Service Operations, Tourism Sector, Literature Review

1. Introduction
Currently, around the world, several industrial sectors have been affected by the covid-19 pandemic, mainly the tourism sector (Tortorella et al. 2021). In 2020, 381 million tourists earned $300 billion in tourism revenue, and global tourism activity declined by 74%, affecting the service operations of many travel agencies, hotels, food consumption, and tour guiding. Today, however, the service industry is looking for the best way to adapt to this change and not be affected one more time.

It should be noted that services permeate all aspects of a modern economy and are the key to connecting nations with each other with information, knowledge, goods, and services (Lins et al. 2021). Therein lies the importance of improving service operations, specifically, in the tourism sector, given that this sector is the one that has had little research in comparison to other services (Arango and Rojas 2018). Likewise, there is a trend in applying Lean tools to services in development, compared to what has already been researched for the manufacturing industry (Burch and Smith 2019). One of the primary methodologies to implement in service organizations is Lean Service, which encompasses value determination, identification of value streams, flow, creep, and the pursuit of perfection. Likewise, these have similar applications to manufacturing organizations (Lisiecka and Burka 2016).

The causes for opting for strategies and methodologies that contribute to the long-term sustainability of the service industry are intense international competition, the exponential acceleration of technological evolution, and the demanding expectations and needs of customers.

This has generated unprecedented challenges in the service sector (Jaw, Lo, and Lin 2010). For this reason, the service sector must seek to continue improving and adopt tools for continuous improvement, efficiency, and effectiveness in its operations, as is the case of lean methodology (Aljazzazen and Schmuck 2021).
From the problems presented in the previous paragraphs, the following research question arises based on the information previously analyzed:

What is the effect of applying the lean methodology in service operations offered by the tourism sector globally?
Therefore, the rationale for this research is focused on, through a systematic literature review, formulating general concepts, determining the progress of current research, identifying relationships and gaps, and extending or developing a new theory regarding lean methodology in the tourism sector. Consequently, this review is organized as follows: in the next chapter, the theoretical background is shown, and in chapter 3, the methodology used for this research. Then, the chapter on results and discussion, which includes a sample of the articles studied and the ideas they share. Finally, it ends with conclusions regarding the research.

1.1 Theoretical Background

The Lean methodology is based on identifying those tasks of added labor versus those that do not present added value and is perceived by the final customer. This methodology comes from the Japanese culture dedicated to its commitment to good quality practices (Burch and Smith 2019). The authors mention that this Lean philosophy originated from the Toyota Production System (TPS), which is described as a system of total elimination of waste from processes and operations (Aljazzazen and Schmuck 2021). Similarly, the objective of that stream is based on zero lead times, inventories, and defects, resulting in higher customer satisfaction (Lisiecka and Burka 2016).

This methodology can be used in various areas, especially those that provide services, as it will boost their development by reducing implementation costs (Kotlyarova et al. 2021). Consequently, the Lean methodology would positively impact the operations of the tourism sector, which encompasses a wide variety of services, such as orientation, information, cultural interpretation, and landscape enjoyment, embracing transportation, lodging, and food (Arango and Rojas 2018). To determine whether tourism is sustainable is essential to use optimally and responsibly the economic, socio-cultural, and environmental resources for its development (Burch and Smith 2019).

The Lean methodology within the hotel service seeks to rearrange the company's approach to organize it so that the value of the manufactured product and its creative flow can be determined. However, finding these values is challenging, so applying the lean methodology within this sector is considered highly complex (Tortorella et al. 2021). On the other hand, trade Service is a methodology that optimizes production through the maximum reduction of losses in the production of the product itself, its delivery, and the process of its consumption (Chan 2013). Furthermore, the authors emphasize that if added value is given to the product, such as free training provided to the consumer to learn how to use the product, the follow-up offered after closing a sale or the various sales channels that are available will reduce these losses that occur in production and sale (Kotlyarova et al. 2021).

1.2 Objective

Review of academic articles and synthesize the relevant information in an orderly and summarized manner to determine the effect of the use of lean methodologies in the tourism sector.

2. Methods

The main objective of this research is to obtain a perfectly structured literature review, so the following steps were followed in an orderly manner, first, the definition of keywords, then perform a search in the Scopus database with articles closely related to the contribution to answering the research question effectively. Finally, an adequate statistical and bibliometric analysis of the previously selected articles was carried out, obtaining optimal results. Figure 1 shows graphically the model that contributes to the analysis of the selection and evaluation of scientific articles is presented graphically below. (Figure 1)

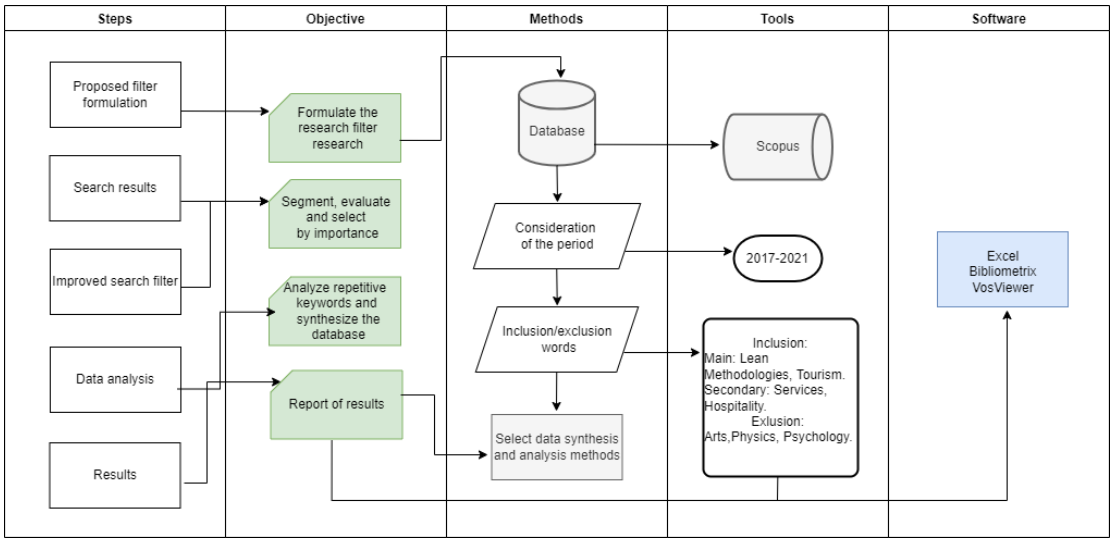

Figure1. Steps, objectives, methods, tools, and programs/software

As seen in the figure above, to carry out a better systematic review of articles, steps were followed to achieve the objectives set, as well as the description of the methods and tools used for a better analysis of the data obtained. Likewise, the Scopus database was used, which is considered the database with the most significant credibility and impact at a global level, with more than 4000 publishers being the most important worldwide. For the systematic review, a period of 5 years was considered (2017-2021), and primary keywords such as Lean Methodologies, Service Operations and Tourism Sector as well as secondary keywords, which are Services and Hospitality, and the exclusion of terms that focused on terms of Art, Psychology, and Physics. Finally, Bibliometric, Excel, and VOS Viewer software were used. Excel dynamic tables were used to organize the information of the selected articles based on categories and subcategories shown in Table 1:

Table 1. Category and sub-category of all articles

Category	Sub-category
Scientific Production on the topic	• Number of papers per year • Academic Journals where the paper is published • The authors of the papers • References
Lean tools and continuous improvement concepts	• Kaizen • 5S • Just In Time (JIT) • Improvement in the use of materials • Standardization • Value analysis • VSM • Six Sigma • Multifunction Staffing • Kanban • Poka Yoke • TPM
Scope of research	• Exploratory • Descriptive

Category	Sub-category
Research approach	• Quantitative • Qualitative • Mixed
Methodological design	• No experimental • Case study • Action research • Theory-based • *Others*
Retail sector problems that were solved by applying Lean tools	• Bad or poor business management • Waste • Poor Customer service • Inefficient line • Process time
Benefits of applying Lean tools in the Retail sector	• Increase in efficiency • Production and service flow • Focus on the value chain • Increased customer satisfaction • Empowerment of employees

3. Data Collection

For the statistical analysis of the 126 selected articles, the bibliometric software was used for better visualization and interpretation of the review. As a result, it was possible to demonstrate and identify trends in the journals that have published the most on the research topic, authors, countries, and years of publication, among others. (Figure 2)

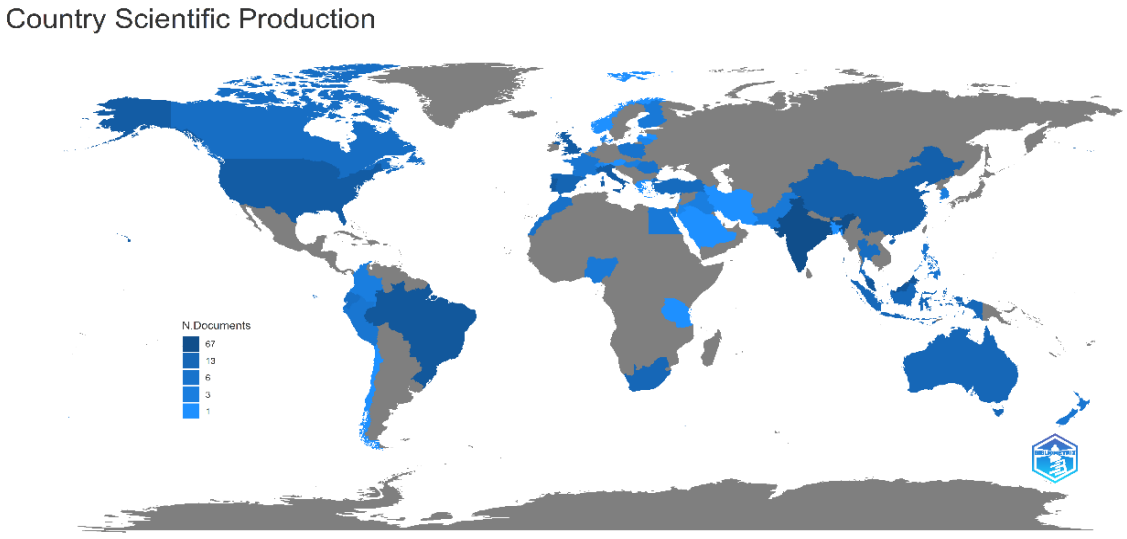

Figure 2. Graphical representation of article creation by country (elaborated in bibliometrix)

Table 2. Frequency of articles per region

Region	India	Malaysia	Brazil	Portugal	Italy	United Kingdom	USA	China	Spain	Australia
Frequency	67	38	35	32	26	26	26	20	15	13

As previously mentioned, Figure 2 shows the total number of items according to their geographical origin. The more items are centered in the same area, the more the area changes its hue, according to the legend, to more intense blue color. The more articles, the darker the region is shown in this case. In this research work, as shown in Table 2, it is concluded that the most significant number of articles related to Lean methodologies in the tourism sector belong to India, Malaysia, and Brazil. The first country has a frequency of 67 scientific articles, followed by 38 and 35 articles, respectively.

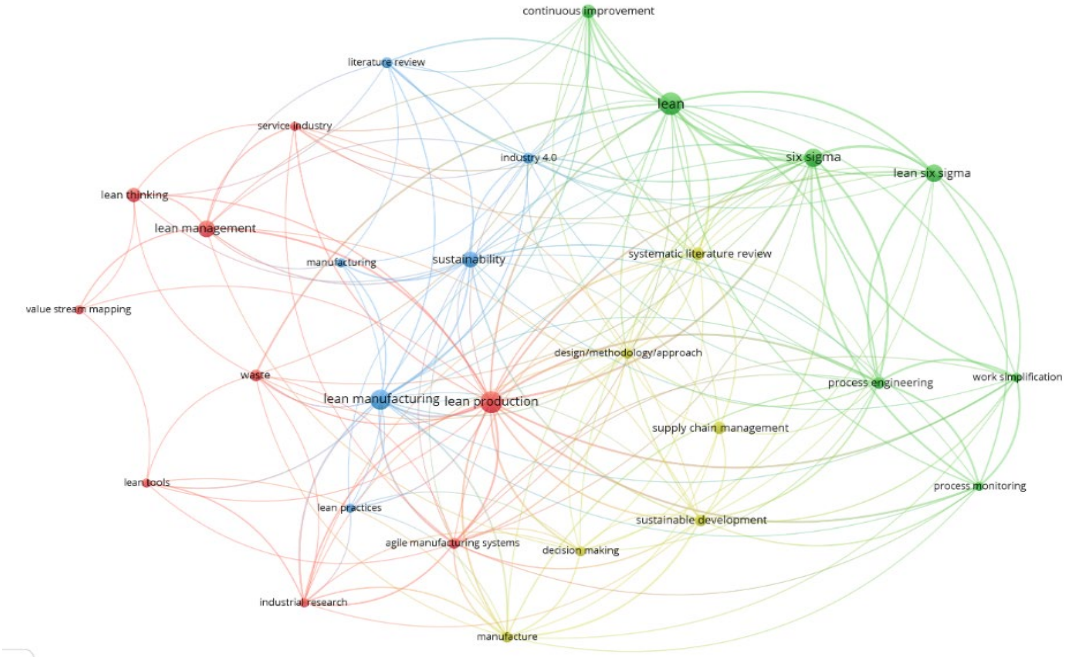

Figure 3. Total keyword match (elaborated in VOSviewer)

Figure 3 shows the correlation of keywords found in all the articles, which will be segmented and explained in the following clusters.

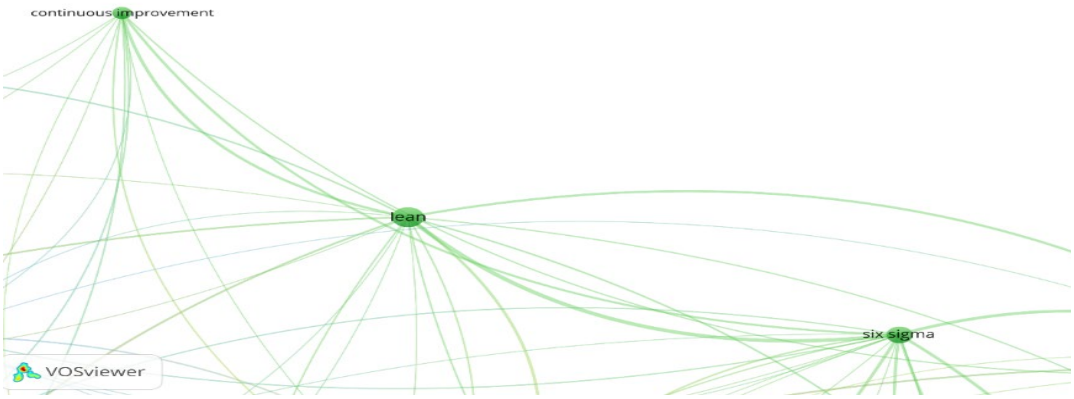

Figure 4. Cluster related to lean methodology (elaborated in VosViewer)

Figure 4 demonstrates the close relationship between lean methodology, continuous improvement, and its primary six sigma strategy. Therefore, it is concluded that, from the articles under study, the application of the lean service methodology in the tourism sector will contribute to continuous improvement in each related process. Therefore, the strategy with the highest frequency of implementation to ensure this sustainability over time will be the six sigma.

5. Results and Discussion

5.1 Numerical Results

VOS viewer, Excel, and bibliometric software were used for this bibliometric analysis. Each of these tools provides an analysis of the data that is easy to interpret and visualize to achieve a better understanding of the most critical indicators and contribute to obtaining optimal results. Likewise, to better understand the following points, it is shown in detail how the advanced search was applied to get the 126 articles and how this show how related they are through clusters, occurrences, and keyword matches.

Table 3. Application of enhanced applied search

Search term	Applied search	Search results (Number of items)
Lean Methodologies AND Service Operations AND Tourism Sector	(TITLE-ABS-KEY (lean)) AND ((service AND operations)) AND (tourism) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017)) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ENGI") OR LIMIT-TO (SUBJAREA , "DECI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ENVI") OR LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "ECON"))	126

From what is shown in Table 3, it can be evidenced what was the typing for an advanced applied search in the Scopus database, finally obtaining 126 selected articles. These final articles went through an exhaustive filter, from the inclusion of the primary and secondary keywords of the research to the exclusion of articles that are not directly related to the answer to the research question. Likewise, the articles are in the final version. That is, they have already been published and are not in the process of publication.

5.2 Graphical Results

Of the 126 research studies reviewed, the articles selected for the systematic literature review were classified into 3 categories according to their typology. These categories were case study, model development, and literature review. Figure 5 below shows the percentage of each of them.

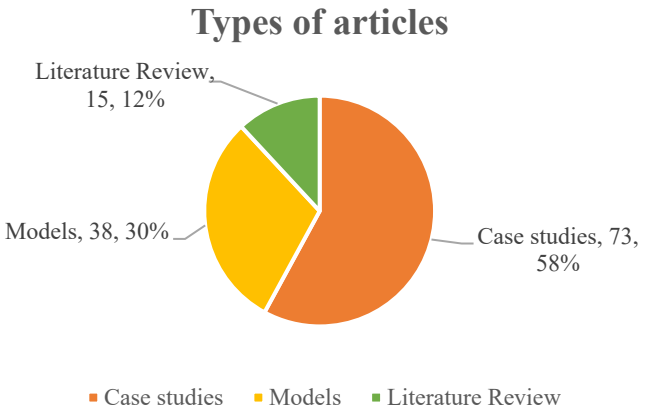

Figure 5. Types of articles reviewed

According to Figure 5 about the type of article in this study, 73 articles are case studies, which represents 58% of the total; 38 articles are of the study model type, which represents 30%; finally, the remaining articles are of the literature review type. It should be noted that most of the case studies are of great importance since they demonstrate the importance of the application of Lean methodologies in the tourism sector, which involves lodging, transportation, food, and guidance, among others. In this way, the empirical results demonstrate the benefits of implementing lean methodologies in the sector and serve as a guide for other companies in the industry to use them to improve their processes.

6. Conclusions

The articles under study highlight a certain degree of uncertainty about whether the totality of Lean techniques can be applied to the tourism sector (Ahmed et al. 2018; Joubert and Bam 2020). Because, in its processes, the management of service operations is involved, and in this aspect, there are customers with different expectations compared to those involved in the goods themselves (Gupta et al. 2020; Parmar and Desai 2020). Therefore, given this problem, the term Lean Service is chosen to identify the Lean Manufacturing techniques that apply to the service sector (Orynyez et al. 2020; Sisson 2019). Likewise, it was determined that Lean methodologies do not have a standard of tools to be applied in the tourism sector. However, it is decided by applying different combinations of techniques, with the objective that these can be implemented in the best way in each of its operations, obtaining favorable results (Yazdi et al. 2021; Ruiz et al. 2017; Pimentel et al. 2019).

From the case studies reviewed, the main results of implementing Lean methodologies in the processes involved in the tourism sector were established. Firstly, it was highlighted as a first step, that of educating managers or those responsible for each area or process, in Kaizen training, which abound the topics of Lean principles and techniques, with an average duration of one week (Patrone et al. 2020; Aktan and Akyuz 2017). Through these meetings, the elaboration of process maps proposed by each expert and knowledgeable member of the process is achieved, where improvements are proposed and finalized with a VSM (Value Stream Map) (Aisyah et al. 2021; Costa et al. 2019). The results obtained from implementing Lean Service in the tourism sector were positive for the companies that applied it in the short and long term (Hartini et al. 2020; Juliani and Oliveira 2019). This fact was evidenced in that in most case studies, customer satisfaction increased, measured through satisfaction surveys, with an average increase of 3% (Jing et al. 2020; Miller et al. 2018; Raval et al. 2018; Kumar et al. 2021).

Another critical factor highlighted in the studied articles was the focus on the value chain of each company belonging to the tourism industry, such as those dedicated to lodging, travel agencies, and restaurants (Sinha et al. 2020; Rehman and Yu 2019). This approach improved their operations' continuous flow, applying the JIT pull, which made them adapt to the needs and expectations of customers, which are usually very changeable (Wichaisri and Sopadang 2017; Costa et al. 2019).

Table 4. Main benefits of Lean methodologies in the tourism sector

Benefit	Description
Increase in efficiency	It focuses on improving each organization's internal operations and satisfying customer needs.
Production and service flow	The flow time is reduced from start to finish, making it more continuous. JIT is used in each input and output.
Focus on the value chain	Analyze the value chain and the service process involved to identify activities that do not generate value and eliminate them.
Increased customer satisfaction	Involve the customer in the design of the service provided. It also trains workers to provide good service.
Empowerment of employees	Allocate financial resources to train employees to increase their performance concerning the service they provide to the customer.

Table 4 shows the main benefits of Lean methodologies in the tourism sector. In addition, a description of each benefit is shown. On the other hand, the articles studied present techniques. Table 5 shows the techniques with the frequency of occurrence.

Table 5. Main techniques applied in the case studies studied

Tecnic	Case studies
Kaizen	44
5S	23
Just In Time (JIT)	22
Improvement in the use of materials	20
Standardization	37
Value analysis	18
VSM	19
Six Sigma	22
Multifunction Staffing	24
Kanban	20
Poka Yoke	10
TPM	18

From the scientific articles studied, it was determined that in most cases, the most used technique was Kaizen, with a frequency of 44 in the case studies. This technique is a basis for initiating an organizational revolution in search of improvements in established processes (Ajmera and Jain 2020). It's crucial to generate not-so-general improvements, seeking the involvement of the entire company, with leadership and motivation being the most determining factors to meet the objectives (Aktan and Akyuz 2017; Joubert and Bam 2020). In the second place, standardization is located, which controls the processes under study, and quantitative measures can be taken to establish the respective improvements (Gupta et al. 2020; Sinha et al. 2020; Juliani and Oliveira 2019).

It should also be noted that one of the techniques that had the most significant impact on cost reduction was that of multifunctional personnel. That is, it managed to reduce the productive resources involved in the processes of the tourism sector, and at the time of providing the service, this was given at a lower cost (Jing et al. 2018; Gutierrez and Antony; 2020).

Finally, it is essential to clarify that applying the abovementioned techniques depends mainly on the problem each organization seeks to solve (Bhat et al. 2020; Anuar et al. 2019; Antony et al. 2018). Consequently, it is crucial that each organization belonging to the tourism sector first perform a thorough analysis of each problem presented to opt for the best tool within the Lean methodologies (Castro and Teixera 2020; Chan 2013; Da Silva et al. 2020).

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Biography

Adrian Gabriel Valladares-Loayza is a student of the last cycle of Industrial Engineering at the University of Lima, currently working as a sales and marketing intern at Toyota, a company belonging to the automotive sector, where he has implemented process improvements. In addition, she is familiar with service operations management, commercial management, supply chain management, strategic marketing, project management, business gaming, agile methodologies, lean methodologies and B2B management. He is currently pursuing two degrees, which are Project Management and Commercial Engineering. He is interested in growing professionally and specializing in the commercial, marketing and sales area.

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