Application of Lean Management Principles to Reduce Waste and Improve Operational Efficiency in the Service Sector

[1]Louise Elizabeth Radjawane, [2]Didit Darmawan, [3]Jony Rodrigues Varela

[1]*Universitas Kristen Indonesia Paulus Makassar, Indonesia*
[2]*Sunan Giri University of Surabaya, Indonesia*
[3]*Universitas Katolik Widya Mandira Kupang, Indonesia*

A R T I C L E I N F O

Article history:
Received 6 May 2022
Revised 14 May 2022
Accepted 8 June 2022

Key words:
Lean management,
Service sector,
Waste,
Operational efficiency,
Service quality,
Technology,
Customer experience.

A B S T R A C T

The application of lean management principles in the service sector focuses on reducing waste and improving operational efficiency through time management, more effective resource management, and improved service quality. The service sector has unique challenges because it is more difficult to measure compared to the manufacturing sector. In the service sector, waste is often not obvious, such as customer waiting times or inefficient interactions, which can reduce service quality. The application of lean requires adaptation to service characteristics and the development of more complex indicators to measure performance. With the use of technology, employee engagement, and the application of lean principles such as value stream mapping, companies can identify waste and improve service process flow. Successful lean application will improve operational efficiency and service quality, which in turn will improve customer satisfaction and the company's competitiveness in an increasingly competitive market.

INTRODUCTION

As the industry becomes development competitive, many sectors are striving to reduce waste and improve operational efficiency, including the service sector. Lean management, which was originally applied in the manufacturing sector, is now being applied in various other sectors, including the service sector, to optimize processes and reduce waste. The concept of lean management focuses on maximizing value for customers by minimizing all forms of waste in every process (Gladysz et al., 2020). The application of lean principles is expected to improve operational performance, reduce unnecessary costs, and ultimately improve customer satisfaction (Vignesh et al., 2016). Lean application in the service sector faces different challenges compared to manufacturing, which need to be identified and addressed for optimal results.

The application of lean management principles in the service sector has great potential to improve efficiency and productivity, but it is not free from various obstacles. One issue that is often faced is the difficulty in identifying and eliminating waste that is not directly visible in the service process (Radnor & Osborne, 2013). Unlike the manufacturing sector, waste in the service sector is often abstract and more difficult to measure, such as waiting time, quality of interaction with customers, or queue management (Suárez-Barraza et al., 2012). Lean approaches in the service sector need to be adapted to be more effective and in line with the characteristics of the services provided.

One of the main problems in the application of lean management in the service sector is the difficulty in identifying waste in the service process. Waste in the service sector is often not physically visible, as in manufacturing, and engages variables that are more difficult to measure, such as service time, customer satisfaction levels, and the quality and quantity of interactions (Vignesh et al., 2016). This makes the implementation of lean principles in the service sector more complex as it must not only focus on reducing physical costs but also pay attention to quality and customer experience. A number of researches show that although lean principles can be applied in the service sector, the main challenge remains in how to detect and measure waste in a more abstract form (Stone, 2012). Lean approaches in the service sector require adaptation and innovation in service performance evaluation and measurement methods.

* *Corresponding author, email address:* ***dr.dididtarmawan@gmail.com***

The application of lean management in the service sector often has difficulties in maintaining a balance between efficiency and service quality. Many service companies focus on reducing costs and operational time without compromising customer satisfaction. While lean management aims to improve efficiency, sometimes an overemphasis on reducing time or costs can reduce the quality of interactions with customers or the overall service experience (Leite & Viera, 2015). In the service sector, aspects such as friendliness, empathy and responsiveness play an important role in shaping customer perceptions of service value. Efficiency achieved at the expense of these aspects can damage reputation and customer loyalty in the long run. Research by Womack and Jones (2003) suggests that lean implementation in the service sector requires a more effective approach that emphasizes employee empowerment and improved customer value. Lean management is not only an efficiency tool, but also a strategy for continuous improvement of service quality and focusing on customer needs.

The application of lean management in the service sector is particularly relevant to observe as this sector is experiencing rapid growth and plays an important role in the global economy (Melović et al, 2016). The service sector, such as banking, healthcare, and transportation, is an integral component of society's daily life. With the increasing demand for fast, efficient, and quality services, the application of lean principles that focus on increasing value and reducing waste has become very relevant in responding to the demands of the times (Alsmadi et al., 2012). While this sector has great potential to improve efficiency, the application of lean management in it is often hampered by the characteristics of services that are more difficult to quantify and manage compared to the manufacturing sector (Helmold, 2020). Implementing lean in the service sector requires an approach that is tailored to the unique characteristics of each type of service. Further studies on the application of lean in the service sector can provide important insights into how the principles can be adapted and optimized to meet the challenges.

The aim of this research is to examine how lean management principles can be applied in the service sector to reduce waste and improve operational efficiency, taking into account the different characteristics of services from the manufacturing sector. The research aims to identify the challenges faced in the application of lean in the service sector and examine ways to customize lean approaches to be more effective in improving service quality and customer satisfaction, without sacrificing efficiency.

RESEARCH METHOD

The literature study approach to examine the application of lean management principles in the service sector aims to analyze various relevant sources to understand how lean is applied in this sector and the challenges faced. The literature study engaged the collection, analysis and synthesis of information from various journals, books, reports and articles that discuss the application of lean management in the service sector. This method provides a comprehensive overview of lean application in the service sector by combining findings from various existing studies. This is important because the service sector has very different characteristics from the manufacturing sector, and not all lean principles can be applied directly without adaptation. This research also highlights how lean approaches can be adapted to the specific needs and challenges that exist in the service sector (Liker, 2004).

In this research, a literature study approach is used to dig up and critique various lean management implementation methods, strategies, and results that have been discussed in the existing literature. Previous research has shown that lean application in the service sector often requires a more flexible approach that is based on industry-specific needs, such as the healthcare, banking, and transportation sectors. By analyzing the existing literature, this research seeks to provide a deeper understanding of how lean principles can be used to improve operational efficiency, as well as identify waste in the service sector that may not always be immediately apparent. It can also provide insight into how companies in the service sector can adapt and implement lean principles effectively (Seddon, 2003).

RESULT AND DISCUSSION

Over time, the service sector has developed and become more complex, with a variety of challenges. The application of lean management in this sector leads to cost and time reduction, and focuses on creating greater value for customers (Schuh & Stüer, 2012). Through the right approach, the service sector can optimize their processes by eliminating waste, improving collaboration between employees, and using the right technology to support efficiency (Chandran & Saleeshya, 2020). Service companies that successfully adopt lean tend to be more adaptive to market changes and have a stronger competitive advantage (Leyer et al., 2015). This discussion will dig deeper into how the application of lean principles in the service sector can bring significant changes in operations and customer satisfaction.

The application of lean management principles in the service sector can reduce waste and improve operational efficiency, while a major challenge lies in the characteristics of services that are more difficult to measure compared to the manufacturing sector (Seman et al., 2020). In the manufacturing sector, waste is often easier to recognize and measure, for example in the form of wasted time, excess inventory, or inefficient processes. In the service sector, waste is often more abstract, such as customer waiting time, inefficient interactions, or inconsistent service quality (Kocerova et al., 2022). Additional challenges arise because service outcomes cannot always be measured by uniform standards, and customer perceptions of service quality can vary widely. The application of lean in the service sector requires adaptation to the characteristics of service processes that are more dynamic and based more on human interaction (Womack & Jones, 2003).

One important aspect of the application of lean management is the understanding and identification of waste, which includes unnecessary time, costs, and resources (Mahendran et al., 2018). In the service sector, waste can be seen in terms of time wasted while customers wait, protracted administrative processes, or even in the form of dissatisfaction felt by customers due to poor interactions (Siregar & Samodra, 2021). Using lean principles to identify and reduce this waste can improve operational efficiency, deliver more value to customers, and at the same time, reduce unnecessary costs (Helmold, 2020). For example, in the financial services sector, the use of technology to automate processes can reduce the time wasted in processing transactions, further improving efficiency (Stone, 2012).

The application of lean in the service sector also engages in identifying the value offered to customers and focusing on creating that value by eliminating steps that do not directly contribute to the end result. Value in this context is defined as anything that customers truly value, such as speed of service, accuracy of diagnosis, or comfort when receiving care (Smith, 2010). This is particularly relevant in the healthcare sector, where doctors' and nurses' time is valuable and should be optimally utilized. In this sector, wastes that need to be eliminated could include time wasted due to long queues, disorganized processes, or lack of coordination between medical staff (Parkhi, 2019). Lean principles such as "value stream mapping" can be used to analyze and optimize each step in the service process, reduce waste, and improve the quality of service provided (Liker, 2004). Lean not only improves operational efficiency, but also contributes to the achievement of key Health sector goals.

Measuring wastage in the service sector is not an easy task. Measurement of wastage in the service sector is challenging due to the intangible nature of the output and is highly influenced by customer perception (Rosa & Broday, 2018). Compared to manufacturing, where physical output can be measured easily, the service sector faces greater challenges in identifying elements that need improvement (Krishnan & Parveen, 2013). For example, the quality of customer service or user experience cannot be measured with numbers directly, and is more subjective. To overcome this challenge, service companies often have to develop performance indicators that are more complex and based on long-term outcomes, such as customer satisfaction or customer retention rates (Seddon, 2003). Lean approaches in the service sector require customization to be more relevant to the characteristics of this sector. The focus extends beyond process efficiency to a deep understanding of customer needs and expectations.

Lean processes also demand improved employee engagement in decision-making to identify waste and design solutions. In the service sector, where interaction with customers is critical, employees who interact directly with customers often have insights that are very useful for improving processes (Salam & Khan, 2016). They are often an invaluable source of information for identifying non-value-added activities and providing concrete input on process improvements. In this case, the application of lean in the service sector requires the establishment of cross-functional teams capable of assessing and eliminating waste at every stage of the service flow. For example, in the hospitality industry, more efficient check-in management by reducing unnecessary steps can improve customer satisfaction while reducing time wastage (Womack & Jones, 2003).

The use of technology also plays an important role in the application of lean in the service sector. Technology can automate processes that used to take a lot of time, such as data processing or inventory management. In the logistics sector, for example, the use of automated tracking systems can reduce time wasted in the distribution process and inventory management. By reducing human intervention in administrative tasks, resources can be redirected to more important tasks and focused on customer value (Bicheno & Holweg, 2009). Technology not only improves operational efficiency, but also enables more accurate performance measurement, providing better insight into wastage that needs to be corrected (Nascimento et al., 2019). Data generated from various digital systems can be analyzed to evaluate process effectiveness, identify waste, and design evidence-based improvement solutions.

The application of lean in the service sector is not just about reducing time or costs, but also engages efforts to maintain high service quality. In the service sector, the value provided to customers is highly dependent on the quality of the interactions that take place, and wastage that occurs in the form of time or poor experiences can lower the overall quality of service (Gupta et al., 2016). It is important for organizations to maintain a balance between efficiency and quality in the application of lean principles. In the education sector, for example, while efforts to reduce waiting times or administrative processes are important, the quality of teaching and interactions between teachers and students should remain a top priority (Seddon, 2003). The application of lean in the service sector can be designed to reduce waste, maintain and improve service quality.

One more challenge in the application of lean management in the service sector is resistance to change. In sectors that rely on human interaction, such as hospitality or healthcare, the application of lean principles often requires a profound change in organizational culture. Employees who have become accustomed to traditional ways of working may find it difficult to adopt new methods or feel that the changes threaten their role in the organization. For this reason, it is important for management to provide appropriate training and create a culture that supports sustainable repair (Bicheno & Holweg, 2009). A good understanding of the benefits of lean can help reduce resistance and encourage employees to more actively participate in the change process.

It is also important to consider the adaptation of lean principles in the service sector taking into account the uniqueness of each sector. Lean is essentially a flexible framework, but its success depends largely on how its basic principles are translated into different operational contexts. In the education or healthcare sector, for example, the application of lean may engage changes to the way learning is delivered or patient management, which requires a different approach from other service sectors such as restaurants or banking. There is a need to adjust the method to not only focus on efficiency, but also on the long-term impact on service quality and user satisfaction. An overly rigid approach may not be suitable for these sectors, so there needs to be flexibility in the way lean is applied to suit the needs and objectives of each sector (Liker, 2004). By understanding the uniqueness of each sector, lean can be adapted intelligently to deliver real improvements without compromising the quality or core values of the services provided.

The application of lean management in the service sector has great potential to improve efficiency and reduce waste, but its success depends largely on the organization's ability to adapt lean principles in a way that suits the characteristics of the service (Smith et al., 2018). While the service sector faces more complex challenges compared to manufacturing, the application of lean principles can have a significant impact on improving service quality, operational efficiency, and customer satisfaction if done with the right approach (Kanakana, 2013). It is important for organizations to understand that lean implementation in the service sector is not just about cost reduction, but also better management of customer experience. Thus, the application of lean management in the service sector, while fraught with challenges, offers great potential for improving efficiency and reducing waste. The service sector has unique characteristics that make the application of lean principles more complex, but this does not reduce its effectiveness in improving operations (Damrath, 2012). In sectors that prioritize customer interaction and experience, such as hospitality or healthcare, lean management provides opportunities to repairing processes without sacrificing quality. The key lies in the flexibility to adapt lean principles to suit the dynamics of the service sector (Alalawin et al., 2022).

For the application of lean to be successful, companies need to overcome barriers that arise, such as resistance to change or difficulty in measuring invisible waste. With a strong commitment from management and active participation from employees, the implementation of lean management in the service sector can help create more efficient processes, reduce waste, and ultimately improve service quality and customer satisfaction. Waste often cannot be seen in physical form, so it requires more precise measurement tools and approaches, such as direct observation, customer interviews, or analysis of user experience data. Ultimately, the application of lean in the service sector is not just about operational efficiency, but also creating more value for customers which is the main key to business success in this increasingly competitive world. Lean should be viewed as an overarching strategy to create a better customer experience. When service processes become smoother and barrier-free, customers experience immediate benefits that increase their satisfaction and loyalty. In an increasingly competitive and customer experience-oriented business world, proper lean implementation can be a strategic advantage that differentiates a company from competitors, making efficiency and quality two sides of one success.

CONCLUSION

The application of lean management principles in the service sector has proven effective in reducing waste and improving operational efficiency. While the service sector has unique challenges that are not as easily quantifiable as those in the manufacturing sector, the lean approach can still be applied with adjustments to the more abstract characteristics of services. With a focus on eliminating waste, managing time, and improving service quality, lean management has the potential to deliver more value to customers and improve their satisfaction. This approach allows organizations to manage time and resources more carefully, while still maintaining service quality. Technology and active participation from employees are important factors in the successful application of lean in the service sector. By encouraging cross-functional collaboration and building a culture of continuous improvement, service organizations can maximize the benefits of lean, create leaner processes, and deliver more value to customers.

The application of lean management in the service sector has important implications for operational management in various industries, such as healthcare, hospitality, and banking. Unlike manufacturing, processes in the service sector rely heavily on human interaction and customer experience, so waste is often invisible. To achieve maximum efficiency, companies must be able to identify and reduce waste that is not directly visible in the service process flow. This requires close collaboration between technology, human resources, and procedures that have been well adapted for the service sector. The successful application of lean will encourage changes in organizational culture that are more oriented towards efficiency and improving service quality, which can further improve the company's competitiveness in the market. In the long-term, companies that successfully adopt lean in the service sector are able to provide fast, accurate, and satisfying services in the midst of increasingly competitive market competition.

For the smooth implementation of lean management in the service sector, it is recommended that companies first conduct training for employees to understand the basic principles of lean and how to identify waste in the services provided. It is important to develop a measurement system suitable for the service sector, which does not only rely on numbers but also includes aspects of customer experience and service quality. The application of technology that can automate administrative processes and improve communication between cross-functional teams also needs to be considered to accelerate lean adoption in the organization.

REFERENCES

Alalawin, A., Qamar, A., AlAlaween, W., Bentahar, Y., Al-Halaybeh, T., Al-Jundi, S., & Tanash, M. (2022). Aligning Key Performance Indicators with Lean Management in the Service Sector: A Case Study for a Jordanian Telecommunication Company. *Cogent Engineering*, 9(1), 1-19.

Alsmadi, M., Almani, A., & Jerisat, R. (2012). A Comparative Analysis of Lean Practices and Performance in the UK Manufacturing and Service Sector Firms. *Total Quality Management & Business Excellence*, 23(3-4), 381-396.

Bicheno, J., & Holweg, M. (2009). *The Lean Toolbox: The Essential Guide to Lean Transformation*. PICSIE Books.

Chandran, A., & Saleeshya, P. G. (2020). Productivity Improvement Through Lean Initiatives: A Service Sector Case Study in India. *International Journal of Business Innovation and Research*, 22(2), 208-228.

Damrath, F. (2012). Increasing Competitiveness of Service Companies: Developing Conceptual Models for Implementing Lean Management in Service Companies. *Independent Thesis Advanced Level*, KTH Royal Institute of Technology.

Gladysz, B., Buczacki, A., & Haskins, C. (2020). Lean Management Approach to Reduce Waste in HoReCa Food Services. *Resources*, 9(12), 1-20.

Gupta, S., Sharma, M., & Sunder M, V. (2016). Lean Services: A Systematic Review. *International Journal of Productivity and Performance Management*, 65(8), 1025-1056.

Helmold, M. (2020). Basics in Lean Management. *In Lean Management and Kaizen: Fundamentals from Cases and Examples in Operations and Supply Chain Management*. Springer International Publishing.

Helmold, M. (2020). Lean Management in the Service Industry. *In Lean Management and Kaizen: Fundamentals from Cases and Examples in Operations and Supply Chain Management*. Springer International Publishing.

Kanakana, G. M. (2013). *Lean in Service Industry*. Southern African Institute of Industrial Engineering.

Krishnan, V., & Parveen, C. M. (2013, July). Comparative study of lean manufacturing tools used in manufacturing firms and service sector. *In Proceedings of the world Congress on Engineering*, 1, 01-05.

Kocerova, S., Kalkis, H., & Roja, Z. (2022). Possibilities of Using Lean and Efficiency Improvement Methodologies in Service Area. *In Social and Occupational Ergonomics*. Applied Human Factors and Ergonomics (AHFE) International.

Leite, H. D. R., & Vieira, G. E. (2015). Lean Philosophy and its Applications in the Service Industry: A Review of the Current Knowledge. *Production*, 25(3), 529-541.

Leyer, M., Vogel, L., & Moormann, J. (2015). Twenty Years Research on Lean Management in Services: Results from a Meta-review. *International Journal of Services and Operations Management*, 21(4), 389-419.

Liker, J. K. (2004). *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. McGraw-Hill.

Mahendran, S., Senthilkumar, A., & Jeyapaul, R. (2018). Analysis of Lean Manufacturing in an Automobile Industry – a Case Study. *International Journal of Enterprise Network Management*, 9(2), 129-142.

Melović, B., Mitrović, S., Zhuravlev, A. Yu., & Braila, N. (2016). The Role of the Concept of Lean Management in Modern Business. *In MATEC Web of Conferences*, 86, 05029.

Nascimento, D. L. M., Alencastro, V., Quelhas, O. L. G., Caiado, R. G. G., Garza-Reyes, J. A., Rocha-Lona, L., & Tortorella, G. (2019). Exploring Industry 4.0 Technologies to Enable Circular Economy Practices in a Manufacturing Context: A Business Model Proposal. *Journal of manufacturing technology management*, 30(3), 607-627.

Parkhi, S. S. (2019). Lean Management Practices in Healthcare Sector: A Literature Review. *Benchmarking: An International Journal*, 26(4), 1275-1289.

Radnor, Z., & Osborne, S. P. (2013). Lean: A Failed Theory for Public Services? *Public Management Review*, 15(2), 265-287.

Rosa, A. C. M., & Broday, E. E. (2018). Comparative Analysis between the Industrial and Service Sectors: A Literature Review of the Improvements Obtained through the Application of Lean Six Sigma. *International Journal for Quality Research*, 12(1), 227.

Salam, M. A., & Khan, S. A. (2016). Value Creation Through Lean Management: A Case Study of Healthcare Service Operations. *International Journal of Services and Operations Management*, 25(3), 275-293.

Schuh, G., & Stüer, P. (2012). Framework for Lean Management in Industrial Services. *In Advances in Production Management Systems. Competitive Manufacturing for Innovative Products and Services: IFIP WG 5.7 International Conference, APMS 2012, Rhodes, Greece, Revised Selected Papers, Part II*. 392-398.

Seddon, J. (2003). *Freedom from Command and Control: Rethinking Management for Lean Service*. Productivity Press.

Seman, N. A., Hatta, Z. N. M., Kamaruddi, N. K., Mustaffa, F. Y., & Ahmad, N. (2020). The Relationship between Lean Management Practices and Operational Performance in Service Sector. *Solid State Technology*, 63(3), 1879-1890.

Siregar, M., & Samodra, G. Y. (2021). Analysis of Service Delivery Improvement of Manufactured Products with Lean Method Management. *Journal of Management Science & Engineering Research*, 3(2), 26-30.

Smith, A. D. (2010). Service Quality Programme Developments and Lean Management Aspects: A Multi-case Study. *International Journal of Services and Operations Management*, 7(1), 1-23.

Smith, M., Paton, S., & MacBryde, J. (2018). Lean Implementation in a Service Factory: Views from the Front-line. *Production Planning & Control*, 29(4), 280-288.

Stone, K. (2012). Lean Work in Services: The Role of Lean in Service Delivery Processes. *Journal of Service Management*, 23(3), 340-364.

Suárez-Barraza, M. F., Smith, T., & Dahlgaard-Park, S. M. (2012). Lean Service: A Literature Analysis and Classification. *Total Quality Management & Business Excellence*, 23(3-4), 359-380.

Vignesh, V., Suresh, M., & Aramvalarthan, S. (2016, September). Lean in Service Industries: A Literature Review. *In IOP conference series: materials science and engineering*, 149(1), 012008

Womack, J. P., & Jones, D. T. (2003). *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. Simon & Schuster.

***Radjawane, L. E., D. Darmawan, & J. R. Varela. (2022). Application of Lean Management Principles to Reduce Waste and Improve Operational Efficiency in the Service Sector, *Journal of Social Science Studies*, 2(2), 261 – 266.**