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Lean Municipality: Case Studies, Practical Applications, and a Comprehensive Literature Review within Bibliometric Analysis

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Abstract: This article explores the fundamental principles, practical applications, and case studies of Lean Municipalism. It illustrates how this management model can optimize the operational processes of municipalities, improving service quality and resource efficiency. The study provides insights into the successes, challenges, and best practices for implementing lean principles in local governments by examining various case studies from countries such as the United States, Germany, Norway, and Türkiye. Comprehensive literature review complements these cases, helping local governments and researchers better understand the opportunities lean management offers. A bibliometric analysis method was employed to identify research trends and critical findings, systematically evaluating academic articles on lean municipalism from databases such as Web of Science. This research aims to serve as a valuable resource for promoting sustainable and effective management models, highlighting the potential benefits and practical considerations of Lean Municipalism for local governments and academics, and providing actionable insights for its implementation.

Keywords: Lean Municipality; Lean Management; Service Quality; Bibliometric Analysis

1. Introduction

Lean municipalism is a strategic approach adopted by local governments today to cope with resource constraints and increase service expectations [1]. This management model primarily aims to maximize customer value, reduce waste, and encourage employee engagement [2, 3]. Lean municipal practices can improve service quality, reduce costs, and increase citizen satisfaction.

Lean municipalism focuses on identifying and eliminating unnecessary activities by analyzing business processes. This approach can help municipalities deliver their services faster and more efficiently. At the same time, by increasing employee involvement, it aims to consider municipal employees' views and support their efforts toward continuous improvement [4].

Many municipalities worldwide have achieved significant success by adopting lean municipal principles. For example, in Japan, Toyota's lean manufacturing principles are effectively used in municipal service delivery. In the United States, many municipalities have adopted lean municipalism practices to optimize business processes and provide more effective services [5].

This study aims to understand how these principles can improve municipalities' performance, service quality, and citizen satisfaction by examining the impact of lean municipal practices on local governments in detail.

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2. Conceptual Dimension of Lean Thinking

Lean thinking is a business management system that originated in Japan and has attracted much global attention. This system aims to eliminate non-value-creating activities and minimize potential problems by ensuring that processes are simple, unpretentious, and waste-free [6]. Its main objective is to use a minimum number of resources and deliver these resources to the customer on time and in a way that meets expectations [7]. Lean was first used in the manufacturing sector, but it has also been effectively applied in other sectors over time. Developed in a period of economic and social difficulties in Japan, lean emerged to overcome these difficulties and to ensure effective functioning [8].

Lean management techniques allow businesses and organizations to improve their business processes with a perspective focused on value creation. These techniques offer a different approach from the short-term solutions businesses often resort to when facing financial problems [9]. The lean approach carefully reviews business processes to reduce waste and optimize processes [10].

Thus, it aims to meet the expectations of both the organization and the customer and focuses on increasing the long-term sustainability of businesses.

Lean thinking plays a critical role in increasing businesses' competitive advantage in times of crisis and challenging situations. While businesses facing financial difficulties often turn to short-term solutions, lean businesses stand out because they focus not only on financial fixes but also on value-creation principles. This approach enables businesses to gain a competitive advantage and achieve sustainable success. Lean thinking allows businesses to pursue excellence with a value creation-oriented perspective so that they can be managed effectively even in challenging times [11].

2.1. The Quest for Excellence and Lean Transformation

The pursuit of excellence is an essential strategic approach where businesses aim not only to increase their profitability but also to maximize customer satisfaction. For the practical realization of this pursuit, lean transformation plays a vital role in today's competitive business environment. Transitioning from lean production to lean management allows organizations to create positive impacts. In this era of fierce competition, businesses are testing different management models to minimize waste and meet customer expectations quickly and with high quality [12].

Lean management is a technique that enables businesses to focus on the pursuit of excellence. When a business or organization faces financial problems, it often seeks short-term solutions. A range of actions are considered, from laying off workers to closing and selling off unprofitable parts. However, the main feature that distinguishes lean businesses from others is the adoption of value creation as a fundamental principle. Organizations overcome financial problems and gain an edge over their competitors. Lean transformation solves existing problems and points to a continuous pursuit of excellence [13]. Many businesses that have achieved this have experienced the lean transformation journey.

Lean Transformation is a transformation process that organizations adopt to increase their effectiveness and meet customer expectations at the highest level in today's highly competitive environment. The transition from lean production to lean management models aims to improve not only an organization's internal functioning but also customer satisfaction and value creation processes [14]. To improve the efficiency of business processes, lean transformation of an organization involves reducing waste and making business processes more efficient and effective. In this process, organizations often shift to a customer-centric perspective, focusing on understanding customer expectations and developing strategies to meet them best. Lean transformation is an approach that aims to provide a competitive advantage by increasing quality and efficiency within the organization and in customer relations [15].

Lean transformation drives businesses and organizations to continuously improve, offering a strategic way to gain a competitive advantage. This approach aims to be a pioneer in delivering value to the customer, not only internally but also along the entire value chain. In this way, organizations can achieve success from a financial perspective and from the perspectives of customer satisfaction and continuous improvement [16].

Lean thinking is an organization's journey of cultural transformation in pursuit of excellence. This journey includes lean manufacturing principles such as value stream analysis, Kaizen, and 5S methodologies. At the same time, this study will also discuss the lean office.

2.2. Value Stream Analysis

The value stream covers the entire product lifecycle, from the product's design to delivery. Lean techniques such as value stream mapping can visually map the entire product flow. Once the value stream is mapped, finding and minimizing non-value-adding steps is easier. Creating continuous and efficient product flow requires the uninterrupted passage of products from production to transportation, which can be achieved by strategically organizing the workspace. A well-organized workspace will result in shorter production times, less inventory size, and less material handling [17]. Value Stream Analysis helps businesses meet customer expectations most effectively by minimizing process waste. This analysis supports the pursuit of excellence and emphasizes the principle of value creation at work. This approach allows businesses to gain short-term and long-term competitive advantages [18].

As a first step in implementing value stream analysis, the business processes should be detailed. This mapping process is critical to visually understanding all the business operations and identifying the value stream. Once the value stream is mapped, strategic improvements can be made to identify and reduce non-value-adding steps [19]. To apply value stream analysis, it is necessary to analyze the business processes in detail, identify waste, and eliminate it effectively [20].

Value Stream Analysis provides a solid foundation for maintaining order and cleanliness in the workplace, using resources more effectively, and managing business processes transparently [21]. It also helps businesses to focus on long-term sustainability and success rather than just focusing on short-term goals. Therefore, it is applied as a strategic tool for businesses to survive and

thrive in a competitive world [22]. Businesses that adopt this basic principle manage Kaizen processes more effectively.

2.3. Kaizen

Kaizen is a Japanese term derived from the words "change" and "good" and means "continuous improvement for the better". This philosophy aims to continuously improve all business functions or processes and involve employees at all levels in this process. Although the history of Kaizen originated in Japan, today, it has had a global impact [23].

Kaizen aims to improve workplace processes through small but continuous changes. While this strategy aims to achieve significant results in the short term, it aims to achieve sustainable improvements in the long term [24]. The benefits of Kaizen include reducing workplace waste, increasing productivity, and responding to customer expectations faster and with higher quality [25].

Kaizen's focus on the philosophy of continuous improvement strengthens the culture of value creation. It encourages businesses to think not only about their current situation but also about how they can continuously improve it [26]. In this way, organizations gain competitive advantage by creating a culture of change and improvement.

Another essential element that Kaizen emphasizes is the human element. Kaizen emphasizes the participation and contribution of employees at all levels [27]. It believes that the ideas of everyone involved in business processes are valuable and, therefore, encourage teamwork. This enables the workforce to identify and implement potential improvements in business processes [28].

The two main approaches of Kaizen are:

- Individual-Focused Efforts (Kaizen): This approach envisages that each employee individually takes responsibility for continuous improvement. Small, day-to-day changes and improvements, combined with the contribution of many individuals, can have a significant overall impact [29].
- Kobetsu Kaizen: This approach targets significant losses within the business. It is based on predetermined strategies and aims for low-cost, high-return improvements. Kobetsu Kaizen is focused on achieving clear and measurable results [30].

Both approaches incorporate the basic principles of Kaizen and provide a flexible application for the different needs of businesses.

The Impact of Kaizen on business processes contributes to the competitive advantage of businesses by optimizing not only product or service quality but also working environments and processes [31]. While this method encourages businesses to make improvements continuously, it can allow them to achieve maximum efficiency when used in combination with other practical tools, such as the 5S methodology.

2.4. 5S Methodology

5S, a primary method of maintaining order and cleanliness in the workplace, means "sorting, organizing, cleaning, standardization and discipline" in Japanese. This methodology provides physical order and aims to reduce waste by optimizing business processes [32]. The deliberate sequencing, organizing, and cleaning of each element and process in the workplace helps to increase the effectiveness of the work environment [33]. Adopting standardized procedures and maintaining discipline is crucial for the sustainability of this order. In this way, the 5S methodology can be applied as a method that increases productivity in the workplace while at the same time supporting employees to perform their work in a more organized and effective way.

- Sorting (Seiri): As a first step, unnecessary equipment, materials, and documents in the workplace are meticulously examined. Unnecessary items are removed to make the environment more organized [34].
- Organization (Seiton): The second step aims to have everything used in the workplace in a logical and accessible order. Necessary equipment and materials are placed in designated places, which speeds up the workflow [35].
- Cleaning (Seiso): Cleaning is not only limited to the physical environment; it also encompasses business processes and equipment. Cleaning practices improve quality by reducing waste in the workplace [36].
- Standardization (Seiketsu): In this step, sorting, organizing, and cleaning steps are standardized. The standards are set to ensure that processes and order are continuously maintained [37].
- Discipline (Shitsuke): The last step, discipline, aims to ensure that employees adhere to the set standards and methodology. This ensures the sustainable implementation of 5S and helps to transform it into a culture [38].

These steps of the 5S Methodology emphasize that order in the workplace is not only a physical concept but also a concept related to business processes and culture. This approach allows

businesses to achieve significant gains in terms of sustainability, productivity, and employee satisfaction. The 5S Methodology has a flexible approach that can be used not only in the manufacturing sector but also in office environments, healthcare, service sectors, and even home environments [39]. It can be applied in many different contexts, such as organizing documents in offices, standardizing sterilization procedures in the healthcare sector, or improving customer service processes in the service sector [40].

The 5S Methodology contains universal principles that are not specific to just one industry. This offers a significant advantage for organizations seeking to achieve order, cleanliness, and efficiency in any business environment. This methodology has the potential to transform the culture and processes of a business to deliver adaptable and sustainable improvement.

In addition to the many advantages of the 5S Methodology, it also contributes to corporate culture [33]. It also offers benefits in the following points.

- Agility and Flexibility: 5S offers the potential to make business processes more agile and flexible [41].
- Visual Management: Accelerates the flow of information using visual markings, standards, and color coding [34].
- Cost Reduction: Reducing waste and optimizing processes generally reduces costs [36].
- Training and Development: 5S can help employees adapt to processes and regulations more quickly [41].
- Employee Motivation: A clean, organized, and efficient work environment can increase employee motivation [31].
- 5S and Other Improvement Approaches: 5S can also be integrated with other continuous improvement methodologies [40].

5S provides a strong foundation for improving order, efficiency, and employee satisfaction in the workplace. Focusing on processes and business culture beyond physical order guides organizations toward a culture of sustainable improvement. When implemented efficiently, 5S reduces waste, minimizes errors, and can provide a competitive advantage by optimizing business processes [42].

However, for the 5S Methodology to be successful, it is essential to pay attention to factors such as management support, employee involvement, and continuous monitoring [43]. While this methodology strengthens the foundation of organizations, it may be helpful to use other lean tools to analyze and improve business processes in more depth as a next step.

2.5. Lean Office

Lean office refers to integrating lean management and production principles into the office environment. It is defined as a method that applies lean management principles, which aim to reduce waste in production processes, increase efficiency, and maximize customer value in office processes. Lean office eliminates activities that do not add value to business [44].

The lean office includes office processes, especially information processing, document management, customer service, human resources, and administration. Office production activities such as information processing, paper handling, correcting processing errors, meeting schedules, and meeting internal and external customer expectations are essential for office efficiency. The processes required to communicate customer orders and deliver a product or service are crucial to gaining and maintaining customer satisfaction in any business environment. Its main objective is to increase customer value by making business processes more effective, focusing on continuous improvement, and minimizing waste [45].

The experience of organizations that have adopted lean office principles proves that there are abundant opportunities to reduce office waste. Typical results include at least a 50% reduction in paper handling process flow time, dramatic reductions in space required, work transitions reduced from 50 to 5, and on-time performance improvements of up to 100% [46].

The lean office journey is a process that starts with the creation of a visual value stream map [47]. First, the team selects a service or product for analysis that can positively impact customers. Then, mapping the process helps the team and facilitators to understand and see the waste, paper handling, transitions, excess information flow, and quality gaps in the current process [48]. The current state map forms the basis for the subsequent discussion and analysis needed to name the processes that add value to the customer. From there, the team creates a future state map.

Lean office principles can be used in the office environment to increase efficiency in business processes, improve customer satisfaction, and reduce waste. These principles include vital principles such as visualizing processes, focusing on continuous improvement, reducing waste, and focusing on customer value. The main topics of lean office practices are as follows [49]:

- Visualizing Business Processes: The lean office emphasizes visually representing business processes. This is important to understand the process flow better and identify waste.
- Continuous Improvement: The lean office focuses on continuous improvement. Regularly reviewing and improving business processes can increase efficiency and reduce waste.
- Waste Minimization: Identifying and eliminating waste is the foundation of lean office practices. Reducing unnecessary steps and waiting times in business processes allows for more efficient use of resources.
- Focus on Customer Value: The lean office prioritizes customer value. Shaping business processes to meet customer expectations can increase customer satisfaction.
- Flexibility and Adaptability: The lean office encourages quick adaptation and flexibility to changing circumstances. This involves continuously optimizing office processes.

Lean office practices can help businesses create a more efficient, flexible, and customer-oriented office environment. Adopting these principles can be valuable for many organizations looking to improve their office processes and gain a competitive advantage.

2.6. Lean in the Service Sector

The service sector operates in a wide range of fields and has a structure based on customer satisfaction beyond offering products [50]. This field, which has various sub-sectors such as restaurants, hotels, financial services, and healthcare, aims to gain a competitive advantage by focusing on improving the quality of the customer experience. However, the nature of services brings some specific dynamics, and it is essential to apply lean principles in accordance with these dynamics [42].

The application of lean principles in the service sector has unique dynamics and challenges. In this context, the following are essential factors to consider for a successful lean transformation [51]:

- Flow and Efficiency-Driven Processes: Service organizations can improve customer experience by simplifying and streamlining their processes. Focusing on process flows is key to improving service quality by reducing waste [42].
- Variable Demand and Flexible Mapping: The service sector often experiences fluctuating demand. This can complicate the process of mapping process. Flexible mapping strategies enable more effective adaptation to changing demands [52].
- Leadership to Increase Employee Engagement: Lean thinking requires employee involvement in continuous improvement. Leaders can increase this involvement by guiding their employees and giving them more responsibility [53].
- Breaking Resistance to Challenges: Questioning and improving the value creation process may cause resistance from some employees. To overcome this resistance, leaders should create a culture that focuses on change and communicate openly with their employees [54].
- Openness to Measurement and Improvement: Measuring quality can be challenging in the service sector. However, it is essential to adopt an open attitude towards continuous measurement and improvement for successful lean practices [55].

Recognizing that the successful implementation of lean principles in the service sector is critical to increasing competitive advantage and customer satisfaction, leading organizations to adopt these principles and create a culture that focuses on continuous improvement and thus achieves sustainable success. The service sector has a prominent dynamism in terms of putting customer experience into the center and adapting quickly to ever-changing demands [56].

Similarly, public services have a structure that works based on citizen satisfaction and efficiency. In this context, lean thinking in the public sector can be used effectively in the field of municipalities, enabling services to be delivered in a more effective, transparent, and participatory manner. Lean municipalism stands out as a management model that supports sustainable urban life by adopting the principle of value creation within the framework of the mission of local governments to serve their communities.

2.7. Lean Municipalism

Municipalism is shaped by local governments' basic principles and missions in providing services to their communities. These principles include transparency, accountability, participation, and interactive management. Municipalities focus on the needs of local people and operate in areas such as urban planning, infrastructure development, environmental protection, transportation arrangements, and social services [57]. Municipalities support social equality and contribute to sustainable development goals by distributing public services fairly. They also play an active role in emergency management, crisis response, and security. Municipalities adopt various participation mechanisms to strengthen local democracy and encourage public participation. Thus, municipalities fulfill their

various duties and responsibilities to improve the welfare of society and ensure a sustainable urban life [58].

The main missions of municipalities include creating a sustainable environment by supporting urban planning and urban development, strengthening infrastructure, and providing services in areas such as clean water supply, waste management, and energy efficiency. They should also contribute to the social development of society by supporting social services such as education, culture, arts, and sports. Municipalities support entrepreneurship to revitalize the local economy, create jobs, and contribute to the development of trade [59]. Protecting public health and being prepared to deal with emergencies and epidemics are also essential responsibilities of municipalities. In addition, to strengthen local democracy, it is an essential goal of municipalities to ensure the participation of residents, listen to their views, and include them in management processes. This enables local governments to operate more transparently, accountable, and participatory [60].

On the other hand, lean municipalism takes basic municipal principles further and offers an approach focused on continuous improvement and efficiency. It enables municipalities to rigorously review their business processes and increase their capacity to deliver more effective services by reducing waste. By enabling more efficient use of resources, lean municipalism helps municipalities to add more value to society. Working effectively and efficiently allows municipalities to provide more comprehensive and quality services to their communities [61].

This approach also allows municipalities to communicate more interactively with citizens. The principles of lean municipalism enable them to more closely monitor the expectations and feedback of residents through digital platforms and interactive communication tools. In this way, municipalities can quickly identify social needs and implement solutions to address these needs more quickly [62].

The ability to respond to needs more quickly and effectively enables municipalities to provide more unique and personalized services to their communities. Services that are shaped in line with the demands and expectations of local people increase community satisfaction and support municipalities to achieve the goal of sustainable urban life more effectively. This enables municipalities to provide more valuable and responsive services by focusing not only on general service delivery but also on individual needs [60].

With lean municipalism, rigid hierarchy, bureaucracy, stationarism, and budgetary problems in municipalities are overcome. These developments enable municipalities to adopt a more flexible, fast, and participatory structure. Instead of rigid hierarchical structures, there is a tendency to adopt a more horizontal and interactive organizational structure. This strengthens municipalities' internal communication and supports rapid decision-making processes [46].

Bureaucracy and red tape issues are reviewed in line with the principles of lean municipalism. Simplifying processes and removing unnecessary bureaucratic obstacles allows municipalities to work more effectively. Furthermore, digitalization and the use of technology can minimize red tape and make business processes more efficient [63].

Lean municipalism involves adopting a more transparent and efficient approach to financial management. Optimizing resource use and avoiding waste can help municipalities make more effective use of limited resources, enabling them to provide better-quality services to their communities. In the following section of the study, we focus on case studies from the literature to understand the Impact of lean municipalism on all these elements.

3. Case Studies and Literature

Today, local government organizations face the dual challenge of diminishing resources and raising citizen expectations for high-quality services. To address these challenges, there is a growing need for practical problem-solving tools, as highlighted by various studies in the literature [64, 65, 66]. For instance, recent research examining lean implementation in the public sector reveals a range of perspectives and underscores the importance of clear communication and realistic expectations when introducing lean practices [67].

Case 1: Lean Implementation in Greek Public Service Organizations

- Problem: Greek public service organizations faced challenges in efficiency, staff engagement, and service quality. Differences in perceptions among employees regarding organizational size, hierarchical levels, skill sets, and sub-sectors further complicated the adoption of lean principles.
- Implementation: To assess the extent of lean adoption, a survey involving 1,022 public employees was conducted. The study aimed to identify how lean principles were perceived and implemented across various public service organizations [68].
- Results: The findings indicated a high level of lean principal adoption across Greek public organizations. However, there was room for further improvement, particularly in areas with varying perceptions based on organization size, hierarchical level, and sector.

- Analysis: This case underscores that while lean principles can be widely adopted, tailored approaches are needed to address the unique characteristics of different organizational structures and employee perceptions. Continuous training and a focus on specific sectors can enhance the effectiveness of lean implementation.

Case 2: A Small City in the United States – Improving Business Processes

- Problem: The local government unit of a small city in the United States faced inefficiencies in its business processes, negatively impacting service quality and citizen satisfaction.
- Implementation: A Lean Six Sigma approach was adopted, focusing on defining, measuring, analyzing, implementing, and controlling issues within the municipality's operations. This systematic planning process aimed to enhance process efficiency and improve service delivery [69].
- Results: Implementing lean municipalism resulted in a noticeable improvement in the efficiency of service delivery and a higher quality of services offered to citizens.
- Analysis: This case demonstrates that the structured application of Lean Six Sigma principles can be an effective means to address operational inefficiencies in local governments. It suggests the need for a comprehensive, data-driven approach when applying lean principles to public sector organizations.

Case 3: Lean Improvement Initiative in a German Municipality

- Problem: The main challenge in this municipality was the complexity of implementing lean practices in the public sector, including difficulties in changing management and ensuring the sustainability of improvements.
- Implementation: An action research methodology was utilized to evaluate a lean improvement initiative. The study specifically focused on project management experiences, incorporating elements of lean thinking, DMAIC project phases, and Six Sigma methodologies [70].
- Results: The findings revealed that implementing lean in the public sector is a challenging and time-consuming process. Change management and effective communication were identified as critical factors for success.
- Analysis: This case emphasizes that introducing lean practices in public sector organizations requires careful consideration of change management strategies. The complexity of public sector operations necessitates a flexible and adaptive approach, emphasizing ongoing communication and scientific support.

Case 4: Lean Municipalism in the Norwegian Municipal Sector

- Problem: The Norwegian municipal sector struggled with aligning lean implementation with organizational culture, employee engagement, and overcoming challenges in the implementation process, such as resistance to change and lack of top management support.
- Implementation: A survey was conducted to explore the perceived impacts of lean implementation, its alignment with organizational culture, and challenges encountered during the process [71].
- Results: Most respondents reported positive perceptions of lean's impact, indicating that lean is generally compatible with the organizational culture. However, the implementation process was marked by cultural challenges, resistance from employees, communication issues, and a lack of involvement from top management.
- Analysis: This case highlights the importance of cultural alignment and top management support in successfully implementing lean. Lean principles may align well with an organization's culture, but without strong leadership and employee engagement, implementation can remain superficial and ineffective.

Case 5: Lean Six Sigma in California State Government

- Problem: California's state government agencies faced inefficiencies in permitting processes, leading to delays and high operational costs.
- Implementation: In 2014, a Lean Six Sigma training program was introduced, focusing on streamlining the permitting process, particularly for managing the discharge of pollutants into water. The project involved several government agencies and aimed to reduce steps in the permitting process [72].
- Results: The initiative significantly reduced the number of steps in the permitting process and shortened the permit completion time. The department now completes 95% of permits in less than 45 days.
- Analysis: This case demonstrates the potential of lean principles in streamlining complex government processes. It indicates that training and process re-evaluation can yield significant efficiency gains, improving public service delivery.

Case 6: Wisconsin Department of Natural Resources

- Problem: The Department needed to reduce the workload, streamline permitting processes, and enhance efficiency, particularly in the wildlife service permit process.
- Implementation: A detailed value stream mapping was conducted to identify wasteful steps in the process. The Lean project focused on simplifying procedures, eliminating non-essential steps, and reducing processing times [73, 74].
- Results: Over six months, the department halved the staff workload for each permit and reduced lead time from seven days to two days. Customer satisfaction also significantly improved.
- Analysis: This case shows the efficacy of value stream mapping in identifying and eliminating inefficiencies. It underscores the importance of customer satisfaction as a key performance indicator when implementing lean practices in public services.

Case 7: Lean Transformation in Melbourne

- Problem: The City of Melbourne aimed to enhance service quality across various government departments, especially high-volume services like permitting.
- Implementation: In 2009, Melbourne adopted a Lean transformation strategy to streamline operations, reducing waiting times for various permits [75].
- Results: The implementation reduced the wait time for street performer permits to zero and sports permits from six weeks to two weeks.
- Analysis: This case highlights how lean transformation in municipal services can significantly enhance responsiveness to community demands, indicating that even well-established processes can be optimized through lean practices.

Case 8: Bursa Metropolitan Municipality, Turkey

- Problem: Bursa Metropolitan Municipality faced the challenge of initiating lean practices to enhance operational efficiency and improve service quality.
- Implementation: The municipality implemented lean practices and basic lean training as part of a medium- and long-term transformation plan. Among over 250 lean tools, eight, including 5S, Kaizen, and A3 reporting, were identified as suitable for initial implementation [76, 77].
- Results: The implementation plan was built on existing process management, quality systems, and internal controls, aiming to bring about strategic and operational improvements.
- Analysis: This case indicates that even municipalities new to lean practices can benefit significantly from adopting tailored lean tools. It also emphasizes the importance of a strategic and phased approach to lean transformation in public services.

Overall Analysis and Insights

The case studies reveal that while Lean Municipalism can significantly enhance efficiency, streamline processes, and improve service quality, successful implementation depends on several factors. Key challenges include change management, employee engagement, top management support, and aligning lean principles with the organizational culture. Tailored strategies, effective communication, ongoing training, and scientific support are critical for navigating these challenges. Furthermore, focusing on measurable outcomes such as reduced processing times, increased customer satisfaction, and improved resource management showcase the tangible benefits of lean practices in public sector organizations.

3. Bibliometric Analysis

This study includes a comprehensive literature review to help local governments and researchers better understand the opportunities offered by lean manufacturing principles and optimize community-oriented management strategies. The bibliometric analysis method was preferred to achieve this objective. This method helps to identify new trends and areas of focused interest through a systematic review of the existing scientific literature. Bibliometric analysis identifies research trends and essential findings by evaluating academic articles published on lean municipalism and management. This analysis used data from academic databases such as Web of Science.

In the analysis process, articles published on related topics were scanned using predetermined keywords, and those that met specific criteria were selected. The bibliographic information of the selected articles, such as publication date, journal name, authors, and number of citations, were collected and analyzed.

The results of the bibliometric analysis highlight current research trends, prominent topics, and key findings in the field of lean municipalism, aiming to provide a guiding resource for managers and researchers.

Data Collection Process

The leading academic database, Web of Science, was used for bibliometric analysis. This database provides access to academic articles published worldwide in a variety of disciplines. It

also provides access to articles published in leading journals in the field of science and technology, which makes it possible to perform a comprehensive bibliometric analysis of academic articles related to customer-oriented manufacturing. The "biblioshiny" library of R-Studio software was used for data analysis. The "biblioshiny" library is a tool for bibliometric analysis. This library provides an interactive interface for analyzing, visualizing, and reporting bibliometric data [78]. Using this tool, researchers can perform citation analysis of articles, examine publication trends, and identify keywords in the literature [79].

Data Collection and Analysis

At this stage, a search on Web of Science on April 29, 2024 with the code "TS=("Lean Municipality" OR "Lean Government" OR "Lean Administration" OR "Lean Public Sector" OR "Lean Governance" OR "Lean Local Government" OR "Lean City" OR "Lean Town" OR "Lean Municipality" OR "Lean County" OR "Lean District" OR "Lean Urban Management") yielded 49 documents.

The diversity of the documents considered in the analysis is also essential; these are 24 articles, 19 papers, one article-book chapter, two book reviews, and three reviews. This shows that the topic is addressed from different angles and covered in various types of publications.

In terms of authors, there are a total of 144 authors in the analyzed documents, and 18.37% of these authors were involved in international cooperation. This shows that the issue is discussed on a global scale and that there is collaboration between different researchers (Table 1.).

Table 1. Basic Information of Data.

Information	**Results**
Time Interval	1995:2023
Sources (Journals, Books, etc.)	44
Documents	49
Annual Growth Rate %	4
Average Document Age	10,7
Average Number of Citations per Document	14,04
References	1745
DOCUMENT CONTENT	
Keywords (ID)	88
Author Keywords (DE)	176
AUTHORS	
Authors	144
Authors of single-author documents	16
AUTHOR COLLABORATION	
Single author documents	16
Average Co-Authors per Document	2,98
International authorship rate %	18,37
DOCUMENT TYPES	
Articles	24
Article; Book Chapter	1
Book Review	2
Declaration	19
Review	3

Table 1 provides an overview of the bibliometric data analyzed in the study, reflecting the foundational characteristics of research on Lean Municipalism. The data spans a broad time interval from 1995 to 2023, indicating sustained academic interest over nearly three decades. A total of 49 documents were analyzed, including articles, book chapters, and reviews, with an annual growth

rate of 4%, signifying consistent progress in the field. The average document age of 10.7 years and an average citation count of 14.04 per document suggest that the topic has achieved moderate academic attention, with several studies serving as influential references. Additionally, the bibliometric analysis identified 88 keywords and 176 author-provided keywords, illustrating the thematic diversity within the literature.

Table 1 underscores the growing and interdisciplinary nature of Lean Municipalism research. The data reflects an emerging yet impactful field, marked by international collaboration and thematic diversity, offering opportunities for further exploration and innovative contributions. To summarize, this bibliometric analysis indicates that the topic of "Lean Municipalism" has an essential place in literature and an exciting research area. It draws attention as an area where different resources and collaborations are available for researchers. Building on the foundational insights provided in Table 1, the keyword cloud in Figure 1 further illustrates the thematic landscape of Lean Municipalism research, offering a visual representation of the most frequently explored concepts and emerging trends in the field.

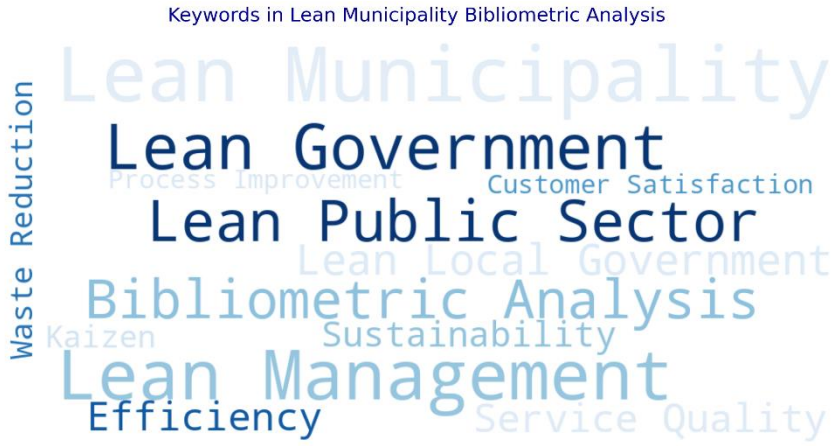

Figure1. Keyword Clouds

Figure 1 presents a keyword cloud highlighting the most frequently used terms in the bibliometric analysis of Lean Municipality studies. Prominent terms such as Lean Municipality, Lean Management, and Lean Government reflect the central focus of the literature, emphasizing efficiency, sustainability, and service quality in municipal operations. Methodological terms like Bibliometric Analysis and Kaizen indicate the tools and frameworks applied, while concepts like Process Improvement and Customer Satisfaction underscore the field's emphasis on citizen-centered governance. This visualization succinctly captures key research themes, aiding in identifying both established trends and potential research gaps.

These findings help us understand the global distribution and concentration of research, and in the following section, we will examine in more detail the impact of geographic diversity on Lean Municipality studies.

Figure 1 presents a keyword cloud highlighting the most frequently used terms in the bibliometric analysis of Lean Municipality studies. Prominent terms such as Lean Municipality, Lean Management, and Lean Government reflect the central focus of the literature, emphasizing efficiency, sustainability, and service quality in municipal operations. Methodological terms like Bibliometric Analysis and Kaizen indicate the tools and frameworks applied, while concepts like Process Improvement and Customer Satisfaction underscore the field's emphasis on citizen-centered governance. This visualization succinctly captures key research themes, aiding in identifying both established trends and potential research gaps.

These findings help us understand the global distribution and concentration of research, and in the following section, we will examine in more detail the impact of geographic diversity on Lean Municipality studies.

Table 2. Distribution by Countries

Country	Number
Germany	34
U.S.A.	26
United Kingdom	15
Czech Republic	9
Brazil	8
China	8
India	7
Netherlands	5
Croatia	4
Russia	4
Australia	3
Egypt	3
Israel	3
Kenya	3
South Africa	3
Denmark	2
Italy	2
Japan	2
Kuwait	2
Norway	2
Poland	2
Portugal	2
Saudi Arabia	2
Belgium	1

When Table 2, which shows the distribution of lean according to countries, is examined, it is seen that the highest number of publications is from Germany (34), followed by the U.S.A. and the United Kingdom with 26 and 15, and that research on this subject has been conducted in many countries of the world, but a limited number of resources have been reached in countries other than these three countries. According to these data, the fact that there are very few publications in this field in Japan, where the philosophy of "lean thinking" was born, may come to the fore as an issue that needs to be discussed.

Janssen and Estevez's study [80] "Lean government and platform-based governance- doing more with less" stands out as the most cited study in the bibliometric analysis. This study focuses on the efforts of governments to promote innovation while reducing costs, and in this context, it deals with the concepts of lean government and platform-based governance. The 198 citations indicate that this study is an essential reference in its field. Since issues such as lean management and platform-based governance are increasingly important in the field of public administration today, this study makes significant contributions to literature.

"Future carbon sequestration in Europe - Effects of land use change" by Schulp, Nabuurs, and Verburg, published in 2008 [81], examines future carbon sequestration in the European Union and assesses the effects of land use changes on carbon stocks. Its 179 citations in total emphasize the importance of this study in the field.

Hinkley's study "Structurally Adjusting: Narratives of a Fiscal Crisis in Four U.S. Cities," published in 2017 [82], examines structural adjustments to fiscal crises in four cities in the United States. It has 94 citations in total, making it an essential reference in urbanization and economics.

Scholl and AlAwadhi's 2016 study [83] "Smart governance as key to multi-jurisdictional smart city initiatives: The case of the eCityGov Alliance" analyzes smart city initiatives and focuses

on the importance of smart governance in developing smart cities. It has 54 citations in total, indicating that it is an essential study in smart city literature.

Scorsone's 2008 study "New development: What are the challenges in transferring Lean thinking to government?" addresses the challenges of transferring lean thinking to government [84]. The fact that it received 23 citations in total reflects the importance of this topic in the public administration literature.

Table 3. Publications by Number of Citations.

Title	Authors	Pub. Date	Citation	Journal
Lean government and platform-based governance-Doing more with less	Janssen, Marijn, & Estevez, Elsa	2013	198	Government Information Quarterly, 30(1), S1-S8
Future carbon sequestration in Europe - Effects of land use change	Schulp, C. J. E., Nabuurs, G. J., & Verburg, P. H.	2008	179	Agriculture Ecosystems & Environment, 127(3-4), 251-264
Structurally adjusting: Narratives of fiscal crisis in four U.S. cities	Hinkley, S.	2017	94	Social Science Information Sur Les Sciences Sociales, 54(9), 2123-2138
Smart governance as key to multi-jurisdictional smart city initiatives	Scholl, H. J., & AlAwadhi, S.	2016	54	Urban Studies, 55(2), 255-277
New development: What are the challenges in transferring Lean thinking to government?	Scorsone, Eric A.	2008	23	Public Money & Management, 28(1), 61-64

With these results, an understanding of the status of "Lean Municipalism" and related topics in literature has been created, and ideas for future studies have been formed. In addition, since it is a new topic in Turkey, it is a good area for researchers and managers.

4. Conclusions

This study evaluates the role and effects of lean municipalism in local governments, shedding light on how this management model can enhance transparency, operational efficiency, and service quality in municipalities. Lean municipalism is a transformative approach that is designed to maximize the use of limited resources, eliminate waste, and streamline municipal processes. Utilizing bibliometric analysis, this research identifies key trends in the field and underscores the significance of the Lean Government concept in enhancing citizen-centered governance and promoting sustainable development in the public sector.

The present study contributes to the theoretical foundation of Lean Municipalism by providing a comprehensive bibliometric analysis of academic literature on the topic. It highlights the evolving nature of the field and the growing interest in applying lean principles to local government operations. The findings underscore the significance of concepts such as efficiency, sustainability, and process improvement, while also emphasizing the role of methodologies like Kaizen in shaping lean governance strategies. Furthermore, this study introduces a new dimension to extend theories on public sector management, suggesting that Lean Municipalism could serve as a framework for improving municipal governance beyond traditional management models.

From a pragmatic standpoint, the present research offers significant insights for policymakers, municipal administrators, and local government practitioners. The findings suggest that lean municipalism has the potential to enhance the effectiveness of municipal management to a considerable degree, leading to cost savings, increased service quality, and improved citizen satisfaction. By adopting lean principles, municipalities can achieve better resource allocation, streamline operations, and foster a culture of continuous improvement. The case studies in the literature consistently demonstrate that municipalities that successfully implement Lean Municipalism can adopt a more customer-oriented approach, thereby improving service delivery and enhancing public trust. This renders the concept highly relevant for municipalities aiming to adapt to the challenges posed by an increasingly complex and resource-constrained environment.

Notwithstanding the valuable insights provided by this study, there are some limitations that must be acknowledged. Firstly, the bibliometric analysis is based solely on documents indexed in the Web of Science database, which may exclude relevant research published in other sources or regional journals. Furthermore, while the analysis encompasses a wide range of publications, it is possible that certain aspects of Lean Municipalism, such as its impact on specific public sector contexts or the challenges of implementation, were not fully explored due to the diversity of document types and geographical focus. Finally, the study does not explore the specific barriers to the

adoption of Lean Municipalism in different regions, particularly in countries with less developed governance systems.

In consideration of the encouraging potential of Lean Municipalism in optimizing municipal operations, several research avenues emerge. Primarily, further studies should investigate the contextual factors that influence the successful implementation of Lean Municipalism in different regions, especially in countries with less developed public sector systems. Research could also focus on the comparative analysis of lean practices in municipalities of varying sizes, structures, and governance models to identify best practices and adaptable strategies. Additionally, future studies should examine the long-term effects of Lean Municipalism on organizational culture and citizen engagement, particularly in terms of how lean practices can impact decision-making processes, public trust, and civic participation. Finally, researchers may consider exploring the integration of digital technologies, such as artificial intelligence and data analytics, into lean municipal management, to understand how these innovations can enhance the effectiveness of lean principles in modern governance.

In conclusion, it is evident that Lean Municipalism signifies a promising approach for municipalities aiming to enhance operational efficiency and service delivery. This study contributes to both theoretical and practical understanding of Lean Municipalism and provides a solid foundation for future research. As local governments continue to face mounting pressures to accomplish more with fewer resources, Lean Municipalism offers an innovative solution that has the potential to pave the way for more efficient, transparent, and citizen-centered governance.

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Data Availability Statement

The data supporting the findings of this study are available within the article and its supplementary materials. Further inquiries can be directed to the corresponding author.

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Conflicts of Interest

The author declares no conflict of interest.

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