

Implementation of Kaizen in Various Industries: A Systematic Literature Review

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Abstrak

Kaizen merupakan pendekatan strategis yang berfokus pada perbaikan berkelanjutan untuk meningkatkan efisiensi, kualitas, dan produktivitas organisasi. Artikel ini membahas implementasi Kaizen di berbagai sektor melalui tinjauan literatur terhadap 45 artikel yang dipublikasikan dari tahun 1996–2024. Penelitian ini bertujuan untuk mengidentifikasi penerapan, manfaat, serta tantangan Kaizen dalam beragam industri, baik manufaktur maupun jasa. Hasil tinjauan menunjukkan bahwa Kaizen telah diterapkan secara luas, terutama di sektor manufaktur (31 artikel), dengan penekanan pada metode seperti 5S, Kanban, dan siklus PDCA untuk mengurangi pemborosan sekaligus meningkatkan produktivitas. Penerapan Kaizen juga berkembang ke sektor non-manufaktur, seperti layanan kesehatan, pendidikan, dan sektor publik, di mana pendekatan ini berkontribusi terhadap efisiensi operasional serta peningkatan kualitas layanan. Namun, sejumlah tantangan seperti resistensi terhadap perubahan, keterbatasan sumber daya, dan kurangnya dukungan manajemen yang kerap menjadi hambatan implementasi Kaizen. Oleh karena itu, penelitian ini memberikan rekomendasi untuk mengembangkan pendekatan Kaizen yang lebih strategis dan adaptif dalam lingkungan bisnis modern, sehingga tetap relevan dan efektif sebagai alat manajemen di berbagai konteks industri.

Kata kunci: Kaizen, manufaktur, management tools, pemborosan, produktivitas, servis

Abstract

Kaizen is a strategic approach that focuses on continuous improvement to increase an organization's efficiency, quality, and productivity. This article explores the implementation of Kaizen in various sectors through a literature review of 45 articles published between 1996 and 2024. This research aims to identify the application, benefits, and challenges of Kaizen in various industries, both manufacturing and services. The results of the review show that Kaizen has been successfully applied in various sectors, especially manufacturing (31 articles), with a focus on methods such as 5S, Kanban, and the PDCA cycle to reduce waste and increase productivity. Additionally, the application of Kaizen has expanded to non-manufacturing sectors, such as healthcare, education, and the public sector, where this approach contributes to operational efficiency and improved services. However, challenges such as resistance to change, limited resources, and lack of management support often become obstacles to implementation. This study provides recommendations for the development of a more strategic and adaptive Kaizen approach in the modern business environment as a relevant and effective management tool in various industrial contexts.

Keywords: Kaizen, management tools, manufacturing, productivity, services, waste

1. Introduction

Kaizen is a strategic approach to achieving continuous improvement oriented towards increasing efficiency, quality and productivity in an organization. Kaizen focuses on a systematic series of steps to identify, analyze, and implement improvements, involving active participation from all levels of the organization (Gupta & Jain, 2014). This approach is used to create a work environment that supports innovation, reduces waste, and strengthens operational processes to generate greater added value for customers.

The main goal of Kaizen is to improve overall organizational performance by minimizing inefficiencies in processes and maximizing the potential of human resources (Alvarado-Ramírez et al., 2018). Implementing Kaizen not only has an impact on reducing costs and improving quality, but also encourages the creation of a work culture that focuses on learning and collaboration. Kaizen is consistently applied through tools and methods such as 5S, PDCA cycle, and root cause analysis, which is designed to ensure a structured and scalable approach.

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In its implementation, Kaizen has been widely adopted in various sectors, including manufacturing, health services, information technology, and education. However, the success of implementing Kaizen is highly dependent on several factors such as management support, employee involvement, technology readiness, and organizational cultural context. In addition, the dynamics of technological change and global competition require the development of a more adaptive Kaizen strategy to face modern challenges. This literature review aims to explore existing studies related to Kaizen implementation, identify barriers and opportunities, and evaluate its impact on organizations in various sectors. This article aims to make a scientific contribution by identifying research trends and proposing new directions for the development of Kaizen as a strategic tool in an ever-changing business era.

This research is essential as Kaizen has demonstrated significant benefits in enhancing efficiency, quality, and productivity across various industries. Despite its widespread adoption, challenges such as cultural adaptation, limited resources, and inconsistent management support hinder its full implementation, especially outside Japan. The rapid evolution of technology and global market dynamics further necessitate an adaptive and strategic application of Kaizen. A systematic review provides critical insights into how Kaizen is applied, its outcomes, and the barriers encountered. This study contributes to the development of a more resilient and future-ready Kaizen framework suitable for modern organizational needs.

2. Research Methods

This research aims to explore more deeply the implementation of Kaizen in various industrial sectors and business organizations. Research was carried out by searching for articles using the Google Scholar, Researchgate, ProQuest and Elsevier databases. This database was chosen because it provides open access services and quality articles. Based on the objectives of this research, the keyword Kaizen is used. These keywords were chosen based on the topic and objectives of this research. Article searches were carried out for publications of more than ten years, namely from 1996 to 2024, to see the relevance of kaizen implementation over a relatively long period, whether there were differences or novelties, or not. An article search was carried out thoroughly, then the findings were collected and sorted into several categories regarding the implementation of Kaizen. Articles from various sources are studied in various ways to understand how Kaizen is applied, especially studying Kaizen analysis and the implications that companies obtain if they apply it.

The preparation of this article follows the basic steps of research, which include determining research objectives; conducting a literature review on Kaizen development in various services and manufacturing; creating a conceptual framework; carrying out analysis and discussions related to Kaizen; and identifying gaps and suggestions for further research. This article has several systematic stages in its preparation as in Figure

1. The systematic stages are as follows: (1) Article search, search for articles with the keyword Kaizen. A total of 87 articles related to the Kaizen case study were successfully collected and reviewed, (2) Initial selection, separating articles that were not related to the research theme leaving 52 articles, (3) Final selection, separating articles that did not have a standard registration number leaving 45 articles, (4) Article summary, summarizing all relevant articles based on each service and manufacturing industry sector such as automotive, metal, finance, transportation, health and others. Then analyze the benefits of each sector, (5) Implications of each article, identify the implications of each discussion related to Kaizen, (6) Identify gaps in the article summary and suggestions for further research.

This study provides explicit benefits that serve as a guide throughout the article. First, it offers a comprehensive understanding of how Kaizen has been applied across various sectors, highlighting best practices that can be replicated or adapted by other organizations. Second, it identifies and categorizes the tangible impacts of Kaizen—such as cost reduction, productivity improvement, and enhanced service quality—which can be used as measurable performance indicators. Third, it uncovers common challenges and critical success factors in Kaizen implementation, providing practical insights for organizations planning to adopt or optimize Kaizen strategies. Lastly, this research supports the development of a more adaptive Kaizen model aligned with current technological advancements and the demands of global competitiveness.

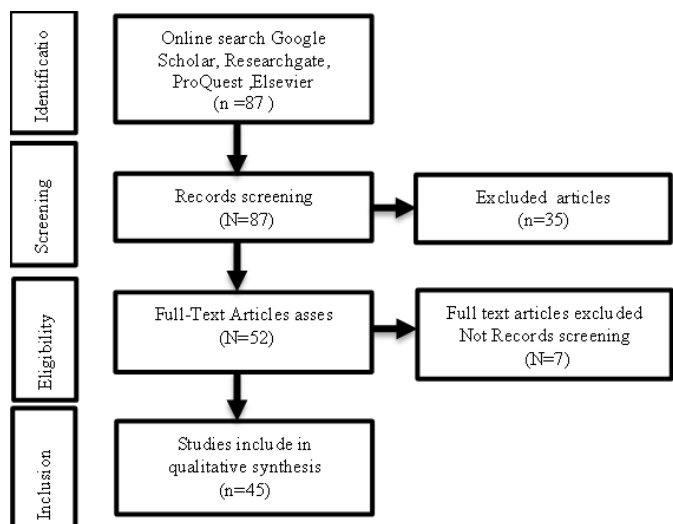


Figure 1. Prisma flow diagram of studies search

3. Results and Discussion

3.1. Article Classification

This article identifies and comprehensively examines several important attributes contained in each literature to recognize and understand the application, benefits and performance of Kaizen in various industries, both services and manufacturing. Articles were collected from 1996 to 2024 with specific topics related to Kaizen implementation, as in Figure 2.

From the 45 articles collected, it can be seen that the application of Kaizen has spread across various

continents, including Asia (26), North America (4), South America (4), Africa (4) and Europe (7) as in Figure 3 and several countries as in Figure 4.

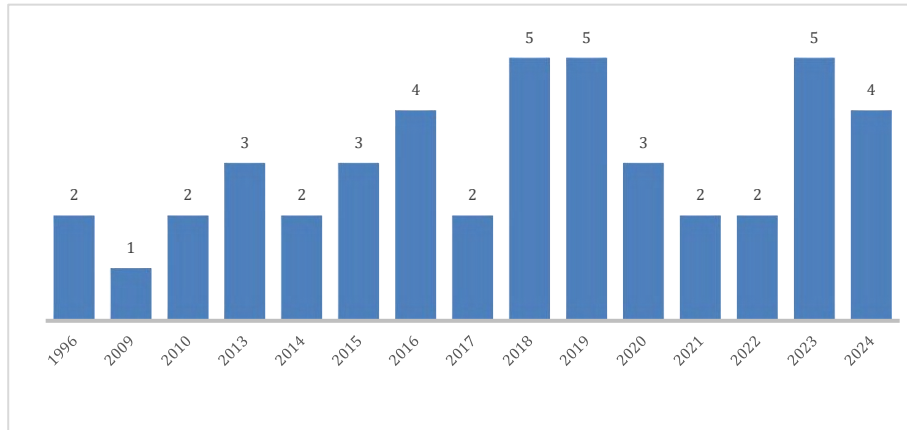


Figure 2. Year of article publication



Figure 3. Distribution of Kaizen Articles in the World

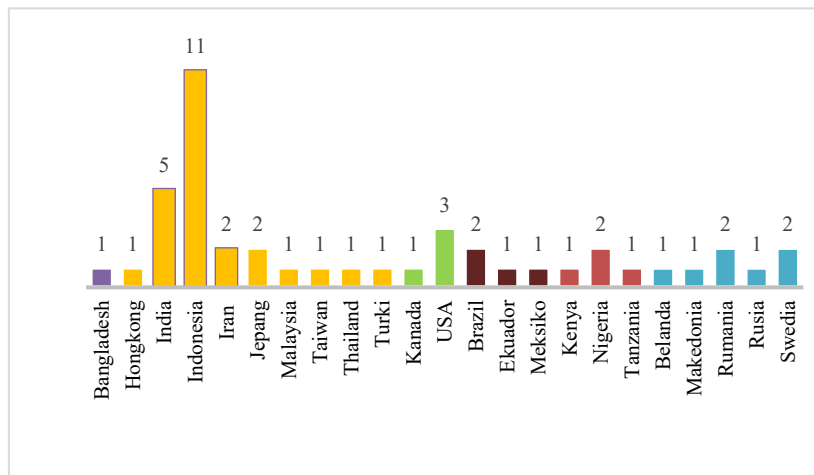


Figure 4. Research Country

This study wants to look at the application of Kaizen in the service and manufacturing business sectors and a comparison of distribution data can be seen in Figure 5.

It can be seen that the manufacturing sector dominates with 31 articles while in the service sector there are 14 articles.

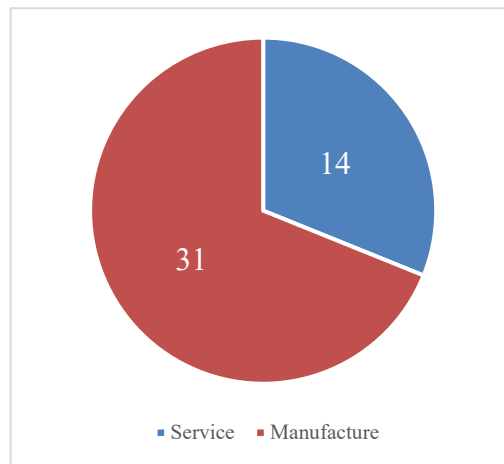


Figure 5. Types of Business

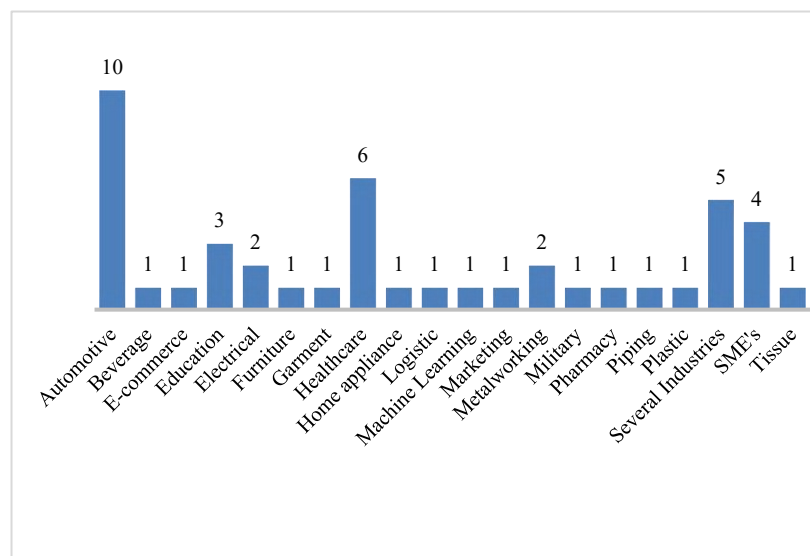


Figure 6. Kaizen in Industrial Types

The distribution of Kaizen applications in various types of industry is presented in detail in Figure 6, where industry *automotive* ranks first with 10 articles, followed by industry *healthcare* as many as 6 articles, *several industries* 5 articles, *SMEs* 4 articles, *education* 3 articles, *electrical* And *metalworking* 2 articles each and others 1 article each.

Based on a summary of Kaizen topics collected from 45 journals, it is divided into several aspects as presented in Table 1.

Kaizen has been widely researched as a management approach that aims to improve operational efficiency, quality and productivity in various sectors. In early literature, the main focus of Kaizen was in the manufacturing sector, where the implementation of this method succeeded in reducing waste and increasing output through structured approaches such as 5S,

Kanban, and the Plan-Do-Check-Act (PDCA) cycle. These studies show that Kaizen can create leaner processes while building a culture of continuous improvement. Over time, the application of Kaizen expanded to non-manufacturing sectors, such as healthcare, education, and the public sector. In healthcare, research shows that Kaizen contributes to increased operational efficiency, for example through reducing patient waiting times or increasing accuracy in the diagnosis process. In the education sector, Kaizen is used to optimize administrative and academic processes to support more effective learning. This flexibility of Kaizen confirms its relevance in various organizational contexts.

Table 1. Summary of Kaizen Topics

ARTICLE	AUTHORS	OBJECT & COUNTRY	RESEARCH RESULT
1	(Rouf et al., 2017)	Services, Hospital Health, Bangladesh	64% of respondents were satisfied regarding cleanliness and 88% were satisfied with ambulance services. 5S has been implemented in health facilities in various locations.
2	(Desta et al., 2014)	Metal Manufacturing, USA	Although there are still some weaknesses, the three pilot companies have succeeded in reducing production costs, improving quality, reducing waiting times, increasing customer satisfaction.
3	(Goyal et al., 2019)	Manufacturing, India	Able to reduce hazardous material waste by up to 13.8% at very low costs.
4	(Okada et al., 2024)	Covid19 Health, Japan	Deep learning models can accurately differentiate COVID-19 patients from non-COVID-19 patients using CT images if developed following strict criteria.
5	(Radharamanan et al., 1996)	furniture manufacturing, Brazil	Through an innovation approach using the Kaizen method, companies can make improvements in various problem areas.
6	(Titu et al., 2010)	Marketing Services, Hongkong	The research results show that the implementation and application of the Kaizen concept does not require large costs or investments, but only requires more attention and care, as well as practical means to work intelligently and wisely, and is supported by reliable performance from workers.
7	(Fatkhurrohman & Subawa, 2016)	Automotive Manufacturing, Indonesia	The results of the improvements can reduce production costs by IDR 180 million/month.
8	(Prashanth & Veena, 2022)	Manufacturing, MSMEs, India	Kaizen contributes to the MSME industry in depth. However, the emphasis on process and product studies as well as the use of QC Tools in MSMEs has a significant influence on increasing employee productivity.
9	(Hartono & Fatkhurozi, 2021)	Manufacturing, Automotive, Indonesia	This improvement was able to reduce loss time by 4.70% and increase productivity by 7.90%.
10	(Rachmatullah et al., 2015)	Plastic Manufacturing, Indonesia	Implementation of the 5K2S culture carried out by PT. Andersen Jaya Plastik as a whole is 82.24%, meaning that in general, 5K2S has been implemented well, namely, it has reached the above average category.
11	(Bellgran et al., 2019)	Pharmaceutical Manufacturing, Sweden	It is concluded that improving environmental sustainability can be achieved not only through new investments but also through behavioral changes in production areas.
12	(Lyu, 1996)	Manufacturing, Piping, Taiwan	In this study, it can be shown that animation as a simulation tool can improve presentation to users and improve communication between managers and system programmers.
13	(Darmawan et al., 2018)	Manufacturing, Automotive, Indonesia	The research results show that implementing Kaizen through 8 PDCA cycles over 6 months succeeded in reducing the defect rate from 2.47% to 1.52%, which is better than the company's target of 1.60%. Improvements were made primarily to plate interference, which contributed to a 38% reduction in plate scrap in the pasting process.
14	(Siswanto & Wijayanto, 2023)	Services, Educational Laboratories, Indonesia	The implementation of kaizen is able to provide improvement results in some areas, while other areas still need continuous improvement.
15	(Bortolotti et al., 2018)	Services, Hospital Services, Dutch	The results of this research show that Kaizen initiatives in the health sector provide significant social benefits, increasing collaboration among staff, improving internal communication, and encouraging employee involvement in the improvement process. In addition, Kaizen initiatives help reduce stress and improve the psychological well-being of staff, as well as having a positive impact on patient satisfaction by improving the quality of service.
16	(Baril et al., 2016)	Services, Hematology-oncology Clinic, You have	The results showed that the use of discrete event simulation along with Kaizen events succeeded in reducing patient waiting time before receiving treatment by 74% after 19 weeks of implementation. This approach allows for the rapid and successful implementation of solutions developed during Kaizen events.
17	(Kumar, 2019)	Manufacturing, Automotive, India	The research results show that by using Kaizen, the author succeeded in finding the root cause of defects using various quality control tools. Kaizen helps in eliminating these defects and continuously improving products and production processes, making manufacturing processes leaner, simpler, and more efficient.

ARTICLE	AUTHORS	OBJECT & COUNTRY	RESEARCH RESULT
18	(Gasper & Beny Mwenda, 2023)	Manufacturing, beverage bottles, Tanzania	The research results show that implementing Kaizen through the PDCA technique can increase productivity significantly. In this study, the implementation of Kaizen resulted in a 37% increase in productivity in the companies studied, as well as a reduction in the time required to fill bottles from 5 minutes to just 2 minutes.
19	(Alarcón et al., 2024)	Services, Learning, Mexico	Machine The research results show that the application of Machine Learning techniques through ML.NET results in a significant increase in efficiency. An automated classification process reduces manual workload and speeds response to improvement proposals. Additionally, accuracy in categorization increases, reducing the possibility of human error and improving the quality of data collected. This research also creates a category-based incentive structure that encourages active employee participation in the continuous improvement process.
20	(Mazzocato et al., 2016)	Services, hospital services, Sweden	The results of this study concluded that there is a need to combine kaizen practices with improvement and innovation practices that help staff and managers deal with complex problems, such as improving clinical care processes. The results of 72% of the improvement suggestions were reactions to perceived problems. The processes involved in suggesting improvements include: 47% technical and administrative support, 38% main clinical process, 16% primary clinical process
21	(Agmoni, 2015)	Services, logistics services, Thailand	The research results show a radical increase in the two companies studied, such as: Financial growth of 30%, productivity increase of 81%.
22	(Rahmanto & Soediantono, 2022)	Manufacturing, Defense Industry, Indonesia	The results of this research found that the application of Kaizen in the defense industry plays an important role in increasing the company's competitive advantage. Implementing Kaizen results in continuous improvements in quality, reduced costs, increased production efficiency, and greater flexibility.
23	(Chikwendu et al., 2021)	Manufacturing, tissue, Nigeria	Research Results: The research results show that the application of Kaizen techniques results in a significant increase in daily production, a decrease in the number of defective products, and an increase in product quality. A 60% increase in throughput, a 31% reduction in defects, and a 51% improvement in quality compared to traditional production systems, even after the number of staff was reduced from 13 to 12 people
24	(Rahmanian & Rahmatinejad, 2013)	Manufacturing, Iran	Research Results: Implementation of Kaizen has proven to be effective in improving quality and productivity. Implementing this strategy results in performance improvements of up to 30%, 50%, or even 100% more in some cases, without requiring large investments.
25	(Taib et al., 2010)	Manufacturing, MSMEs, Malaysia	Research Results: Implementation of Kaizen was proven to be effective in reducing lost time in the production process by 48.44%. Sales order processing time was reduced by approximately 6.98%, while production time was reduced by 14.93%. These results show that the Kaizen method has succeeded in increasing the company's operational efficiency and speeding up the production process and order processing
26	(Dandin & Mench, 2015)	Manufacturing, Automotive, India	Research results: The Kaizen process plays an important role in increasing company productivity, the improvement results were successful in reducing and reducing by 46.67%, 45.89%, 43.44% and 44% respectively.
27	(Mitreva et al., 2024)	Manufacturing, Automotive, Macedonia	Kaizen implementation improves work quality, process efficiency, and reduces waste. Implementation of methods such as 5S results in a cleaner, organized, and safer work environment, with increased productivity and employee motivation. Poka-Yoke helps prevent errors in the production process, such as detecting and blocking operations that do not meet specifications. Standardization of processes through methods such as Operator Description Sheets (ODS) creates predictability and stability in production.
28	(Umeda et al., 2020)	Services, Education, Japan	The results show that the use of Digital Triplet is effective in increasing the ability of participants (engineers and students) in carrying out a structured kaizen cycle.
29	(Cardoso et al., 2018)	Manufacturing, Garment, Brazil	The research results help reduce operational problems, increase production compliance with quality standards, and improve process performance at external sewing locations.
30	(Topuz & Arasan, 2013)	Services, Education, Türkiye	The results of implementing the Kaizen-Ed model showed that participants experienced an increase in self-awareness and motivation.

ARTICLE	AUTHORS	OBJECT & COUNTRY	RESEARCH RESULT
31	(REWERS et al., 2016)	Manufacturing, deer	The results of this research are that the implementation of Kaizen increases productivity from 392 units per day to 482 units per day, cycle time is reduced from 362.8 seconds to 330.6 seconds, production area is reduced from 55.8 m ² to 49 m ² , the amount of work in process is reduced from 30 to 15 units, and productivity per operator increased from 3.5 units/hour to 4.3 units/hour.
32	(Ihsan et al., 2019)	Manufacturing, Automotive, Indonesia	The results of this research are that the application of the PDCA cycle and the kaizen concept has succeeded in reducing machine damage, a significant increase in maintenance operator performance, and a positive impact on machine performance and product quality used by customers.
33	(Prasetyo, 2023)	Services, MSMEs, Indonesia	The research results show that leadership style has an effect on employee job satisfaction, while Kaizen culture has no effect on job satisfaction.
34	(Mano et al., 2014)	Manufacturing, metal, Japan	The research results show that Kaizen training helps reduce waste of materials and activities, increasing productivity and product quality.
35	(Androniceanu et al., 2023)	Manufacturing, Appliances, Swiss	Home The research results show that by applying the Kaizen methodology, several areas with the highest energy consumption can be identified, and the solutions identified for each area studied lead to a reduction in energy consumption.
36	(Shojaei et al., 2019)	Manufacturing, Automotive, Iran	The research results show that there is a significant relationship between Kaizen and employee performance in all dimensions, and after implementing Kaizen, the average performance in all dimensions increases.
37	(Gupta & Jain, 2014)	Manufacturing, MSMEs, India	The research results show that implementing 5S brings major changes in organizations, for example, increasing effectiveness and efficiency in processes
38	(Gunawan & Nurbani, 2023)	automotive Manufacturing, Indonesia	The research results show that the application of kaizen costing can reduce the costs of making and writing process labels at PT Ibara Lioho Indonesia, so that kaizen costing can be used as an alternative for management to achieve cost reduction.
39	(Alvarado-Ramírez et al., 2018)	Manufacturing, Mexico	Reduction in production costs and time (20 percent in SP/Mexico and 27 percent in MDQ/Ecuador).
40	(Jacobson et al., 2009)	Services, health services, deer	The research results showed that the Kaizen program was successful in identifying process problems in 76% of the proposed IP.
41	(Okpala et al., 2024)	Manufacturing, Nigeria	The research results show that by adopting Kaizen, manufacturers can create a culture of continuous improvement that drives long-term success and competitive advantage.
42	(Sahri & Novita, 2019)	Jasa, e-commerce, Indonesia	The research results show that implementing 5S management properly and correctly can increase employee productivity and create a clean, safe and enjoyable work environment, which ultimately influences competitive advantage.
43	(Markova & Markov, 2018)	Manufacturing, Russia	The research results show that the application of Kaizen is very beneficial for the company's economic profits
44	(Ioana et al., 2020)	Manufacturing, Automotive, Rumania	New work procedures and standards replaced old methods, increasing productivity by 6% over a 6-month period and significantly increasing productivity. 4500 m ³ saved in the Romanian Factory and 40,000 hours saved in just one production segment
45	(Wicaksono & Rozaq, 2020)	Manufacturing, Automotive, Indonesia	By fixing the position of the table shutter, installing the slipper holder, and perfecting the design of the slipper holder; The average dent defect per unit on the exhaust manifold was reduced by 4.35% to 2.39%.

Table 2. Implication of Kaizen

No	Kaizen Implications	Article Number
1	Reduce Service Time	16
2	Reduce Cost	7, 11, 22, 38, 43
3	Reduce Material	3, 34
4	Reduce Loss Time	9, 25, 32, 37, 44
5	Reduce Failure	5
6	Reduce Energy	35

No	Kaizen Implications	Article Number
7	Reduce Defect	13, 17, 23, 29, 45
8	Reduce Cycle Time	18, 19, 26
9	Increase Productivity	2, 6, 8, 10, 12, 14, 15, 21, 24, 27, 28, 30, 31, 33, 36, 39, 40, 42
10	Increase Accuracy	4
11	Increase Customer Satisfy	1, 20, 41

However, the literature also highlights challenges in implementing Kaizen, especially outside the Japanese cultural context. Factors such as resistance to change, limited resources, and lack of management support often hinder successful implementation. In addition, with the development of technology and the complexity of the business environment, the need to integrate Kaizen with digital technologies such as Industry 4.0, automation, and data analytics is increasingly pressing. There is a significant research gap regarding the adaptation of Kaizen in the face of technological change and global dynamics. Additionally, further studies are needed to explore a more adaptive and strategic approach to Kaizen in a modern context. By evaluating existing literature, this review aims to develop Kaizen as a relevant strategic tool in a dynamic business environment.

3.2. Kaizen Implication

In this literature review, the discussion focuses on the impact or implications of implementing Kaizen in every industry, both service and manufacturing, which can be seen based on the research results in each article as described in Table 1. The research results are explained in the form of qualitative and quantitative data, where all the results show that Kaizen has a significant impact in providing benefits to all industries or organizations. Based on Figure 7 and Table 2, the study of this article produces 11 types of implication

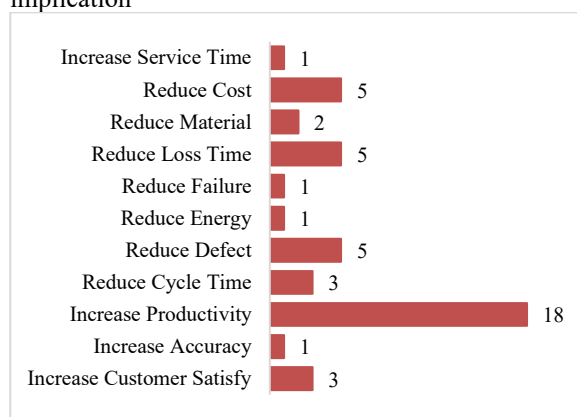


Figure 7. Implication of Kaizen

a. Increase Service Time

Article 16 was conducted in Canada at a hematology-oncology clinic with the results that the use of discrete event simulation together with event kaizen succeeded in reducing patient

waiting time before receiving treatment by 74% after 19 weeks of implementation.

b. Reduce Cost

Article 7 was carried out in Indonesia in automotive manufacturing with the result of reducing production costs by IDR 180 million/month. Article 11 in the pharmaceutical manufacturing sector shows that Kaizen reduces costs by prioritizing environmental improvements. Meanwhile, article 22 on defense equipment manufacturing in Indonesia found that the application of Kaizen in the defense industry plays an important role in increasing the company's competitive advantage in quality, reducing costs, increasing efficiency, production, as well as higher flexibility. Article 38 on automotive manufacturing in Indonesia shows that the application of Kaizen costing can reduce the costs of making and writing process labels at PT Ibara Lioho Indonesia and article 43 in the Russian manufacturing sector shows that the application of Kaizen is very beneficial for the company's economic profits.

c. Reduce Material

Reducing materials including hazardous materials is one of the results of implementing Kaizen which is able to reduce hazardous material waste by up to 13.8% at very low costs in the manufacturing industry in India (article 3) and reduce waste of materials and activities, increasing productivity and product quality in the metal industry in Nairobi, Kenya (article 34).

d. Reduce Loss Time

Using as little time as possible is one aspect that supports efficiency. This is the result of the application of Kaizen found in research in the automotive manufacturing industry in Indonesia where the company was able to reduce loss time by 4.70% (article 9), in MSME manufacturing in Malaysia it was proven to be effective in reducing lost time in the production process by 48.44%. Sales order processing time was reduced by approximately 6.98%, while production time was reduced by 14.93% (article 25). In other research (article 32) on automotive manufacturing in Indonesia, Kaizen was able to reduce machine damage so that it could reduce repair time, article 37 on MSME manufacturing in India showed that the application of Kaizen 5S brought an increase in the effectiveness and efficiency of operator movement time, while in article 44 showed time savings of 40,000 hours in just one production

segment in the automotive manufacturing industry in Romania.

e. Reduce Failure

On article 5 Kaizen can help reduce errors in operational implementation in furniture manufacturing companies in Brazil.

f. Increase Productivity

Research shows that implementing Kaizen and 5S methods consistently increases productivity through efficiency, quality and cost reduction. In manufacturing, in Northern Ethiopia, Kaizen can increase productivity through quality improvements despite challenges in management commitment (article 2 and 39). The use of QC tools and redesign of manufacturing processes can increase productivity by up to 50% (article 12). In the kaizen production process, unit output can be increased from 392 to 482 with hourly productivity increasing from 3.5 to 4.3 units per person (article 31). In MSMEs (Small and Medium Enterprises), the application of Kaizen can increase employee productivity by increasing company operational efficiency and adapting company culture (article 8 and 14). In other sectors such as the automotive, defense and health sectors, Kaizen can increase efficiency such as reducing production defects, as well as increasing the involvement of all positions and parts in improving quality in the production process (article 15, 21, 27 and 40). Kaizen with the 5S method can have a significant effect on order and tidiness in the work area, and can create a safer and more enjoyable work environment (article 6, 10, and 42). There are innovative developments in kaizen such as Kaizen-Ed, Kaizen-Ed can increase motivation and self-awareness for all involved in the organization (article 30), then there is also the Digital Triplet which can support idea validation and manufacturing system improvements (article 28). Implementing Kaizen can increase job satisfaction (article 33), can increase productivity by up to 30-100% without large investment, simply by optimizing creativity and existing facilities (article 24 and 36).

g. Increase Accuracy

Increase Accuracy Kaizen activities focus on improving the accuracy and consistency of processes to produce higher quality and error-free output. In article 4 conducted in Japan, the development process used was a model deep learning with strict criteria from KAIZEN checklist based on the development of AI for COVID-19 diagnostic imaging. On model validation slice and series with accuracy of 0.989 and 0.982 as well as 95.9% and 93% and fast system implementation with an inference time of 2.83 seconds per case. Research results on the application of KAIZEN-based AI checklist not only improves diagnostic accuracy and efficiency

but also drives the adaptation of AI technology for global health.

h. Increase Customer Satisfy

In the kaizen perspective, customer satisfaction can be achieved through continuous improvement and focus on customer needs. In article 1 discussing 5S, KAIZEN and TQM in the health sector in Bangladesh, the results of the research were 64% of respondents said the hospital security system was very good, and were satisfied with the cleanliness and hospital laboratory facilities, 88% were satisfied with the facilities Sanitary water, 54% Satisfied with electricity supply, and 72% Satisfied with medicine and radiology supply. Article 20 conducted in a Swedish hospital found 186 improvement suggestion documents made by 165 employees. The results were that 72% of the improvement proposals were reactions to perceived problems, 47% were supporting processes, 38% were technical and 16% were administrative. The majority of kaizen documents deal with simple situations focusing on operational results. The level of compliance with the template is high on several problem identification and proposed solution items but low on testing and solution implementation items. In article 41 discusses the basic principles of Kaizen and the impact of transformation on the manufacturing process to achieve continuous improvement in the manufacturing process, key concepts such as Kaizen blitz, 5S, Poka Yoke, PDCA, VSM and kanban to help achieve efficiency, high quality and waste reduction. Kaizen is not only considered a technical strategy but is also considered a philosophy that can create cultural change in organizaion.

3.3 Challenge

Although Kaizen has proven to provide significant benefits such as increased productivity, reduced costs, and heightened customer satisfaction, its implementation is not without various challenges that organizations in multiple sectors must confront. Below are some of the primary challenges associated with implementing Kaizen:

a. Inconsistent management commitment

One of the main obstacles to implementing Kaizen is the lack of managerial commitment, particularly over the long term. Studies in Ethiopia [2, 39] indicate that while Kaizen can boost productivity and quality, achieving maximum results is challenging without robust and sustained management support.

b. Changes in organizational behavior and culture

Transforming an organizational culture into one of continuous improvement requires time and a systematic approach. Research in the manufacturing sector in Sweden [11] highlights that enhancing sustainability demands not only

new investments but also behavioral changes in the production area—something that is difficult to accomplish without training and a persuasive approach.

c. Challenges in Implementing and Testing Solutions

Research in Swedish hospitals [20] reveals that, although many improvement ideas are generated by employees, the level of implementation and testing of solutions remains relatively low. This indicates difficulties in fully completing the PDCA (Plan-Do-Check-Act) cycle, particularly at the Check and Act stages.

d. Lack of Resources and Initial Investment

Some sectors, such as MSMEs, face limitations regarding human and financial resources necessary for conducting training, purchasing tools, and providing supporting infrastructure for Kaizen. This challenge often results in less than optimal implementation of Kaizen or limits it to only certain aspects [8, 14].

e. Adaptation of New Technology

The implementation of digital-based Kaizen, such as Kaizen-Ed [30] and Digital Triplet [28], necessitates the adaptation of new technologies and skill sets. Not all organizations are prepared to tackle the challenges of digitalizing the Kaizen process, both in technical and HR readiness.

f. Resistance to Change

Employee resistance to changes in work procedures is a common obstacle in Kaizen implementation. This resistance often stems from concerns about increased workloads or the potential loss of comfortable routines.

g. Lack of Training and Understanding of Concepts

The success of Kaizen heavily relies on a comprehensive understanding of its fundamental 5S, Poka Yoke, PDCA, and others. Without adequate training, many employees fail to identify problems or devise effective solutions, leading to suboptimal Kaizen efforts.

h. Inconsistent Impact Measurement

In several studies, while indications of improvement were noted, the impact measurement methods were not applied consistently, complicating the objective and sustainable assessment of the program's success.

4 Conclusion

Kaizen is an effective strategic approach in increasing efficiency, quality and productivity in various sectors, both manufacturing and services. This literature review shows that Kaizen is successfully applied widely through structured methods such as 5S, Kanban, and the PDCA cycle, which not only reduce waste but also build a culture of continuous improvement. The manufacturing sector dominates the application of Kaizen, but its implementation is also expanding into non-manufacturing sectors such as healthcare, education and the public sector, with

significant benefits such as increased operational efficiency and process optimization. However, successful implementation of Kaizen faces challenges, especially in non-Japanese cultural contexts, such as resistance to change, limited resources, and lack of management support.

In the era of technology and global competition, the integration of Kaizen with digital technology, automation and data analytics has become an urgent need. This review highlights the importance of Kaizen adaptation in the face of technological change and global dynamics, and identifies research gaps for more strategic and relevant approaches in the future. Thus, Kaizen remains a relevant management tool for improving organizational performance in a dynamic business environment.

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