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Integrating 5S and Systematic Layout Planning for Operational Efficiency: A Study in Food Service Concessions

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Abstract

The food franchising industry faces persistent operational inefficiencies, including delays and resource waste, negatively impacting service quality and customer satisfaction. Previous studies have explored Lean Manufacturing and organizational methodologies, yet their application in food concessions remains underdeveloped. This research addressed critical challenges, such as bottlenecks in production and inadequate workspace organization, which hamper operational performance. By integrating the 5S methodology and Systematic Layout Planning (SLP), the study proposed a structured model to optimize workflow and enhance punctuality. Key outcomes included a 33.62% reduction in material transport distances and a 27.27% decrease in service line delays, leading to a compliance rate improvement from 89.6% to 100%. The elimination of diner incidents underscored the model's effectiveness in improving safety and quality. These findings contribute to the literature by demonstrating the scalability of Lean tools in service sectors, offering actionable frameworks for operational excellence. Future research could explore advanced technologies to sustain these gains.

Keywords
5S Methodology, Systematic Layout Planning, Food Service Concessions, Lean Tools Implementation.

1. Introduction
The food franchising industry plays a crucial role in the global economy, especially in Latin America and Peru. This sector not only provides a variety of food products to consumers, but also generates employment and contributes to the economic development of local communities. In Peru, the growing demand for healthy food and the need to improve the quality of food services have led to an increase in investment in food concessions, reflecting a global trend towards improved food security and sustainability (Gittelsohn et al. 2014). The importance of this sector is reinforced by the need to address issues of access to healthy food, which are fundamental for public health and the

well-being of the population (Castelblanco 2023). In this context, food franchisors must adapt to changing consumer demands and government regulations, which poses significant challenges for their operation and management.
Despite its relevance, food franchising companies face a number of production problems that affect their efficiency and quality of service. These problems include delays in the start of food service, delays in food preparation, and an increase in the number of claims from diners (Prowse et al. 2018). These drawbacks not only affect customer satisfaction, but can also have significant economic repercussions for businesses, as customer dissatisfaction can lead to loss of revenue and a damaged reputation (Ding et al. 2022). In addition, a lack of efficient management in the supply chain and production processes can result in a waste of resources and increased operational costs (Auriol & Picard 2013). It is therefore imperative that food concession companies address these issues proactively to improve their performance and sustainability.

The importance of addressing these production problems cannot be underestimated. Improving operational efficiency and reducing wait times are essential to increase customer satisfaction and, therefore, business profitability (Park et al. 2018). In addition, the implementation of appropriate management practices can contribute to the sustainability of the sector, enabling companies not only to meet consumer expectations but also to adapt to environmental and public health regulations (Buffington et al. 2014). Adopting methodologies such as Lean Manufacturing can be particularly beneficial, since these practices are designed to optimize processes, reduce waste, and improve service quality (Marco & Mangano 2013). Thus, by effectively addressing production problems, food franchising companies can not only improve their performance but also contribute to the overall well-being of the community.

However, there is a significant gap in the literature on how food franchisors can implement effective strategies to improve their production and service. Although studies on operational efficiency have been conducted in other sectors, the application of Lean Manufacturing methodologies in the context of food concessions remains an under-explored area (Guo & Xie 2021). This research aims to bridge this gap by developing a production model that incorporates lean tools such as 5S and systematic layout planning (SOP) (Carter et al. 2011). These tools will not only help to optimize production processes but also facilitate the creation of a more efficient and organized work environment, which is essential for improving service quality and customer satisfaction (Yu & Chen 2019). By addressing this knowledge gap, research will contribute to continuous improvement in the food concession sector, promoting more sustainable and efficient practices. In conclusion, the food franchising industry is vital to the global and local economy, facing significant challenges that require immediate attention. The implementation of Lean Manufacturing methodologies can provide effective solutions to improve production and service, thus addressing current problems and contributing to the sustainable development of the sector. This research not only seeks to fill a gap in the literature but also provides a practical framework that companies can adopt to improve their operational efficiency and customer satisfaction.

2. Literature Review

Literature review on the application of improvement methodologies in the production process of food concession companies is essential to understand how these practices can optimize efficiency and quality in this sector. Below is a detailed analysis of five relevant methodologies: Lean Manufacturing, 5S, Systematic Layout Planning, process standardization and continuous improvement.

2.1 Lean Manufacturing in Food Dealers

Lean manufacturing has been widely adopted in various industries, including food, to improve efficiency and reduce waste. In the context of food franchising companies, this methodology focuses on process optimization, minimizing activities that do not add value. According to Geminarqi (2023), the implementation of Lean Manufacturing allows companies to adapt to global challenges such as fluctuating commodity prices and increasing consumer demands. In addition, research by Igbokwe and Godwin Igbokwe & Godwin (2021) highlights that improving operational efficiency through Lean can result in a significant reduction of production costs, which is crucial in a competitive market.

The Lean approach also promotes a culture of continuous improvement, where each employee is responsible for identifying and eliminating waste in their work area. This is in line with the findings of Hwang et al. (2019), who suggest that active employee involvement in process improvement can lead to an increase in the quality of the final product. In addition, the review by Ricke et al. (2018) indicates that the implementation of advanced technologies within the Lean framework can improve contaminant detection, which is vital for food safety at concessionary companies.Finally, the literature suggests that the integration of Lean Manufacturing not only improves operational efficiency but also contributes to sustainability. Research by Zhang et al. (2023) shows that reducing waste and optimizing resources are essential steps towards more sustainable production in the food industry.

2.2 Application of the 5S Methodology

The 5S methodology, which focuses on workplace organization and standardization, has proven effective in improving efficiency in the food sector. This methodology, which includes the stages of sorting, tidying, cleaning, standardizing and sustaining, helps to create a safer and more efficient work environment. According to the Song study (Song, 2023), the implementation of 5S in food companies not only improves organization but also reduces the time for searching for materials and tools, which translates into higher productivity. In addition, the research of Ohiichuk Ohiichuk (2022) highlights that the application of 5S in the context of HACCP (Hazard Analysis and Critical Control Points) is fundamental to ensure food safety. Process standardization and regular cleaning are essential to prevent contamination in food production facilities. This approach not only improves product quality, but also ensures compliance with food safety regulations.

On the other hand, the adoption of 5S also fosters a culture of responsibility among employees. Research by Hwang et al. Hwang et al. (2019) suggests that a well-organized and clean work environment can boost staff morale and commitment to product quality. This is particularly relevant in the food industry, where quality and safety are paramount.Finally, the implementation of 5S can have a positive impact on the sustainability of operations. According to the analysis by Venot et al. (2014), reducing waste and improving operational efficiency results in a more responsible use of resources, which is essential for the long-term sustainability of food franchisees.

2.3 Systematic Layout Planning in the Food Industry

Layout design in production facilities is a critical aspect that influences operational efficiency. Systematic Layout Planning (SLP) methodology allows companies to optimize the layout of their equipment and workflows. According to the study by Capacci et al. (2012), a well-designed layout can significantly reduce transport times and improve the overall efficiency of the production process. Research by Fan et al. (2018) highlights that efficient layout design not only improves productivity but also contributes to food safety by minimizing the risk of cross-contamination. In the context of food-processing companies, this is particularly relevant as the layout of equipment and work areas should facilitate compliance with health and safety regulations.

In addition, the application of SLP enables enterprises to adapt to changes in demand and production processes. According to the analysis of Fan et al. (2018), flexibility in layout design is key to responding to market fluctuations and innovations in production processes. This is crucial in a dynamic environment such as the food industry.
Finally, the implementation of SLP can also contribute to sustainability. Research by Wang et al. (2016) suggests that an optimized layout can reduce energy and resource consumption, which is essential for companies seeking to minimize their environmental impact. In summary, the SLP methodology is a valuable tool for improving efficiency and sustainability in food concession companies.

2.4 Process Standardization in Food Production

Process standardization is essential to ensure the quality and safety of food products. This methodology involves the creation of standard operating procedures (SOPs) that ensure all employees follow the same production practices. According to the study by Li et al. (2021), standardization not only improves product consistency but also facilitates new employee training and implementation of continuous improvement practices. In addition, research by Desai et al. (2020) shows that process standardization can reduce variability in production, which is crucial for maintaining quality in the food industry. This is especially important in a sector where food security is an ongoing concern. Implementing clear and measurable standards allows companies to monitor and control the quality of their products more effectively. Standardization also has a positive impact on operational efficiency. According to the analysis of McCullough and Matson (2011), the creation of standardized procedures can reduce downtime and improve resource utilization. This is essential for food franchising companies facing constant pressure to reduce costs and improve efficiency.

Finally, process standardization contributes to sustainability. Research by Kaliba et al. (2018) suggests that the implementation of standardized practices can reduce waste and improve resource efficiency, what is essential for companies seeking to operate in a more sustainable way in an increasingly competitive environment.

2.5 Continuous Improvement in Food Dealers

Continuous improvement is a key approach to quality management in the food industry. This approach involves the implementation of feedback cycles that allow companies to identify areas for improvement and make adjustments in their processes. According to the Rani study (2023), continuous improvement is essential to maintain competitiveness in a constantly changing market where consumer expectations and regulations are becoming increasingly stringent.
In addition, the research of Hwang et al. (2019) highlights that continuous improvement is not only focused on operational efficiency but also on product quality. The implementation of continuous improvement practices enables companies to adapt to changing consumer needs and production innovations. This is particularly relevant in the food industry, where quality and safety are paramount.

Continuous improvement also fosters a culture of innovation within companies. According to the analysis of Zhang et al. (Zhang et al., 2023), creating an environment that promotes feedback and collaboration among employees can lead to the identification of new opportunities for improvement and implementation of innovative solutions. This is crucial for food franchisors looking to differentiate themselves in a competitive market. Finally, continuous improvement contributes to sustainability. Research by Venot et al. (2014) suggests that the implementation of continuous improvement practices can reduce waste and improve resource efficiency, which is essential for companies looking to operate in a more sustainable way. In short, continuous improvement is a holistic approach that can transform the operations of food franchisors, improving both product quality and sustainability.

3. Methods

3.1 Basis of the Proposed Model

In Figure 1, a model is presented that integrates the 5S methodology and Systematic Layout Planning (SLP) as complementary tools to enhance efficiency in food service operations. The model was designed to address critical inefficiencies such as delays in service initiation, congestion, and unnecessary movement within production areas. It began with the identification of key inputs, including the underlying operational challenges that impacted punctuality and order. The 5S methodology was implemented as an initial step to promote organizational practices and cleanliness, creating a foundation for more structured processes. This stage focuses on fostering discipline and systematic organization among employees to ensure sustainable improvements. Subsequently, the SLP methodology was applied to design an optimized layout through a structured and analytical approach. This phase aimed to reorganize spatial configurations to eliminate bottlenecks, reduce unnecessary travel distances, and ensure better workflow alignment. The model concluded with the achievement of outputs, reflected in enhanced punctuality and operational order, which directly addressed the identified inefficiencies. The integration of these tools underscored a holistic approach to continuous improvement, emphasizing the alignment of physical spaces and behavioral practices to achieve measurable outcomes in service performance. This systematic framework provided a replicable strategy for operational excellence.

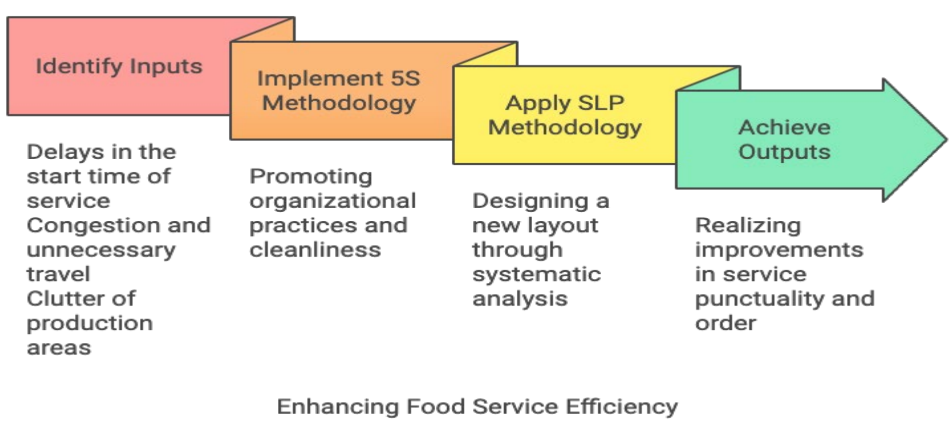

Figure 1. Proposed Model

3.2 Description of the model components

The proposed model illustrated in the figure represents a systematic approach designed to enhance efficiency in food service operations by sequentially applying recognized tools of continuous improvement and organization. This model addresses common issues in service processes that impact punctuality and order by proposing structured solutions based on the 5S methodology and Systematic Layout Planning (SLP). The relevance of this model lies in its ability to integrate organizational principles and process analysis to transform traditional operations into more efficient and organized systems. A detailed description of each stage of the model is presented below.

Identifying Inputs and Initial Diagnosis

In this stage, the primary focus was on identifying the key factors affecting efficiency in food service operations. Common issues such as delays in starting operations, congestion in critical areas, and unnecessary movements that increased idle times were analyzed. Additionally, the accumulation of non-essential items in production areas created disorganization, hindering workflow. This initial diagnosis not only identified the root causes of inefficiencies but also established a baseline for implementing targeted improvements. Clarity in recognizing the inputs and underlying issues ensured that the proposed solutions directly addressed the identified needs.

***I*mplementing the 5S Methodology for Organization and Cleanliness**

Following the diagnosis, the 5S methodology was introduced as the foundation for fostering organization and cleanliness in service areas. This methodology encouraged disciplined practices, including the classification of essential items, the removal of unnecessary elements, and the implementation of visual systems that facilitated access to critical tools and materials. Continuous cleaning was another fundamental pillar that ensured a safer and more orderly operational environment. These actions not only reduced preparation times but also promoted a culture of order that positively impacted staff morale, fostering greater commitment to system objectives. By consolidating these organizational habits, a strong foundation was established for transitioning efficiently to optimizing the physical layout of the spaces.

Applying SLP Methodology for Designing a New Layout

The next step involved redesigning the physical layout using the Systematic Layout Planning (SLP) methodology. This method provided a structured approach to analyze workflows, identify bottlenecks, and propose alternative configurations that minimized travel times and maximized space utilization. By analyzing functional relationships between work areas, a layout was developed that facilitated the logical sequence of operations, significantly reducing unnecessary movements and improving access to critical resources. Implementing this new design not only enhanced operational efficiency but also enabled more effective management of installed capacity, achieving direct alignment between space configuration and service needs.

***A*chieving Tangible Outcomes: Outputs of the Proposed Model**

The final stage consisted of evaluating the outcomes achieved after implementing the proposed improvements. The analysis of the outputs demonstrated significant enhancements in service punctuality and an increase in overall operational order. These improvements translated into higher customer satisfaction and more efficient use of available resources. Integrating the 5S and SLP methodologies consolidated a standardized work system that not only addressed the initial problems but also established a framework for continuous improvement. In summary, the model's outputs reflect the positive impact of the implemented tools, highlighting their potential to be replicated in similar contexts aiming to improve efficiency in food service operations.

The proposed model constitutes a valuable contribution to existing literature by effectively combining continuous improvement tools to address specific issues in food service operations. By integrating well-established methodologies into a systematic approach, this model offers a practical and adaptable solution for diverse operational environments. Moreover, its focus on organization, cleanliness, and functional analysis provides a robust framework for optimizing processes, reducing inefficiencies, and improving operational outcomes. This model not only resolves current issues but also prepares organizations to face future challenges with a stronger and more efficient operational structure.

3.3 Model Indicators

Specialized metrics were developed to monitor and evaluate performance throughout the case study to assess the impact of the production management model that incorporates SLP and 5S tools. These metrics provided a reliable basis for examining the critical components of the food dealer's production management. This methodical approach allowed for a thorough review of the critical performance indicators, thus ensuring accurate monitoring and promoting continuous improvements in the production process.

Compliance Rate

This indicator measures the proportion of days without delays relative to the total operating days. It reflects operational consistency and helps identify areas requiring improvement to ensure timely service delivery.

$$Compliance\ Rate = \frac{Days\ without\ delays}{Total\ operating\ days} \tag{1}$$

Selection and transport time of raw material to kitchen

This indicator tracks the time required to select and transport raw materials to the kitchen. It is critical for ensuring that ingredients are available promptly to avoid production delays.

$$STTRMK = \sum (Selection\ time + Transport\ time\ to\ kitchen) \tag{2}$$

Kitchen to maintainer production time

This indicator monitors the time spent on production processes from the kitchen to the maintainer. Reducing this time enhances process efficiency and optimizes resource usage.

$$KMPT = \sum (Production\ time) \tag{3}$$

Transport time to line

These measures the time taken to transport prepared items from the kitchen to the service line. Optimizing this minimizes bottlenecks and ensures timely service.

$$TTL = \sum (Transport\ time\ to\ line) \tag{4}$$

Distance traveled by raw material during production process

This tracks the cumulative distance traveled by raw materials during the production process. Minimizing this distance reduces inefficiencies and physical strain.

$$DTRMDPP = \sum (Distance\ traveled\ by\ raw\ materials) \tag{5}$$

Compliance with 5S culture

This indicator evaluates adherence to the 5S workplace organization methodology. Achieving high compliance scores reflects operational discipline and productivity.

$$CO5S = \left(\frac{\sum\ Audit\ score}{100}\right) \times 100 \tag{6}$$

Number of incidents reported by diners
This tracks the percentage of reported incidents during the month. A reduction in this value indicates improved service quality and customer safety.

$$NIRD = \left(\frac{\sum Incidents\ reported}{Total\ operating\ days\ of\ the\ month}\right) \times 100 \quad (7)$$

4. Validation

4.1 Validation Scenario
The validation scenario was carried out in a case study focused on designing, managing and implementing comprehensive facilities management solutions for its clients and employees, with the mission of improving quality of life and contributing to economic development, social and environmental in the country. The case study operations focused on customized solutions to meet the specific needs of their customers, highlighting collective feeding among their business units. In 2023, sales related to food services for the corporate industries sector in metropolitan Lima reached PEN 60 million. The research focused on analyzing delays in starting food services, specifically for a concession holder responsible for preparing 690 daily lunches in an 80 square meter space.

4.2 Initial Diagnosis
In Figure 2, a problem tree illustrates the diagnosis conducted in the case study, aiming to identify the causes behind the discrepancy between the organization’s compliance rate of 80.6% and the industry standard of 95%. This analysis revealed an economic impact associated with the main issue, estimated at 20,381 PEN per year, equivalent to 1.03% of the company's annual revenue. The core problem was defined as the delay in the start of food service, with its causes grouped into three categories: delays in food preparation, accounting for 58.7% of cases; complaints from diners, contributing 28.9%; and other reasons, representing 12.4%. Among the most significant root causes were inadequate workstation layout, congestion and path crossings, and a lack of order and cleanliness, each with a notable percentage impact. Additionally, factors such as inadequate equipment, lack of training, and errors in ration projection further contributed to the issue. This diagnosis was crucial in prioritizing interventions aimed at enhancing operational efficiency and achieving the sector’s compliance standards.

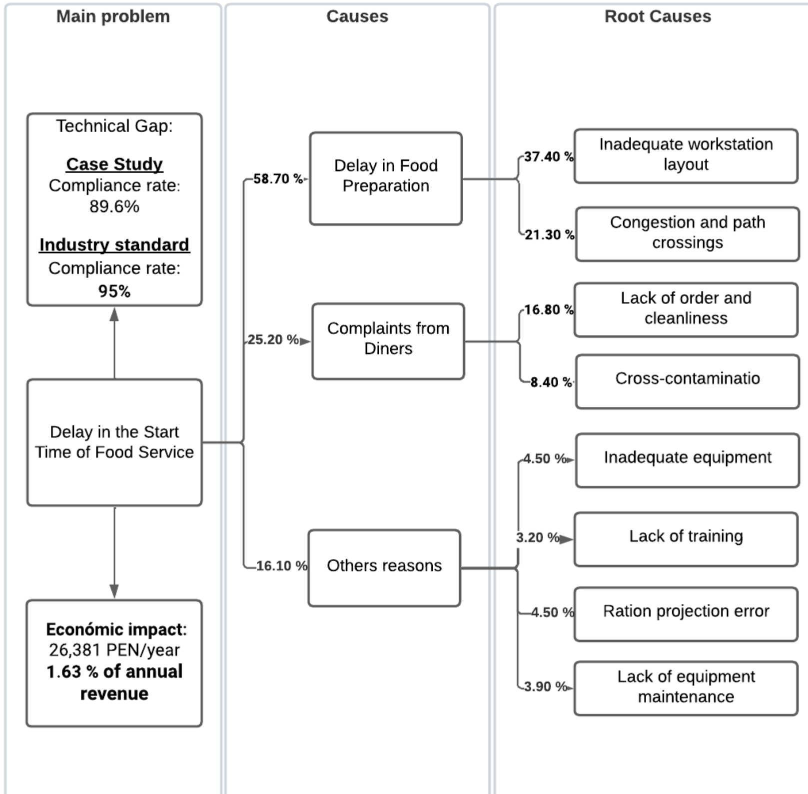

Figure 2. Problem Tree

4.3 Implementation of the model in the case study

The implementation of the model proposed in this case study sought to optimize the efficiency of production process operations through the use of plant distribution and 5S methodology. The tools used allowed to reduce transport times and improve organization, reducing the impact of congestion on workstations and optimizing material flow.

Implementation Phases. The improvement proposal was structured in two main components: plant layout (Systematic Layout Planning) and 5S implementation. The focus was on minimizing delays in service start-up and improving efficiency in food preparation. The sequence of activities included the evaluation of material flow, relationships between workstations, and the adoption of tidying and cleaning practices that significantly increased service timeliness.

Plant Layout. For process restructuring, the eight production workstations were analyzed. The sequence of raw material flow between production areas allowed to identify the distances travelled, and reducing these distances is a key aspect for improving operational efficiency. The total travel distance was reduced from 2,109 to 1,400 meters, resulting in a significant optimization of the internal material flow.

The figure 3 shows the relationship diagram before the improvement process, highlighting the intensity of connections between different workstations within the production facility. Strong relationships, represented by red lines, indicate frequent interactions or material transfers between areas such as "Armado," "Cocina caliente," and "Desinfección." The diagram also illustrates less frequent relationships using lines of different colors, suggesting areas where optimization of material flow and spatial arrangement could significantly reduce congestion and improve efficiency.

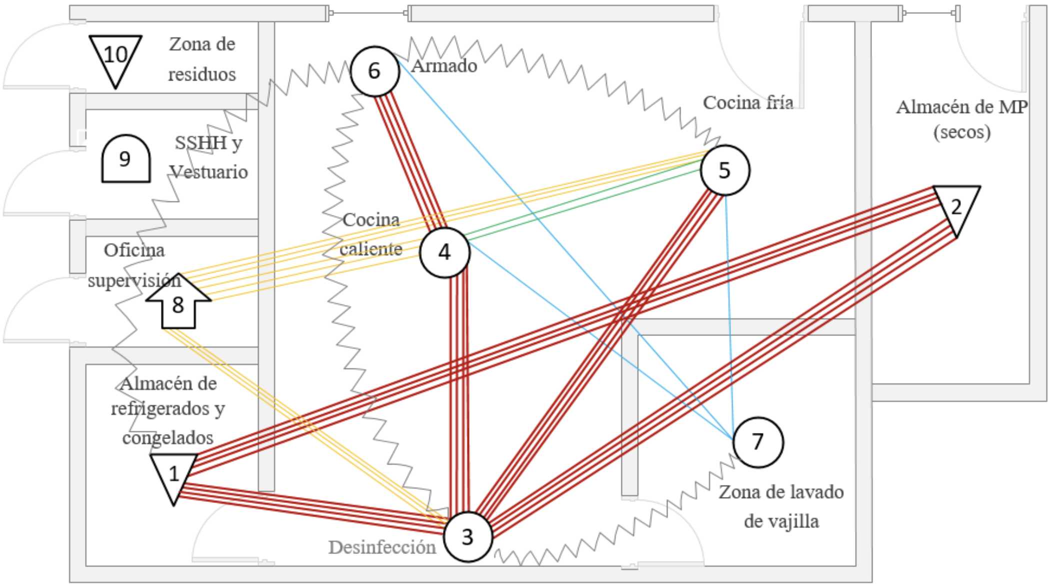

Figure 3. Relationship diagram before improvement

The figure 4 illustrates the relationship diagram after the improvement process, showcasing optimized connections between the different workstations in the production facility. Compared to the initial setup, some connections have been reduced or rerouted to enhance workflow efficiency and minimize congestion. Strong relationships, represented by red lines, indicate high-frequency material transfers, while other lines show less critical interactions. The adjustments aimed to reduce the unnecessary movement of materials and improve the overall production process by aligning key areas closer and minimizing the distances traveled.

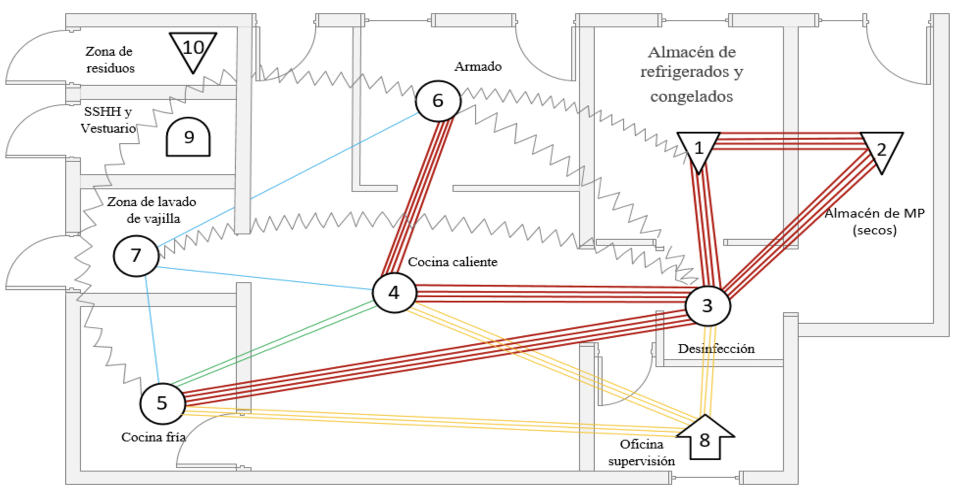

Figure 4. Relationship diagram after improvement

Flow and Proximity. Analysis The analysis of workloads and transport routes identified the most congested areas, particularly the food disinfection station. Strategic reallocation of storage areas has reduced bottlenecks. The proximity between stations was adjusted according to efficiency criteria and operational needs, which allowed a reduction of 33.62% in the total route during production.

Proposal for 5S Implementation. The application of 5S was fundamental to solve problems of clutter and improve cleaning efficiency. During the initial audit, the values for sorting and cleaning were low, with an average compliance of 55 per cent. The implementation of corrective actions increased the level of discipline and order, achieving a 63.64% improvement in 5S compliance. In addition, the elimination of incidents of food mishandling contributed to a safer and more organized working environment.

Figure 5 illustrates the lack of order observed in the workstations within the food storage and handling areas. The left image shows a cluttered raw material storage area, while the middle image highlights improper stacking of containers, indicating disorganization. The right image displays improper food handling practices, contributing to inefficiencies and potential safety risks.

Figure 5. Lack of order in the workstations

Reorganization of Workstations. The redesign of workstations focused on minimizing staff effort by relocating raw materials warehouses near disinfection and production areas. There was a significant improvement in the monitoring capacity and overall process efficiency. This change has reduced both the time and distance of travel, thus improved staff productivity and facilitating the integration of work teams.

Proposal for Audits and Monitoring. The audit and continuous monitoring of the implementation of 5S allowed to maintain the standard achieved. Systematic evaluation contributed to the identification of critical areas and timely correction of deviations, ensuring a continuous improvement cycle in production areas.

Standardization and Visual Management. In the Seiketsu phase, it was proposed to standardize procedures to avoid cross-contamination by visually managing warehouses through signage and applying a color code to work areas. This strategy included the implementation of specific signage to delimit areas and minimize risks associated with the process. Color stripes and safety signs were implemented for all stations, from the hot kitchen to the storage area. In addition, records of procedures and prescriptions were included which should be visible to all staff.

Figure 6 displays the standardization of traffic routes, procedures, and centralized prescriptions in the production environment. Panel (a) shows the hot kitchen area, where designated pathways have been marked for better workflow. Panel (b) depicts the digital registration system used to streamline information access. Panel (c) illustrates proper waste management practices, promoting hygiene. Lastly, panel (d) highlights the standardized service line, ensuring consistency in food preparation and customer interaction. This visual standardization aims to enhance efficiency, safety, and order throughout the production process.

Figure 6. Standardization of traffic routes, procedures and centralized prescriptions

Figure 7 demonstrates the visual control system implemented in the warehouse for raw material stacking. Panel (a) shows the initial state of the warehouse, where materials are disorganized, resulting in inefficient use of space. Panel (b) presents the standardized approach, which includes labeling and proper limits on stacking, such as a maximum of four rolls, allowing for better inventory control and reducing risks associated with improper storage practices.

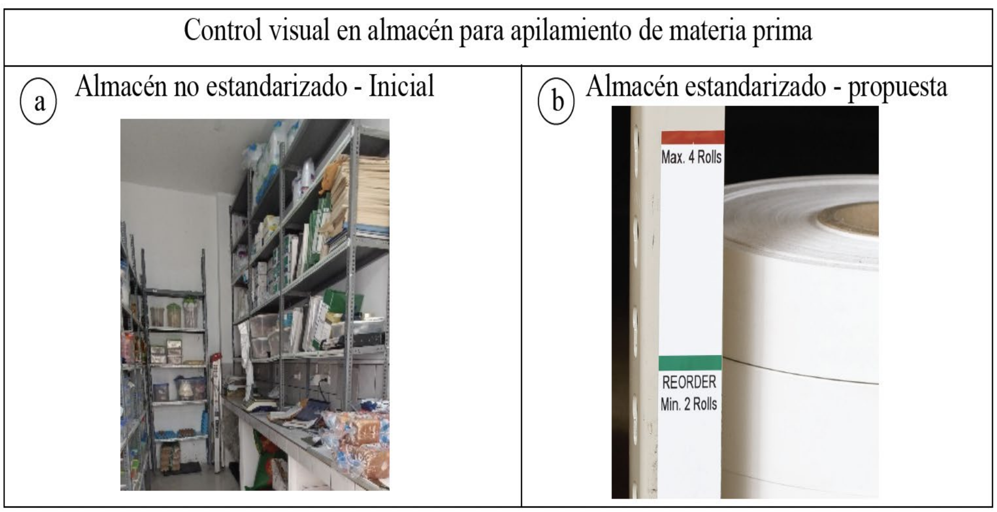

Figure 7. Visual control in the warehouse for raw material stacking

Maintenance of Standardization (Shitsuke). In the fifth stage, routine audits and monthly follow-ups were planned to ensure compliance with the 5S methodology. A quarterly recognition system was established for staff achieving 90 per cent or higher audit compliance, thus strengthening team discipline and commitment. Sustained improvement in discipline was critical to ensuring an orderly and efficient work environment.

5S Audit Results. The figure represents the results of the 5S audit, showing the achieved compliance rates for each of the 5S elements. The categories include Classify (Seire), Order (Seiton), Clean (Seiso), Standardize (Seiketsu), and Discipline (Shitsuke). The achieved scores are as follows: 93% for Classify, 90% for both Order and Clean, 90% for Standardize, and 88% for Discipline. This radar chart visually indicates a high level of adherence to the 5S principles, with each element reaching or nearing the target compliance level, demonstrating effective implementation of the methodology in the workspace.

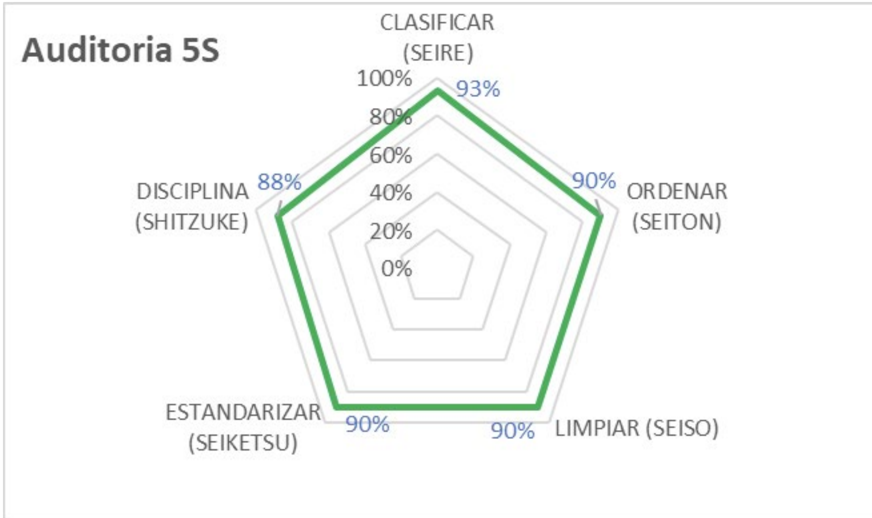

Figure 8. Final audit 5S

5. Results

In Table 1, the validation of the production management model is presented, showing significant improvements. The compliance rate increased from 89.6% to 100%, while the selection and transport time of raw materials was reduced by 18.64%. Additionally, the kitchen to maintainer production time decreased by 1.46%, and transport time to the line was reduced by 27.27%. The distance traveled by raw materials was cut by 33.62%. Furthermore, compliance with the 5S culture increased by 63.64%, and incidents reported by diners were eliminated, dropping from 5% to 0%.

Table 1. Results of validation of the proposed model

Indicators	Unit	As-Is	To-Be	Results	Variation (%)
Compliance Rate	%	89.60%	95%	100%	11.61%
Selection and transport time of raw material to kitchen (TST)	Minutes	59	49	48	-18.64%
Kitchen to maintainer production time (TPC)	Minutes	893	883	880	-1.46%
Transport time to line (TTL)	Minutes	55	41	40	-27.27%
Distance traveled by raw material during production process (DRMP)	Meters	2109	1407	1400	-33.62%
Compliance with 5S culture (COL)	%	55%	90%	90%	63.64%
Number of incidents reported by diners (CIRPC)	%	5.00%	0%	0%	-100.00%

6. Conclusions.

The study identified the main issues affecting operational efficiency in food concession companies, focusing on the implementation of continuous improvement tools such as 5S and Systematic Layout Planning (SLP). Among the most significant findings, a 33.62% reduction in the distance traveled by materials during the production process and a 27.27% decrease in transport time to the service line were achieved. The compliance rate significantly improved from 89.6% to 100% and reported diner incidents were entirely eliminated. These outcomes demonstrate that integrating the proposed tools positively impacted organization and cleanliness, optimized workflow, and enhanced the quality of service delivered.

The relevance of this research lies in its practical and replicable approach to addressing efficiency issues in a highly competitive and regulated sector. Optimizing resource use and reducing waste not only address operational needs but also contribute to the economic and environmental sustainability of these organizations. Additionally, the results underscore the importance of implementing systematic and standardized practices in sectors where food quality and safety are paramount. This approach fosters an organizational culture oriented toward continuous improvement, promoting habits that extend beyond immediate benefits while strengthening companies' ability to adapt to a changing environment.

This study contributes to the field of industrial engineering by validating the effectiveness of methodologies such as 5S and SLP in a specific context, demonstrating their applicability beyond traditional sectors like manufacturing. The integration of these tools within a comprehensive model presents an innovative solution for managing resources efficiently and improving customer experience. Furthermore, the study highlights the importance of designing performance indicators to monitor the impact of implemented improvements. This not only reinforces data-driven decision-making but also provides a robust methodological framework for future research in service industries.

Finally, while the results achieved are encouraging, opportunities for further research emerge. It would be valuable to analyze the interaction between Lean methodologies and advanced management tools, such as data analytics or artificial intelligence, to predict and mitigate operational issues with greater precision. Longitudinal studies are also recommended to evaluate the long-term sustainability of results and their impact on organizational culture. Such an approach would not only enrich the knowledge base in this field but also provide decision-makers with a broader set of strategies to strengthen their competitiveness in a demanding and dynamic market.

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