Implementing Lean Management in catering operations: perspectives and benefits

Paula Ostrowska[1], Piotr Walentynowicz[2]

[1]Faulty of Management, University of Gdansk
Poland

[2]Institute of Management, Pomeranian University
Poland

***Abstract*— The article presents considerations on the benefits of using Lean Management in the catering industry, especially in the conditions of the current economic downturn. The main purpose of the article is to present the idea of Lean Management in the catering business, the main types of waste that can occur in this activity and the basic Lean solutions that can help eliminate these inefficiencies. The article also indicates three basic models of Lean in restaurant operations developed in an original way based on empirical research carried out using the case studies method. An additional research method was the method of analysis and synthesis of literature sources. The benefits that the use of Lean Management at a high level of professionalism can bring to this type of activity have been identified. The main limitation of the study is that it is conducted on a limited number of entities. However, based on the results of the study, the authors sincerely recommend that executives and restaurant owners take an interest in this management concept.**

Keywords— Lean Management, restaurant industry, MUDA, implementation benefits

I. INTRODUCTION

Catering enterprises are part of the service sector and are an increasingly important element of it [Nowak, Trziszka, Otto, 2008]. According to the Central Statistical Office, the number of catering establishments in Poland in 2022 was approx. 83.9 thousand (a year-on-year increase of 13.1%), of which 39.8% were catering outlets, 28.2% were restaurants, 26.4% were bars, and canteens were 5.6%. However, according to GFK Polonia, "the Polish catering market is growing in value, but it is in bad shape. Although the value of the Polish catering market is growing and already amounts to PLN 31.3 billion, this increase is primarily due to higher prices, which, however, are backed by high costs of doing business" [retailnet.pl, 2023]. It should also be noted that despite the quantitative growth of outlets (72.3 thousand in 2019; 64.4 thousand in 2020; 74.2 thousand in 2021), this market has not yet recovered in value (in revenues and real profits) after the crisis in 2020 as a result of the COVID-19 pandemic (PLN 50.9 billion in 2019; PLN 37.6 billion in 2020 and PLN 48.7 billion in 2022) [bankier.pl, 2022; poradnikrestauratora.pl, 2021]. As other sources of information [money.pl, 2024; dlahandlu.pl, 2024] also indicate that the current situation in the catering services market in Poland is also not favourable for customers and restaurateurs. So, for some catering establishments, among other activities, the solution is to implement or deepen Lean Management. As the research results indicate, this concept has helped enterprises in many other industries in crises [Krasiński, 2015; Womack, Jones, 2008].

The aim of the article is, therefore, to analyze and synthesize the fundamental possibilities of using Lean Management in catering activities and the benefits resulting from it for the purpose of disseminating this knowledge both among students, especially of management and hotel and tourism faculties, as well as practitioners of this activity. The main research methods used in the preparation of this study were analysis and synthesis of the literature on the subject (and other online sources of information), as well as external observation, participant observation and logical inference.

ASEJ - Scientific Journal of Bielsko-Biala School of Finance and Law
Volume 28, No 4 (2024), pages 8
https://doi.org/10.19192/wsfip.sj4.2024.13
Received: November 2024., Accepted: December 2024,
Published: December 2024

II. MATERIALS, METHODS AND LIMITS OF THE STUDY

Using the general definitions of Lean Management - "Lean Management is a method of improving the functioning of the company, which through the continuous elimination of waste optimizes the creation and flow of value in the entire production process. Its goal is to build quality into the manufacturing process, while adopting cost reduction as a principle" (Lisiński, Ostrowski, 2026, p. 71) or "Lean Management is a concept based on the use of such methods of enterprise operation as to achieve the best possible results with the lowest possible outlays in given technical and organizational conditions. In this concept, this is achieved primarily through the comprehensive elimination of all kinds of waste (in Japanese – muda), which operating entities try to eliminate not only from the production system and, in the long run, from the entire organization, but also from the entire logistics chain related to the company's operations. In addition to eliminating muda, lean operators focus on improving quality, reducing costs and reducing process times to deliver added value to the customer (external and internal). This is achieved by specially developed methods of organization and management characteristic of this concept" [Nogalski, Walentynowicz, 2009] - one may be tempted to define Lean Management in restaurant activity. Therefore, in gastronomy, Lean Management will be a way of management in which the management and the rest of the company's staff focus on achieving the highest possible customer satisfaction and repeatability of using their restaurant services, as a result of offering a high, distinctive quality service; shortening the time of activities and processes and reducing the associated costs, in particular by eliminating/reducing various types of waste or other undesirable phenomena in the restaurant [cf. Gupta et al., 2016]. The general model of Lean Management in a restaurant is shown in Figure 1.

*** SQDC** – security, quality, delivery, cost; 3Mu – muda, muri, mura (waste, excess, irregularity).

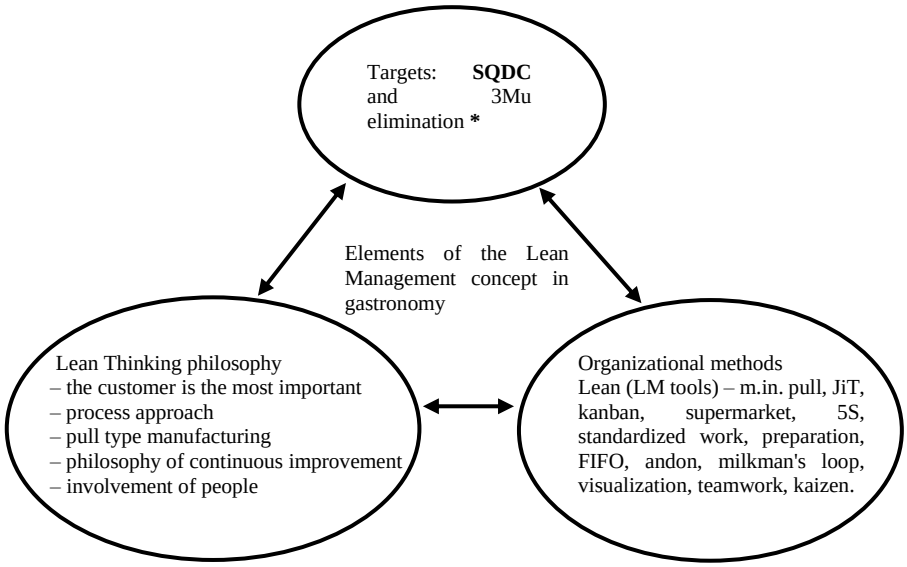


FIGURE 1. BASIC ASSUMPTIONS AND ELEMENTS OF LEAN MANAGEMENT IN A RESTAURANT

Source: Own study based on: [Walentynowicz, 2013, p. 54]

Because the assumptions and tools of Lean Management are known and widely discussed in the literature on the subject, in this subsection, the authors will focus on the discussion of selected undesirable phenomena occurring in restaurants based on the 3Mu classification and indicate some proposals for their reduction. Thus, the restaurant environment is characterized by high heterogeneity (due to different business models, the type and manner of dishes served, and the type and location of catering establishments) [Sala, 2011, p. 20]. Regardless, many restaurants face 3 Mu - Muda, Muri and Mura (waste, excess and irregularity), causing negative organizational, financial and market consequences. Examples of 3 Mu in restaurants include:

1) Overproduction, which results in food waste and the formation of large amounts of plate leftovers. The causes of overproduction are [Priefer et al., 2016; Kilibarda et al., 2019; Bloom, 2010; Maguire, 2016]:
   - preparation of semi-finished products and ready meals in too large quantities to the daily demand (most often based on wrong forecasts) – especially in mass catering;
   - preparing semi-finished products and ready meals in advance, for which there is no demand on a given day;
   - incorrect description (name and date of production) of semi-finished and ready meals that are prepared in advance and sent to the cold store,
   - "eat as much as you want" restaurants or "all in" hotel offerings, where customers fill their plates with too much food and then, uneaten, it is irretrievable;
   - too large portions of meals.

Consequently, overproduction wastes time and money, and the potential of catering infrastructure (opportunity costs) generates unnecessary inventory costs. It seems that this problem is solved by production based on pull and JiT methods (based on a specific order, precisely on time), but in a situation where guests do not want to wait an excessive amount of time, it is not so easy to organize. A specific organizational model in this system can be fast-food restaurant chains such as McDonalds, Burger King, KFC, or Subway.

- Excess stocks that can be caused by [Garrone et al., 2014; Matyla, Wójcik, 2016]:
- incorrect determination of the demand for raw materials,
- lack of an appropriate inventory monitoring system,
- excessive number of dishes on the menu,
- There are too large intervals between the delivery periods of most food components, resulting in deliveries (purchases) in too large batches and, consequently, the need for excessive storage.

The above waste causes the need for excessive storage space, including refrigeration, waste of energy, loss of expired inventory and the associated financial consequences. One of the ways to eliminate it is better warehouse management (reduction of inventories) and logistics in the JiT system (at least daily deliveries).

2) Quality deficiencies or errors in production [Matyla, Wójcik, 2016; Duursma et al., 2016] can be caused by:

- insufficient competence of the executive staff and lack of work standards,
- incorrect functioning of the information system, enabling efficient communication between the production department and the sales department,
- low quality or expired raw materials,
- deficiencies in kitchen equipment,
- insufficient quality and quantity of staff training.

The above reasons result in reduced quality of products and services, including delays in serving dishes, and thus a decrease in customers' sense of satisfaction and the degree of their return. Hiring highly competent staff, introducing work standards, and appropriate training are the proper remedies for these problems.

3) Insufficient availability of raw materials, equipment, space and personnel [Ramalho et al., 201; Peregrin, 2011] can be caused by:

- incorrect estimation of demand and planning of the necessary raw materials,
- too little space in the production or sales department, preventing the free movement of employees and lack of space for proper storage of dishes and equipment,
- falsely understood savings on outlays and costs of restaurant operation, resulting in insufficient staff and equipment constituting the restaurant's equipment,
- poor restaurant design.

The above reasons consequently cause production to stop and prevent the sale of individual dishes, conflicts, and reduced productivity of production and auxiliary staff. Proper organization of production and commercial space (perhaps using the PPP method and "spaghetti" charts), especially at the restaurant design stage, should help solve most of the abovementioned problems. Securing the necessary resources (business plan) and developing appropriate work standards should help solve most of the abovementioned problems. An appropriate level of logistics management using the ABC/XYZ method is also essential.

4) Unnecessary movement at the production or customer service workstation that can be caused by [Ohno, 1999; Ulrych 2018, Matyla, Wójcik, 2016]:

- improper organization of workstations (lack of 5S) and incorrect layout of the restaurant,
- incorrect arrangement of dishes and kitchen appliances (the place where they are stored should be close to the place where they are most often used),
- incorrect functioning of the information system between the production department (cooks) and the sales department (servers),
- lack of standards for moving around the production or commercial space (in the milkman's loop system).

Unnecessary movement at the workplace prolongs activities that are supposed to create added value for the customer, wastes the time, strength, and energy of employees, results in low work efficiency, and consequently discourages customers. The organization of workstations based on the 5S method (including shadow boards), standardization of work, and employee training should significantly reduce the occurrence of this waste.

5) Unnecessary processing or improper processing methods may be caused by [Ulrych 2018; Matyla, Wójcik, 2016]:

- insufficient knowledge of employees on the operation of kitchen appliances,
- insufficient knowledge of employees about the technology of producing various types of dishes (recipes),
- insufficient knowledge of employees about customer service methods,
- lack of standards of work for cooks and servers.

Consequently, this results in a waste of time, energy, production potential, extended delivery/customer service times and a decrease in the dishes' quality. The development of work standards and comprehensive staff training (e.g. based on the TWI method or on-the-job coaching), as well as the employment of competent staff, should greatly help to reduce this type of waste in the restaurant.

6) Expectation, which in the restaurant environment is related to both deliveries, production and customer service [Ulrych 2018; Matyla, Wójcik, 2016, Locher, 2016], be caused by:

- malfunctioning information system between customer service and the production department,
- waiting for raw materials, delays in deliveries,
- incorrect organization of work, shortages in equipment and lack of personnel,
- low competence of the staff and lack of work standards,
- broken or improperly functioning kitchen equipment.

The above waste, which strongly affects the efficiency and profitability of restaurants and the level of customer satisfaction, in practice, can be reduced by Lean organizational

methods such as FIFO, kanban, JiT, standardized work, TPM and staff training.

7) Unnecessary transport is most often caused by [Ulrych 2018; Matyla, Wójcik, 2016, Locher, 2016]:
- improper location of the cold store and warehouse, at a significant distance from the production department,
- a significant distance from the auxiliary warehouse for servers from the sales department,
- shortages in scheduled deliveries, requiring additional transport of raw materials from wholesalers or stores directly by restaurant employees.

This phenomenon results in wasted time, fatigue for employees, and additional, unnecessary costs. Better organization of production and service space and more accurate delivery planning will certainly reduce it. Lean methods that can be used in this process are supermarkets, visual communication, zooming in on the stands and organizing them in the form of "U" sockets, e-kanbans, check-lists, and logistics in the milkman's loop system.

8) Lost creativity of employees [Walentynowicz, 2013], which can be caused by:
- improper organizational culture of the restaurant,
- inappropriate management styles in the restaurant,
- lack of meetings for all restaurant employees, where they can share their ideas or exchange comments,
- no anonymous suggestion boxes through which employees can freely express their opinions,
- failure to listen to employees' opinions by management and imposing suboptimal organizational solutions on them.

Mistakes of this type made by management result in lower-than-expected motivation of employees and their involvement in the restaurant's development, which can ultimately have a very strong impact on the quality of dishes and the level of organization and operation of the restaurant.

9) Irregularity and seasonality of demand [Walentynowicz, 2013]. Since this is a feature very characteristic of services, which is challenging to eliminate, one of the essential solutions to this problem is the appropriate hour-day planning of restaurant resources based on empirical experience, appropriate AI programs that can already be used today, and the operation of restaurants in the pull and JiT systems.

Since Lean Management is primarily about Lean human resource management, managers should start with themselves when changing attitudes and behaviours in an organization. Suppose they want to change the organizational culture in the right direction (to participate in teamwork, care for quality, the customer, and the organization's organization to develop the restaurant and its employees). In that case, they should show the right energy and commitment and set a positive example. As practice proves (see the cyclical TVN program "Kitchen Revolutions"), only such an approach to managing a restaurant can provide and does provide the proper, desired results.

III. LEAN ORGANIZATIONAL SOLUTIONS IN THE CATERING BUSINESS

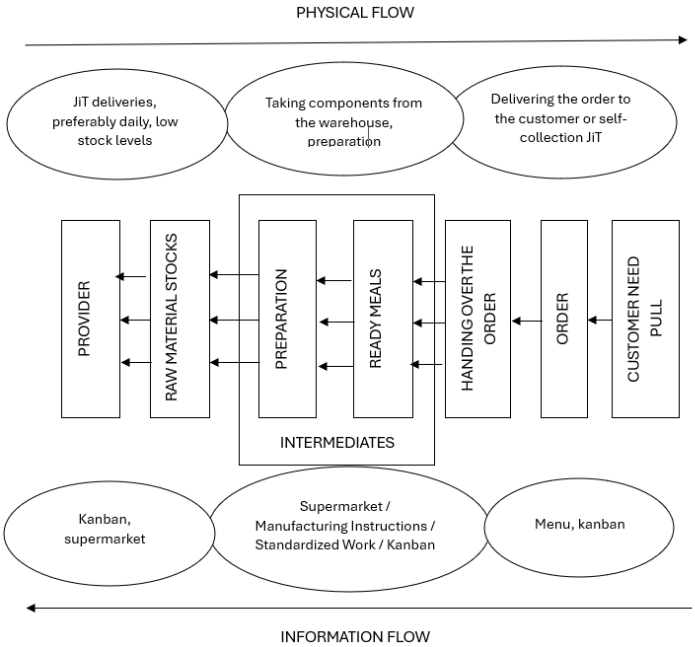
Lean Management is a very capacious and flexible concept. Therefore, rigid copying of solutions from the prototypes of this concept (the automotive industry) is not the right approach. In service activities, especially in restaurants, one should look for solutions that lead to better implementation of the objectives of this concept and the reduction of various types of waste occurring in gastronomy. Benchmarking lean solutions developed among direct competitors or as part of other gastronomic business models is also advisable. On the other hand, one of the most important factors of progress is the awareness of goals and the existence of this management concept among restaurant management/owners in general. The general model of restaurant operation based on the assumptions of the Lean concept is presented in Figure 2. On the other hand, the primary three models of lean solutions in the catering industry include:

1) Network model. It is used in various fast-food restaurant chains, such as Mcdonald's, KFC, and Burger King, and recently, with some modifications to eliminate the imperfections of its predecessors in Max Burger, Nord Fish or Subway. It was initiated by solutions used for the first time in the McDonald's chain (interestingly, long before the Lean concept spread worldwide). Characteristic features of this model are centralized purchasing (in order to reduce costs and maintain quality standards) and systemic deliveries in the JiT formula to individual restaurants of the chain, standardized menu list, preparation of dishes in the pull system (at a clear signal from the customer) and the use of various types of lean solutions in the production and service activities of the restaurant. Even though the quality of the dishes served by these establishments still leaves much to be desired, the general formula (business model) of the restaurants and their organization were very much to the liking of customers [cf. Matyla, Wójcik, 2016 and Gładysz, Haskins, Buczacki, 2020; Orynycz, Tucki, Prystasz, 2020]tags. These networks are viral in the world and continue to develop dynamically. Global chains, such as Pizza Hut, Telepizza, Starbucks, and Costa Coffee, have successfully used this model. However, each looks for slightly different ways to stand out and maximize revenue. These are not always strictly Lean solutions, especially in smaller chains of national dishes (kebab, sushi, Asian cuisine). A primary metaphor for this Lean business model type is the slogan: "comprehensive standardization".
2) Bain-marie model. This model has recently experienced a renaissance after becoming somewhat infamy in the "rightfully gone" times, i.e. the socialist economy, and using it in cheap eateries. The essence of this gastronomy lies in the fact that previously prepared dishes, but on an ongoing basis, in small quantities, fresh and warm, are waiting for the customer in heated bain-maries. In this way, the customer can choose what he wants. Secondly, receive a high-quality dish at an attractive price; and thirdly,

quickly and neat. Conditions are used by chains located in shopping centres, such as Smak na Tak, Luna Ekspress or Ekspress Oriental. In addition, the famous "milk bars" in Poland continue to operate in this model. Suppose a restaurant operating in this model uses various types of Lean solutions in terms of logistics and production. In that case, economic results and customer satisfaction are a pretty good model of modern gastronomy. Based on this model, one of the benchmarking patterns for functioning in gastronomy may be the Gdynia restaurant "U Senwickich".

3) A model of individual lean solutions in a single restaurant. Within this model, owners/management are looking for individual organizational solutions in the spirit of Lean leading to a positive differentiation of the restaurant on the market while focusing on resource savings and eliminating various types of muda. However, it is challenging to give various examples here because each of these types of organizations would have to be analyzed by the mechanisms of its functioning based on the principles of the Lean concept (very often, the mess in the back room and the low quality of sanitary and epidemiological production conditions discredit such companies (the authors deliberately do not give such examples). At the same time, some of the best organized in this respect are various sushi restaurants or other Asian ones. A specific example of the application of the Lean concept in a Polish "inn" restaurant is given by Gładysz, Haskins, and Buczacki [2020]; the author of the article was also the leader of a project in one of the restaurants in a shopping mall X, which was an initial success.

FIGURE 2. GENERAL MODEL OF LEAN RESTAURANT OPERATION



Source: Own study based on: [Gładysz, Haskins, Buczacki, 2020].

IV. DISCUSSION – DATA ANALYSIS

In the literature on the subject, it is emphasized that the implementation of Lean in catering enterprises differs from the implementation of Lean in manufacturing enterprises [Gładysz, Haskins, Buczacki, 2020; Matyla, Wójcik, 2016; Orynycz, Tucki, Prystasz, 2020]. Therefore, owners must take into account different effects and their scale; however, as confirmed by the results of research, the implementation of Lean in restaurants has a positive impact on their financial results and market position [Gładysz, Haskins, Buczacki, 2020; Orynycz, Tucki, Prystasz, 2020, Suarez-Barraza, M.F. et al., 2012; Muller, 2012]. Other specific benefits of implementing/applying Lean Management in gastronomy include:

1) The lead time (meal preparation) was reduced by about 55% thanks to the reorganization of the production department, shortening transport routes, and appropriate arrangement of the stove, sink, and small household appliances [Gładysz, Haskins, Buczacki, 2020]. Faster meal preparation and serving can positively impact demand, thanks to the competitive pace of service compared to other restaurants.
2) Eliminate food waste thanks to pull technology, constant inventory control and visual management. It positively impacts the company's finances, enabling its development as a result of the resulting savings. The environmental aspect is also essential, as gastronomy is responsible for 12% of food waste in the world [FUSIONS, 2016].
3) Reduce losses due to expired food, which also positively impacts the environment [Engström, Carlsson-Kanyama, 2004; Gomes-Neves, 2007; Ramalho et al., 2015].
4) total costs decreased by about 16% [Gładysz, Haskins, Buczacki, 2020].
5) Greater independence of employees, without supervision and with a lower level of routine control by the owner [Piasecka-Głuszak, 2013].
6) Increase the amount of training, awareness, and competence of employees. Thanks to greater emphasis on employee training, the restaurant owner can reduce the costs of possible food losses resulting from the inability to handle it (proper arrangement in the cold room, label control, non-crossing dirty food with clean food, improper processing, smaller processing batches). A better-trained employee is also more efficient, so it is possible to increase the quantity and quality of dishes served [Engström, Carlsson-Kanyama, 2004; Gomes-Neves, 2007; Ramalho et al., 2015].
7) Gaining additional time from the owner, which can be used for marketing and business development activities, thanks to better-trained staff.
8) The position's working time was reduced by almost 70% [Orynycz, Tucki, Prystasz, 2020], which made it possible to reduce employment or increase the facility's productivity.
9) Accelerating the entire production cycle, e.g., in fast food restaurants by 23% [Orynycz, Tucki, Prystasz, 2020], increasing market competitiveness, which may also translate into increased demand.
10) Reducing energy consumption, e.g., by about 4%,

according to Orynycz, Tucki, and Prystasz [2020], which is a very important cost factor for restaurants in conditions of high energy costs.

11) Reduction of carbon dioxide emissions [Orynycz, Tucki, Prystasz, 2020].
12) Reduced inventory of raw materials and finished products, which is one of the primary sources of waste in catering establishments [Garrone et al., 2014; Matyla, Wójcik, 2016; Żubrecki, Kruczek, 2018, p. 262].
13) Greater competitiveness in the market, thanks to faster response to customer demand, and thus increased demand and sales.
14) Greater stability in the market, even during a possible crisis in the catering industry, thanks to Lean solutions [Orynycz, Tucki, Prystasz, 2020].

In addition, in the era of the ever-changing food service sector and culinary trends, adequate flexibility in the operation of restaurants with a stable position on the market is necessary, which Lean ensures.

A project in which the co-author of this study participated in 2023 has empirically confirmed the possibility of obtaining most of the above-mentioned benefits.

As emphasized by various authors, the implementation of Lean in gastronomy takes place at different levels and with the use of different techniques, depending on the specifics of the restaurant and the knowledge of the management [Gładysz, Haskins, Buczacki, 2020; Orynycz, Tucki, Prystasz, 2020, Suarez-Barraza et al., 2012; Muller, 2012]. This affects the different benefits that different restaurants can get from this concept. Orynycz O., Tucki K. and Prystasz M. [2020] also point out the benefits of using artificial intelligence in restaurant planning work.

The literature on the subject indicates that SMEs, including catering establishments, are often managed and run by the owner or family businesses. In contrast to large enterprises, SMEs, particularly micro and small enterprises, are distinguished by lower bureaucracy, centralization of decisions and a shortened communication channel. These features indicate greater flexibility and, as reported by Żubrecki Z. and Kruczek M. [2018, p. 262], may facilitate more efficient implementation of changes in large enterprises. However, the key to the success of Lean implementation in a company is the involvement and conviction of the management of the benefits of the concept [Żubrecki, Kruczek, 2018, p. 262].

The characteristics of individual companies and the business type should determine the appropriate tools when implementing Lean. In the literature on the subject, the following methods and techniques that can be implemented in catering establishments are distinguished primarily [Gładysz, Haskins, Buczacki, 2020; Orynycz, Tucki, Prystasz, 2020; Suarez-Barraza et al., 2012; Muller, 2012; Żubrecki, Kruczek, 2018] :

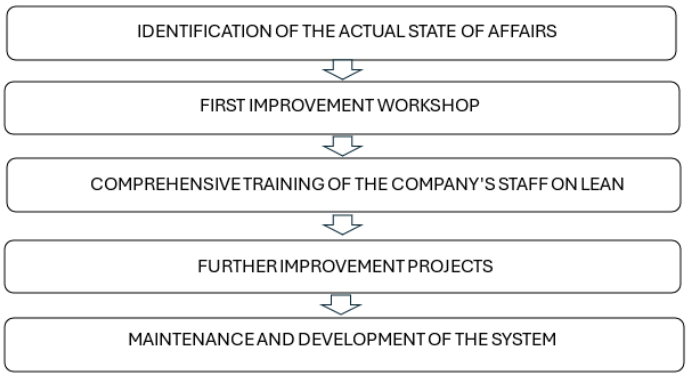
1) FIFO - First in First Out,
2) 5S,
3) Just in Time,
4) Kanban,
5) Value stream mapping,
6) Poka Yoke,
7) SMED,
8) Visual management,
9) Ishikawa diagram,
10) Andon
11) Pull/suction system,
12) PDCA.

Based on our experience, we can also recommend:

1) Standardized work;
2) Different problem-solving methods (e.g. brainstorming, genbutsu ghemba or 5Why?) and ways to collect ideas from the crew in the spirit of Kaizen (applications, debriefing meetings and group improvement projects);
3) Balancing workloads at workstations;
4) Teamwork (which is almost natural in the catering industry). Therefore, in lean restaurants, taking care of the right atmosphere in a leadership way is also one of the essential management solutions;
5) "The Milkman's Loop";
6) Empowerment.

In the literature on the subject, in addition to the Lean transformation models of large or medium-sized entities [Walentynowicz, 2013], there are also publications on how to implement Lean in catering entities [e.g. Gładysz, Haskins, Buczacki, 2020]. These authors also point out that most often, the first step among restaurants implementing Lean is the implementation of 5S and redesigning departments in the catering facility. But not necessarily. According to the authors of this article, the first step in implementing Lean Management in a catering business should be the analysis and diagnosis of the actual state of a given facility and, above all, its problems. Only then can you start explaining to restaurant owners what this concept is and what effects they can achieve due to its implementation; otherwise, they will not feel the need to use it. Using the empirical experience of one of the article's authors, we propose an approach to implementing Lean Management in a small restaurant enterprise, presented in Figure 3.

FIGURE 3. STAGES OF IMPLEMENTING LEAN MANAGEMENT IN SMALL CATERING ENTERPRISES



Source: Study based on: [Walentynowicz, Szreder, 2019].

Research on the implementation of the Lean concept in catering establishments and other enterprises from the SME sector indicates the following barriers in this process [Grycuk, 2016; Matt, Rauch, 2014; Podobiński 2015; Rose, Deros, Rahman, 2009; Ulewicz, Kucęba, 2016 Żebrucki; Kruczek, 2018]:

- lack or limited knowledge of the concept,
- lack of skills and experience in applying Lean,
- lack of willingness of owners or managers to make various types of changes,
- reduction of financial and technological resources,
- focusing on the current situation (satisfactory prosperity of the company) and stopping the process of development of the company, which in the future results in a decrease in competitiveness,
- reluctance to reduce the number of personnel,
- often not enough staff,
- lack of motivation among employees,
- ignorance of Lean tools,
- lack of feedback,
- low competence of the management staff,
- lack of standardization,
- low level of management by objectives, lack of specific development goals,
- insufficient or even lack of various types of training,
- employment, who is based on "junk" contracts and seasonality of work, which is not conducive to building the right organizational culture and involvement of employees in the company's development processes.

These barriers, especially the lack of awareness of their occurrence among management and the lack of reaction to them, can significantly hinder, and sometimes even prevent, the successful implementation of Lean Management in the catering business. However, the authors hope that awareness of the benefits and opportunities offered by applying this concept in restaurant operations can be a very motivating factor in overcoming the barriers.

V. Conclusions

The indicated barriers to the implementation/successful application of Lean Management in catering activities can be a good source of information for the reflection of owners or managers on the status of their enterprises and the possibility of their development, and thus survival in the highly competitive market of catering services. However, an even better source of motivation for them to implement this concept should be knowledge of the assumptions and mechanisms of the correct application of the Lean concept in restaurant operations and the benefits they can gain from it. The authors intend this publication to make easier for them. Presenting this knowledge in a synthetic form, collected based on the analysis and synthesis of the literature on the subject, as well as the authors observations and experiences, was the primary goal of this study. Despite the fact that the research was conducted using a non-representative method, but only with the help of selected case studies, the authors managed to identify three basic models of Lean Management occurring in restaurant operations, which can also be a guide for practitioners on choosing the right solution. The article's authors hope that as many practitioners of catering activities as possible will benefit from this knowledge.

VI. References

Bloom J., American wasteland: how America throws away nearly half of its food (and what we can do about it). Da Capo Press, Cambridge MA 2010.

Duursma G., Vrenegoor., Kobus S. (2016), Food waste reduction at Restaurant De Pleats: Small steps for mankind., Research in Hospitality Management, 6(1): 95-100.

Engström R., Carlsson-Kanyama A. (2004), Food losses in food service institutions Examples from Sweden., Food Policy, 29(3): 203-213.

FUSIONS, Estimates of European food waste levels, 2016, https://www.eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf, accessed: 10.01.2024.

Garrone P., Melacini M., Perego A., Pollo M., Opening the Black Box of Food Waste Reduction., Food Policy 2014., 46: 129-139.

Gładysz B., Buczacki A., Haskins C., 2020, Lean Management Approach to Reduce Waste in HoReCa Food Services, Food Waste Prevention: Reduction, Reuse and Recycling, Resources, 9(12), 144.

Gomes-Neves E., Araújoa A., Ramosc E., Cardoso C., Food handling: Comparative analysis of general knowledge and practice in three relevant groups in Portugal., Food Control 2013, 18(6): 707-712.

Grycuk, A., (2016), Barriers to the application of the lean management concept. Quarterly of Business Administration, 40(3): 72-79.

Gupta S., Sharma M., Sunder V.M., 2016, Lean services: a systematic review, International Journal of Productivity and Performance Management, No. 65(8).

Kilibarda N., Djokovic F., Suzić R. (2019) Food Waste Management — Reducing and Managing Food Waste in Hospitality., Meat Technology, 60(2): 134-142.

Lisiński, M., & Ostrowski, B. (2006). Lean Management in the restructuring of the company. Kraków-Kluczbork: Antiqua.

Kukiz J., (2018), Lean tools – a practical approach. LeanCert Sp. z o.o., Polanica Zdrój.

Krasiński M. (2015), Lean management in preventing and overcoming crisis in the enterprise, Marketing i Rynek, No. 5: 266-276.

Locher D. (2012), Lean in the office and services, MT Biznes Publishing House, Warsaw.

Maguire M., Wasted Potential: A Food Waste Reduction Strategy for Toronto Restaurants, York University, Toronto 2016.

Matt, D.T., Rauch, E. (2014). Implementation of Lean Production in small sized Enterprises. 8th CIRP Conference on Intelligent Computation in Manufacturing Engineering, www.sciencedirect.com, accesed: 10.01.2024.

Matyla J., Wójcik A. (2016), Various faces of logistics. A collection of students' works. Lean Management in Services, or How to Eat Without a Queue, [in:] Motowidlak U., Wronkowski D., Reńda A. (eds), Repository of the University of Lodz.

Müller, C. (2012), The Restaurant as Hybrid: Lean Manufacturer and Service Provider. Boston Hosp. Rev., Fall,: 39-47.

Nogalski, B., Walentynowicz, P. (2009). Helping to increase the competitiveness of business partners as one of the basic assumptions of the Lean Management concept. (in:) S. Lachiewicz & M. Matejun (Eds.), Development Management of Small and Medium-Sized Enterprises. Warsaw: Wolters Kluwer.

Nowak M., Trziszka T., Otto J. (2008). The position of meal quality among the factors shaping the preferences of buyers of catering services. Food. Science. Technology. Quality 3(58), 12-140.

Ohno T. (1988), The Toyota Production System: Beyond Large Scale Production, Productivity Press, Portland.

Orynycz O., Tucki K., Prystasz M., 2020, Implementation of lean management as a toll for decrease of energy consumption and CO2 emissions in the fast food restaurant, carbon dioxide (CO2) utlization, energies.13(5), 1184.

Piasecka-Głuszak A. (2013), Benefits of implementing lean management in Polish enterprises in times of crisis – results of survey research, Integration and crisis on local markets in the modern world, Scientific Papers of the Wrocław University of Economics, No. 315, vol. 2: 99-111.

Peregrin T. (2011), Sustainability in foodservice operations: an update., J Am Diet Assoc, 111(9): 1286-12940.

Podobiński, M. (2015). Barriers and limitations of implementing the concept of Lean Management – research results. Management Sciences, 3(24).

Priefer C., Jörissen J., Bräutigam K. (2016), Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action, Resources, Conservation and Recycling, 109: 155-165.

Ramalho V., Cunha M., Moura A. (2015), Why do small business butcher shops fail to fully implement HACCP?, Food Control, 49: 85-91.

Rose, A.N.M., Deros, B.M., Rahman, M.N.A. (2009). A review of lean manufacturing practices in small and medium enterprises. Seminar 3 – AMReG 09, Kajang, Selangor, Malaysia.

Sala J. (2011), Marketing in gastronomy. PWE, Warsaw.

Suarez-Barraza M.F., Smith T., Dahlgaard-Park, S.M. (2012), Lean Service: A Literature Analysis and Classification. Total Quality Management, American Journal of Industrial and Business Management, vol.7, no.5, p. 30.

Ulewicz, R., Kucęba, R. (2016). Identification of problems of implementation of Lean concept in the SME sector. Economics and Management, 8, 1.

Ulrych W. (2018), Performance management practices in the context of the requirements of the lean concept in the service environment, University of Lodz Press, Łódź.

Walentynowicz P. (2013), Determinants of the effectiveness of Lean Management implementation in manufacturing enterprises in Poland, University of Gdańsk Press, Gdańsk.

Walentynowicz P., Szreder, J. (2019) The Metod of the Implementation of Lean Management in a Small Enterprise (in:) A.W. Serbulov (eds.) Uprawlenie innowacjem: wyżowy i wozmogosti dlia otrasliej i sektorow ekonomiki, Baltijskij Federal'nyj Universitet Imeni Immanuila Kanta, Kaliningrad.

Żebrucki Z., Kruczek M. (2018), Conditions for the implementation of the Lean Management concept in the SME sector, Organization and Management, Scientific Papers of the Silesian University of Technology, vol. 120: 257-272.

VII. NETOGRAPHY

https://retailnet.pl/2023/08/18/gfk-polski-rynek-gastronomiczny-rosnie-wartosciowo-ale-jest-w-zlej-kondycji/, accesed: 28.09.2024

https://poradnikrestauratora.pl/artykuly/gus-ogolna-liczba-placowek-gastronomicznych-byla-mniejsza-o-109-w-porownaniu-z-2019-r/\, accesed:28.09.2024.

https://www.bankier.pl/wiadomosc/GUS-wzrosly-przychody-z-dzialalnosci-gastronomicznej-Jest-tez-wiecej-lokali-8431821.html\, accesed: 28.09.2024.

https://www.money.pl/gospodarka/branza-w-kryzysie-gastronomia-po-uszy-zadluzona-7026643195210240a.html, accesed: 30.09.2024.

https://www.dlahandlu.pl/gastronomia/mcdonald-s-kfc-pizza-hut-i-starbucks-w-kryzysie-to-koniec-fast-foodow,146266.html, accesed: 30.09.2024.

.