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Financial Motivational Factors Supporting the Optimisation Process

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ABSTRACT

Objective: The research objective of the paper is to present the results of an analysis of financial motivational factors supporting the optimisation process in the implementation of *Lean Management* concepts on the example of a selected manufacturing company.

Methodology: To verify the studied issue, a survey was conducted on the relationship of the influence of financial motivation on the reporting of *Kaizen* requests among the employees of a manufacturing company apart on two groups of employees, that is, two groups of respondents: $GI_{N=158}^{2022}$ and $GII_{N=137}^{2023}$, using a five-point Likert scale. The paper draws on *Lean Management* and *Kaizen* literature, academic articles, online sources, analyses of data from 2020–2023 obtained from the analysed company, and empirical results. Mathematical analysis tools were used to describe the research results obtained, allowing for the construction of summaries and the creation of presented conclusions. An estimation model was also developed to allow managers to evaluate existing motivational factors.

Findings: The research identified a gap resulting from the communication and information flow process operating within the company. A 4 percentage points increase in the effectiveness of the activities carried out, with a 62% level of non-involvement, was observed, indicating the low attractiveness of the current financial motivation factors as a tool to support optimisation processes in the surveyed company.

Value Added: By carrying out the research, valuable and practical information was obtained, which has been used by company managers to take measures to increase employee motivation and the impact of the financial motivation factor operating within the company to support optimisation processes.

Recommendations: The current bonus system in terms of financial incentives to support optimisation processes is at an unsatisfactory level for employees. The scoring of applications should be evaluated or the financial value per model evaluation point should be increased.

Key words: optimisation, *Lean Management & Kaizen*, cost minimizing, company objectives, factor productivity, profit maximizing, environment and growth

JEL codes: D21, D24, L15, L21, L25, O44

Introduction

The range of instruments supporting the optimisation and productivity enhancement processes of companies include the concepts: *Lean Management* and *Kaizen*. The former eliminates waste and excess waste in continuous improvement cycles. The latter, on the other hand, which is a philosophy of continuous improvement, involves employees in implementing the improvements developed. Hence, optimisation projects implemented in accordance with them bring benefits to the company, such as increased productivity, reduced costs, improved product and service quality, and increased customer satisfaction. However, the possibility of certain risks must also be taken into account, such as implementing changes too quickly, failing to adequately train employees, or inadequately managing change processes. The introduction of *Lean Management* and *Kaizen* requires time, commitment, and an understanding of the nature of the processes as well as the change in the philosophy by both employees and managers. At the same time, process optimisation and continuous improvement can bring long-term financial benefits and contribute to a company's success.

With this approach, the motivational factors accompanying the implementation of the *Lean Management* philosophy can help increase the effectiveness and efficiency of operations. With clearly defined goals, employees know exactly what they need to achieve and what the employer's expectations are. It is then

also important to provide them with the right level of training and a support system, which only increases the effectiveness and efficiency of subsequent implementations. An additional factor, such as an individually designed system of rewards and recognition for good performance, can increase employee motivation and encourage commitment to Lean. Employees should also be offered the opportunity to contribute suggestions and ideas that can improve processes and multiply productivity, which in turn can affect their motivation to perform.

There are inherent financial aspects related to change processes. Hence, the selection of instruments that enable measurement allows business owners or managers to accurately assess the effectiveness of implementations, including cost reductions, increased productivity, improved quality, and minimised losses. Conducting such an analysis facilitates measuring whether the introduction of the *Lean Management* concept has brought the expected financial benefits and whether further investment in this area is justified. Practicing the method requires a change in the way an organisation thinks and works, which can be challenging for both employees and management.

The research objective of this article is to present the results of an analysis of a change management project in terms of financial motivational factors supporting the optimisation process in implementing the *Lean Management* concept on the example of a selected manufacturing company. That is, the aim is to examine in detail the essence of the influence of the financial motivation factor on the effectiveness of the implementation of *the Lean Management* concept and to attempt to identify the determinants supporting the effectiveness of these activities in terms of the most effective financial motivators.

Materials & Methods

In order to analyse the influence of the financial motivation factor on the support of *Lean Management* optimisation processes, a survey was conducted on the relationship of the influence of financial motivation on the reporting of

Kaizen requests among the employees of a manufacturing company. The voluntary and anonymous survey was conducted twice: in October 2022 and then in March 2023. The aim of the survey was to find out the importance of financial motivation factors for employees in the context of implementing the *Kaizen* concept and the significance of the issue of the influence of financial aspects on the willingness to participate in a *Kaizen* implementation project in the analysed company. The survey consisted of closed questions using a five-point Likert scale. The survey was preceded by internal marketing campaigns promoting all aspects concerning the employee suggestion programme (posters, posters, flyers). The results of the survey were analysed and, based on them, changes were implemented in the company to increase employee involvement in the *Kaizen* programme of suggestions. Five months after implementation, a repeat survey was carried out to once again verify the results obtained, enabling the project to be further improved.

Using the survey, the impact of financial factors on employee motivation levels was analysed and the effectiveness of the suggestion system was assessed in terms of increasing the efficiency of production processes. The survey aimed to gain insight into the behaviour of employees and their attitudes toward innovative solutions that could contribute to improving product quality and increasing the efficiency of production processes.

The research groups described as:

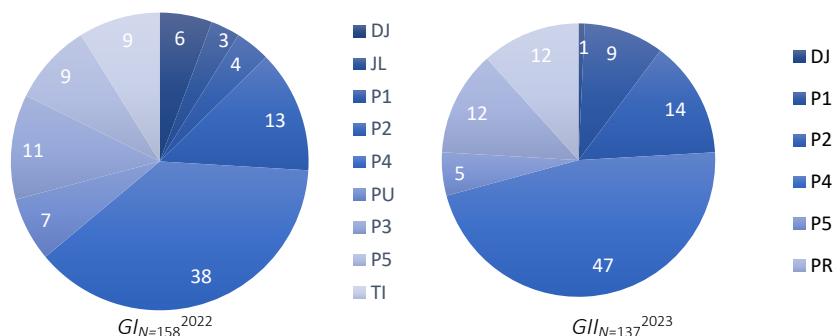
- Group I: $GI_{N=158}^{2022}$ (survey conducted in October 2022)
- Group II: $GI_{N=137}^{2023}$ (survey conducted in March 2023)

show variation in both the proportion of respondents of the respective departments and their survey sample size. The company has a total of 506 employees ($G_{N=506}^{All}$); however, only the group of production employees working in departments classified according to the company's internal procedure ($G_{N=489}$) was surveyed:

- DJ – Quality Assurance
- JL – Laboratory

- P1 – Modelling Plant
- P2 – Smelting Shop
- P3 – Hand Foundry
- P4 – Machine Foundry
- P5 – Mechanical Foundry
- TI – Technology
- PU – Maintenance
- PR – Core Shop (Figure 1).

Figure 1. Proportion of GI & GII trials [%]

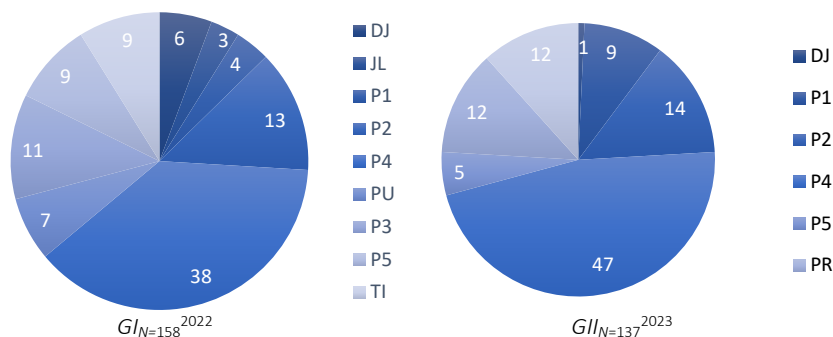


Source: own research.

The highest proportion of $GI_{N=158}^{2022}$ and $GII_{N=137}^{2023}$ respondents were employees of department P4, which is the most numerous in terms of the number of employees.

The respondents with $GI_{N=158}^{2022}$ are: 60 employees with seniority of 1 to 10 years, 34 employees with seniority of 31 to 40 years, 21 employees with seniority of 21 to 30 years, 20 employees with seniority of 11 to 20 years, 18 employees with seniority of 41 to 50 years. 5 workers in the research group analysed entered the survey without providing information to enable classification (Figure 2).

Figure 2. Seniority structure of *GI* & *GII* sample respondents [in years]



Source: own research.

In contrast, respondents with $GII_{N=137}^{2023}$ are: 71 employees with a length of service between 1 and 10 years, 29 employees between 31 and 40 years, 16 employees between 21 and 30 years, 9 employees between 11 and 20 years, 7 employees between 41 and 50 years. Also, 5 workers did not provide an answer in this surveyed criterion. The structure of participation confirms that it is the employees with the youngest seniority in the company who care about the continuous improvement of the workplace, as this group is the most numerous in both $GI_{N=158}^{2022}$ and $GII_{N=137}^{2023}$.

The paper draws on *Lean Management* and *Kaizen* literature, academic articles, online sources, analyses of data obtained from the company from 2020–2023, and empirical findings. To describe the research results obtained, mathematical analysis tools were used to construct summaries and create the presented conclusions. On the other hand, financial modelling tools were applied to the presented estimation model allowing managers to evaluate existing motivational factors.

Current State of Knowledge

Lean Management Concept – Continuous Enhancement

Lean Management is an operating philosophy developed by Toyota in the 1950s. The main objective of this concept is to eliminate waste and maximise the efficiency of processes to contribute to customer satisfaction by providing added value to products, while minimising waste of resources (Conviss & Liker, 2012). It is worth noting that the term '*Lean*' has many applications that are applied in different contexts including:

- *Lean Philosophy* – focusing on continuous improvement and the elimination of waste,
- *Lean Thinking* – a way of thinking that focuses on increasing efficiency by identifying non-value-adding activities and eliminating them,
- *Lean Management* – a concept for the comprehensive management of an organisation by eliminating waste in all areas of activity,
- *Lean Manufacturing* – a lean production system that applies continuous improvement tools (Connaughton, 2008).

Lean Management as a philosophy of the Toyota Production System (TPS), was developed by Taiichi Ohno, director of production at Toyota Motor Corporation in the 1950s, who began to look for different ways to improve production efficiency in the then young but rapidly growing company. Inspired by the mechanics of mass production, he began to analyse the production systems of western automotive corporations. He noticed that many of the elements of these systems were characterised by waste and inefficiency. He drew particular attention to their two major production flaws that were key factors in the creation of numerous imperfections and errors:

- the inability to adapt the variety of products to the needs and tastes of customers,

- production on a mass scale, generating excessive inventories that incur high costs and require large storage space (Holweg, 2007).

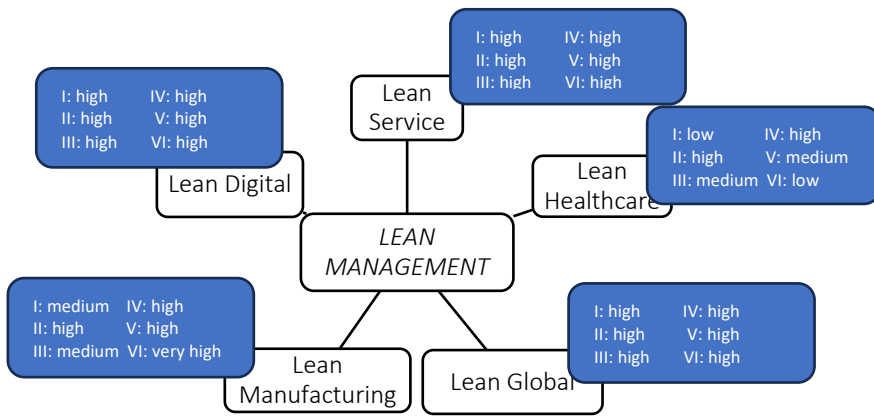
The result was the start of developing a new production system to eliminate waste, increase production flexibility, and focus on customer needs. To achieve this goal, three main principles – called the TPS pillars (Japanese: *Jidoka*) – were developed, on which Toyota’s new production system was based:

- producing only what is absolutely necessary,
- eliminating everything that does not add value to the product,
- stopping production when an error is detected.

The introduction of the above strategy, which became the foundation of the *Lean Management* concept, resulted in Toyota in the 1970s beginning to achieve significant success through high productivity and low production cost. The extraordinary potential lying in the organisation’s employees was also recognised, which contributed to the development of teamwork, increased individual responsibility and decentralised decision-making (Liker & Franz, 2013; Liker, 2005).

Since the 1980s, *Lean Management* has gained recognition among managers and entrepreneurs worldwide, and the publication of the book *Lean Thinking* by James Womack and Daniel Jones in the 1990s cemented the importance of the entire concept (Figure 3) (Womack & Jones, 2001).

Figure 3. Lean diversity



where:

I: competition

II: customer expectations

III: customer satisfaction

IV: quality improvements

V: responsiveness

VI: process improvements

Source: own elaboration based on literature review.

Lean Management has also started to be applied in the service sector, where it has been adapted to the needs and requirements of this market, characterised by strong competition and high customer expectations. *Lean Manufacturing*, on the other hand, is mainly directed at improving manufacturing processes, while *Lean Service* focuses on improving the quality and efficiency of service processes. The aim of this concept is to identify and eliminate waste and to streamline service processes, thereby improving their quality and increasing customer satisfaction. *Lean Service* is customer-oriented and assumes that the highest quality services should be delivered as quickly as possible at the least cost. *Lean Service* takes into account the importance of understanding customer needs and adapting service processes to meet these needs in the best possible way. *Lean Management* is evolving and successive phases cover precise areas of business: *Lean Global*, *Lean Digital* or *Lean Healthcare*, which has been specifically adapted to the healthcare sector (see also Coignet et al., 2019).

Kaizen Concept – Continuous Improvement

Kaizen is a philosophy of management thinking and action pioneered in 1986 by the Japanese Masaaki Imai at the Toyota automotive group. Today, it is a practice used worldwide in a variety of industries to support the achievement of goals set by companies. *Kaizen* (Japanese: *kai* – change, *zen* – good) means a change for the better. It is also the search for and implementation of improvements with the involvement of every employee – both management and rank-and-file workers. The *Kaizen* concept is a method that is a link between philosophies, systems, and problem-solving tools. Its message is one of improvement and continuous improvement without significant investment (Imai, 2022, 2007). The opposite of the *Kaizen* method is innovation, i.e., introducing change through the use of high-cost technology.

Kaizen-driven companies must be focused on common-sense solutions to daily difficulties that arise and on seeking and implementing change on every position. Following the notion “*any chain is as strong as its weakest link*” (Wohlleben, 2016). The smallest mistakes that go unnoticed in the functioning of a company can cause negative effects that accumulate. To prevent this, it is necessary to observe every single detail of the entire process, even the smallest one, and to strive for an even better result, i.e., endless improvements. An important aspect is the involvement of every employee who is part of the process, i.e., observing basic principles such as

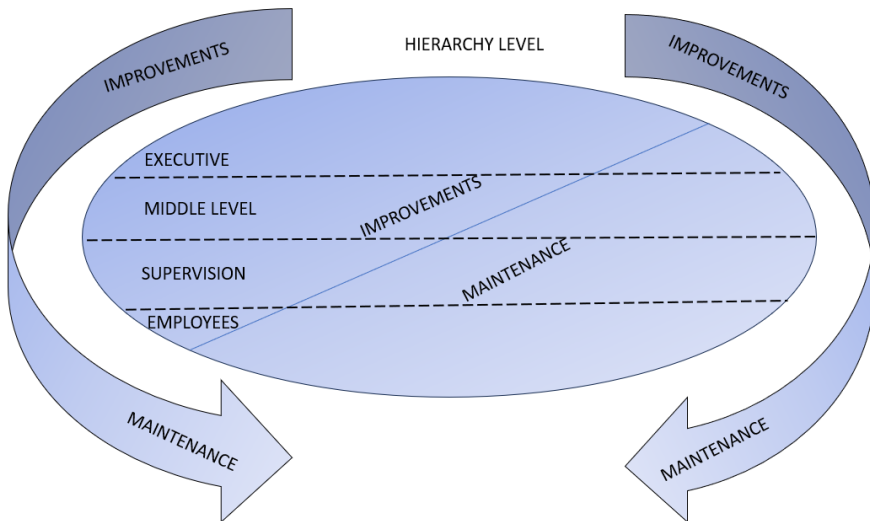
1. order in the workplace,
2. elimination of waste, or
3. standardisation.

Order in the workplace allows developing self-control in the employee and, through self-discipline and appropriate motivation, also maintaining it. This is an important element of improvement, because a person without such a principle will not provide a product/service of good quality. According to this concept, waste is referred to as *muda*, i.e., all activities that do not contribute to the value. The concept of *muda* was defined by Japanese engineer Taiichi Ohno

as “anything that does not add value, adds cost”. The elimination of *muda* facilitates increasing productivity and reducing operational expenditures at no cost (Ohno, 2017, 2012, 1998; Bańka, 2007). *Kaizen* seeks to eliminate *muda* by accumulating small improvements within processes, the rules of which are standardised and followed by every employee. Standards are written process steps that guarantee the quality of individual processes and prevent the repetition of errors already observed.

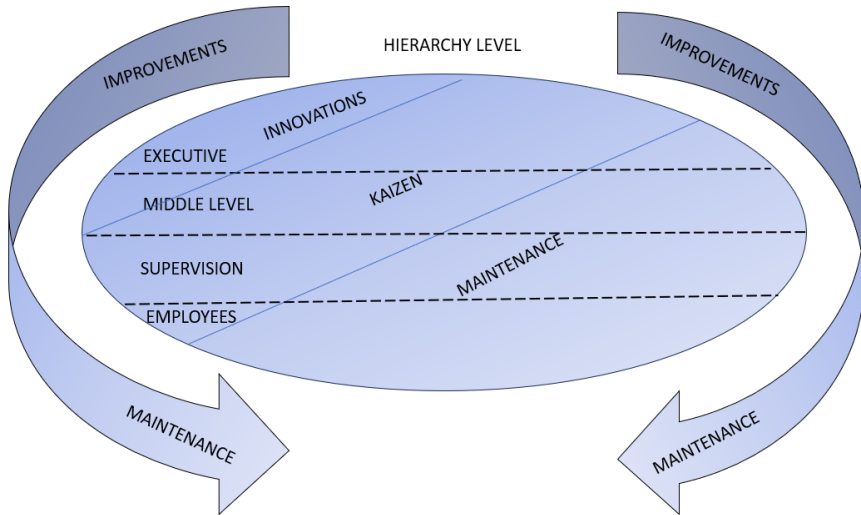
Management is also an important element of the process, with the task of following procedures, spreading them among employees, and maintaining discipline through continuous improvement, i.e., activities aimed at raising the level of current standards: maintenance and improvement and enhancement. Maintenance focuses on meeting current technological, managerial, and operational standards (Figure 4 & 5).

Figure 4. Japanese perception of employee functions



Source: own elaboration based on Imai, 2022.

Figure 5. Improvements split into innovation and *Kaizen*



Source: own elaboration based on Imai, 2022.

Involving individuals within an innovation improvement guarantees radical improvement through investment, whereas *Kaizen* emphasises human effort, communication, training, teamwork commitment, and self-discipline.

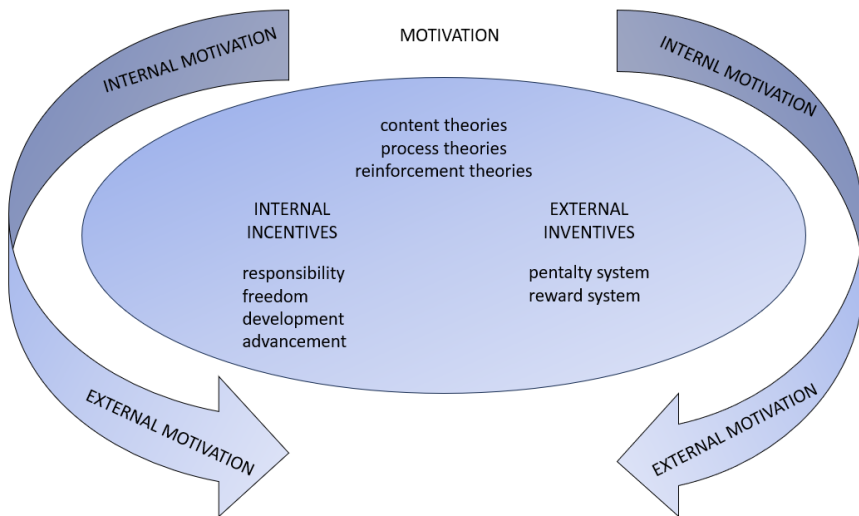
Motivation Factors Increasing Productivity

Motivation is an issue addressed by sociology as well as organisational and management science. It is one of the main factors driving performance and influencing everyone's actions. It is a force for action of employees, thanks to which basic needs are satisfied, what, at the same time, constitutes a motive for work that translates into the realisation of the company's goals and mission (Dejnaka, 2003; Filipowicz, 1998).

Motivation is the driving force behind human action and behaviour, which can be of a diverse nature (Reykowski, 1979). Two types of motivation are distinguished:

- internal – spontaneously occurring stimuli, by which people behave in a certain way and move in a certain direction; the following stimuli are distinguished: responsibility, freedom of action, possibility of development or promotion,
- external – a system of penalties and rewards (Figure 6).

Figure 6. Motivation types



Source: own elaboration based on literature review.

The process of influencing motivation is called a motivate process. According to economist S. Borkowski, motivation is the process of consciously and deliberately influencing people's motives and behaviour at work by creating conditions and opportunities for them to realise their value systems and expectations in order to achieve the motivating goal (Borkowski & Ulewicz, 2008). Management theory addresses aspects of people's work by seeking appropriate

ways to motivate action, in which the degree to which different needs are taken into account is a basic assumption (Stoner & Wankel, 1997).

According to J.A.F. Stoner and Ch. Wankel (1997), there are three main views of motivation in the management theory:

- content theories – emphasise the importance of the intrinsic factors that cause a person to act in a certain way (“what motivates”, i.e., what is motivated),
- process theories – identify how and by what goals individuals are motivated (“how one is motivated”),
- reinforcement theories – determine how the effects of past action influence future behaviour in a cyclical process of individual learning (“behavioural learning”) (Stoner & Wankel, 1997).

The basis for most management definitions is psychologist’s A. Maslow’s concept of the hierarchy of needs. Needs theory explains the internal factors that cause certain human behaviours. It assumes that every human being has certain internal needs and strives for their full or partial satisfaction, which in turn provides the driving force for action. Recognising the factors that trigger certain behaviours leads to the identification and classification of needs (Maslow, 2017, 2006, 2004).

Objectivity of *Lean Management* and *Kaizen* Implementation

Lean Management and *Kaizen* are two management concepts that are gaining increasing acceptance among organisations in various industries around the world. They aim to increase the efficiency of an organisation’s processes by eliminating waste and continuously improving. Introducing *Lean Management* and *Kaizen* into an organisation brings many benefits; however, the implementation of these concepts can also give rise to many difficulties that need to be considered during the implementation process (see also Karlof, 1992). The more thoroughly both

the benefits and limitations of *Lean Management* are understood, the more effective planning activities that implement the concept in an organisation. More and more companies in Poland are introducing or planning to introduce *Lean Management* into their management policies. This is because of the real benefits that can arise from the application of Japanese resource management methods and techniques. However, it should be emphasised that despite the numerous advantages that the introduction of this concept brings, still relatively few companies use it to its full extent. This is unfortunately due to the fact that organisations encounter many difficulties when implementing *Lean Management*. The literature identifies some of the most common obstacles, such as:

- lack of support from management – successful implementation of *Lean Management* requires the commitment of management, who must be willing to implement change and provide adequate support,
- lack of belief in the effectiveness of the overall method,
- lack of proper communication between different levels of the organization,
- excessive control system and lack of cooperation among employees,
- insufficient employee training – employees need to be adequately trained to understand and implement the *Lean Management* approach,
- too much pressure to perform – pressure to continuously improve processes and increase productivity can lead to too much pressure put on employees, which in turn can lead to stress and burnout,
- difficulty in changing organisational culture – implementing *Lean Management* requires a change in organisational culture, which may be met with resistance from employees (Małecka, 2022; Podobiński, 2015; Carr et al., 1998).

Implementing *Lean Management* in a manufacturing company can bring many benefits, such as:

- increased process efficiency – by using *Lean Management* methodology, an organisation is able to eliminate unnecessary activities and reduce the time it takes to complete a task,

- improved quality – by eliminating errors and imperfections in processes, an organisation can achieve higher quality products or services,
- increasing efficiency – continuous process improvement can lead to increased efficiency and reduced costs,
- improved organisational culture – *Lean Management* requires the active participation of employees in continuous process improvement, which can lead to an improved organisational culture and greater job satisfaction,
- increased profitability – improving process efficiency allows an organisation to achieve higher profits,
- efficient use of resources – by focusing on eliminating waste, an organisation can achieve better use of its resources (Pawłyszyn, 2017).

When looking at the process of implementing the *Kaizen* philosophy, there are both positive and negative aspects of the method.

The main advantages include:

- mutual benefits – gradual introduction of changes, which positively influences employee acceptance; this offers them more time to assimilate new information and better organise their work, avoiding unnecessary stress related to sudden changes,
- easier to achieve a stable competitive position – by introducing gradual changes and continuously improving processes, the company gains more experience and can better prepare itself for different situations on the market; as the changes are gradual and do not require a large financial outlay, the company can achieve a good competitive position without making major sacrifices; as a result, its products are improved on an ongoing basis, which contributes to their quality, which in turn attracts customers and builds a positive image of the company on the market,
- eliminating waste in processes through continuous improvement – the employees are constantly busy, which ensures that they feel needed and useful, and the company avoids additional costs and delays; all this is possible thanks to the constant observation of the employees and

the introduction of small improvements, to which they themselves contribute their ideas; in such a company, there is no room for unnecessary slack times (*muda*), which only increase costs and reduce productivity,

- the responsibility for the quality of the products does not rest with just one employee, but is shared among the whole team – each employee has their own tasks and is responsible for carrying them out properly and according to the established standards; this leads to the dispersion of responsibility and reduces the risk of errors; each employee knows what they should do and at what stage of production the product is; this low and simple responsibility makes it easier to control the production processes, as well as to react quickly to possible problems,
- straightforwardly proportional increase in performance and commitment – companies implementing this concept have the opportunity to see an improvement in production performance and an increase in employee commitment to the change processes; importantly, these benefits do not require a large financial outlay, meaning that the company can continue to operate with less risk; at the same time, the process of continuous improvement provides incremental improvements to the company; in other words, introducing the Kaizen philosophy to a company brings benefits both immediately and in the long term,
- low implementation costs – the philosophy focuses on incremental changes to processes and employees rather than large financial investments; however, it requires commitment and the right approach from managers, who should influence the positive attitude of their employees and create a friendly atmosphere within the company (Król, 2004).

Although *Kaizen* is used for its many advantages, it also has several disadvantages worth noting:

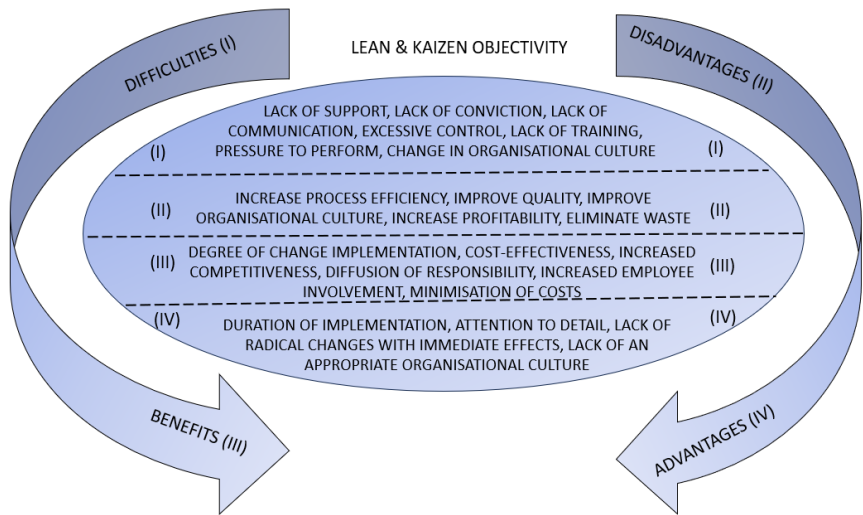
- requires time and patience – changes are introduced gradually and in small steps; therefore, not every company can opt for this method,

especially when it is in a difficult financial situation, such as on the verge of bankruptcy; in this case, more drastic measures may be needed to quickly improve the situation and recover from the crisis,

- for large companies, being too meticulous in the *Kaizen* process can be a challenge as it requires focusing on every detail of the process and coordinating the work of many employees; this can lead to dealing with unnecessary issues and additional problems arising, which in turn makes it difficult to reach all employees,
- failure to radically change the status quo – instead, it focuses on small improvements that are intended to lead to a gradual, systematic improvement in the quality of work; it does not aim at revolutionary investments or the overhaul of the entire company, but rather at changing the mentality of employees in order to guide them towards a continuous improvement and betterment of the status quo,
- there may be a lack of an appropriate organisational culture in European companies, which may be a barrier to adopting the *Kaizen* concept; the presence of barriers to assimilating and understanding the new management concept and defining quality (Matecka 2018; Król 2004).

From the advantages and disadvantages presented, it can be concluded that both *Kaizen* and *Lean* themselves have many benefits for companies that want to improve their efficiency, product quality, and employee engagement, but the decision to implement should be rational and take into account the disadvantages and limitations of the processes (Figure 7).

Figure 7. *Lean and Kaizen objectivity*



Source: own elaboration based on literature review.

Despite some disadvantages, such as the need for time and employee involvement, these methods offer many advantages, such as increased productivity, improved product quality, reduced project times, and increased employee involvement. Implementing *Lean* and *Kaizen* methods can be difficult and resource-intensive, but they are well worth investing in to achieve market dominance and stay ahead of the competition in the long term.

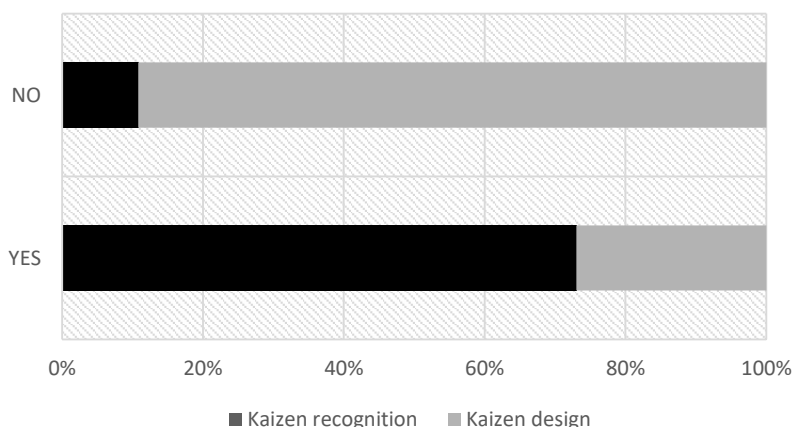
Result

Financial Motivational Factors supporting the Optimisation Process in the Light of Empirical Research

Measuring the results of the $GI_{N=158}^{2022}$ survey, it was found that 92% of the respondents heard of *Kaizen* operating in the area of employee suggestion programmes in the company before, while 8% of the respondents have not. It is

the company's business practice to encourage employees to actively and creatively optimise their jobs. Of the surveyed group $GI_{N=158}^{2022}$, 34% of the respondents applied to the *Kaizen* programme, while 66% of respondents did not participate in the programme, with an existing financial incentive programme of 1pts. = EUR 3.02 (Figure 8).

Figure 8. *GI Kaizen* recognition and designing [%]



Source: own research.

It was, therefore, decided to modify the financial factors and increase the baseline of one point by 13%. When the changes in the design of the financial aspects of the motivational factors were made after 5 months and implemented, the respondents were asked identical questions regarding their understanding of the *Kaizen* programme and the results of the $GI_{N=137}^{2023}$ survey were measured (Table 1).

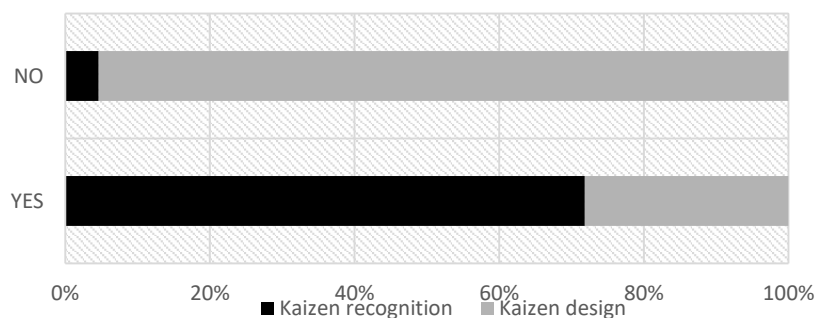
Table 1. Financial motivation factors *GI* & *GII* [%]

Points [min.– max.]	Value of points <i>GI</i> _{N=158} ²⁰²² [EUR*]	Additional award <i>GI</i> _{N=158} ²⁰²²		Points	Value of points <i>GII</i> _{N=137} ²⁰²³ [EUR*]	Additional award <i>GII</i> _{N=137} ²⁰²³		Value of points <i>GII</i> – <i>GI</i> [%]	Additional award for <i>GI</i> & <i>GII</i>	
		Kaizen of the quarter	Kaizen of the year			Kaizen of the quarter	Kaizen of the year		Kaizen of the quarter	Kaizen of the year
1	3.02			1	3.49			15.38		
100	302.33	232.56	697.67	100	348.84	232.56	697.67	15.38	0	0

* For a EUR exchange rate of 4.3.

Source: own research.

A 5 percentage points increase was found in the aspect of the first measurement, as 97% of the respondents heard of the programme however, 3% still have not. In contrast, participation in the programme increased to 38% (Figure 9).

Figure 9. *GI* Kaizen recognition and designing [%]

Source: own research.

The results allow concluding that more than half of the surveyed employees did not participate in the programme, while 1/3 decided to apply. This means that 1 in 3 respondents was involved in the *Kaizen* programme (Table 2).

Table 2. *GI & GII index of variation [%]*

Index of variation	Kaizen recognition		Kaizen design	
	[%]			
YES	5	↑	4	↑
NO	-5	↓	-4	↓

Source: own research.

Despite the measures taken in terms of: (1) intensifying the marketing action related to intensifying the information about *Kaizen* by placing information posters in the plant aimed at increasing the awareness of employees about the need to continuously improve production processes and (2) increasing the value of the financial motivating factor to encourage employees to actively participate in the programme, 3% of the respondents answered that they have not heard about the *Kaizen* programme. Thus, there are still some gaps in the organisation due to the communication process and the flow of information, which should be considered as a necessary element to be diagnosed, verified, and improved. The 4 percentage point increase in participation in the programme is significant, however, with the level of non-involvement in *Kaizen* optimisation concepts remaining at 62%, it must be concluded that the financial motivation factor supporting optimisation processes is not sufficient or that it still remains at a too low level.

Analysing the data globally for four consecutive years, a heterogeneous trend in the number of proposals submitted between 2020 and 2023 was registered (by 100%, 84.6%, -32.2%, -64.9%*, or 40.3%** , respectively) (Table 3).

Table 3. Tendency of *Kaizen* design and implementation

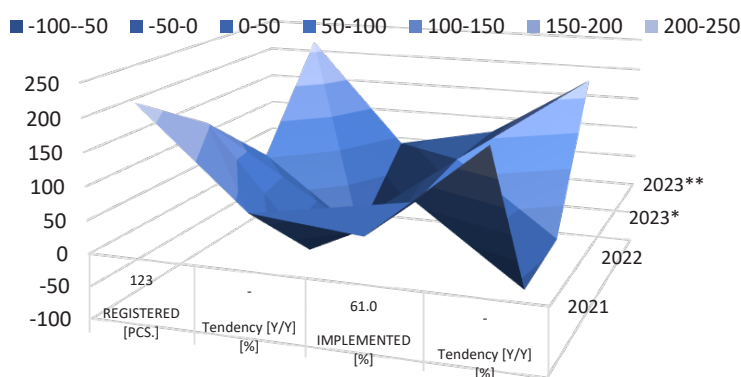
Year [Y]	Number of applications			
	REGISTERED [PCS.]	Tendency [Y/Y] [%]	IMPLEMENTED [%]	Tendency [Y/Y] [%]
2020	123	-	61.0	-
2021	227	84.6	68.3	206.7
2022	154	-32.2	59.1	-58.7
2023*	54	-64.9	74.1	-44.0
2023**	216	40.3	74.1	175.8

*data as of March 2023

** estimate 2023 Q1x4

Source: own elaboration based on financial data from the company.

There is a noticeable trend toward implementation above 59.1% of the applications reported (average for the 4 years 2020–2023 at 67.3%), which allows for the construction of a model based on the estimation for 2023 (Figure 10).

Figure 10. Structure tendency of *Kaizen* design and implementation

Source: own elaboration based on financial data from the company.

With the assumptions that the number of applications and their implementations will be the product of the values from the first quarter of 2021 (Q1), a potential financial model for savings and costs in 2023 can be calculated (Table 4).

Table 4. Outcome estimation 2023

Year [Y]	Amounts value of							
	Savings				Costs			
	S_x	S_y		C_x	C_y	C_z	C_H	
	Total	Average		Awards	Implement- ation	Total	Average cost of implementation	
	Value	Value	%	Value	Value	Value	Value	%
2020	290 000.00	3 866.67	0.01333	19 370.00	ND	19 370.00	258.27	0.01333
2021	555 000.00	3 580.65	0.00645	61 358.00	71 556.00	132 914.00	857.51	0.00645
2022	647 000.00	7 109.89	0.01099	42 000.00	76 000.00	118 000.00	1 296.70	0.01099
2023**	776 384.10	4 852.40	0.00645	51 679.00	73 778.00	125 457.00	1 672.76	0.01333

** Estimated data for 2023, where: $S_x = \text{number of implementation} * S_y^{2023}$

$$S_y = \sum S_y^{2020-2022} \sum S_{\text{years}}^{2020-2022}$$

$$S_y [\%] = \min. (S_x^{2020-2022})$$

$$C_x = C_z * \{ \sum C_x^{2021-2022} \sum C_{\text{years}}^{2021-2022} \} / \{ \sum C_z^{2021-2022} \sum C_{\text{years}}^{2021-2022} \} \Rightarrow \text{factor} = 0.41$$

$$C_y = C_z * \{ \sum C_y^{2021-2022} \sum C_{\text{years}}^{2021-2022} \} / \{ \sum C_z^{2021-2022} \sum C_{\text{years}}^{2021-2022} \} \Rightarrow \text{factor} = 0.59$$

$$C_z = \sum C_D^{2020-2022} \sum C_{\text{years}}^{2021-2022}$$

$$C_H = C_z * \max. (C_H^{2020-2022})$$

$$C_H [\%] = \max. (C_H^{2020-2022})$$

Source: own research.

Then, using a financial model, individual scenarios can be analysed as to the potential value of financial incentives in the form of bonuses for involvement in the optimisation process and participation in the *Kaizen* programme. At the same time, it should be noted that it is most likely that applications are often not rated at 100 points, as a simulated increase of 57% in the number of applications submitted results in less than 13% increase in costs. Thus being exactly as much as the modification of the value of the incentive factor in the form of a quota bonus. Hence, it seems that company managers are either unaware of the need to revise the scoring system or deliberately want to achieve higher savings while maintaining 2022 costs.

The results of the analysis presented here point the way to further research related to the detailed observation of the determinants associated with

the reasons for submitting an application as well as the reasons for non-participation in the optimisation programme.

Conclusion

The aim of the study is to present the results of an analysis of a change management project in terms of financial motivational factors supporting the optimisation process in the implementation of Lean Management concepts on the example of a selected manufacturing company. Therefore, it was a question of checking the importance of financial motivation factors for employees in the context of implementing the *Kaizen* concept and the significance of the issue of the influence of financial aspects on the willingness to participate in a *Kaizen* implementation project in the analysed company.

Using the results of the study, an analysis was conducted of the financial motivational factor and its inclinations with the level of motivation of employees to implement optimisation processes in a manufacturing enterprise – in this case *Kaizen* projects. The effectiveness of the suggestion system model operating in the enterprise in the context of increasing the efficiency of manufacturing processes was assessed. The study aimed to gain insights into employees' behaviour and attitudes towards optimisation solutions that could contribute to improving product quality and increasing the efficiency of production processes.

The study was conducted between 2022 and 2023 on a sample of $GI_{N=158}^{2022}$ and $GII_{N=137}^{2023}$. The homogeneity of the research environment and the use of the same research tool allowed verifying the validity of management assumptions and the effectiveness of the analysed financial motivator. Through the changes introduced, a 4 percentage points increase in participation in *Kaizen* optimisation programmes was noted; however, with the unit cost of implementation increasing disproportionately to the change in the point value in the company's existing system of financial motivators, and a continuing deficiency in the level of knowledge regarding the understanding of the need for

employees to implement optimisation methods. Thus, there are still some gaps in the organisation due to the communication and information flow process, which should be considered as an element that needs to be diagnosed, verified, and improved. On the other hand, the financial motivation factor supporting optimisation processes is not sufficient or still remains at a too low a level of attractiveness for employees.

By carrying out the research, valuable and practical information was obtained, which was used by company managers to take measures to increase employee motivation and improve the use of the *Kaizen* employee suggestion system.

A monetary equivalent for each point of *Kaizen* awarded was set as the most important limitation to be eliminated. The monetary equivalent for each *Kaizen* point awarded was identified as the most significant constraint to be eliminated. This element, however, is not only left as a suggestion for the future, but is to be one of the elements of the surveyed company's policy for the creation of an operational strategy for 2024, which creates further opportunities and determines the next direction of research.

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