
Barriers and Benefits of Implementing the Lean Concept in Enterprises

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Abstract:

Purpose: The aim of the paper is to present preliminary research concerning the barriers and benefits of implementing the Lean concept in enterprises from the Greater Poland Voivodeship.

Design/Methodology/Approach: The methodology is composed of three major steps. First, the meaning of Lean was discussed. This is followed by a description of implementation and the barriers involved. In the following section, the benefits of applying the Lean concept are analysed.

Findings: The results of the research were presented and analysed, in the conclusion, it was pointed out that a large part of companies poorly implement and apply the concept of Lean, which negatively affects their competitiveness on the market.

Practical implications: The respondents after they got the presented have found that it is worthwhile to use new management systems to become a leader in their industry. Presenting the paper to the wider group can contribute to dissemination of the lean concept not only in large but also in small companies.

Originality/value: The value of the paper is mostly practical, as the lean concept is widely presented in literature, yet not fully explored in business practice.

Keywords: Lean concept, barriers, implementation method, benefits.

JEL Classification: M2, L11.

Paper type: Research paper.

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1. Introduction

Competition is a fundamental feature of a market economy and companies operating in it must be competitive. A competitive company should be characterized by the ability and flexibility to adapt to changing market conditions in which it operates and strive to make such business decisions that will provide it with a long-term competitive advantage. So, companies should be managed to try to get the maximum profit at the minimum cost. Companies can use many modern solutions to cut costs, but one of the best is one that doesn't require a lot of money to implement. Such an approach can be the introduction of Lean concepts.

Lean approach to management refers to the production of products or services in accordance with customer expectations, at minimum cost and with optimal use of resources by eliminating waste in the entire area of activity of the company. Thus, Lean Manufacturing is lean, resilient, and flexible production that achieves sensational success, so the main goal of companies that want to introduce lean thinking in their organization is to produce more and more with the least possible use of tangible and intangible resources. Initially, the focus should be on implementing the concept at the level of one selected process, and then the whole internal and external system (suppliers and customers) should be adjusted to the established assumptions (Zamostny, 2014; Fertsch, Pawlak, and Stachowiak, 2011; Womack and Jones 2003; Pawlak and Hadaś 2017; Alves Sousa and Dinis-Carvalho Moreira, 2015; Pereira, Dinis-Carvalho, and Alves, Arezes, 2019; Pawlak, Długońska, and Andryszak, 2021).

Besides, the essence of the Lean concept is to minimize the time between acceptance of the customer's order and its execution. To efficiently realize this essence, waste must be eliminated in the stream of (Pająk, 2007). However, when implementing Lean concepts, it is first necessary to identify only the basic and most frequent wastes, so as not to cause financial expenses and sudden revolutionary changes.

There are also barriers that limit or slow down the application of the concept in the enterprise. It is worth remembering that they should be eliminated, because implementation after they are abolished, will bring much more long-term benefits to the organization.

2. Studies Carried Out

The fundamental purpose of conducting the study was:

- Learning about the degree of implementation of the Lean concept in enterprises in Greater Poland Voivodeship.
- Learning about the benefits most often resulting from the application of the Lean concept in companies.

The subjects of the research are enterprises, especially production enterprises from Greater Poland Voivodeship. Defining the study population:

- Subject – preferably a management position.

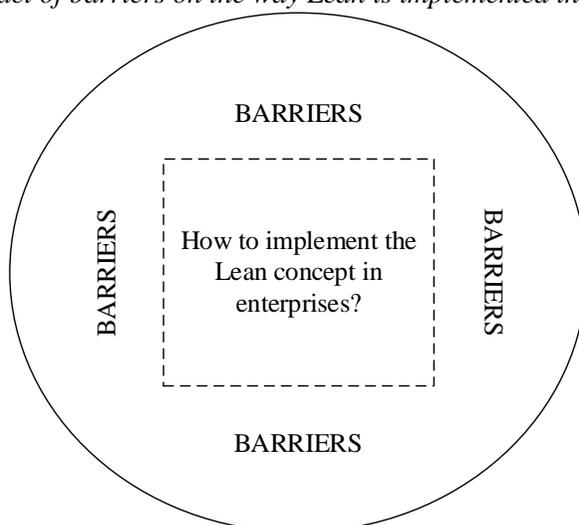
- Sample unit – enterprises, preferably manufacturing enterprises.
- Spatial scope – Greater Poland Voivodeship.
- Time - 2020 and 2021.

The survey involved 1000 enterprises located in Greater Poland Voivodship. The choice of companies was random. It was mainly due to any choice of companies in Greater Poland Voivodeship and previously established contacts. The survey was conducted using a questionnaire distributed by email, to which 84 companies out of 1000 participating in the survey responded. After initial screening, 10 responses were rejected, so 74 responses obtained were analyzed.

3. The Way of Implementing the Lean Concept in Enterprises, and Barriers to its Use and Introduction³

One of the questions in the survey research was how to implement the Lean concept in companies. The structure of this question was open-ended, so the respondent could describe in a few words exactly how things work in the company where they are employed. The answers received were quite different. These range from short answers to a few sentences. Responses indicated that the implementation of lean thinking may end in failure. There are many barriers to applying and maintaining Lean concepts in the literature, which will be contrasted with the ways described by the interviewees. Barriers have a significant impact on how a company will implement Lean.

Figure 1. The impact of barriers on the way Lean is implemented in companies



Source: Own elaboration.

Many respondents wrote that the companies where they are employed have a phased plan in place, usually over several years. In a given stage, goals are set that the company would

³Based on Grycuk A., *Bariery w stosowaniu koncepcji lean management*, *Kwartalnik nauk o przedsiębiorstwie*, Warszawa 2016, s. 74-78.

like to achieve in a given time. It is a very effective method of implementing any concept in business. Note that the implementation of Lean concepts is not standardized in the literature. There is no specific, effective way to implement this concept. There is no model or algorithm for how business owners should apply it.

There are many different approaches to implementation. You should focus on your business and not model your business on other cases because every case is different. The same is true of time. Lean concepts typically take several years to implement, not a few weeks. Patience, discipline, and efficient planning skills are required. However, many managers and owners expect results after a very short time. They are concerned with financial benefits, because as it is worth noting, obtaining the highest possible revenue is the main goal of any company. Many times, due to the lack of quick results, there are frequent changes in leadership positions, which negatively affects employee morale as well as the pace and consistency of lean implementation in the organization, which can bring the implementation process to a halt.

Some of the responses indicated the introduction of specific tools related to the lean concept. The most frequently mentioned tools were, 5S, SMED, TPM and VSM. This is the wrong approach of the company towards implementing lean thinking in the organization. Lean should not be understood as a set of tools, but as an extension of the philosophy of continuous improvement according to Kaizen. Those involved in implementation are required to change the behaviors, attitudes and mindsets of all employees. Without a change in the mindset of the organization's members, the benefits of implementing this concept will be short-lived and very limited.

Many respondents indicated frequent training as a way to implement Lean concepts. It should be noted that training should be provided to all employees, as well as production workers, as well as managers and supervisors. Often the barrier to sustaining successful change is the lack of commitment and knowledge of senior management. Authority is required in resolving emerging conflicts that will arise during changes in the company's processes.

Managers must have the required knowledge of Lean, understand all the principles associated with this approach and have the competence to implement changes. Just because they will be supported by a newly formed Lean department or people hired specifically to introduce the concept does not absolve them of their lack of knowledge. They are also required to change their leadership style. Their approach needs to become more of a partnership. Supervisors become "teachers" to their employees. They develop their competences and knowledge of the changes that have taken place.

One of the answers given by the respondent was "chaos". This is a very bad approach regarding the implementation of Lean concepts. The implementation should have a roadmap that considers the conditions and capabilities of the company. It's not just about financial capability, as implementing lean thinking doesn't require a lot of money. It is about the time that will be used to train the employees and at later stages while following the Kaizen philosophy, i.e., implementing small changes in a gradual way.

It is worth noting the goals that the company will pursue during each separate stage of the implementation process. Lean thinking should be linked to the strategic goals of the company. There should be a department that is tasked with implementing and maintaining Lean in the company. Personnel policy thinking needs to change. Changes should be made to bonuses and employee compensation.

Frequent internal audits that control the positions of employees as well as entire departments and the exchange of experience with other companies in accordance with benchmarking are also an effective way. A good way to tap into employee potential is to introduce an employee suggestion program. It comes down to mounting the container in a generally accessible location. Any member of the organization can submit a proposal with their innovative idea. From time to time, a designated works committee meets to carefully review the ideas submitted. The best of them can count on gratification in the form of a financial bonus.

Figure 2. *Employee suggestion box*



Source: leancenter.pl.

Another interesting answer given by the respondent is the following "by force, instilling Lean concepts in employees" or "self-education". Keep in mind that the foundation of lean management and production is employees. It is often possible to encounter resistance from them when making changes. They fear change by having little knowledge of Lean concepts. They lack confidence in their superiors. Some may have had negative experiences from previous deployments with other owners. They may also fear downsizing after successfully implementing Lean in an organization.

This type of resistance is addressed with effective communication and initial training for all employees. On the other hand, in order to limit the reduction of jobs, the company should suspend the recruitment of new employees or introduce the "sale" of employees in other companies, the so-called insourcing. It is important to present the implementation plan to all members of the organization so that they are ready for the change. The changes implemented are linked to changes in the work environment. The employee has more flexibility to do the job, but in turn is required to have a broader specialization to be effective not only at his/her job, the so-called multitasking.

It should also be involved in the continuous improvement process. In conclusion, however, how the changes will affect the work environment as well as employee resistance depends on the management and more specifically how they manage the changes in the company.

Many of the answers referred to concern requirements. It is according to these principles that changes in companies are implemented. They are often associated with high innovation, which is associated with being competitive in the market by the company, while Lean is difficult to use in processes associated with experimentation. Nonetheless, they can be effectively introduced to support product development in the initial stages of product creation. One of these stages is that associated with research and development activities, where "lean design" or "lean product development" is used, which reduces the cost of working on new products and speeds up the process of introducing them to the market.

In summary, the most significant barrier is that Lean Management or Lean Production has not yet been fully defined. In many circles, the words concept, system, program, set of principles, techniques and tools, philosophy or even business strategy are used interchangeably. This concept is characterized by a very large capacity and ambiguity. This is a very big problem for theorists as well as for practitioners because ambiguity makes it difficult to implement Lean in a company. This process should be individualized. An organization should not model itself after another case because every company has a different structure, different organizational setup, different industry, and many other variables that influence you to not find the same company in the market.

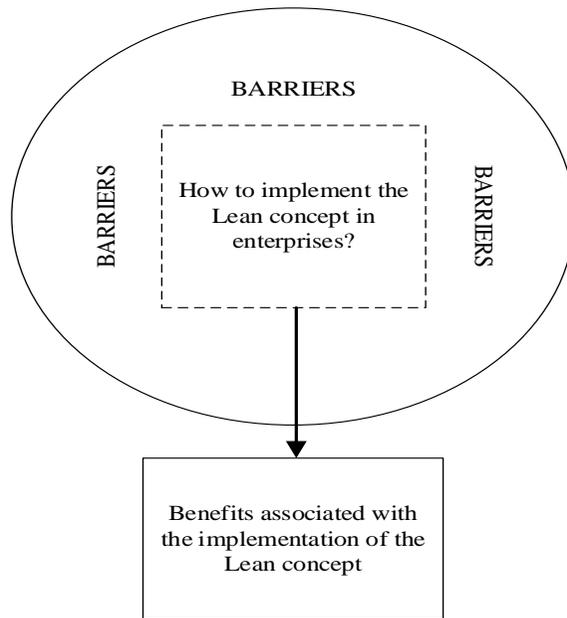
4. The Way of Implementing Lean Concept and Benefits Resulting from its Use

How an enterprise will introduce the Lean concept in its organization and then maintain the implementation at a decent level has a colossal impact on what benefits will result from the introduced changes. The barriers described earlier can stunt or inhibit the successful implementation of lean thinking, which can negatively impact the benefits associated with implementing the concept.

To determine the benefits of the implementation process as well as maintenance at a decent level in the survey questionnaire, the respondents were given the opportunity to indicate the main benefits that are revealed when lean thinking is applied.

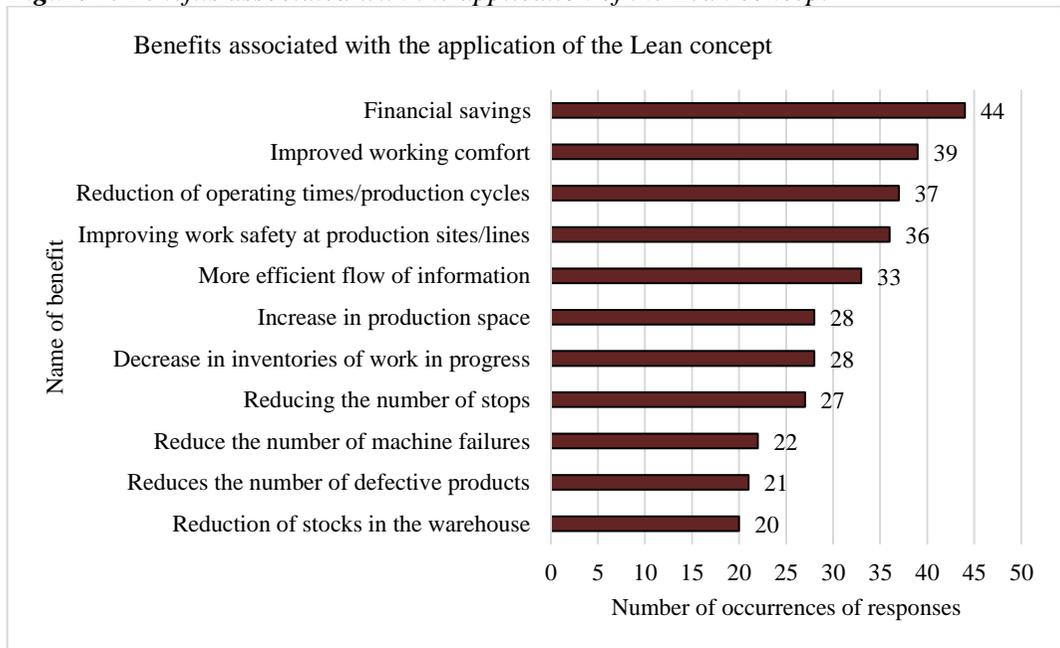
Savings related to finances were the most frequently cited by respondents. It is important to identify the main goal of any business which is to make as much profit as possible. Profit is the difference between a company's revenue and its cost. When we reduce any costs associated with waste, for example, while revenue remains the same, the organization's profit becomes higher.

Figure 3. The way of implementing Lean concepts, and benefits resulting from the implementation



Source: Own elaboration.

Figure 4. Benefits associated with the application of the Lean concept



Source: Own elaboration based on conducted research

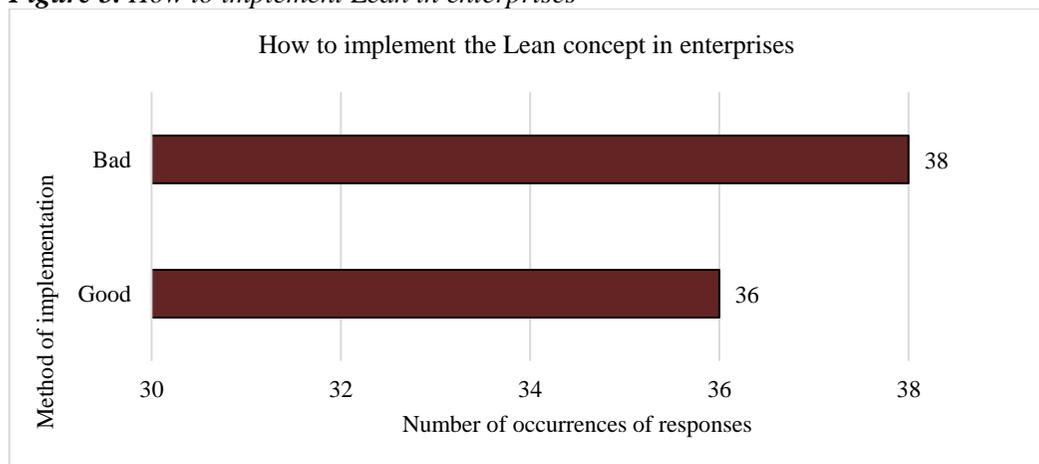
Such a turn of events is desired by business owners, because for them it is the quick profit that counts. The top three most cited benefits also included responses such as, improved

working comfort or reduction of operating times/production cycles. The tools and the lean concept are used to improve the efficiency of the duties performed by the employees. It is necessary to take care of the work area for the employees, to organize the work so that the personnel do not get tired and bored with constant work. The elimination of monotonicity is important. For this purpose, employees should rotate with each other from time to time.

Thanks to this they will gain new skills and experience which should positively influence the already mentioned term of monotonicity elimination. With respect to the third place, reducing times where possible is a major goal of the Lean philosophy. Processes should be continuously improved to produce a product or service faster. An important tool in this case is VSM, or value stream mapping, which allows for quick identification of problem spots in the process.

As mentioned earlier how lean thinking is implemented in an organization affects the benefits gained by the organization. Responses related to the method of implementation were subjectively evaluated as to whether the method is a good way or not. The results are presented in the graph (Figure 5.)

Figure 5. How to implement Lean in enterprises



Source: Own elaboration based on conducted research.

The responses were equally distributed, which may indicate a lack of knowledge about a good and effective way of implementation, and that the benefits obtained by the company may be short-term and superficial. The authors' assessment was based on bad implementation habits, i.e., where only single tools were implemented without systemic changes or without a plan then such a response was classified as bad. Similarly, it was classified when the respondent answered that he/she does not know how the concept is implemented but indicated some of the benefits later in the questionnaire. Lack of knowledge is also a bad way to implement. The following Table 1 shows the answers classified as bad implementation - after their analysis by the authors. Some were categorized and those that could not be done were listed.

Table 1. Selection of answers rated as bad way to implement Lean concept in the company

Lp.	Answer given by the respondent	Number of speeches
1.	It is not implemented.	10
2.	Individualtools.	5
3.	I don'tknow.	14
4.	Chaos.	1
5.	The company prides itself on having Lean, when in fact it doesn't exist.	1
6.	Someone is pretending to implement something.	1
7.	Small changes of daily conversation and showing the effects of small changes on the process in general.	1
8.	Forcefulsolution.	1
9.	Self-education.	1
10.	Brainstorming within the engineering team. Working together to make an improvement reported to the team leader.	1
11.	As in most companies in Poland. Only Top Management, the employee is left out, and the implemented solutions according to the methodology of the consulting company.	1
12.	It is continued at the will of the previous implementers.	1

Source: Own elaboration based on conducted research.

Where all staff were involved, a system was implemented rather than individual tools, or Lean was implemented using a plan or schedule, the authors found this way to be effective and good. The following Table 2 shows the responses classified as good implementation after their analysis by the authors. Some were categorized and those that could not be done were listed.

The next step in the analysis of the results was to compare the means of implementation with the number of benefits indicated by the respondents. For this purpose, the number of benefits was sorted according to the following criterion:

- No benefits- 0 benefits,
- Small number of benefits - from 1 to 2 benefits,
- Medium number of benefits - from 3 to 5 benefits,
- A large number of benefits - above 5 benefits.

Table 2. Selection of answers rated as good way to implement Lean concept in the company

Lp.	Answer given by the respondent	Number of speeches
1.	Every day in small steps at every stage of your business.	1
2.	Concern standards.	2
3.	By introducing systems / processes (e.g. AM, Centerlining) in selected areas.	1
4.	Work organization, identification, metrics and accountability.	1
5.	Analyzing problems, applying the methodologies mentioned.	3

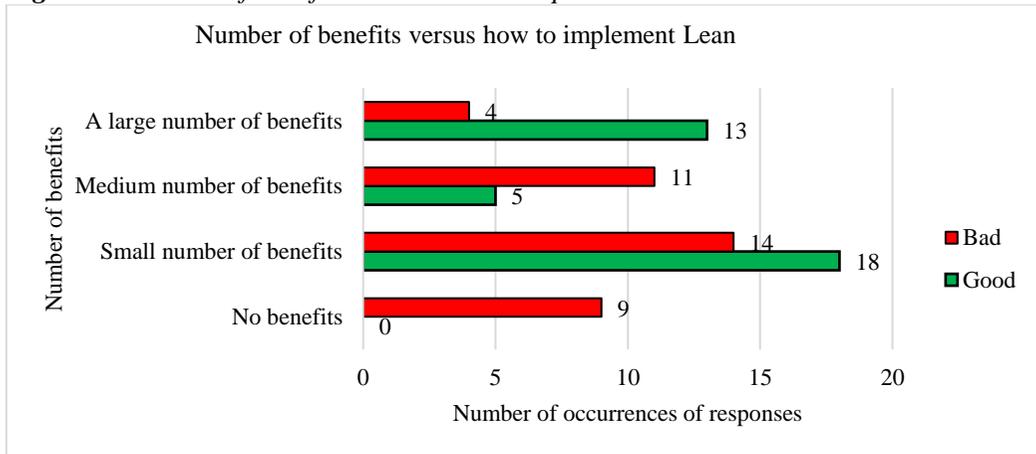
Lp.	Answer given by the respondent	Number of speeches
6.	Training.	6
7.	We try to represent the concepts of Lean transformation rather than Lean implementation. We work to create or reorganize processes in order to involve all employees in the common goal of the company and teach them to identify and eliminate waste as well as use their potential for continuous improvement.	1
8.	Every day in small steps at every stage of your business.	1
9.	Learning, demonstrating good practice, auditing with staff.	1
10.	A process approach.	3
11.	The main question is: what do you need to do this task better/faster?	1
12.	Department responsible for Lean.	1
13.	Long-term implementation plan developed	2
14.	Multidimensional activities at every stage of the company. From senior leadership training to root cause analysis and daily kaizen at every level.	1
15.	In small steps in project groups, initially on a pilot basis, then on to the other production lines.	1
16.	Slow with getting a consensus among everyone.	1
17.	Through group activities in specific areas.	1
18.	Strategic projects.	1
19.	Example from the top, involving everyone.	1
20.	With the help of Lean specialists and through postgraduate studies.	1
21.	The Lean method is used primarily in the IT department and in production. In IT, you define the customer, create a value stream, continuously iterate and improve products.	1
22.	Lean is implemented through gradual familiarization with each position. We started with the first production start-up and through audits we identified muda in the workplace and reacted to remove it, and 5S was introduced. Admittedly not a textbook example, but sufficient for the company I work for. This was followed by measuring the position to visualize the results and familiarizing the employees. This is how we operate with each subsequent post.	1
23.	Lean was usually implemented in a tool-oriented manner, which did not have the desired effect. Today, we focus on a systems approach to building an organization's culture based on the ability to raise your hand when there is a problem, quality and eliminate waste.	1
24.	Group strategy and standards.	1
25.	Implementation team.	1
26.	Through company strategy.	1

Source: Own elaboration based on conducted research.

Table 3. Data on the number of benefits versus how Lean concepts are implemented

Number of benefits / way of implementation	Good	Bad
A large number of benefits	13	4
Medium number of benefits	5	11
Small number of benefits	18	14
No benefits	0	9

Source: Own elaboration based on conducted research.

Figure 6. Number of benefits versus how to implement Lean

Source: Own elaboration based on conducted research.

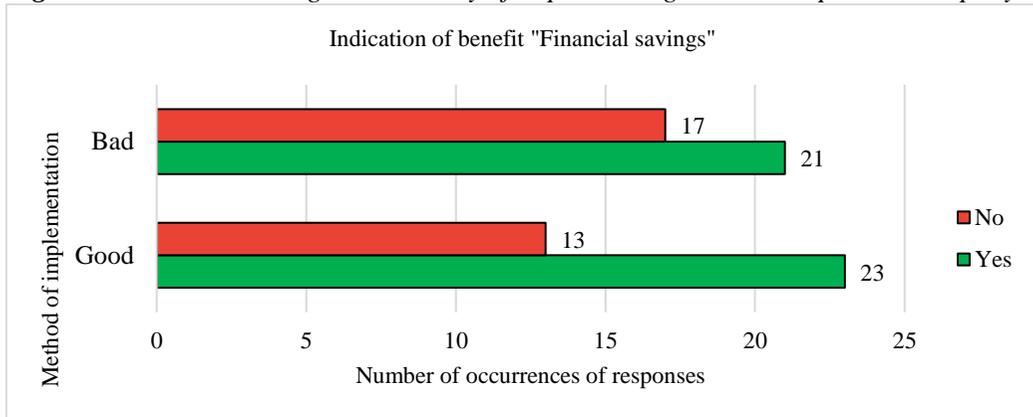
The data after analysis were tabulated (Table 3) and a graph was created from them (Figure 6). Some of the practices implemented by companies, despite their benefits, are bad, e.g., the introduction of tools alone or the failure to involve all staff in system transformation, so that the results are slightly hypocritical. The benefits obtained in this case are short-term and unsustainable. Such a case can be seen for the quantity of benefits small and medium. From the graph it can also be observed that when the implementation method is good then the number of benefits is also high. Such a relationship testifies to the effectiveness of the implementation and maintenance of the Lean concept in the organization.

In contrast, the opposite observation is the one that shows no benefit where the implementation modality is bad, with this value reaching zero for the good modality. Two opposing poles become apparent: where the way is organised, a plan is put in place or all employees are involved, the benefits are in very high numbers, and where the way is unorganised, everything is implemented quickly, in great chaos, the benefits are missing.

The authors found it useful to look at the correlation of whether the way Lean concepts are implemented affects the three most frequently selected benefits.

Companies know that financial benefits are very important to management or owners. All in all, that is all they care about, and how it's achieved is a secondary concern. The chart above (Figure 7) shows that companies are gaining these types of benefits despite poor implementation practices. It's another matter to keep it that way in the future when the way lean thinking is implemented and maintained doesn't change over time. Glad to see a difference of 10 responses where the implementation method is effective. This perhaps proves the long-term financial benefits of the organization, which is sure to please the owners of this type of business.

Figure 7. Financial savings and the way of implementing Lean concepts in a company

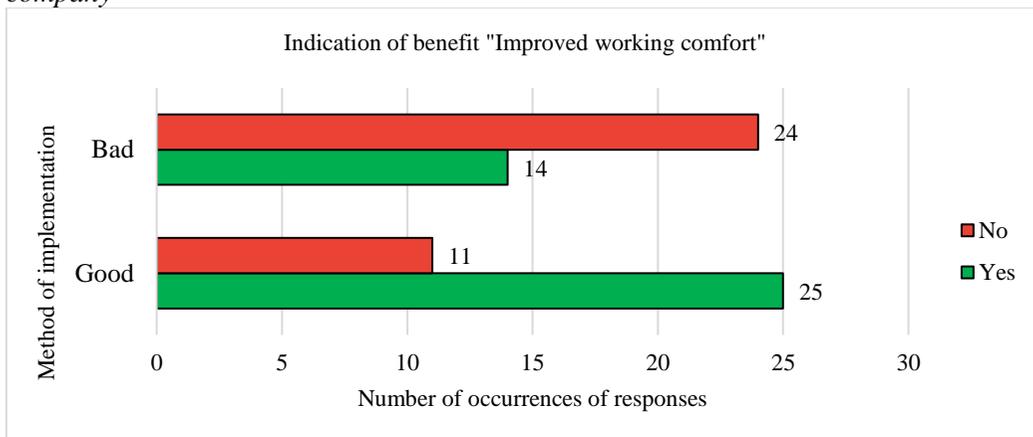


Source: Own elaboration based on conducted research.

Another benefit identified by respondents was "Improved work comfort". Where implementation was rated as bad, respondents did not indicate this response in large numbers. "Yes" answers may indicate the implementation of only single 5S type tools, which will certainly affect the comfort of employees at their workstations, but it is not a good way to implement this concept in the organization. All staff should be involved.

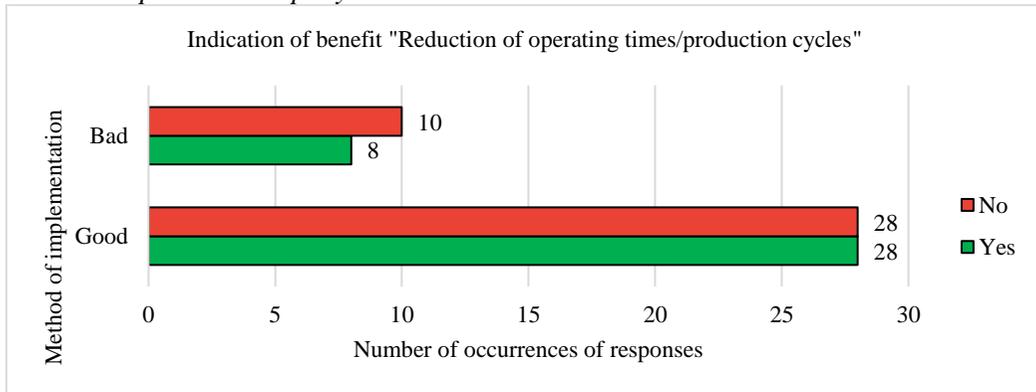
Employees should identify with the company, its strategy, and goals. The whole system should be introduced, not just individual elements. It is gratifying to note the high prevalence of "yes" answers where the implementation was assessed positively. Apparently, the companies in this case are aware of what lean thinking is being implemented for.

Figure 8. Improvement of work comfort and the way of implementing Lean concepts in a company



Source: Own elaboration based on conducted research.

Figure 9. Reduction of operating times/production cycles, and how to implement the Lean concept in the company



Source: Own elaboration based on conducted research

The last of the most frequently indicated answers is the one related to reduction of time and/or production cycles. It is interesting to note that the respondents evenly distributed their responses. Whether the times will be reduced not in the short term but maintained for a certain period of time will be influenced by the way of implementation. There are lean tools such as VSM or SMED, which allow you to reduce the time of performed operations or changeovers of machines and equipment.

However, without proper staff training, operator involvement, and adherence to the rules that have been put in place, influenced by a change in thinking, such improvements will not last very long. Once implemented, there will be a problem with maintaining the changes, so it is said that the basic foundation of the Lean concept is employees.

In summary, if the benefits are to be sustained over the long term, companies should change their approach to implementing. Don't do it chaotically. A plan is required that will involve everyone in every department of the organization. Otherwise, the introduction of this concept is baseless and ineffective.

5. Summary

Competitive companies need to constantly evolve in order not to disappear from the market. The research shows that over 50% of the companies in Greater Poland Voivodeship implement the Lean concept incorrectly. Continuous development is important, but you have to look at it this way: not every organization is able to change by spending a lot of money. With help comes the concept of Lean, which can transform the operations of most businesses with minimal investment.

It is important to involve all staff in the implementation processes, which are stopped by many barriers that arise during the introduction but also during the application of lean thinking in the organization. However, despite the many constraints that should be tackled collectively, there are many benefits on the horizon that the business will gain after successful implementation. Cultural change, and in particular the approach of the

staff in such a way that they feel important in the context of the functioning of the company is the key to success, which is a properly implemented new system of functioning of the company. With minimal finances, the benefits gained by an organization can be enormous.

As those which are the most important for managers - financial savings as well as those related to comfort of work or elimination of any waste. All these benefits make it worthwhile to implement new systems in companies, and the Lean concept is a perfect example.

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