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**LEAN TRANSFORMATION
IN NON-PRODUCTION ORGANISATIONS****Key words**

Optimisation of the organisation management process, Lean Transformation in non-production organisations, efficiency and competitiveness of business entities improvement, organisation culture change, cost reduction.

Abstract

Each organisation, regardless of its profile, strives to achieve the best results possible; however, it needs to be noted that they frequently are different for each entity. Based on the studies and observations, the authors noticed that famous companies have similar approaches to the organisation of processes. These processes can be assigned to Lean Philosophy derived from the Japanese manufacturing industry. Many corporations and even smaller companies apply Lean principles. To introduce changes to the organisation and functioning of businesses, it is indispensable to subject them to Lean Transformation and to map basic value streams for the company as a whole and for its individual departments.

Introduction

The purpose of this article is to popularize the principles of Lean Philosophy in non-production environments. The implementation of Lean Theory in economic practice has a direct impact on the economic performance of enterprises, which translates into an increase of their profitability, while on a macroeconomic scale, it affects the GDP growth. It is the application of Lean Philosophy outside of production environments, while at the same time, combining it closely with the principles of leadership in an organization that constitutes the innovative element. Currently, thinking Lean is primarily applied in industry, mostly in the departments directly or indirectly related to production.

Lean Philosophy should not be perceived as a project that can be implemented and finalised, because it is based on continuous development and improvement. This is caused by changes taking place in the external environment of company (on both a macro and micro scale) concerning economic, social, and technological aspects. The application of Lean Philosophy allows one to find potentials that should be used to improve the activity of an organisation and lead it on the path towards reduced costs and increased profits. Proper preparation of a business entity for changes will certainly prevent bad implementation of the elements of the Lean Philosophy. Lean Transformation can be properly executed only with great engagement and involvement of the managers, whose role is also particularly important when maintaining implemented processes and breaking staff's habits. This certainly is one of the most interesting but, at the same time, the most difficult challenges of the contemporary management.

1. Lean Manufacturing: state of the art

The idea of Lean Manufacturing can be defined as the elimination of all unnecessary activity within a manufacturing process that does not add value to the product or service offered. In order to do so, one can apply a number of tools offered by the philosophy of Lean Management. The term was coined by John Krafcik who first used it in his article [6]. However, the idea was popularised by a group of the MIT researchers, J. Womack, D.T. Jones, and D. Roos who, in their work [7], presented the results of the *International Motor Vehicle Program* (1984–1990). Their research concerned the comparison of expenditure and outcomes in Japanese, US, and European companies. The Japanese Toyota Motor Corporation was considered to be a leader, and the company's philosophy about the amount of plant space, the number of staff, and the amount of material resources needed for production, with the concurrent compliance with the client's actual requirements, was strikingly different from the philosophies applied in western countries, and when referring to this philosophy, the authors used the term "Lean Manufacturing."

The Japanese were in fact the pioneers of the philosophy of Lean Manufacturing, and T. Ohno [8], the father of Toyota Production System, created three main Lean principles on which he based his ideas for quicker and more effective production, i.e. (1) do only what is needed, (2) eliminate everything that does not add value to the products, and (3) stop when things go wrong [9]. These principles became the foundation of Lean Philosophy that spread over the entire company. Contemporary understanding of Lean Philosophy is much broader, refers to the introduction of changes to the activity of a company, its structure, organisation, management, and the training of employees, which all ensure better efficiency and improve the quality of products, and services the company offers [10]. Regardless of the character of a business, the introduction of Lean Management leads to the eventual elimination of waste and helps the company to make better use of its own resources.

By making a number of breakthrough innovations in the field of organisation of production, over the years, Toyota has developed an alternative to the dominant production model, which is the mass production model pioneered by Henry Ford [11].

2. Lean Philosophy in manufacturing and non-production organisations

Although Lean Philosophy was born in an automobile factory, where within a manufacturing process a material is translated into a visible end product, it turned out that it could also be used in any company, regardless of its character, field of activity, and size [12], since, basically, every type of business should be a compact organism connected through information and quality systems.

Analysing the work of an organisation, one can notice that many service companies and offices successfully utilise principles of Lean Philosophy. This not only stems from the very rational and practical way of thinking this philosophy advocates, but it is also connected to the possibility to find areas that call for changes and improve financial outcomes of company. Therefore, it is surprising that Lean Philosophy is still not widespread in non-production companies.

Changes in production departments occur much faster than in other areas, and companies are more prepared for them. In addition, there is no direct contact with the customer and their varying needs. The structure and nature of production departments are more organised, and it is easier for them to adapt to new requirements. On the other hand, there is no need to adjust to technological requirements of production or assembly lines in non-production organisations. Each action can be immediately introduced, and the results are quickly visible. It is estimated that Lean Transformation takes up to 5 years in non-production companies and up to 10 years in industry.

To introduce this transformation, one key issue is mandatory. The key issue here is the role of leadership.

3. Lean Leadership

Having a closer look at the structure of production and service companies, many practices that impair the efficiency of processes and employees have been noticed. This rarely stems from incompetence or bad will, and it is mostly associated with leaders' bad habits, routine practices, and systems implemented by leaders. One of the signs that the company is in dire need of changes is the so-called "silo" structure of management in which the activity of each department is supervised by a separate leader and responsibility or communication is poor. Why is Lean Transformation so closely related to leadership? The answer contains the use of leadership laws in a way that enables constant development of an organisation. Successful Lean Transformation frequently needs the organisation culture to be entirely changed. In order for this to happen, lifelong learning of leaders and employees is necessary, because it leads to a change in mentality, which is the most difficult and time consuming challenge of Lean Philosophy. Utilising leadership laws [13], like the law of influence, the law of process, the law of navigation, the law of addition, the law of solid ground, the law of respect, the law of magnetism, and the law of connection, an effective, Lean-based organisation can be created (Fig. 1).

Attempts to reorganise a business entity in Lean Ideology have a chance of success only when the entire organisation is aware of the need to maintain the changes introduced and discipline, and shares a sense of the need for continuous development and the improvement of its activities.

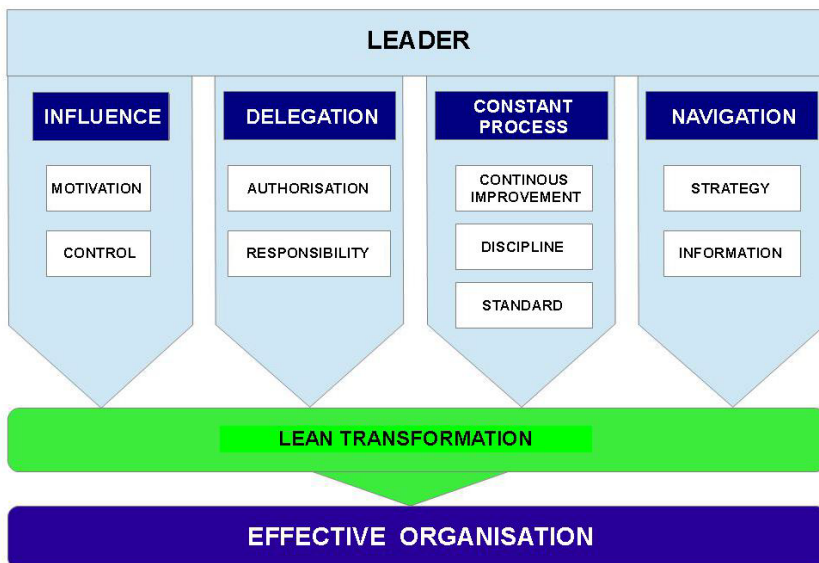


Fig. 1. Basic leader jobs in a Lean Organisation

Source: Authors.

To summarise the role of leadership in Lean Transformation, it needs to be concluded that it is essential for the proper direction of changes associated with the implementation of Lean Management processes.

4. Basic steps in introduction of Lean Management in non-production environments

Before implementation, one needs to define the basic steps enabling the identification of organisation's hidden potentials. Based on Ohno's "seven types of waste" (*Jap. Muda*) [8], it is necessary to check which areas need to be subjected to changes first, and appropriate plans for elimination and limitation of waste need to be drafted. According to Lean Philosophy, waste can take the following forms:

- 1) Over-production,
- 2) Inventory,
- 3) Defects,
- 4) Waiting,
- 5) Over-processing,
- 6) Motion/transportation, and
- 7) Unutilised employee skills.

The authors focus on the identification of the areas of the occurrence of the above-listed types of waste in a non-production environment. Just like in production companies, the implementation of changes requires activities aimed at their introduction to be adjusted to the nature of business activity by eliminating waste, and this can achieve results by significantly reducing workloads, time, costs, and without maintaining an excessive inventory.

Over-production

In this case, it concerns the excessive number of documents and reports. In the case of R&D institutions or companies with their own laboratories, it can also refer to repetitive analyses and reports nobody uses.

Inventory

This is an asset, which in non-production companies, is of minor importance compared to the inventory of enterprises. However, it can be successfully defined and optimised, starting from the management of office supplies, to building and transportation maintenance.

Quality defects

This type of waste is determined by the employees' bad work leading to mistakes that need to be corrected. Therefore, it seems more appropriate to define this waste as a "necessary correction." The elimination or limitation of corrections is possible, among others, through the implementation of a proper staff training process and the organisation of the flow of information in the company.

Waiting

This waste is most likely to be found in service companies [14]. Proper organisation of work minimises the leadtime by 20–40%, and the queue time that constitutes about 95% of the leadtime can be practically completely eliminated.

Over-processing

When defining this type of waste, the time needed for correction and waiting should be considered. It is important to check whether the objectives are set out in an appropriate manner, whether they are in line with the strategy, and whether any activities commissioned are necessary to obtain the desired results.

Unwanted motion/transportation

When eliminating this waste, any activities that do not add value and are time-consuming must be considered. Optimisation mainly concerns the layout of the company with the arrangement of office elements.

Unutilised employee potential

In any organisation, costs associated with the underload or overload of employees can be specified. Therefore, balanced loading plays a key role in determining the potential of employees. When analysing employee potential, the responsibilities should be properly assigned to the skills and knowledge of the employee. For this purpose, a Lean Tool, "tact time," can be used in non-production companies to specify the time needed to carry out a given process. When all employees work according to the tact time, any disturbances become visible. Evidently, an essential role is played by a proper determination of the working time.

Once actions aimed at the identification and elimination of the defined areas of waste, as a result of which the mentality of the personnel and the entire organisation culture evolve and change, it is recommended to proceed to the next stage of the implementation of Lean Philosophy composed of the following four variants:

- 1) Stabilisation,
- 2) Standardisation,
- 3) Visualisation, and
- 4) Continuous improvement.

This is the most important element of Lean implementation, thanks to which, when entering other areas of a company's activity, different processes can be optimised.

Stabilisation

The aim of the first variant, stabilisation, is to identify and introduce processes that ensure the most repeatable and predictable actions through identifying the elements that stand behind the lack of seriality and inconsistent results.

Standardisation

Standardisation takes place after or at least concurrently to process stabilisation. It consists of the development of practices with which the employees involved in the process should comply. Moreover, standardisation should also facilitate the identification of any nonstandard activity, i.e. events that need to be closely investigated in order to retain an acceptable level of process execution. Determination of standard work is the foundation of the effective utilisation of the organisation's potential.

Visualisation

The next pillar of Lean Manufacturing is visualisation. This is a method of information exchange in simple graphics, tables, lists, etc. It is crucial for the information to be properly matched to given tasks and objectives. A properly prepared visual system helps one to reduce the waiting time and improve performance through the possibility of early response to irregularities. Visualisation also raises greater employee awareness of organisation and its results.

Continuous improvement

The final stage, continuous improvement, aims at building awareness of the need for continuous improvement of each process and at each workstation. In accordance with the principle determining current economic standards, an organisation that does not improve its processes does not grow, and it actually begins to fall into stagnation, a process, which worsens the results. Continuous improvement is, therefore, one of the basic principles of the modern organisation.

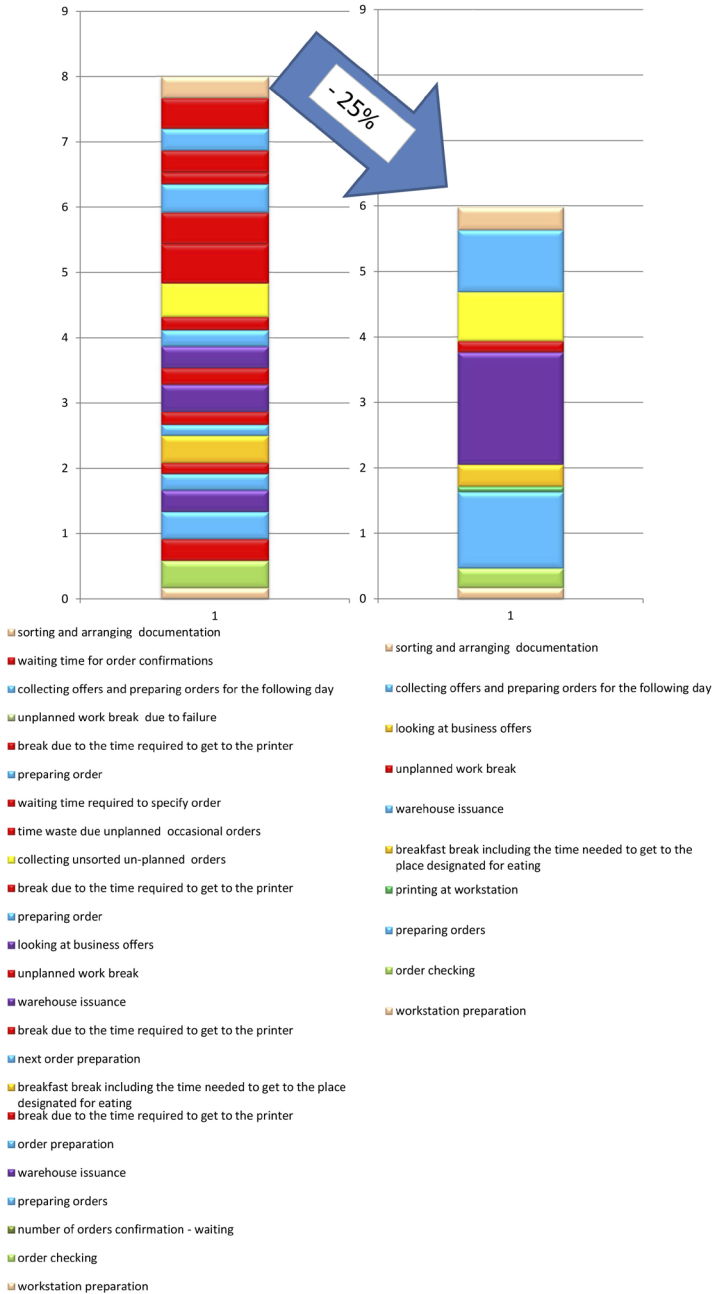


Fig. 2. Optimization of the labour time in the supply department after the introduction of the Lean Philosophy in a non-production company

Source: Authors.

The next stage consists in the identification of detailed areas of organisation covered by the concept of Lean Management (e.g. energy consumption, inventory/productivity, key performance indicators). This is followed by the determination of value streams for the entire organisation and identification of value sub-streams for individual departments. On that basis, bottlenecks can be defined, minimised and eliminated [5]. The introduction of Lean Ideology is especially important in organisations combining services, office work, and R&D activity, with elements of production. Sometimes, it happens that production and mechanical departments support the main activity of a non-production organisation; however, at the same time, they also are the main generator of high costs.

To properly implement Lead Principles, the organisation needs to be prepared in a way that would enable the creation of the “pull system” (Toyota Production System) [8]. In such a system, none of the products, documents, or reports are produced unless the client demands them. The main principle of such a system lies in “pulling” the product/service by the client when required. The key is to set the necessary skills in customer–supplier relations (internal or external). The deterioration or lack of proper relationships causes the pull system to turn into a push system, in which the work already done is pushed out. The pull system operates with a minimum amount of waste.

An optimization of the company's functioning after the introduction of Lean Philosophy is presented in the example of a procurement department in a trade and distribution company.

The implementation of Lean resulted in approximately 25% reduction of labour time in the supply department while maintaining the same amount of performed labour. Assuming the cost per labour-hour at PLN 30.00 (EUR 8.00), annual savings per employee is approximately PLN 20.000 (EUR 5.000). This means that each company that uses transformation potentials, as defined by Lean, is able to increase its competitiveness by improving expense management.

Conclusions

Changes taking place on global markets mean that every company needs to introduce innovative management methods in order to keep up with the technological progress. Implementation of Lean Philosophy is a perfect way to build a modern innovative organisation. An innovative company is an entity that not only invests in new technologies, but also applies proven management systems. Using these systems, managers that play an essential role in Lean Transformation and the proper attitude of all employees are required. When successful, the implementation of Lean Philosophy can bring great organisational, personal, and economic results. However, when not properly conducted, it can discourage employees and reduce their motivation, and in extreme situations, it can also lower the company's financial results. Lean Ideology is based on employee – employer trust relations. The main objective of

Lean Transformation is to identify unutilised potential and improve the company's financial situation through introducing organisational changes. Using this tool only to reduce costs, particularly through personnel cuts, is very risky. Such activities break trust relations and prevent the creation of a coherent organisation. To truly transform the organisation, Lean Philosophy must be implemented for all functions and at all levels of the company.

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Transformacja Lean w organizacjach pozaprodukcyjnych

Słowa kluczowe

Optymalizacja procesu zarządzania organizacją, implementacja filozofii Lean w organizacjach pozaprodukcyjnych, zwiększenie wydajności i konkurencyjności podmiotów gospodarczych, zmiana kultury organizacyjnej, redukcja kosztów.

Streszczenie

Celem każdej organizacji zarówno działającej w przemyśle, jak i w firmach usługowych, urzędach czy jednostkach budżetowych jest uzyskanie jak najlepszych wyników. Wyniki te są definiowane dla każdego podmiotu w odmienny sposób. Na podstawie badań i obserwacji określono, że procesy w każdej ze znanych organizacji cechują się wieloma podobieństwami. Procesy te można połączyć i podporządkować filozofii Lean mającej swoje korzenie w japońskich przedsiębiorstwach produkcyjnych. Wiele dużych koncernów podobnie jak mniejszych firm z powodzeniem stosuje zawarte w tej filozofii zasady działania. Zmiany w funkcjonowaniu zarówno ludzi i/lub kultury działania organizacji dzięki implementacji Lean możliwe są w przypadku wskazania podstawowego strumienia wartości dla ogółu firmy, jak i strumienia wartości dla poszczególnych jej działów.