IMPLEMENTATION PROCEDURE OF LEAN METHODS IN LOGISTICS PROCESSES

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Abstract

Diversification of companies, in the business environment, does not give a great option to the standardisation of procedures. Companies which want to maintain or improve their position in the market should focus on improving their processes. Each company is characterised by its specific characteristics that make the company unique, but areas such as logistics, production, purchasing and sales have common characteristics that may be separated and special attention can be paid to them.

The paper is focused on the steps to implement lean methods related to logistics, because logistics includes many non-value added processes. Lean methods offer a space to effortless changes through which companies can achieve improving of their market position. The authors also present the results of a survey conducted in the V4 countries. Based on this survey the steps to implement the methods of a lean logistics are proposed in the practical part, what is also the main aim of this paper.

Keywords: lean Concept, Implementation, Logistics Processes, Market Research

1. INTRODUCTION

The prosperity of the company should be improved in all areas. Therefore older and also new methods should be implemented in the company by simple procedures and not in lengthy and costly way. The existence of Lean Concepts can be observed over the last century, and their impact upon business is of considerable importance. A low level of information and an apprehension of new concepts hindered this process. The lean concept is designed to eliminate waste and implement only those activities that deliver value to customers and their negative impact is the lowest. The concept as a whole is primarily intended for companies with serial production. However, methods and procedures can be divided into logistics, manufacturing, administrative, purchase or sales groups by examining concept principles. Most of them can be used in several areas at the same time. The paper focuses on the steps to implement lean methods related to logistics, because especially logistics processes can represent the greatest potential for improving. It does not have to be like this because the probability of wasting is higher in this area than in others. The main aim of this paper is to present the detailed information about the implementation of lean methods in field of logistics to the wider business context. The paper is primarily for the readers/businesses that are willing to begin on the road to improvements through lean concepts in logistics without involving external companies.

2. MAIN TEXT

Methods of Lean concepts can be used in all areas of business. The biggest intersection can be seen between logistics and the production area. Therefore, the paper attempts to separate the methods that directly enter into business logistics. A survey was conducted in V4 countries, focused on knowledge and the level of use of lean methods in industrial companies. Within this questionnaire, 605 respondents were contacted from industry. 162 organisations answered the questionnaire, which represents a return rate of 26.8%. 39% of the respondents were large companies with a staff of more than 250, 35% were small companies employing up to 50, and 26% of medium-sized companies, where the number of employees ranges from 51 to 250. The questionnaire evaluated the usage of the fundamental concepts of lean
manufacturing methods usable in the logistics system, namely: KAIZEN, Teamwork, KANBAN, VSM, 5S, TPM.[1]

The results of the survey showed, that companies use this method regardless of the type of production. The type of production is closely related to the vastness and complexity of the logistics system. The methods are ranked from most used to least used in mass production in order by frequency: Teamwork, 5S, KAIZEN, TPM, KANBAN and VSM. [1]

In Fig. 1 you can see the differences in representation of types of production. The most frequent is the usage of lean methods in companies dealing with serial production. The lean concept was designed for this type of production. The Fig. 1 also shows that different methods are also used in companies with others types of production. [1]

![Fig. 1 Using of lean methods in different types of production](image)

This section of the paper is specifically focused on the sequence of lean methods implementation steps. These sequences should support the interest of self-help application in companies that are not financially efficient enough to outsource the implementation to another company. In the following section each sequence through the use of diagrams will be described. These are decision diagrams, which correctly direct the user to successful implementation of above mentioned methods and the elimination of NVA (Not value added) processes. The main section of the paper is built on the author’s previous research published in the METAL2012 conference text book, entitled the "Application of Lean Principles in Business Logistics". In addition of practical examples of using lean methods in the previous article these methods were divided into two categories. The first category included the methods that directly enter the logistic processes (KANBAN, VSM) and in the second category were methods that indirectly affect the logistics processes (Teamwork, KAIZEN, 5S, TPM). [2]

The most frequent method according the survey is Teamwork. This method is focused on employee’s cooperation in order to achieve a synergistic effect of all employees. Teamwork is a method that indirectly enters into logistics processes. The sequence of its implementation steps is shown in Fig. 2. Teamwork implementation, like other methods, requires the selection of people who will deal with this process. Teamwork is the way of work organization in teams from 4 to 15 people. [3]
The next most frequently used method in terms of industrial practice needs is 5S. The method is oriented to increase the work efficiency at workplaces through its proper organization. Based on our previous research, this method can be classified among those that indirectly enter into logistics processes. Therefore, it is necessary to consider with less impact to the whole area of logistics. The diagram shows the different stages (pink rectangles), divided into processes that describe in detail the 5S implementation (see Fig. 3).

**Fig. 2** The sequence of Teamwork implementation steps

KAIZEN (see Fig. 4) is designed to capture the improvement from all the corporate employees. KAIZEN was included in methods that indirectly enter the logistics processes in previous research. Its principle is continuous improvement in small increments, as opposed to large capital-intensive innovative changes.

**Fig. 3** The sequence of 5S implementation steps
Selection of the team for implementation the LEAN method

Team training

Yes

Does the selected team have the current knowledge for the application of LEAN methods?

Team training

No

Aids and documents preparation

Initial training

To develop a system of motivation and rewards for developers and evaluation team

Collecting improvement proposals

Workplace observation

Analysis of current situation

Motivation for further improvements

Categorization of solution proposal and its results

Is the proposal feasible?

NO

YES

Developing action plan

Evaluation of enterprise-wide benefits

The effect is

Positive

A Proposal of fully-area implementation of solution

Implementation of the final solution

Negative

Implementation of improvements in the specific workplace

Selection of the team for implementation solution

Standardization of the improved stage

Fig. 4 The sequence of KAIZEN implementation steps

TPM – this method is utilised to maintain the constant working pace without unexpected failures. TPM is accordingly included in the group of methods within direct impact on logistics processes. Diagram of the sequence of TPM implementation steps is shown in Fig. 5. [4]
The TPM implementation is a lengthy process but the initial success can be seen in a short time. Two phases of TPM implementation as phase of process approval and phase of the TPM implementation itself can be seen in the diagram of the sequence of steps. We also refer to Visual Management use in the diagram. Its tools are used in the case of TPM either.

The method KANBAN supports decreasing of production batches. Lower production batches mean fewer semi-products in production. The method was classified into the group of methods that directly enter the logistics processes in the previous research. The sequence of KANBAN implementation steps is shown in Fig. 6.

![Fig. 6 The sequence of KANBAN implementation steps](image)

The activities are divided into two phases. First one is the "preparation of a production system" - without this phase implementation is impossible and second one is the "Application of KANBAN" – this phase shows the progress of activities especially for the physical location of the elements in the production system. [5]

The VSM method belongs to the first ones that are applied in the concept of lean production (see Fig. 7).

![Fig. 7 The sequence of VSM implementation steps](image)
It is possible to reveal areas in which improvements start through VSM. This method reveals most of the waste in logistics. In the diagram of sequence of VSM implementation steps four phases can be seen that represent theoretical steps as: 1. Selection of representative for group of products, 2. Presentation of the current state, 3. Presentation of future state and 4. Implementation of measures (actions). The main steps were divided into more specific activities. The most important part of the implementation is to determine VA (Value added) and NVA (Not Value Added) processes. [6]

Conclusions
In the article, selected methods have been used from the basic concepts of lean manufacturing methods, suitable for application in the logistics business. The survey was based on the use of lean methods in the V4 countries. The main part of the paper was focused on the sequence of each method's implementation steps. This section was mainly focused on displaying the activities through the decision diagrams that describe activities related to the implementation of these methods in detail. More detailed theoretical knowledge of selected methods was mentioned in the paper "LEAN PRINCIPLES APPLICATION IN BUSINESS LOGISTICS" published in the METAL2012th text book last year.

The issue of Lean Concepts implementation in small companies will not be as a matter of course in a short time but it is hoped that our paper can help to inspire industrial companies to increased activity in this area. Implementation is not easy in any way because every company is an individual entity.

REFERENCES