

IMPACT OF LEAN MANAGEMENT ON LOGISTICS INFRASTRUCTURE IN ENTERPRISES

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Abstract: This paper highlights an issue of lean management in logistics infrastructure. The paper emphasizes the opportunities of application of lean management to achieve strategic goals and to obtain a market advantage.

Key words: logistics, infrastructure, lean management

Logistics infrastructure

In logistics processes which occur in logistics system, whose fundamental task is to ensure the availability of the products in the market, an important role is played by all sorts of components of the logistics infrastructure. Logistics infrastructure is understood mainly as material resources, methods for use and the application systems which are meant for realization of physical flow of goods as well as flow of information. The relevant literature provides the reader with a comprehensive approach to logistic infrastructure with regards to its tasks. This results mainly from the fact that the coordination of processes of materials management, which took place in the presented logistics infrastructure, was the cornerstone of development of logistics as a science [1].

One of the most important components of infrastructure in logistics process is a communication and information infrastructure which performs a range of key functions in a company. Thanks to this, it is possible to obtain continuous information on the state of various logistics subsystems as well as communication between each component of the system and forwarding the information to various links of supply chain. Generally, the communication and information infrastructure encompasses information systems employed for management of processes of goods and information flow in a company and the equipment used for this purpose (computer networks, barcode scanners and others). Information systems, as any others used for logistics, must meet particular requirements. These include [2]:

- functional integrity which means that the system should encompass all the areas of technical and economic activities of a business unit,
- functional and structural flexibility which expresses dynamic adaptation of the system at variable requirements and needs generated by the environment
- openness, which is reflected by creation of connections with external systems
- content-related advancement, which consists in a comprehensive computerized support of information-decision processes as well as practical use of logistics management concepts within such a system

- technological advances such as use of Intranet and Internet as well as multimedia or
- regulatory compliance with the acts such as the Accounting Act.

Communication and information infrastructure encompasses all the activities of the company which are related to logistics processes, therefore processes of flow of raw materials, materials, products as well as other elements of company's operation which result from such a flow, e.g. cash flow. The employed computerized systems should therefore encompass a wide range of company's operation and should consider the scope of the realized functions. The following systems can therefore be distinguished [1]:

- filing / accounting
- information / decision
- process control e.g. warehousing
- integrated, which encompass all the necessary functions realized in the logistics area.

The most frequently met systems are filing and accounting systems, mainly due to the easiest implementation of a system and also low requirements in terms of the equipment, which also causes low costs of implementation. However, more and more frequently sought solutions which concern the informational systems used in business are information-decision systems and integrated systems.

The essence of the communication and information infrastructure at the company

One of the logistics processes infrastructure significant elements is the communication and information infrastructure, fulfilling a number of important functions at the company. It makes possible to obtain default information about the state of the various kind logistics subsystems, as well as communication between each elements of the system, and also delivering the information to the various links of supply chain. The base of communication and information infrastructure are information systems used for managing goods and information flows at the company together with the equipment which serves for it (computer networks, scanners reading the bar codes etc.). Information systems used for logistics have to fulfill the determined requirements, which are [6]:

- functional complexity what means that the system should comprise all branches of technical and economical activities of economic object,
- functional and structural flexibility which is expressing dynamic adjustment of the system at variable requirements and needs generated by the environment,
- creating new connections with outside systems expressed by openness,
- content-related advancement, consisting on full computer support of information and decision processes and also the practical based of such a system on the logistic management concepts,
- technological advancement, consisting on intranet, Internet and multimedias usage,
- compatibility with Polish law regulations, e.g. the accountancy act.

Communication and information infrastructure comprises every activity of the company which are tied with logistics processes, so all processes of the raw materials, materials and products flows, as well as other elements resulting from these flows, like cash flows. So information systems used should comprise the broad spectrum of companies action and take into consideration the range of realizing functions. By this it is possible to distinguish occurring systems [5]:

- recording-settlementive,

- info- decisional
- of steering processes e.g. stocking,
- integrated, comprising all necessary functions realized in the sphere of logistics.

Most common systems are clearing systems because of their easy implementation, as well as of low equipment requirements, what is also causing low implementation expenses. However there are solutions searched referring to info- decisional and integrated information systems utilized at companies.

Lean management

Origins of LM (Lean Management) date back as far as 1907 when first publication on that issue was released in Japanese. That study, dedicated to Japanese system of car manufacturing (especially Toyotas) was translated into English in 1988, though [4]. Since that moment an increase in interest in this concept has occurred. General rule of *Lean Management* is an integrated, comprehensive orientation, which spreads out over the whole chain of the acquired value, including external relationships with suppliers and customers. Fundamental tasks and components of this concept are presented in Fig. 1.

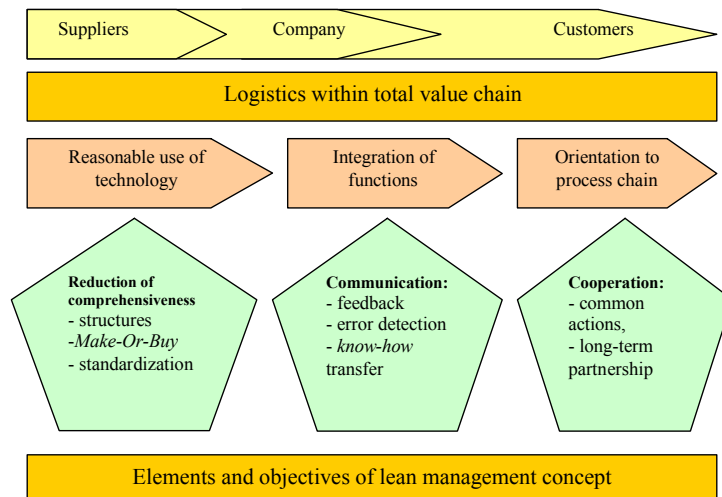


Figure 1 Lean Management Source: F. Unger: *Konten durch ganzheitliche Logisti*”, *Verlagsgruppe Handelsblatt, Fachverlag Dusseldorf, 1993* za P. Blaik: *Logistyka. Koncepcja zintegrowanego zarzadzania PWE Warsaw 2001, p. 231.*

Reduction in comprehensiveness is a significant element of lean management concept, i.e. simplification of all the processes and flows in order to avoid errors and waste or missed opportunities. Realization of this task is reflected by the structure, change in production technology and work management, as well as in simplification of the structures [1].

The approach of *Lean Company* radically changes current view of the company. In the company like this the inventory is kept at the lowest possible level (in many cases it even does not exist). The company immediately responds to orders from customers. The materials and raw materials are delivered directly to the suppliers (understood as internal and external suppliers) to the locations of use while in all the areas of company’s operation the processes of measurements are carried out. The results of measurements are used as a basis for decision-making. Such activities tend to eliminate waste and they can generate huge benefits [3].

Generally, *lean* approach is based on five fundamental rules:

1. Determination of what contributes to increase in product or service value for the consumers' point of view and not from the perspective of function, manufacturer or other supply chain participants,
2. In order to identify the activities which do not improve the consumers' satisfaction, determination of all necessary steps to design, organize, manufacture and sell a product,
3. Performing the activities affecting consumers' satisfaction while avoiding: breaks, roundabout and downstream flows, waiting times or defects,
4. Effect on a product or service in the areas which satisfy current consumer's demand,
5. Pursuit for perfection in continuous detection of waste and its reduction [6].

Additionally, in company's operation one can observe the following types of waste[2]:

1. Production surplus – too high level of production or too early production in relation to the demand,
2. Office errors, production defects and distribution mistakes,
3. Unjustified inventory – inventory surplus and delay in flow of goods and information,
4. Improper processing – application of improper tools and procedures or systems,
5. transport surplus – unnecessary relocation of people, information or goods,
6. Waiting – long periods of inactivity of people or the flow of goods and information,
7. Unjustified relocations – improper workplace organization which results in lack of ergonomics, which as a result gives unnecessary changes in workplaces or goods storage locations or often results in losing tools or materials.

The objective of the concept of lean manufacturing, which is based on continuous improvement due to new orientation to customer, strict relation to the suppliers and change in company's culture, is a continuously growing productivity of manufacturing while reduction in workforce, space, inventory, flow time (lead time), investment and error elimination.

H. Weber characterizes it shortly: „<Lean> company, which uses the concept of lean management, satisfies its customers faster than its competition, at lower costs and higher quality” [5].

Comparing lean management to contemporary logistics one can assume that the more the differences are looked for, the easiest the conclusion on lack of significant dissimilarities in objectives and the rules for the described concept [1]. The results of this method and approach to changes in lean methods are terrific in hundreds of companies worldwide.

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