

**LEAN LOGISTICS - THE IMPORTANCE AND UTILISATION  
IN SLOVAK INDUSTRIAL PRACTICE**

Helena VIDOVÁ

**Abstract**

*Predkladaný článok predstavuje problematiku štihlosti aplikovanú na oblasť podnikovej logistiky. Jeho zámerom bolo charakterizovať zásadné okruhy problémov logistiky, ktoré je možno práve týmto prístupom eliminovať a dosiahnuť tak pozitívne ekonomické výsledky. Súčasťou príspevku sú parciálne výsledky prieskumu, zameraného na zistenie miery uplatnenia a využívania štihlej logistiky v priemyselných podnikoch na Slovensku.*

**Key words**

*optimization, streamlined company, lean logistics, muda debugging ,logistics problems*

**Introduction**

The actual worldwide economic situation poses massive need for problem solutions in changing conditions. Many times fundamental changes in business strategy are needed. There are changes concerning all parts of business management. Generally, changes are made by strengthening customer relations, innovation in the production process, eliminating waste, raising production continuity through stock reduction and increasing the turnover ratio, connection of partial processes into logical chains and coordinating them by use of information technology, building up corporate culture through staff education and also supporting product quality and activities at the highest level. Logistics contributes to the fulfillment of these goals because its synthetic approach, oriented to fast and economical customer service, corresponds with the mentioned tasks.

---

Helena Vidová, PhD. - Institute of Industrial Engineering, Management, and Quality, Faculty of Materials Science and Technology in Trnava, Slovak University of Technology Bratislava, Paulínska 16, 917 24 Trnava, Slovak Republic, e-mail: helena.vidova@stuba.sk

## Lean Origins

A world financial and economic crisis has affected many businesses. Only those companies which were prepared can resist it. Those which behave rationally and eliminate wasteful expenditures and waste generally can resist it as well.

Toyota realized these facts in the 50's of the last century. It started with their approach to business process management and by limiting all that did not add value to the product or service. They labeled this problem as 3M, or more specifically [1]:

1. *Muda – waste:* surplus production, waiting, useless transport, needless operation performance, extra stocks, wasted movements, bad quality, under-capacity staff operation.
2. *Muri – abnormal staff and machinery charging.*
3. *Mura – operations irregularity.* Mura is the result of these previous two Ms. There is production quantity variation because of internal problems such as dead time or missing material.

Mura and Muri are the basis of the existence of waste (Muda). It is necessary to fix Mura and Muri before starting with removal of Muda. Activities that do not add value to the products and are not necessary to make them are a waste of resources (delay, double handling, raw material accumulation). That is why it is necessary to eliminate them. Toyota put Mura, Muri and Muda into position to eliminate unwanted elements of process execution.

In 1990 the Massachusetts Institute of Technology (MIT) published a survey entitled “The Machinery that Has Changed the World” [2]. They precisely described how the western and Japanese automotive industries differ. Until that time, it was suggested that the right answer to the Japanese challenge is automation (as tried at VW or Fiat). The MIT survey argued that western assembly factories fall behind the Japan ones because of organization innovations.

The result of Japan's innovations was strong control of the organization of work. The employees started to work in teams and therefore they increased their adaptability and their interest in getting better. The process of continual improvement was established. In Japanese philosophy, a lot of small upturns are more important for efficiency than implementation of a completely new and expensive technology. Quality control and maintenance were made the job of line workers and therefore many indirect procedures became obsolete. All levels of company hierarchy were dismantled making the work organization more flexible and transparent. Complex quality control procedures and zero tolerance for sloppiness became leading priorities of business. Many aspects of business inputs were halved – the number of workers, trough time, production stock, area, space, etc. Fast reaction to everything was possible because the work made the employees proactive. Information technologies supplied higher production flexibility in the machine pool. The result was super lean organization of the company with super effective and committed personnel.

## Lean Logistics Mission

Logistics, as the complex of inclusive service activities, has a very important position in management of business tasks. In some cases, it takes a share of 30% of final company costs. It is a fundamental proportion. Therefore it has sense to be interested in it in detail, to analyze the logistics processes, and to measure and evaluate their fruitfulness.

Practical experience shows that many businesses are focus mostly on lean production elements. Production has a massive effect on added value for the customer, but other business activities determine how fast and effectively we finally earn money. The Toyota way, based on the application of lean principles in logistics, is the impulse for improvement in this field.

*Lean logistics is a set of complex approaches covering the management of inputs by functional supply relations and also cooperation in the existing company logistics structure. It is a key factor to emphasize the value of flow management, the quality factor, and continuous partial changes and improvement such as Kaizen. This should make harmony between “hard” elements like machines and facilities and “soft” elements such as people’s work attitudes, motivation and knowledge, teamwork trends and efforts to communicate and solve specific problems [5].*

In harmonizing these components, companies try to find the economic problems hidden in [2]:

- *stocks, excess property, components and spare parts* – materials are delivered to companies in an untimely fashion or in excess quantity, the reason being inexact documentation or mistakes made in the planning system or by the supplier,
- *redundant handling* – useless material movements, relocation, transport,
- *waiting* – for components, materials, information, vehicles,
- *repair failures* – in transport, handling or information system,
- *mistakes* – setting out materials and components in incorrect quantity and time,
- *absent transport capacities,*
- *absent skills of the employees.*

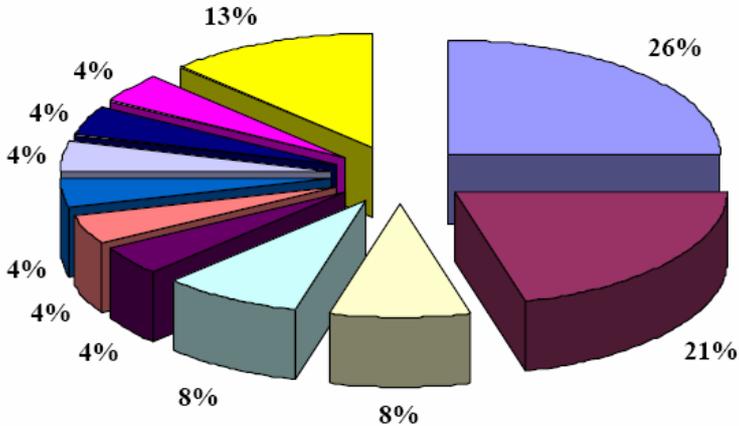
In Slovakia, it is a relatively new matter to know and apply the lean conception in logistics. It is mostly an element of companies with participation of foreign ownership. The next chapter will deal with the characteristics and particular method of application in Slovak industry.

### The Mission of Lean Logistics in Slovak Industrial Businesses

This survey has been carried out in spring of 2009. It was about the detection of the application of lean logistics and the Kaizen principle in Slovak Industrial Businesses. We addressed it to 128 companies. The response rate was 23 %. The survey was sent to logistics staff, quality managers, and to managers of economics departments.

The results show that the highest representation in the survey was big companies having more than 250 employees, mostly with foreign property participation. The respondents to the questionnaire were mostly from the engineering industry (26 %) and the automotive industry

(21 %). Besides that, businesses from the building, glass, electro-technical, textile, printing, and IT industry took part in it.

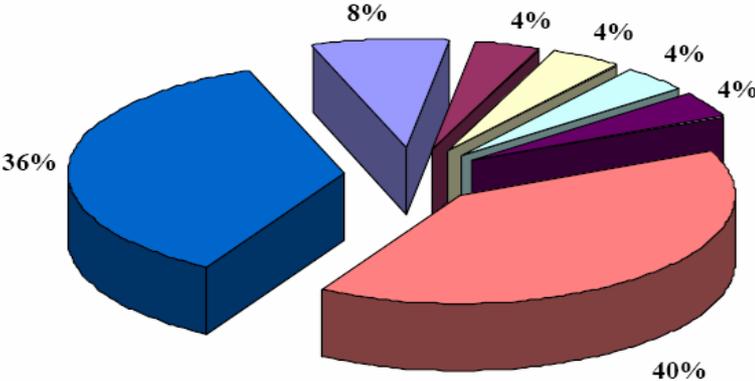


*Fig. 1. Industries Taking Part in the Survey*

The most frequent sources of problems in terms of continuity and efficiency of the logistics process were:

- product differentiation, frequent material renewal,
- material flow, utilization and organization of the warehouse area,
- observation of receiving and pick up windows,
- rising efficiency efforts in disharmony with area and staff utilization,
- communication failures, misunderstandings, issues ignored, ignorance, etc.

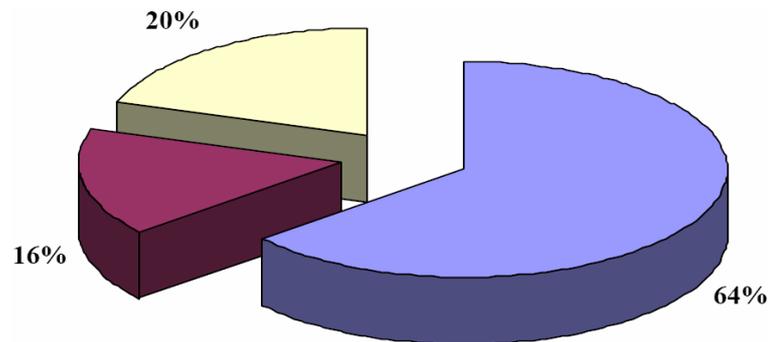
In discussion of these problems, we were interested in the approaches used for removal of mentioned issues.



*Fig. 2. Issues Removal*

The situation was not good because 40 % of the respondents do not solve those problems. Another 36 % did not answer this question because of fear or ignorance. Further companies tried to modify the lay-out of the work place, changing the arrangement to optimize material flow in business. Other ones used pull approaches, e.g. JIT, Kanban, to solve the stock issues and their quantity.

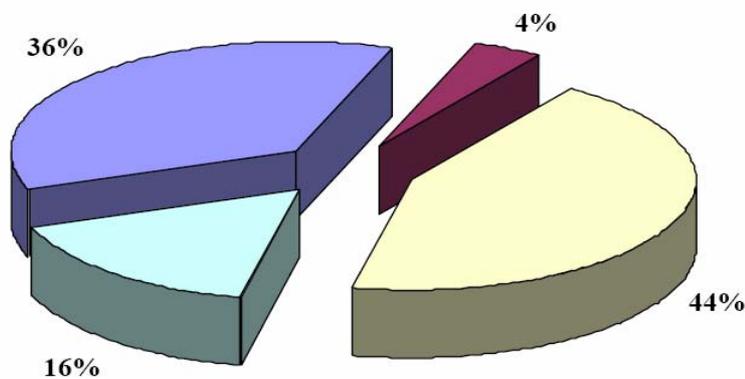
We also asked if the companies are familiar with the lean logistics problem at all.



*Fig. 3. Problem Understanding*

Sixty-four percent of respondents replied that they know the problems of lean logistics and 45 % of them implement it in practice. The most important problems that pertain to application of the principles of lean logistics were related to lack of confidence in this new spirit. Among businesses which have implemented and applied lean logistics, most applied it for more than one year. The median period was 3-4 years.

In evaluating the achieved contributions of lean principles in logistics, we have found that 36 % of the studied businesses achieve positive results, and that is why they proceed in this way. Unfortunately, 44 % of respondents do not evaluate the gained results. It can be concluded that they are missing economic tools and control of logistics activities in the relevant organizations.

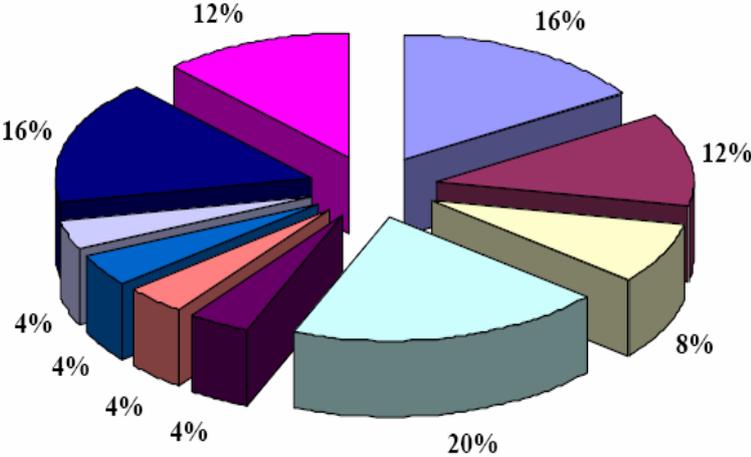


*Fig. 4. Evaluation of Lean Logistics Impacts*

The contribution of lean logistics becomes evident in the following positive ways:

- growth of labour productivity,
- transport reduction (cca. about 15 %),
- efficiency and quality increase,
- faster investments returns,
- workplace organization (20 % - 40 %),
- cost saving.

If the contributions of lean logistics are clear, which factors mainly affect its lack of use in practice? The most frequent reasons are: non-acquaintance because of lack of information or experts in this field (20 %) and no-confidence in new management concepts (16 %).



*Fig. 5. Barriers to Lean Logistics Utilization*

Some respondents explained their answers based on: the ongoing economic and financial crisis, administrative difficulties of the process, the need for continued training, motivation absence, stagnant thinking, non-use of the approaches that could improve the economy of the company, and log time functioning managers refusing the changes [3].

How could we break these barriers? The core solution is to be well-informed and to mention the advantages of lean logistics, e.g. cost and time savings, better area utilization, rising traffic speed, the transparency and organization of working places, increased employee motivation and involvement, faster reaction to customers’ requirements, and finally stability development and competitiveness of the company in comparison with other businesses in the marketplace.

**Conclusion**

Now, lean efforts are one of the actual tools of effective business management and are the main ways how to improve business processes, and to clear them from redundant activities and waste at the administrative, production, and logistics level. This topic is important because we live in an era of big changes, economic reductions and money saving. In spite of that fact, we can observe from questionnaire results that there is still fear of new things in the business area that could bring positive effects. Businesses that have applied lean logistics and used it for several years have many positive outcomes. The courage of a competent staff is needed to break the barriers and primary failures too.

## References:

- [1] ČAMBÁL, M. CIBULKA, V. *Logistika výrobného podniku*. Bratislava: Vydavateľstvo STU, 2009, 198 s. ISBN 978-80-227-2904-8
- [2] KOŠTRIAK, J., FROLÍK, Z. a kol. *Štíhly a inovatívni podnik*. Praha: Alfa Publishing, s. r. o. 2006, s. 240. ISBN 80-86851-38-9
- [3] KUFFNER, F., KOVÁČOVÁ, Ľ. Aplikácie „Lean Production“ v automobilovom priemysle. In: *Transfer inovácií*, 2003, 6, s. 30-33. ISSN 1337 – 7094
- [4] MATUŠÍKOVÁ, I. *Návrh na zvýšenie efektivity fungovania logistických aktivít v priemyselných podnikoch SR prostredníctvom koncepcie Lean a Kaizen – Diplomová práca*. Trnava: MtF STU, 2009, s. 72.
- [5] VIČÍKOVÁ, J. Utilization customer relationship management in logistic. In *International Doctoral Seminar 2009*. Trnava: AlumniPress, 2009, s. 363-367. ISBN 978-80-8096-088-9
- [6] VIDOVÁ, H. Pozícia štíhlej logistiky v riadení štíhlej organizácie. In *Trendy ekonomiky a managementu*. Brno: Akademické nakladatelství Cerm, s. r. o., 2008, s. 62-67. ISBN 1802 – 8527

## Reviewers:

Miloš Čambál, Assoc. Professor, PhD. – Institute of Industrial Engineering, Management and Quality, Faculty of Materials Science and Technology in Trnava

Jaroslav Rašner, Assoc. Professor, PhD. – University of Technology in Zvolen

