

1

Logistics – Science of Present-Day and Future

Is the logistic only a new trend in the world of nowadays science, technology and economy or is the logistics a science, philosophy and industry, which influence the worlds' economy?

Logistics has become one of the most essential and dynamic factors of worlds' economy in last decades of 20th century and 15-20 years of 21st century. Reasons for that were mostly because of:

1. Globalization of world and globalization of world trade.
2. Unbalance between the resources, production and consumption and its allocation in world-wide environment.
3. Development of new management technologies (in mathematics, cybernetics and informatics).
4. Factor of costs and prices reduction. Global competitiveness – period of logistics.

Ad Point 1

With the world's globalization and in Europe with the end of socialism, a new market was opened. An environment for movement of investments, materials, products, energy, information and human resources was liberalized. The flow volumes of above-mentioned substances are growing. Build up of new transportation systems in roads, railways and aerial navigation (for example in Europe: TINA and TENS) have positively influence this growth. Creation of world-wide information highways and networks with high speed and volume of transport are revolutionary change also in area of flow management of products, information and finance, which mean of logistic systems. Electronic commerce (order, appraisal of orders, automated payments, electronic signature, etc)

increase the efficiency and productivity and support the management of business activities – commercial logistics.

Companies realizing the competitive opportunities are creating chains and networks of companies, starting from the raw material mining, processing into polymers and products, delivery to customers, product services, recycling of its wrappings, waste and products itself. Due to these they are creating logistic networks and macro-logistics is developed.

Ad Point 2

Flow as moving substance changing its parameters in time and place, is created as a distinction of potentials. We can explain it analogically by an example of electric field. Electric current results from the interconnection of higher potential (+) with lower potential. Logistics creates conditions for flow establishment, manages them and ensures them.

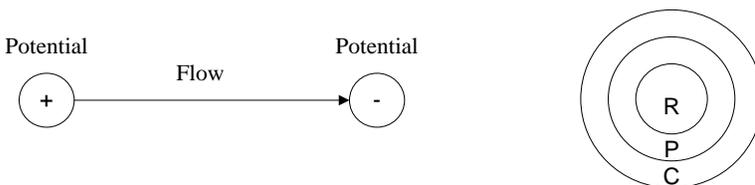


Fig. 1. Flow as the results of potential distinction.

There is a main difference among allocation of potentials in the world:

Raw resources → Production → Consumption

These flows are vital important for world economy operation and liberalization of world's economy and they support native balancing of these potentials. Optimal allocation of these potentials from the logistic point of view is in one place.

The World flow of R - P - C

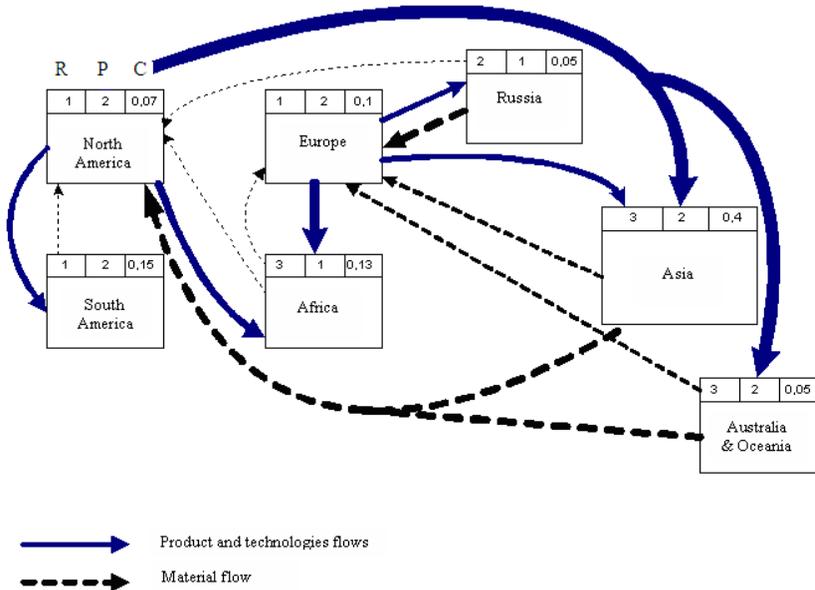


Fig. 2. Main material flows of the world R/P/C.

From worlds' statistics it is obvious in the global point of view, if we compare these three potentials resources – production – consumption, then these material flows are established by following factors (Fig. 1):

1. Europe and North America upraise approximately only half of raw materials they need for their industry production. That is the reason they need to import the materials.
2. Russia is dealing with the opposite situation. They upraise almost twice that much of raw materials then they are able to use in their industry production. Asia, Australia and Oceania upraise also almost one third more then they use.

3. On the other hand, Europe and North America and their industry produce much more products and technologies than their market can consume. That is the reason they need to export their products mostly to Asia, Africa, Russia, South America etc. On the (Fig. 1.) we can see the main three material flows. Above each of them, there is a triplet R/P/C
- R/P – proportion of production and consumption of raw materials.
 - C – share of world's consumption of goods rising from proportion of population to world's population.
 - Together with material flow, there are parallel and inverse flows of information and finance are created.

Unbalance among resources – production – consumption is mostly caused by historical development of economy stage, territorial geology, development of population and living standard. Balancing of these potentials and existence of flows are long-term situation needed to be solved for several decades to come. That is the main reason why logistics plays such an important role in costs and competitiveness.

Ad Point 3

Also development of managerial methods contributed to the development of logistics – management of distributed companies' productivity, methods of outsourcing, risk management, concentration of capital into big corporations, etc. development of distributed management methods, modelling and simulation, multi-criteria optimizing and its usability within world information networks gives us tools for dealing with the flows within the world-wide environment.

Ad Point 4

World-wide market and competitiveness, tendency of producers to reach world's markets force the producers to cut and reduce their costs. Automation and informatization have increased the productivity of production systems. Times when automation and informatization were leading the dynamic of worlds' economy are over. They are considered to be prevalence in nowadays production systems. It is difficult to picture a successful production without them. The reduction of costs is that's why in the area of connected operations, supporting processes and in its management – in logistics. In compare to automation and informatization of technological processes, allocation of logistics is less expensive and more effective. Mostly it doesn't require high investment but only a good idea, organization and cooperation.

If we take a look at the 20th century, economical dynamic was always influenced by different factors [3].

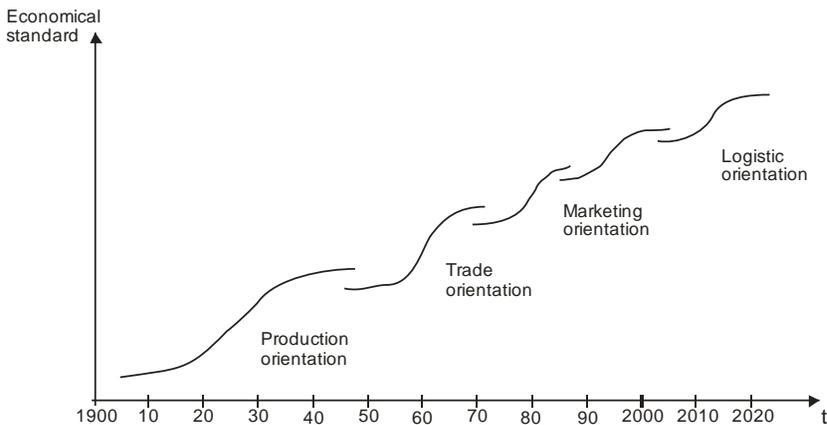


Fig. 3. Factors influencing the economy of 20th century.

- 50s – 60s of 20th century is also called production oriented economy, which focused on maximizing of production. Main issue was to produce as much

as possible. Successful companies were those which could produce the most possible amount.

- *50s – 70s* were mostly oriented on sale – maximizing of sale. Production has exceeded the demand; old markets were totally covered by products. Successful companies were those which could sell as much as possible.
- *70s – 90s* are known for their marketing orientation. The aim was to maximize the area of trade. Customers started to be more essential, battles for new markets was common. Research and companies are more interested in marketing strategies. More and more companies base on long-term contracts, strategic customers and trades.
- *Last years of 20th century* – logistic oriented economy focused on maximal satisfaction of customers. The whole chain of company's activities is oriented on global costs reduction and on final customer.

Global optimizing in the whole chain is replacing the local optimizing of activities; internal management is concentrated on coordination and systematic approach. Quality is becoming more essential together with environmental issues.

Research results of Dept. of production economy and productivity of University of Vaasa [2] in Finland supports the above-described idea.

There were three groups of experts participating on the research:

1. Experts in area of research and education.
2. Experts.
3. Companies – firms from Kankajoki region.

These three groups of subjects were supposed to answer following questions:

1. What are the new areas of know-how, factors for new markets and establishment of new companies.
2. Future technologies and directions. Carrier, developing, sophisticated directions and technologies.
3. Key technologies on which nowadays business activities are based on.

Answers were based on life curve of products, technologies and know-how (Fig. 4).

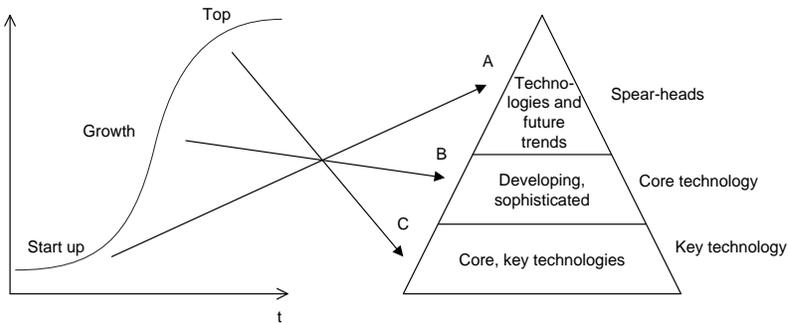
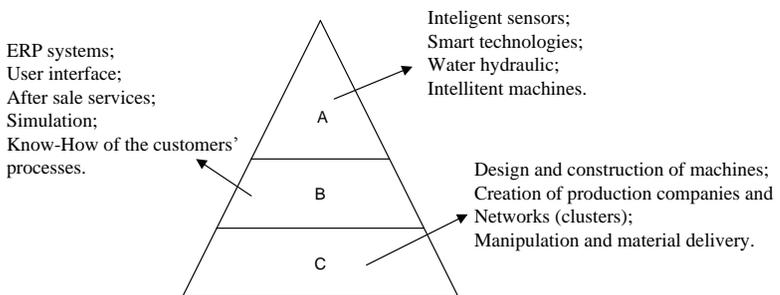


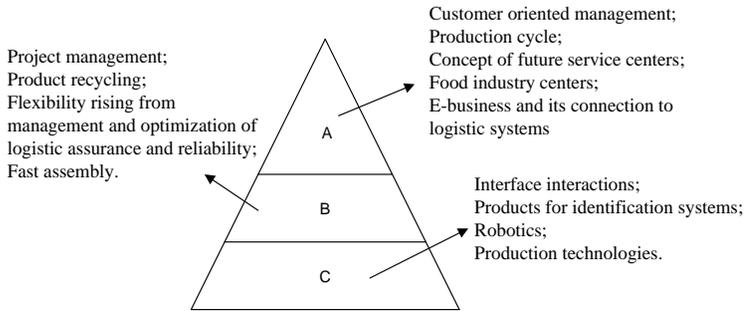
Fig. 4. Relation between life curve and technological pyramid.

Research results were as follows:

Regional companies



Experts



Educational and research institutions

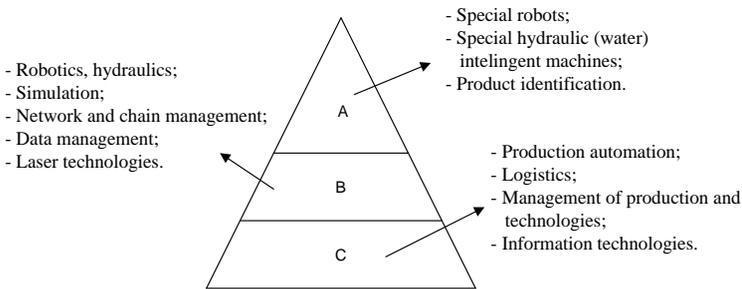


Fig. 5. Technological pyramids.

As we can see from the (Fig. 5.), all technological pyramids include inter alia:

1. The pyramid of companies:

B - After sale business (part of commercial logistics).

C - Creation of production companies clusters (their management – part of strategic logistics).

Manipulation and distribution of materials (part of production logistics).

2. The pyramid of experts:

A - E-business and its connection to logistic systems.

B - Creation of regional clusters and international company networks.

Flexibility rising from management level and optimization of logistic chains.

3. *The pyramid of educational and research institutions:*

A - Identification of products.

B - Simulation.

Networks and chain management (Supply chain management).

C - Logistics.

From above-mentioned information we can conclude that logistics is a science and philosophy, which significantly influences world trends and economy and will keep on influencing it in next decades to come.