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CORPORATE LOGISTICS AND INNOVATIONS

Innovation strategy could be critical for the firm success (or firm survival) within dynamic markets and may be also the source of competitive advantage to attack market niches. The critical changes in contemporary logistics, which formed modern logistics and build good start up position to be enough adaptive in current crises period are these ones: process orientation, new logistics and new in logistics implemented technologies, logistics audit, reengineering, outsourcing, progressive view on internal logistics. Authors explain consequences between mentioned logistics approaches and firm innovation strategy. Results of research clarify that innovative logistics is profitable and place accent on internal logistics efficiency and logistics performance indicators.

Keywords: innovations, innovation strategy, logistics, supply chain management, process management, logistics audit, logistics outsourcing

1. INTRODUCTION

Innovation strategy shifts corporate business strategy into way how to create new value for the customers. *Innovation can be defined as a method of usable innovative thinking, which affects the entire business.* It means finding ways to change the competition rules. Innovation strategy could be critical for the firm success (or firm survival) within dynamic markets and may be also the source of competitive advantage against other market niches. Innovative strategies create the prospect of further business development also provide new perspectives for the growth on financial markets and the hope to survive at dynamic world.

The global economic crises and deepening recession inside all national economies force experts to reflect to the performance of many processes inside companies.¹ Contemporary world economic crises reflect the significant influence on the logistics and transport. Every industry, every company are orientated to reduce costs and achieve efficiency. The 12th European Congress of Logistics and Transportation held in Prague in May 2009 summed up the transport and logistics tasks for European Union countries as follows:

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¹ J. Brezovský, *RFID Realizmus: Na masové využitie si ešte počkáme*. [In:] „Systémy logistiky”, No. 14/2008, p. 14.

- optimization of the internal transport on domestic markets,
- remove of administrative barriers for transport business,
- increase the competitiveness of EU transport systems,
- safety on roads.

The important direction must be consider to the support of advanced technologies in transport, particularly to the introduction of modern traffic management systems, intelligent transport systems for road transport, the upgrading of the flight systems, road safety, faster deployment of advanced security technologies such as warning brake systems, electronic systems for vehicle stability etc.

The current economic crises is forcing to explore good, efficient approaches to this status, seeking answers to actual questions, predict, analyze approaches to the crises confronting change in strategy, costs and expenses, communications and business experience. Economic crises means slump in figures (figures presented at The 12th European Congress of Logistics and Transportation held in Prague in May 2009), for example within these areas:

- within European union are 20 millions jobless people,
- average unemployment is between 9-10%,
- decrease of air cargo around 30%,
- marine shipping space capacity 1,3 million TEU,
- decrease the performance of road transport minimum about 25%.

The decline can be seen in the performance of freight transport, forwarding, in storage activities. The crises affect the new construction of logistics parks, distribution centres. Changes the pricing programs offering storage space could lead to a decline in demand for cheap storage areas and a price decrease for services at all. Together with the decline in consumer demand we see reduction of outputs in every sector and logistics business feels it very hard. Falling demand means the increase of the costs for storing and holding stocks, rising demand support growth in transport costs.

2. CHANGES IN CORPORATE LOGISTICS

"Development of logistics centres started thanks to the influence of new retailers, on the base of their requirements for new networks of warehouses and logistics centres. The great change in this business was therefore the logical increase of the volume of shopping malls and supermarkets, which require daily supply to their stores from distribution centres. Old system of warehouses and intermediaries centres became to be malfunctioning, so the situation challenged for a new logistics and technologies trends and for the higher level of logistics services, which are designed in the way of the dynamic supplies within newly formed business networks".²

Wide-spread information technologies for such processes allow usage of new technological innovations. Customer based solution stay on the specific logistics processes. It represents the information connection to the customers' requirements via the planning and delivery network, packaging, handling, control and handling of logistics units, warehouse management etc. *"Information systems play an important role in managing the logistics market, especially computers with point of sales terminals, bar*

² Z. Mittelman, *Logistické centrá ako podpora regiónu*. [In:] Eurobiznis, No. 3/2009.

codes, satellite tracking of supplies, electronic data interchange (EDI) and electronic means of payment (Electronic Funds Transfer - EFT)."³

Innovations and firm innovation activities are heavily influenced by the expansion of information and processing capabilities. There are notable prospects for generating new innovation and marketing activities and logistics shows very hard the impact of information flow in business processes. At current time we see e-concepts such as: e-commerce, e-CRM, e-design, e-category, e-logistics, e-procurement, e-SCM, e-sourcing, e-auction. *"This global trend involves concentration, vertical integration, brand impact, the minimum stock capital, quality standards, proactive supplier management and surplus of capacity."*⁴

Information technology supports *decision-making processes*. Companies are starting to use information-intensive technologies to achieve net economic effects at all levels of management. These companies are currently focusing their attention on business processes, reducing costs, optimizing the performance, but this is not enough to have competitive advantage. The area of innovation technology will succeed, despite the current global problems. This innovation provides a new source of firm wealth creation capability.

Development within market economies showed that companies over the past thirty years had concentrated to become a process-oriented firm. Companies learned how to create process maps and documents of existing processes, utilize analytical techniques to find bottlenecks and useful steps forward. These models helped to improve quality of management performance. All these steps led managements to understand how their firms can operate within the complex of world competing companies. Documented processes helps companies understand the core competencies and value added processes. The development is going on and for the firm is important *"... not to focused only on procedural restructuring, but also on the internal structure of the company to achieve optimal flow of internal processes. Based on the new crescent networking with suppliers, sales partners and customers, companies must take into account ways how to optimize the whole chain and focused on the active management of the chain. To satisfy the customers desires with a large selection of products, at lower costs and better quality, supported by better service."*⁵

Author Košťuriak⁶ states that transportation business, storage and handling employ up to 25% of workers, cover about 55% of the industrial areas and around 87% of the whole time materials spend inside the company. These activities represent from 15 to 70% of the total product costs and have big affects on the quality of products. From 3 to 5% of offsets due the incorrect material transport, handling and storage are observed. On the base of these figures, exploiting innovation implies a reduction in goods costs related with the flow. For this reason it is fundamental to apply the innovation in logistics to achieve changes in the handling, transportation, costs reduction, reduce losses and achieve net economic effects.

³ P. Kotler, L. Keller, *Marketing manažment*, 12. vydanie. Grada Publishing, Praha 2007, p. 563.

⁴ J. Zrník, *Inovační trendy v nákupu*. [In:] *Prednáška na konferencii „e-nákup“*. Trenčín 2005.

⁵ G. Tomek, V. Vavrová, *Marketing od myšlenky k realizaci*. 2. vydanie. Professional Publishing, Praha 2008.

⁶ J. Košťuriak, *Strategické inovácie*. [In:] „e-Focus“, No. 1/2006. p. 37.

According to Kotler and Keller logistics is about four main decisions:

- 1) how to process orders,
- 2) where to place inventories (storage location),
- 3) how many stock to keep, (inventory management),
- 4) how to send goods (right transport mode).

The critical changes in contemporary logistics within last year decade, which formed modern logistics and build good start up position to be enough adaptive in current crises period are these ones: *process orientation, new logistics and within logistics implemented technologies, logistics audit, reengineering, outsourcing, progressive view on internal logistics*.

Internal logistics costs reduction is important step when improving internal processes and can be achieved by the use of labour, technical and technological means of exploiting innovation. A few examples of logistics innovation and improvement are for example these ones: automated storage, warehousing managed by voice, ecological types of trucks, usage of vehicle tracking systems, new warehouse equipments, the usage of RFID etc. Innovations are reflected also in the packaging systems, packaging simplification.

With the rapid flow of information, companies could use *the time factor as a crucial advantage*. Quicker, free flowing logistics means better utilization of production and distribution capacity, which tends to costs reduction, to reduce losses in the absence of inventories, declines in inventories, the unlocking capital bounded in inventories. Higher resistance to unexpected changes on the market, the possibility of quicker response to customer specific requirements, increase of the volume of orders, bigger sales, profit, reached better return on investments, shorter length of the goods flows. This means that the impact of information technologies together with business activities acquired a qualitatively new element – higher flexibility.

The base of any changes is the audit of logistics activities, in order to be able to accurately analyze all the basic processes, especially costs of internal processes. It used the latest methods, techniques and technologies. Reengineering is very suitable starting point for change. Its principle is based on a fundamental revision and radical reconstruction (redesign) of the business processes. The outcome is improved quality, service, speed and bigger cost reductions. Reengineering activities, all of them focused on customer needs, are crucial to gain a competitive advantage for excellence in production, quality and new technologies in the meticulous labour productivity growth.

Czech authors Drahotský and Rezníček⁷ mentioned these drivers of reengineering within company:

- fundamental questions: why, what and how to do it,
- radical solution of meritorious issues,
- dramatic improvement, jumping changes,
- process thinking and relationships approach,
- new proposal brings innovation of products and activities,
- comprehensive systemic approach,
- teamwork,
- new start for the new status,
- simplifying of complex conditions,

⁷ I. Drahotský, B. Řezníček, *Logistika – Procesy a jejich řízení*, Computer Press, Brno 2003, p. 199.

- return to logical thinking,
- address and elimination of the bad motives, not consequences.

The audit will identify internal reserves to be used in the process of reengineering and could successfully manage the direction of management processes. Processes must be managed effectively. Optimization of logistics processes can be used for the analysis of business logistics processes.

According to P. Pernica, logistics expert, within logistics functions, the sequence of operations is not a full guarantee of the maximum flexibility and efficiency. *"With appropriate methods, we choose these operations and organize them into units so at a given level of cost efficiency is maximized logistics system or conversely, to operate the logistics system at low costs to achieve the desired performance. For such optimal arrangement of operations into relatively steady process we use the name logistics technology."*⁸ The look at the technologies in this way is close to value-added process approach, in which the aim is the most effectively meet the customer needs by product or process. When choosing an appropriate logistics technology, there is necessary apply logistical acceptable level of management, as is shown in Table 1.

Table 1. Selection of logistics technologies

System level	Logistic technologies	Structure of logistics technology
Technical subsystem	classic	<ul style="list-style-type: none"> ▪ making handling groups ▪ combined transport ▪ concentration and centralization of storage networking stocks
Subsystems: information communication	telematics communication	<ul style="list-style-type: none"> ▪ automatic identification ▪ radio frequency data communication ▪ electronic data interchange and Internet ▪ technology to support the operation of the transport fleet management
Subsystem: management	virtual	<ul style="list-style-type: none"> ▪ simulation ▪ graphical visualization
(multi) system	complex	<ul style="list-style-type: none"> ▪ Just-in-time ▪ Kanban ▪ quick Response (QR) ▪ efficient consumer response (ECR)

Source: [13], (modification by authors)

As shown in the table, we consider the various types of systemic levels. But in addition to technical/technological systems, which occur in conventional technologies creation of handling groups, we include also combined transport, storage networks and concentration and centralization of warehousing facilities etc.

The subsystems of information and communication with the usage of telematic technologies could perform the automatic identification, radio frequency communication, data exchanges and also the use of navigated traffic vehicles. This section will focus on innovations and especially innovations in logistics technology.

⁸ P. Pernica, *Logistika pro 21. století*. RADIX, Praha 2005, p. 836.

Virtual management subsystem allows simulate and graphically displayed real company logistics processes depending on the environment. As an example could be the storage process and its visualization in real time. Alternatively, voice controlled warehousing combined with visualization allows you to watch real-time process of picking and unloading of goods according customer orders. Important precondition for easy handling and optimum dimensional unification of the packaging is standardization. *"Standardization of packaging – is the base for making logistical units, modular packages that can be accurately stored on so called EUR standard pallets."*⁹ We can use automatic identification, radio-frequency communication, data transfer at information and communication subsystems as well as transport vehicles management. This part will be the main area for innovations and news in logistic technologies.

3. INNOVATIVE LOGISTICS IS PROFITABLE

Innovations and applications within the firm create good company reputation as an innovative logistics company, which is brings competitive advantage. Innovations come as new logistics services, new logistics processes accompanied by the growth of labour productivity (per unit), as reduction of packaging material consumption also limiting the damage via transportation and as the reduction in total logistics costs. Savings could be used for improvement the sales structure. Upgraded logistics system based on pull approach came from the automotive industry. It means demand-driven production and production based on orders. The merit is communication with customers, kanban processes, just-in-time processes, separation of production and logistics (f. e. in the case of spare parts supply within 24 hours) and optimization of internal processes. Towards integration partner, company creates supply chain collaboration, which closely links business partners. Next *benefits of innovative logistics* are followings:

- accurate and timely orders picking,
- growth in labour productivity in the warehouses,
- optimization of the warehouse stock movements,
- errors minimization in shipping, reduce the time needed for inventory keeping,
- surveillance of trade and storage rules,
- increase of inventory turnover,
- better warehouse space utilization,
- detailed information about operations carried out,
- on-line information about the performance in warehouse,
- reduction of goods losses,
- optimization of warehousing operations, as wave destocking, cross docking.

Innovation is important in the time of crises, when companies go through *restructuring (reengineering) internal processes*. Restructuration of business processes means to focus on the optimal solution of the material flow, to achieve the efficient flow within firm internal environment. Good solution of restructuring must be done together with IT partner; to eliminate limits of the goods flow, optimize storage places utilization, to improve and enhance the crossings within the firm facility area, to reduce transport costs.

⁹ M. Dzurová, *Obchodná technológia – veľkoobchod: vybrané problémy*, Vydavateľstvo EKONÓM, Bratislava 2004, p. 88.

This collaboration could to improve and streamline the processes and could clearly identify the benefits of resolving the problem:

- exclusion and limiting urban spatial overlaps,
- limitation the risk of goods damages,
- safety work,
- increase the quality of storage,
- effectiveness of the use of warehouse space,
- productivity growth,
- implementation of barcodes, RFID or other technologies.

The time horizon for the proposed process of optimization is 3-5 years, together with investments. For optimum setting of logistic processes is crucial is the location and layout of the production company within its production facility area, the layout of elements of logistics infrastructure, especially storage are of finished products (storage process). Usually, there is existing building that has inadequate capacity and its reconstruction is needed not only in the size and quality of the building, but also in its technological equipment. Such firm internal analyses take into account these parameters:

- volume of stock facilities,
- inventory turnover,
- the volume of manipulated and consigned goods,
- volume of dispatched goods,
- volume of handling and packing units,
- necessary estimated investments in construction work.

When dealing with internal logistics problems, it is essential in this case to define the direction of logistics strategy. In contemporary time, no matter there is crises or not, best solution is to apply SCM – supply chain management approach. Information technologies provide logistical support activities. The focus is on the optimization processes in these areas:

- purchasing processes,
- orders management,
- inventory and warehouses management.

Thinking in the way of SCM, next key areas must be reviewed – outsourcing, facility locations as f. e. warehouses centralization. Centralization of stocks helps improve and optimize costs. It is also the base of the unification and standardization of these components:

- information technologies,
- logistic processes,
- service indicators,
- economic – costs parameters.

4. INTERNAL LOGISTICS EFFICIENCY, PERFORMANCE INDICATORS

In previous years, before the economic crises had been identified, the rapid growth in production quantities was associated with the growth of the volume transported goods. Expanding storage and merchandising requirements, growing high-quality service deliveries associated with speed, precision and flows associated with in time information.

These main factors determined the success and reliability of the entire supply chain. Assessment of the effectiveness is necessity for process management and subsequent improvement of internal processes.

Companies often solved problems with weak warehousing system with insufficient operational capacity. There should be choices to be made good overview of the supply chain connectivity to speed up processes, improve customer service. The connectivity is currently a significant feature for logistics systems in Europe, with target to optimize amount of inventory, to decrease costs of maintenance and logistics processes and make more fluent traffic flows within the EU countries.

One of the key trends, which formed EU logistics last years, was outsourcing. Outsourcing partners as main activities and benefits could reduce the costs by impact of the total volume of goods they handle, simplify handling and speed up the flow of goods. *On the base of research we can identify the benefits of outsourcing, which are reducing costs for:*

- personnel (staff costs),
- storage areas (own warehousing facilities costs or renting costs),
- transport and transport equipment (investments costs, leasing costs),
- collection of goods (cross docking processes cost reduction effects),
- warehousing technologies.

The manufacturer typically requires savings. The base is comparing the costs with the firms own processes and stock purchased via outsourcing processes. To logistics service provider is then transferred the entire process of storage. Not only receiving and storage, protection of goods, but also picking customer orders, dispatching, deal with the system of returnable packaging. Costs are reduced when comprehensive service by logistics provider is done. Outsourcing of logistics warehouse means continuous production, which means focusing on the core-business of producer – production activities and processes. It allows use stronger marketing to overcome demand fluctuations in season and off season time. Logistics service provider will process orders, provide customer distribution, packaging, transport, storage and handling.

Outsourcing and its use could be in many cases chaotic, improperly used and could bring a number of risks. The reason why the use of outsourcing of business processes is savings of operational costs, which may reach 10 per cent per year, depending on the service delivery process. The logistics could be "outsourced supply chain" and we can use also term multi-sourcing. Significant is attendance to the management of sourcing relationships and customer service of logistics provider. Multi-sourcing contributes to the development of new capabilities for the global expansion, higher flexibility of company, to profitability and to creating of competitive advantage. The next, also today trend is network sourcing, base on the philosophy of now forming network economy and network relationship.

The very important is the choice of indicators to judge outsourcing, to define the base group of indicators, which are crucial for example for the stock strategy. This is the *recommendation for indicators to monitor and measure internally* within the firm:

- 1) *reliability of deliveries*: supply plan fulfilment, accurate prediction of sales, level of customer service,
- 2) *speed*: goods turnover,

- 3) *costs*: production, consumption of packaging materials, distribution costs, costs generated by errors.
- 4) *warehouse area coverage*.

Customer service is crucial and it means, f. e. number of timely and accurate logistics units delivered with all the ordered items (in %). Next important indicator is the accuracy of sales forecasts: volume of differences between planned figures of demand and actual figures of demand, referring to the projected demand (in %). Coverage of warehouse area: inventories at the beginning of the period and at the end, as a function of weekly sales plan. Distribution costs: the share of distribution costs to financial volume of sales (in %). Reliability of suppliers: deliveries supplied in time, in tolerance and taken in relation to all deliveries (in %).

The company must evaluate all these variables, to be able compare own performance with an external service provider.

Reasons to choose an external supplier of logistics services could be declared as follows:

- 1) *cost efficiency* – using the benefits of volume and specialized know-how, process restructuring,
- 2) *customer service* – improving the level of customer service, increase of operational flexibility,
- 3) *marketing* – focusing on core competencies, market expansion, the need for advanced logistics solutions, to gain access to new technologies,
- 4) *earnings stability and company growth* – reduction of investments, transforming fixed costs into variables ones, gain the flexibility for grow and sharing the risk.

Within the Table 2 we note several recommendations, rules and principles how to cooperate and measure performance of logistics service provider.

Table 2. Rules and principles for cooperation and performance measurement of logistics service provider

Accurately define and agree performance indicators
Analysis of internal processes of the supplier
Partnership based on long-term cooperation is an advantage
Measurement reliability interfaces
Reduce the risk of low performance, joint planning and budgeting
Define only a few key indicators
Precise definition, condition, frequency of evaluation
Establish the level of service – good, standard, at least as a reason for dismissal
Bonus and penalty
Procedure for unacceptable level of service
Contractual obligations for productivity growth

Source: Authors.

When company start logistics outsourcing project, first must set up basket of main criteria. Key factor are the annual costs, the technological quality of logistics processes, the performance of equipment. The critical condition could be today status of logistics facilities, a number of options or varieties. Company needs to evaluate project or pre-project from several points of views:

- feasibility,
- time complexity,
- technological complexity,
- compare the volume of investments and operating costs,

choose the most appropriate alternative of development within macro and micro environment.

To prepare good, new logistics project within company (firm logistics or outsourced logistics) needs properly implement new trends, new technologies as is EDI, identification systems, software solutions connecting logistics and marketing, logistics and sales or better whole firm core activities.

Electronic Data Interchange of the forms, paperless business transactions documents enable partners to accelerate the flow of products. This technology increase the reliability, credibility from the perspective of the audit, allowing optimal IS applications to reduce administrative costs for the exchange of data or forms of business information. Information technology and good quality of information systems enable that "... *information flows are less dependent on geographical borders or language and legislative differences.*"¹⁰

Automatic identification is a basis to link the various activities from entering the goods the warehouse, handling up to dispatching. System of exact location in the warehouse, online link mobile computers to a central computer, the possibility of using voice control storage and handling, creates conditions for complex storage and distribution systems. The results are in costs reduction, labour productivity growth and limitations in personnel errors, limitations of the goods damages and also technology damages, better customer service and finally competitive advantage.

We experience growing importance of relations between marketing and logistics. Software solutions working with the changing characteristics of the uncertain market environment allow you to create a competitive advantage. Developing strategies for differential values to the customer is directly depending on very close links between marketing and logistics system. This generate to higher flexibility of company business and better economic performance.

CONCLUSION

Changes within market environment, strong competition are forcing managements of companies to find firm competitive advantage and develop strong market position. They review the marketing and trade policy. Especially in time of the crises they must better use marketing tools, up-today marketing tools and use innovations in business operations, supported by information and communication technology solutions. "*Innovation (creative destruction), progressive technologies, science and other elements have major impact on forming consumption and quality of life of the individuals.*"¹¹ The text is the output of the project VEGA 1/0557/08 Innovations of marketing and business activities of Slovak enterprises.

¹⁰ P. Cimler, D. Zdražilová a kol., *Retail management*, Management Press, Praha 2007, p. 130.

¹¹ Z. Francová, *Vzťahový marketing v obchode – implementácia, nové smery využívania v kontexte teórie Josepha Schumpetera*. [In:] *Vzťahový marketing ako nástroj konkurencieschopnosti*, Ekonomická univerzita v Bratislave, OF, Bratislava 2008.

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LOGISTYKA FIRMY A INNOWACJE

Streszczenie

W warunkach dynamicznego rynku strategia innowacji może stanowić zasadniczy czynnik sukcesu firmy (lub jej przetrwania), ale także staje się źródłem przewagi konkurencyjnej, sprzyjającym zdobyciu nisz rynkowych. Zasadnicze zmiany, które doprowadziły do powstania nowoczesnego podejścia do logistyki oraz dały podstawę do tego, by firmy mogły być wystarczająco elastyczne w dobie obecnego kryzysu, stanowią: orientacja procesowa, nowa logistyka i zastosowanie nowoczesnych technologii w logistyce, audyt logistyczny, *reengineering*, *outsourcing*, perspektywiczne podejście do logistyki wewnętrznej. W artykule autorzy wyjaśniają powiązania między wspomnianymi pojęciami a strategią innowacji przedsiębiorstwa. Wyniki badań wskazują, że innowacyjna logistyka jest źródłem korzyści, a nacisk kładzie na efektywność logistyki wewnętrznej oraz wskaźniki wykonania.

Złożono w redakcji w grudniu 2009 r.