

# AN ANALYSIS OF THE LOGISTICS INNOVATION DEVELOPMENT PROCESS AT LOGISTICS SERVICE PROVIDERS

Patricija Bajec

**Abstract.** *An innovative approach is no longer a luxury for logistics service providers, nor their clients, but a necessity, that is critical to the success of both partners of outsourcing. In the field of logistics, the importance of innovation has long been neglected. Approaches developed within the field of product and service innovation are not suitable for the logistics industry or they cannot be simply implemented by logistics service providers, therefore a new approach from a logistics service provider point of view is needed. This paper looks at different research literature and summarizes the major findings in this research area, focusing on the logistics innovation development process within a logistics service provider. The objectives of this paper is to examine approaches of logistics innovation development and to describe the process of logistics service development from a logistics service provider view point. A four-phase process is selected. Moreover, some proposals of potential logistics innovations for each logistics subsystem have been added, since supply chains should now be viewed as a whole in order to meet competition.*

**Keywords:** *Logistics Service Provider, Logistics Innovation, Innovation Development Process, Logistics Innovation Management, Knowledge Transfer, Mutual Relationship, Trust.*

**JEL Classification:** *O31.*

## Introduction

International business has been undergoing a period of significant transformation. "Globalisation and the development of information and communication technology are all reshaping the world's trading patterns and consequently physical goods flows" [47], which leads to more complex supply chains and increases companies' needs. In order to ensure and improve growth they should not only be obsessed with cutting costs, but also on developing new high-value products and services. [21] Enterprises need to innovate in order to stay ahead in the market and "achieve significant advantages in time to market." [48] [2] and [39] believe that the concept of innovation is as an effective key to create and sustain a company's competitive core, future ability to compete and an appropriate level of profit. As enterprises often don't have enough skills in-house needed to develop innovations [2], [39], they need to "find ways in which more core business functions (but not all) can be opened to the shared knowledge of the external logistics service providers, without losing core competitive capabilities." [21] Demand for innovation in the context of outsourcing presents a new challenge and enables existence on a competitive market for logistics providers, too.

But, they lack the knowledge and experience for successful implementation of innovation.

The aim of our paper is to gather as much information as possible about innovation from literature, from international surveys and our own research and to use those insights to better understand how to make innovation happen, how logistics service providers can approach innovation management more actively and what is the company's role. Additionally, in the last part of the article some cases of the most popular incremental and semi-incremental innovations for each supply chain's part have been added. We hope that this paper will significantly motivate logistics service providers to offer more innovative solutions as well as encourage companies to use outsourcing more frequently.

This article has 6 main sections. The first chapter states the problem, second chapter outlines innovation, types of logistics innovation and logistics innovation strategies. The third section presents approaches of logistics innovation development and analyses the logistics innovation development process within a logistics service provider. The fourth section suggests some examples of innovations within entire supply chain. The findings are summarised in the discussion and the conclusion.

## **1 Statement of a problem**

High expectations associated with outsourcing and greater customer needs are increasingly hard to meet. Traditional outsourcing, focused on cost reduction, cannot provide significant competitive advantage anymore. Research carried out by [7] even demonstrated that a full 50 percent of traditional outsourcing contracts will fail to meet increased customer demands. In addition to this, [14], [15] and [30] stated innovations as critical to the success of service providers, which need to pay more attention to innovation and to provide better services for their customers, that acquire higher quality of tactical and operational logistics service, higher range of available value-added services, knowledge and skills on supply chain innovations and improvements, while still allowing lower costs.[25]

Also data received from personal interviews with senior logistics managers, conducted from 20 February to 6 July 2010, in 26 large and medium sized logistics service providers in the Slovenian logistics field identify the importance of innovative approach for 3PLs (57.7% of respondents strongly agreed) and shippers (84.6% of respondents strongly agreed). Additionally, the survey shows the importance and need for new methodology in the case of innovative approach (65.4% of respondents strongly agreed).

[24] affirms his opinion that both logistics providers, as well as enterprises become aware of the importance of an innovative approach, but unfortunately often lack the relevant knowledge of an encounter with innovation. As the quantity and quality of innovation that an organisation can achieve depends on the right process of logistics innovation development and right management, the primary interest of this research paper is to uncover the processes needed in order to be innovative, while also focusing on the role of both enterprises in this process.

## 2 Methods

In this section, a review of literature, limited mainly to academic articles and recent books is presented. First, searching for articles dealing with innovations in general was made. Regarding the fact that objective of this paper the development of logistics innovation was, the research was then focused on types of logistics innovations. The final searching area involved innovative strategies, where again general literature was used, followed by a survey of key factors that promote and inhibit innovations, where both general as well as literature related to logistics innovations was used.

### 2.1 General information on logistics innovation

Research literature provides a variety of definitions to describe innovation. To give a few examples, [9], [23] and [50] define innovation as introduction of an idea, practice, equipment, product, service, process, policy, project or object that is perceived as novel by an individual or other unit of adoption. Although definitions about innovation differ [14] think that "one common theme is that innovation does not need to be new to the world, but merely new in the eyes of the beholder." As such, logistics innovation represents any logistical related service, process or product from the basic to the complex that is new and helpful to a particular client or focal audience.

[32] further gives particular emphasis on knowledge management and organizational learning and states that "they are determined factors in innovation." Also [42] are of the opinion that "innovation generation has increasingly been recognized as an outcome of interaction between a firm and various outside entities." According to this view, the logistics service provider's involvement is the route to innovation generation.

### 2.2 Types and strategies of logistics innovations

[9], [19], [30] and [34] and many other authors classify innovations into **technical/technological** innovation that covers products, services and production process technology and **administrative** innovation that according to [34] refer to changes in structures, business processes, and customer and supplier relationship management etc. A logistics service provider can assist its clients firms in both administrative and technological innovation, but for [53] the logistics service providers are likely to find greater familiarity and success with technological innovation.

Another way to classify innovations is to consider them as either **radical**, that results in new products or services and business processes, **semi-radical**, that can provide significant change to either the business model or technology of an organization – but not to both, or **incremental**, that leads to small improvements in existing products and business processes. [10], [37]

The amount and type of innovations (radical, semi-radical, and incremental) as well as methods and ways to utilize innovative potential depends on the innovation strategy, which must be aligned with business strategy. [29] According to [10] we can talk about two classes of innovation strategy »play to win« or proactive strategy and »play not to lose« or reactive strategy. [18] The goal of play to win or proactive

strategy is to produce significant competitive advantages (radical or semi-radical innovations). Play not to lose or reactive strategy is a strategy that typically includes more incremental innovation.

### 2.3 Key successful factors and inhibitors of logistics innovation management

Understanding the process of innovation development and furthermore innovation management requires an understanding of the factors that stimulate and inhibit the development of innovation. Several factors that inhibit logistics innovation development are: lack of clear definition of innovation and innovation strategy [29], [38], lack of long-term dedication [11], [17], risk of sensitive information leakage to competitors, the fear of losing core skills, knowledge (spillover risk) [51] and competitive advantage to competitors [21], a lack of process [14], [38] and the barriers to measurement [10]. In order to avoid the pitfalls high level of collaboration and open culture [44], trust [3], [22], [26], [31], strong leadership [10], long-term focus, financial resources, people and skills, effective transfer of knowledge, [19], [20], [27], [33], [43], [46], right metrics and rewards for innovation [48], process and tools [34] and performance measures, should be ensured.

## 3 Analysis of logistics innovation development processes at logistics service providers

Before putting in place a process for developing and managing innovations it should be highlighted, that the process of innovation in logistics largely depends on four approaches [12], which differ in degree of novelty and standardization. **Full standardization, no customization** means developing of completely standard service, without tailoring the solution to specific customer requirements. **Full customization, no standardization** means providing only customized solutions, without relying on standard service modules. **First standardization, then customization** means presenting first a standard service, which could be adjusted to customer-specific requirements. **First customization, then standardization** means developing first customer-specific solutions, and then generic modules and standards.

[16], [35] and [49] claim that innovation by logistics service providers occurs almost exclusively at the customer interface, as customer-driven or "open innovation" [6], resulting directly from requirements of individual customers. Solutions are developed from both internal (customer) and external (logistics provider) inputs. [13]

### 3.1 Designing the process of innovation creation

The logistics innovation process is still an unregulated process. [16] and [52] emphasise that "standard models for the management of innovation activities in this type of an environment are not suitable either because they are too rigid and their ability to respond is restricted and/or because they cannot be implemented effectively by logistics service providers." By this, an innovation model that presents a facilitative framework for achieving innovation results in alignment with the organization's strategic direction, has to be developed. As many authors allege that innovation in logistics occurs almost exclusively at the customer interface, [17] pointed out that the

"logistics innovation development model's starting point should be a focal firm", which means that the efforts of the process are directed towards creating value for this firm first. Most authors [4], [10], [14], [15], [42] that were investigating the logistics innovation development process agree that it should include the four phases approach: idea creation and selection, innovation development, innovation realization and innovation measurement.

At the beginning of the process, when the logistics service providers hunt, gather and generate ideas it is the **creative phase**. [10] think that "during this phase more ideas are developed than can or should be used." The search for ideas or ideation is according to [15] and [42] mostly decentralized and upon the request of customers, which often propose new ideas, in [52] view "usually when they need a solution to a specific operation problem." In other cases, internal and external sources should be used to gather as many good new ideas as possible. Before the ideas pass to the selection process, a brainstorming session about the possible requirements of the solution should be made. By this, [52] think that "when the analysis of requirements rely on the development of non-specific solutions, it could be helpful to invite the participation of external consultants, otherwise the client should be included." As ideas pass the phase of requirements' analysis, the execution board (for internal innovation projects of the logistics service provider) and customer (for specific solutions) must validate several ideas. Referring to evaluation, [52] state that in the case of a generic solution (with no customer specificity), several distinct alternatives should be evaluated and compared to each other. After that, ideas move through the selection process until "those that are selected receive a major resource commitment" [10] and move to the innovation development stage.

**Innovation realization or development phase**, results in a concrete product or service. [15] make the point that "throughout this phase it is very important to maintain close contact with the customers in order to ensure that the new product or service really meets their needs." The first subphase of innovation development is prototyping. According to [52] during this subphase "individual solutions should be tested in respect to performance and their chances of success." The second activity of innovation development is testing and validating acceptance of the service. According to [15], the objective of this "subphase is the ultimate validation that represents the basis for a decision on whether to launch the product or service." In the case of a customer-focused process, the customer has to be quite closely involved. If the solution development is not aiming at one specific customer, the concept should be tested with everyday customers or involve customers in confidential discussions to pre-test the solution. [52]

Planning and implementing the innovation as well as its transfer into operation reality is accomplished in phase 3 - **launch of the innovation**. It begins with preparation of the site of implementation and the training of users and other staff. Implementation activities include the launch, the management of the implementation, project control and analysis of customer satisfaction. In [52] view "this is the case when responsibility for a process is transferred from the logistics service provider to the client." The implementation subphase ends with the transfer into day-to-day

business. As soon as a solution is implemented to one customer, it should be analyzed and decided if the solution can be made available to other customers.

The final phase – **validation of the innovation process** is particularly important in the case of the innovation development process from the viewpoint of the logistics service provider. It includes the evaluation and improvement of the innovation methodology and procedure during the innovation process. All participants included in the innovation process should be given the possibility to propose some ideas, modifications as well as weaknesses of the innovation process. [15] and [52] point out that the purpose of this post-launch review is "to keep learning about the innovation process in order to continually improve it." This phase is of great importance to the competitiveness and future success of logistics providers.

In the case of customer specific solutions [14] also propose an iterative process for managing logistics innovation, which is comprised of four activities: 1. **setting the stage** (creating and modifying environments and training people to foster innovation activities), **customer clue gathering** (engaging with customers to search for clues for changing needs and to identify unmet needs), **negotiating, clarifying, and reflecting customer need** and **inter-organizational learning** (engaging in joint learning and open innovation with customers).

## **4 Exploration of innovation within the supply chain**

Given the fact that we currently face competition between entire supply chains rather than individual enterprises, providing an innovative approach of individual enterprises within supply chains is no longer sufficient. Providing innovations within all of a supply chain's parts is necessary; moreover, the importance of the integral approach within supply chains has elevated the importance of supply chain management and consequently stimulates new solutions for effectively managing all supply chain parts.

### **4.1 Modes of innovation within supply chains**

Innovations within supply chains can be achieved by three different means: new technologies, new modes of cooperation and new knowledge. [5] It should be noted that these methods should not be addressed separately, as they are interrelated.

Information technology innovations are the most common innovations these days and can be divided into identification technology, data communications technologies and data acquisition technologies. [1] Implementation of such technologies brings about many benefits in terms of costs and services improvements. With the recognition of the importance of supply chain management, the use of transactional arm's length relationships has become less frequent. For achieving competitive advantage as well as cost reduction, long-term relationships between logistics providers and enterprises is required [54], as it ensures superior performance, win-win effects and provides benefits in terms of costs reduction, quality improvement, responsiveness and flexibility. In addition to the above mentioned modes of innovation, willingness and the ability to share know-how and skills between partners, which results in more effectively provided services and processes or even new products or services, which in

turn raises added value and leads to a greater competitive advantage, is of great importance.

## 4.2 Potential innovations within the supply chain

Regarding the fact that the average manufacturing firm spends more than 50% of its sales revenue on the **purchase of raw materials or semi-products**, this area should be given special attention. [40] Examples of improvements that can greatly contribute to the differentiation of procurement logistics could be: e-procurement, implementation of innovative software solutions, such as the possibility of direct ordering in the supplier's system, implementation of software tools, such as vendor manage inventory, supplier relationship management, transfer of complete order process to external logistics service provider, etc. One of the key benefits of implementing new or more sophisticated solutions related to IT systems is a high degree of automation, which simplifies procurement processes, reduces the number of employees, eliminates errors, increases accuracy, helps to overcome the silo and bullwhip effects, etc. Moreover, a higher level of services, in terms of product availability, is ensured. This is also greatly facilitated by the implementation of vendor managed inventory, which provides, inter alia, reduction of inventory, reduction of stock-outs, fewer and more accurate forecasting and purchasing activities, increases in sale, etc. In addition, it also improves visibility, reduces errors and encourages strategic cooperation. Aside from a higher level of performance and better quality, these solutions also bring cost benefits to all included partners.

A quick response certainly is one of the key elements that ensures successful supply chain management, which largely depends on the **production logistics'** flexibility. In order to be flexible greater attention should be paid to inventory planning as well as production planning and management. Software solutions, such as material requirements planning for more optimized planning of inbound and outbound flows of material, collaborative planning, forecasting and replenishment for more accurate forecasting or software solutions that enable acquisition of point of sale information as well as the Kanban method for better production organization and optimization of in-process inventories, might be helpful. These solutions have many advantages in terms of costs and better service quality. Material requirements planning, for example, ensures availability of raw materials as well as products for final distribution. Additionally, it helps maintain an optimal level of inventory and planning production activities, deliveries and payments. Moreover, fewer stock control and administrative tasks are required. Collaborative planning, forecasting and replenishment, on the other hand, helps significantly reduce the variability between supply and consumption, which has a positive effect on stock levels and reduces out of stock possibility. Consequently, increased sales and an improvement in the distributor's service level is enabled, while a software solution that enables acquisition of point of sale information directly effects a faster response of production. The same effect could be achieved by implementation of the Kanban system, which also minimizes inventories and prevents over-production.

**Distribution** is a key factor affecting the overall viability of the enterprise, as it directly affects the supply chain costs and customer expectations. Therefore, intense attention should be paid to the proper selection of transport mode, warehousing and inventory strategy. In order to meet those conditions, implementation of proper solutions is needed. Some software solutions and methods could be software solutions for better retailer response to customer needs, such as efficient consumer response, software solutions for maintaining good business relations with customers, such as customer relationship management, transport strategies such as consolidated shipments, methods directly correlated with warehousing, such as transshipment method or implementation of a cross-docking distribution center, etc. Efficient consumer response enables faster, better and cheaper final customers supply. In addition it reduces costs and inventory across the whole supply chain and improves the quality of supply services as well as quality and freshness of the products on store shelves. On the other hand consolidated shipments reduces transport and inventory cost, while at the same time allows better utilization of cargo space and minimizes any negative impact on the environment. Transshipment, in addition, allows for a lower level of buffer stocks and dearth of stock, which positively influences service quality for the final consumer. The same can also be achieved by transforming the distribution center into cross-docking, which also enables quick response to orders, shorter delivery times, better organization of transport, lower labor costs, less manipulation, etc.

The importance of **reverse logistics** as an opportunity to achieve greater competitive advantage has accelerated the implementation of advanced reverse logistics programs, as differentiators that may increase the effectiveness of processes, while at the same time minimizing costs and increasing customer service level. Such innovations can take many forms, related to process, inventory or transport solutions, for example, implementation of advanced technology applications and specialized or customized facilities, such as a centralized asset-recovery program to maintain control over the return process, re-scheduling re-manufacturing timetables, making expectations to return allowance quotes [41], implementing a front-end web portal for better customer's visibility of returns process, etc.

## 5 Discussion

Innovation does not happen by itself, but several conditions should be met. First, we conclude that definite elements of successful innovation are strong leadership, financial resources, performance metrics, measurements, incentive rewards, close cooperation and collaboration, based on trust and commitment etc. But the quantity and quality of innovation that an organisation achieves, to the greatest extent depends on the right process of logistics innovation development. Second, there is no secret recipe, which could be used by all companies, as the innovation development process differs from company to company. Presented model should be used just as a facilitative framework which provides only an understanding of the logistics innovation development and the logistics service provider's role in that process and should be adapted to each company's needs, situation and strategy. A third conclusion we draw is that innovations by logistics service providers occur almost exclusively as



customer-driven innovation. Therefore, the logistics innovation development process's starting point should be a focal firm, which means that the efforts of the process are directed towards creating value for the firm first. We have also seen that there should also be different processes for different types and strategies of innovation. Each of them has their own requirements needed to succeed. The reactive innovation strategy for example requires more emphasis on process than proactive innovation. In addition, "different support systems (culture, structure, reward systems) are required for success in executing different innovation strategies." [18] The choice of an innovation strategy depends on several factors: current business strategy, financial, human and material resources, environment in which enterprise operate etc. Finally, it is worth pointing out that even a proper innovation development process itself cannot provide success, if the management system, which represents the base for the innovation development process, is inadequate. But like the logistics innovation development process, management systems also vary between companies and there is no set of systems that will serve all companies. Regarding the much greater demand for custom-made innovations in logistics it is vital that the customized solutions developed by the logistics service provider can be transformed and offered for sale to a broader range of customers. [16]

## **Conclusion**

This paper has provided an systematic literature review of logistics innovations and their development. We found out that there is many literature on innovations and development of innovations in general. Even types of logistics innovations and innovation strategies are quite sufficiently addressed. However, very little is written about the development of innovations in logistics.

We have seen that many general facts about innovation, particularly types of innovations as well as innovative strategies are useful in the field of logistics. However, some differences of the factors that contribute to successful innovations or inhibit the process of innovation were found. The greatest differences were detected in the field of innovation process, since it depends not only on the type of innovation and innovation strategy, but also on degree of customization and standardization that provider or enterprise wants to achieve. In addition, research have shown greatest interest for customer-driven logistics innovations.

This paper has highlighted two important facts associated with innovation development. First, carefully planned and managed process, based on strong leadership, close cooperation and collaboration, trust, commitment etc., supported by financial resources, performance metrics, measurement, incentive rewards etc. Second, proposed process' phases do not have to be performed sequentially as it was proposed, but should be taken at some point. There is no one size fits all. Each enterprise should adapt process to its industry, business strategy, type of innovation and level of standardization and customization. In addition,

Due to the fact that most incentives for innovation come from individual companies, it's impossible to speak about specific innovations. Therefore, some potential solutions that are not really new, as they existed in the market for some time,

were presented. Nevertheless, they certainly could represent novelties for many companies. In view of this and regarding the fact that proposed solution would be tailored to the individual needs of enterprises, this still represents an innovation that perhaps best referred to as semi-radical or incremental.

The study has some limitations. As it has only been able to cover literature review, further studies to validate proposed process of innovation creation are needed. The most appropriate would be the case study.

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## **Contact Address**

### **Patricija Bajec, D.Sc.**

University of Ljubljana, Faculty of Maritime Studies and Transportation

Pot pomorščakov, 4, 6320, Portorož, Slovenia

Email: patricija.bajec@fpp.uni-lj.si

Phone number: +386 (0)5 67 67 202

Received: 27. 09. 2011

Reviewed: 24. 11. 2011

Approved for publication: 16. 01. 2012