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INNOVATION IN SERVICES ON A LOGISTICS OPERATOR AND ITS CONTRIBUTION TO EFFICIENCY IN THE SUPPLY NETWORK

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Abstract. This is an operational feasibility study on a logistics operator of a supply network of food service. The paper shows an application of concepts of innovation in services and how they can contribute to the operational efficiency gains in the supply network. It is demonstrated through the consolidated data that there was added value in the supply network due to a 50% increase in operational efficiency. The problem discussed in the paper focus on the transport process upstream of the network, between suppliers and logistics operator. The article highlights the change in the transport process, which has gone from receiving, model Cost, Insurance and Freight (CIF), for scheduled collection and milk run, model Free on Board (FOB). On the other hand, the article discusses how the concepts of innovation in services can influence the operational improvements in food service supply network.

Keywords: Innovation in services, supply network, transportation process, operational efficiency.

1 Introduction

The purpose of this paper is to study the feasibility of changing the transportation model of a logistics operator of food service in one of their supply networks. The proposal changes the relationship with partners upstream network, formerly operating in the cost model, Insurance and freight (CIF), for scheduled collection of products with the milk run, model free on board (FOB). Furthermore, it shows that the change happened within the entire supply network, and there was operational efficiencies improvement.

Additionally, the paper is drafted based on customer service studies, especially in the approach to innovation in services. The improvement of the efficiency of logistics processes of transportation in the food service supply network in study represents an incremental innovation in the logistics operator services.

To [1], service is a resource sharing among actors of a network because there is no transfer of ownership to the customer of service, which consumes and shares resources simultaneously. On the other hand, the participation of the customer is fundamental in coproduction of value. In this case study, the service is provided by the logistics operator for the supply network. The principal amount produced is the elimination of waste in the process of receiving and unloading of products resulting from the transport system products, under the CIF model.

The central position in the supply network allows the logistics operator to have an overview and places it as a service provider for two-way flow of materials - upstream and downstream. The situation of change can be analyzed as innovation in service.

Thus, this incremental improvement process shows two main axes, the first refers to the co-production value by active action of the logistics operator with supplier and partners; the second relates to the reverse cycle of value as [2]. According to this author, innovation in services occurs first in processes and then in product. In this case, the change in the CIF transport model for FOB allows the logistics operator to create a differential to develop new products and explore new markets.

The paper is structured in five items in addition to the references: the introduction, the theoretical framework, divided into supply chain; Model CIF and FOB transport and innovation in services, the research methodology, the case study and data analysis and final considerations.

2 Theoretical Reference

2.1 Supply chains and networks

The business logistics today is the result of the union of three types of logistics: inbound logistics, or supply logistics; internal logistics, which process the raw material to transform it in finished goods; and outbound logisitics, which is external to the company and is responsible for deliver the goods to costumers [3].
Furthermore, entrepreneurs came to see that the path to convert resources into products to the final customer was long, and began to realize that this process should be part of a context. This long road that stretches from the raw material suppliers, through manufacturing of products by distributors and reaching the consumer, is called supply chain [4].
The concept became more popular after the companies began to realize that it was not enough just to produce, and the manufacture of its products only contemplated the application of internal activities of the company. Then comes the need to extend the logic of integration out of the company's borders, including suppliers, customers and service providers of infrastructure and resources for processing and transaction of goods and services [5].
Thus, [4] shows that a basic terminology for the supply chain is the integration of the flow of materials and information between suppliers of raw materials and the end customer, in order to develop a sustainable competitive advantage. Figure 1 shows the main conceptual elements that are part of logistics activities.
Logistical activities begin the planning procedures and studies. Once approved, it goes to the implementation phase and operation. From there the system should be assessed, monitored and controlled continuously. Flows associated with the logistics run through the whole process from the point of origin - suppliers and manufacturers - to the distributor and retailer to the final destination, the consumer.

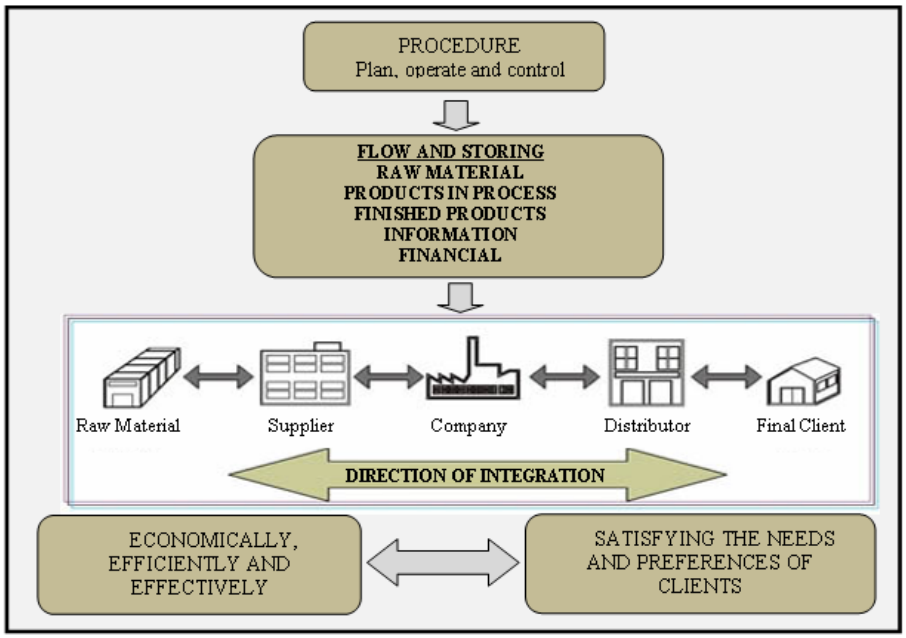

Figure 1: Basic Logistics Elements. Source: Adapted from [4] e [5]

In addition to the flow of materials, there is the cash flow, as opposed to the first and the information that goes through the two directions. The primary goal is to meet the needs of customers and end users with efficient and effective solutions, optimized in cost within the contracted period [4].
Then, according to [3] and [4], a supply chain consists of several logistics actors interconnected in order to deliver a product and/or services that have value to the customer. The final price pays the costs of the network, considering each actor engaged with the supply network. Also according to[3] and [4], there should be a relationship between the actors in order to integrate the processes from the company of raw materials to the point of consumption, allowing the generation of value to products and / or services to the final client.
Moreover, [6] considers the supply chain as integrated functional activities such as transportation or inventory control, which are repeated across the channel through which the raw materials are being converted into value-added products to the customer. But the core concept to meet customer satisfaction is the establishment of an inter-connectivity with the ability to aggregate utility value. Therefore, currently the logistics activities tend to a composition in supply networks.
The definition of networks can be understood as a set of interconnected organizations or individuals in different ways, through joints which represent the conditions of actors, customers, manufacturers, suppliers or people.

2.2 Transport: Receipt versus Collection

According to [7], the charging system for the transport process is among the logistics activities that requires attention and is set according to the operations of the logistics operator. This is an important paper because it impacts the quality of logistics services, once it is directly related to the delivery time, reliability and safety of products. It stands out as essential since modern organizations can not operate without some kind of movement of its raw materials or its finished products between agents of the supply network. The freight transport modes can be classified as road, air, rail, pipeline, maritime and fluvial.
However, transport management is a function of strategic and operational decisions. There are four strategic decisions: choice of modes; ownership of the fleet; selection and negotiation with carriers; cargo consolidation policy.
It stands out as operational decisions: Planning shipments; vehicle scheduling; routing; freight audit and management damage. This article is focused only in road transport, with attention to the scheduling of vehicles, as the decision to receive or collect the goods, and the consequent consolidation of freight and routing to optimize routes and routines.
This optimization comes with the milk run process, described on figure 2. It is a delivery method for mixed loads from different suppliers – the logistics operator sends a vehicle every week to meet the weekly needs of a supply network; one vehicle visits the group of the suppliers programmed on a same day and makes collects.
This method began from the dairy industry where one tank collects milk every day from several dairy farmers for delivery to a milk processing firm. The objective of milk run is reduce stock, minimize costs, daily goods flow and make instant data flow compatible with the logistics needs of the supply network. Goods and information flow in milk run transportation is two ways: high volume shipment from suppliers and low volume shipments via warehouses of the logistics operator.

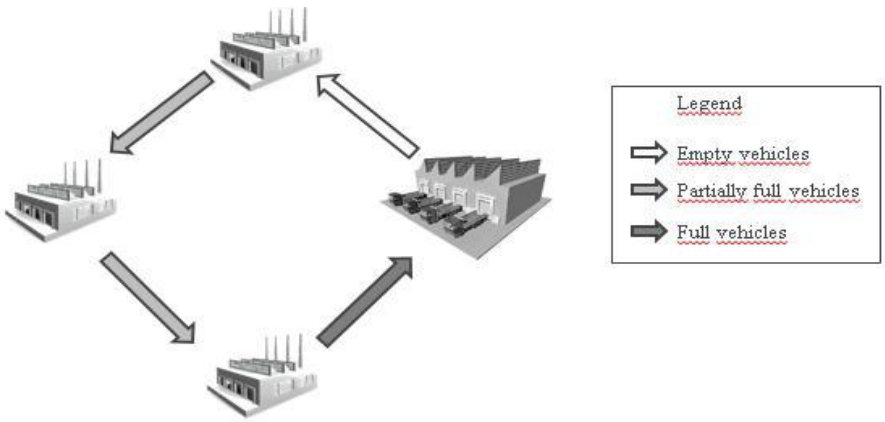

Figure 2: Milk Run Process. Source: Prepared by the authors.

On the other hand, [8] analyzes the innovation in logistics and transport and suggests that the fundamentals of Kaizen and Lean Manufacturing followed by the concepts of incremental continuous innovation have great utility in the development of transport.
Transport systems should also pay attention to the INCOTERMS, regulated by the International Chamber of Commerce. They are international terms of trade and define the minimum rights and obligations of the seller and the buyer as freight, insurance, handling in terminals, releases in customs and obtaining an international contract of sale documents, and for most logistics costs, as suppliers may be located in different regions [7].
For purposes of this paper, it highlights two models of Incoterms, FOB and CIF. In the model FOB the buyer assumes all risks and costs of the transportation of goods, since in the CIF model the supplier is responsible for all costs and risks to the delivery of goods, including shipping services and freight.

2.3 Customer Service – Innovation in Services

Before discussing innovation in services, it should be noted the significance of innovation. According to [9], invention is the first creation of an idea about a product or process only with scientific insight, since innovation requires immediate practical application. The first can occur in universities and research laboratories, while the second one must take place in an organizational context of private or public companies.
On the other hand, innovations become viable, as [9,] if the companies combine different types of knowledge and skills in production and marketing, as well as dispose of financial resources. Inventions require a certain time to achieve innovations conditions, since in many cases the technology or marketing conditions are not yet sufficiently developed.
Thus, according to [9], innovations can be characterized from the perspective of a system and are classified by [10] in five different types: new products, new production methods, new sources of supply, exploration of new markets and new ways to organize business.
However, for economic considerations, [9] considers the design of new products or new methods of production as the focus on innovation. There is a division of the innovation process in "technological process innovation" and "organizational process innovations", arguing that the latter is not limited to a new form of organization of production processes but to reorganize the entire company.
Still considering [10], innovation can be identified with a degree of radial strength, such as technological revolutions or continuous improvement, treated as "incremental innovation" or "marginal innovation." To [10] the cumulative economic effect of incremental innovations cause so large impacts or higher than those of radical innovation.
However, according to [11], customer service when worked effectively is a very important variable and provides significant impact on demand creation and customer loyalty.
To [12], the customer service has function to provide "utility of time and place" in the transfer of goods and services between the buyer and the seller, it means that the product or service have no value until they are in the customers' hands, featuring a proactive integration.
Although there is an empirical understanding of the practice of the services its conceptualization remains a challenge. The classical view considers that the services rely on four specific characteristics - intangibility, heterogeneity, inseparability and perishability (IHIP) - but [1], based on service marketing paradigm argue that service is a resource sharing between actors or a social network, since there is no transfer of ownership from the provider to the customer.
Therefore, [5] sets under the "Service Supply Chain Management", two types of systems. First highlights the "Service Only Supply Chain - (SOSCs)" and then the "Product Service Supply Chain - (PSSCs)." For purposes of this article the best definition is the PSSCs, since along with the displacement of the physical product is the provision of services.
However, according to [13], product innovations in services can include significant improvements in regards to how they are offered or in addition to new functions and features in existing services as well as the introduction of entirely new services.
The innovations in process include new or significantly improved methods for the creation and delivery of services. They may involve substantial changes in equipment and software used in service-oriented firms or in the procedures and techniques that are used for distribution services. The innovation can also integrate products and services.

Furthermore, [14] considers the non-linearity of innovation processes in services, considering the spread, as [15]. It is the result of action and effort in many areas or departments sprayed by the organization, such as strategy, marketing, business development and services, not just R&D, differing manufacturing.
Figure 3 shows the model of the four dimensions of [16], and stresses that any innovation in service is a function of a specific integration between dimensions.

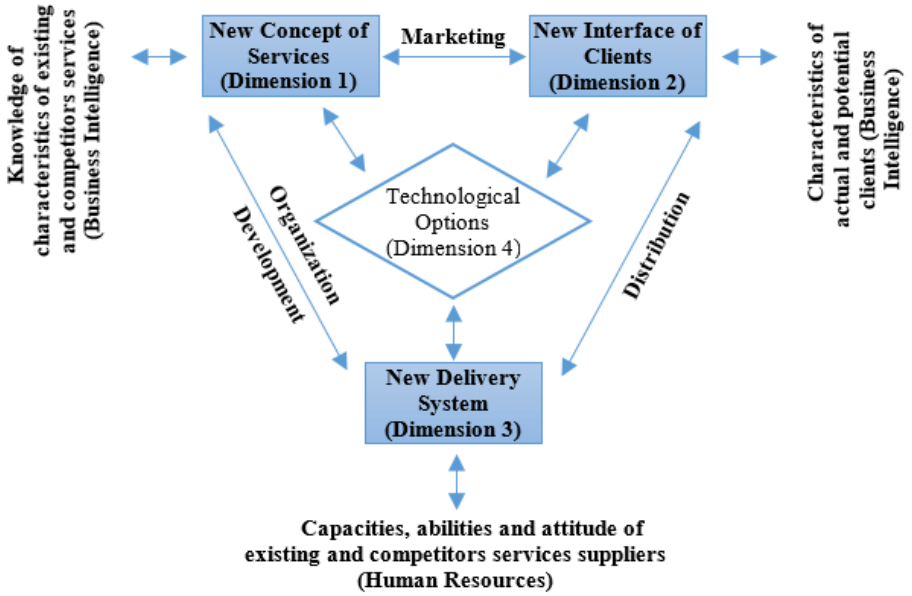

Figure 3: Concepts of Innovation in Services. Source: Adapted from [16]

Thus, the consolidation of the innovation process in services for organizations should be crafted for the areas of marketing, distribution and organizational development. Therefore, the launch of a new service concept requires marketing expertise, an interface with the customer and tailoring the delivery system, such as changing the transport flow into a logistics operator requires knowledge of the process of distributing services. The decision on the possible development of new services requires organizational knowledge.
This model points to the multidimensional nature and importance of non-technological dimensions for innovation in services.
The key elements for innovation in services are: customer needs analysis, promotion of a new value proposition, integrated and / or specialized services, partnerships, dissemination of knowledge and skills internally and communicate them to control markets and innovation management.
Therefore, from the perspective of [17], the experience of a new service or a service solution can be consolidated into a new service, in a new portfolio of services or be a new service process that individually or in combination, provides a new way to create value for the customer, such as reverse cycle of product of [2], since the improved process starts to increase the delivery efficiency of existing services and then moves innovation to improve quality and thus generates new types of services.

3 Methodology

The paper is based on an exploratory research on the literature about innovation in services and their correlation with the logistical transport processes. As for nature, it is an applied research qualitative and quantitative, which uses practical approach as a case study.
According to [18], the case study method may involve situations of single or multiple cases. This paper shows a single case study conducted in a supply network of food service.
The studies are divided into three phases: the first phase is focused on identifying the problem of receiving products by the logistics operator. The second phase is focused on data collection, carried out through interviews with company managers who participate directly in the process and the technical reports query. In the third phase of the research, on-site observations of the flow of the activities of the receiving process situation were carried out.

Data were provided regarding the demands for specific care of the food service supply network. Thus it was possible to draw up comparative tables on the current situation, the proposed condition and results.
The study is a change in product transport operation of the food service supply network. It shows the change from the receipt of goods, CIF model of freight, to scheduled collection and milk run, FOB model of freight.

4 Case Study

4.1 Company Characterization

The company is a logistics operator of the Food Service industry. Its main activity is to manage the supply chains of ten big restaurant chains, as shown in Figure 4; the studied supply chain attended by about five hundred suppliers, such as food, packaging and cleaning products manufacturers, and more than two thousand restaurants distributed in all Brazilian states.

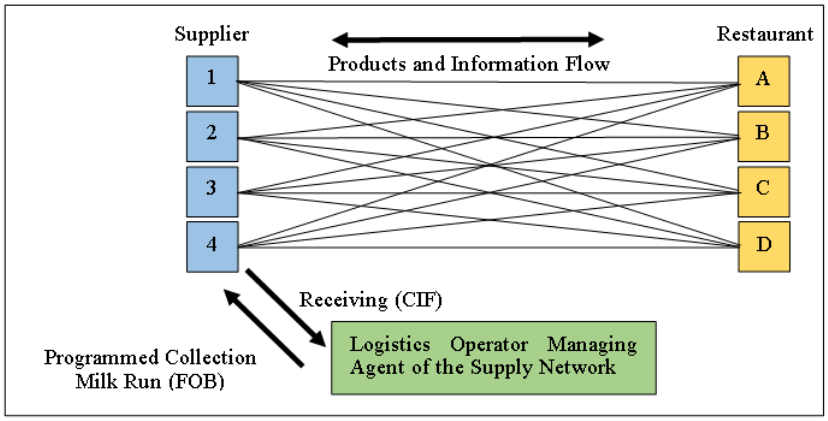

Figure 4: Supply Network of Food Service. Source: Prepared by the authors.

The management system consists of demand planning, purchasing, transportation, storage, picking process, sales and final distribution of the various products that are the raw material for the operations of several restaurant chains.
The logistics operator has a central office located in São Paulo and operations throughout Brazil, with a fleet of road vehicles dedicated to transport operations. The supply chain managed by the logistics operator object of this study, move tens of millions of reais per month.

4.2 Problematic Studied

The focus of this case study is the road transport operations in inbound logistics of a network of restaurants managed the logistics operator. This network has about 60 suppliers and 80 stores in Brazil and is managed from operations located in São Paulo.
The transport process currently used by the logistics operator is the freight CIF model, which generates high movement of vehicles and frequent congestion at its distribution center. Receipt of a vehicle involves a series of activities: entry at the gate, check the invoice, schedule conference, dock allocation, definition of team to perform the unloading and the realization of the unloading; and there is a limitation of the available resources in the process.
It was made about ten observations on the modus operandi of the logistics operator inbound logistics in place on alternate days and times. In principle, this case study required about four meetings, two with the supply manager, dealing with operating conditions, and the other with the supply chain director of the logistics operator to the data collection.
It was found that the migration of the receipt model transport operation - Freight CIF - for scheduled collection model and milk run - freight FOB - enabled the new operation, without causing fluctuation in the volume of supply.

However, the change in transportation system corresponded to changes in supply logistics process of the products, generating new standards, new routes, new models for loading and unloading and verification of invoices. Many activities were relocated.
However, [7] states that the transport charging system absorb significant logistics costs and according to [8], innovation in transport processes create value and reduce waste for inbound logistics and meets the supply network needs and it is essential to support the competitiveness of the logistics operator and the entire supply network.

4.3 Data Analysis

It was identified that the transport of products to the logistics operator uses trucks with a capacity of 14 or 28 pallets. Customer supply network study has 60 suppliers and purchase on average 413 pallets per week. Moreover, 85% of suppliers have average weekly demand of up to 7 pallets, which generates a high vacancy rate in transport. Because of this, to optimize the freight account, logistics operator purchase biweekly from these suppliers.
From this premise, considering the number of pallets per supplier per week and frequency of order for each supplier, the number of travels made per month for the supply of the supply network was calculated. The receiving process requires 154 monthly travels, and at least two for each supplier, as Table 1.

Table 1: Situation of Travels per Month CIF model (Source: Logistics Operator)

Region	Weekly Demand (pallets)	Travels/ month/ supplier	Quantity of Suppliers	Total Travel/ Month
Southeast	316	12	1	12
		4	7	28
		2	48	96
West	84	12	1	12
South	13	2	3	6
Total	**413**	**-**	**-**	**154**

The scheduled collection and milk run depend on the geographical location and each supplier profile. Checks carried out at the site, allowed the identification of the values highlighted in Table 2. The suppliers were grouped as follows: 7 suppliers formed 5 groups and other 48 suppliers formed 26 groups, mainly in the Southeast, which allowed the reduction in the number of travels, reached a total of 72 monthly travel in the FOB model, against 154 trips from CIF model..

Table 2: Situation of Travels per Month FOB model (Source: Logistics Operator).

Region	Weekly Demand (pallets)	Travels/ month/ group	Quantity of Groups	Total Travel/ Month	Results (Travels)
Southeast	316	12	1	12	-57 %
		4	5	20	
		2	13	26	
West	84	12	1	12	0%
South	13	2	1	2	-67 %
Total	**413**	**-**	**-**	**72**	**-53 %**

5 Final Considerations

The case study analyzed the transport process proposed by the logistics operator of the food service supply network, for its inbound logistics. The transport process has changed from receiving products, CIF model for the process of scheduled collection and milk run, FOB model.
The results of innovation were the reduction in the average flow of vehicles, in the total of travels and management of the vehicle fleet in the logistics operator site.
Thus, there was a 50% gain in operational efficiency of the logistics operator inbound logistics and supply network, which will allow gains in inventory turnover, reduced load of products at suppliers, in the daily

flow of charges, receipts and unload of products, and eliminate downtime when the collection vehicle is in suppliers or in-house.
However, the study was a single case, involving only one supply network with suppliers and restaurants with specific characteristics. The generalization of the study is compromised and requires further work on different networks and supply chains to determine the strategic, economic and operational boundaries to replace the CIF model for FOB model, since there are implications not addressed in this article, such as fleet maintenance, the planning of routes, the new logistics planning and the possible need for outsourcing. There may be implications for the labor legislation because of the need of hiring drivers as well as the consumer protection code, as there is a transfer of responsibility from the supplier to the logistics operator.
On the other hand, it was observed that the systems studied from the perspective of innovation in services, offer opportunities to explore relevant parameters of process efficiency. Thus, the logistics operator has the opportunity to create a differential to explore new products and markets.

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