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The role of TPLs in innovative logistics solutions in importation

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Abstract

Purpose – The purpose of this paper is to investigate the role of third-party logistics providers (TPLs) in providing innovative logistics solutions for Brazilian importations.

Design/methodology/approach – A multiple case study has been conducted in which four logistics service providers are interviewed on the topic of innovation in importation logistics. The collected data (interviews, brochures and presentations) were triangulated and analyzed.

Findings – The collected data highlight the integrating role of TPLs in providing innovative logistics solutions of the technological nature, in addition to drivers, which involve communication, trust, logistics and institutional actions.

Research limitations/implications – This study, instead of focusing on procedural issues, intended to focus on two important theoretical and practical drivers: innovation in the importation process and strengthening of intangible factors. It is known that trading conditions and geographical proximity have an impact in importation, but they have not been discussed here because of the subject delimitation of the present study. Regarding the implications of the present study, no specific theoretical reference has been found on the subject in terms of the importation process but is rather related to information technology, which is then presented.

Practical implications – This study focuses on the fundamental role of TPLs in the development of innovative logistics solutions in importation.

Social implications – The fundamental role of TPLs in the development of innovative logistics solutions in importation is based on trust and relationship, internal and external to the organization.

Originality/value – This study, instead of focusing on procedural issues, intends to focus on two important theoretical and practical drivers – innovation in the importation process and strengthening of intangible factors – suggesting that a change of mind-set and a differentiated background in importation logistics are developed by TPLs.

Keywords Innovation, Logistics, Third-party logistics, Supply chain, International logistics, Brazilian importation

Paper type Research paper

1. Introduction

The opening of the Brazilian trade in the 1990s reduced non-tariff barriers, considerably increasing importations, given that international logistics are characterized to facilitate the

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flow of business in the activities of the supply chain. Due to its dynamic nature, International Logistics trade requires innovation to maximize efficiency, according to Luo (2012). From 1997 to 2014, Brazilian importations increased from US$60 to 229bn, almost four times higher according to data from MDIC[1] (www.mdic.gov.br).

Given this scenario, supply chain activities assume an increasingly important role in a global, dynamic and competitive market (David and Stewart, 2010). Within the area of operations, the supply chain function involves the flow of goods, services and information from the raw material level to processing, distribution and consumption (Tompkins and Harmelink, 2004). Importation is a process in this flow. Third-party logistics providers, or TPLs, are companies that operate international logistics activities on behalf of others (Delfmann *et al.*, 2002), like international transportation and customs clearance. They are key to this process, as they have expertise in supply activities, according to Alston and Kelly (2012). They are part of many different supply chains and need to be constantly improved to ensure that superior value is delivered to the customer (Flint *et al.*, 2008).

The complexity of importation bureaucracy makes an international innovative approach seem necessary, seeking to address the infrastructure problems of countries, according to Demant (2011). Luo (2010) defended that, through innovation in information, technology and services, it is possible to increase market gains because of this competitive advantage. Busse and Marcus Wallenburg (2011) argued that innovation in logistics should occur within importing customers rather than TPLs. To Flint *et al.* (2005), the customers of TPLs are the ones that drive innovation, but Wagner and Sutter (2012) mentioned that little is known about the synergy between these TPLs and the customers and how they engage each other in innovation projects, as well as the benefits that can come from it.

For Busse (2010), there is a gap in TPLs' innovation performance that is not possible to explain. Bajec (2011) agreed with Busse (2010), indicating that there is a theoretical gap about the logistics innovation development and, according to Aykol *et al.* (2013), methods of acquiring information about importation and operation management in importations are useful themes to be studied. These authors also mentioned that many studies do not address the fact that importation is a strategic activity inside the companies, adding that there could be a possibility of exploring a global process exchange in the companies.

Given this context, the existence of an opportunity to explore the theme of innovation is remarkable, more specifically innovation in importation and the role of TPLs in it. The present research sought to analyze the role of four TPLs in the development of innovative importation logistics solutions in Brazil and also to understand what innovation in importation logistics means to them. Thus, this article intends to answer the following question: What is the role of TPLs in the development of innovative logistics solutions? To achieve this, the main objective has been defined as the analysis of the role of the four TPLs in the development of innovative logistics solutions in Brazilian importations. To structure this main objective, four specific stages have been identified:

(1) To present the four TPLs and the type of relationship they have with customers.

(2) To describe what the TPLs understand by innovation in importation processes.

(3) To identify the critical aspects that contribute to or hinder the development of innovative logistics solutions in importations.

(4) To indicate actions for the development of innovative logistics solutions in Brazilian importations.

This paper includes five sections. Following the introduction, there is a theoretical review in Section 2, regarding the main subjects involved: supply chain, importation and TPLs,

having an innovation perspective inside each one. Section 3 presents the method used to develop this qualitative multiple case study. Section 4 presents the four TPLs studied, as well as the respective cross analysis of the cases. Finally, Section 5 presents the research conclusions about the role of TPLs in innovative logistics solutions for Brazilian importations.

2. Theoretical background

2.1 Supply chain and innovation

Supply chain management integrates the flow of materials through logistical networks, according to Halldórsson and Skjøtt-Larsen (2004). It evolves technologically along with communications and transportation. It aims at continuous improvements to reach a sustainable competitive advantage, according to Ballou (2007). Moreover, it is a business support activity that, in addition to the primary ones, facilitates value creation, which is related to what customers are willing to pay for the products (Porter, 1989; Kaplan and Norton, 2008).

Technological innovation is a competitive advantage for market share and in the supply chain components, considering there is a competitive interdependence (Porter, 1989; Luo, 2010). Customers look for innovative support in information technology, generating competitive advantage through its technological infrastructure (Freeman, 2004; Wagner and Sutter, 2012).

Yang (2012) states that cost-oriented enterprises usually achieve high levels of efficiency but suffer a gap in adaptive innovation, not promoting supply chain growth. Prest and Sopher (2014) said that much of what is invested in the supply chain is meant to support the continuity of the processes rather than innovation. The authors add that scarcity of talents and focus on cost are barriers for supply chain innovation as a priority. There are, however, innovation priorities such as multichannel logistics and analytical tools in the supply chain that can enable the communication of innovative ideas, reducing costs and risks.

To gain agility, it is necessary to anticipate market demands; this can be done by improving the value proposition focused on innovation, according to Flint *et al.* (2008), thus having the whole chain involved in the innovation process. On example of logistics tools that can drive innovation, Blind and Jungmittag (2004) said that foreign investments in importation have a positive effect on innovative processes. For Prest and Sopher (2014), the mobility-integrated systems, M2M (mobility/machine-to-machine), are being seen as an innovative strategic issue, focusing on the areas of operations and inventory in the supply chain partners, as well as 3D printers, which are being considered emerging innovations. On the other hand, these authors say that sustainability can either be an innovation, increasing the value of their brands, or a barrier to it, considering the counterpoint of cost demand of some projects such as green transportation/green fuels and the cost-reduction focus of the supply chains. There is also big data, a tool that provides an option to target customer needs (Tan *et al.*, 2015).

Further, according to Busse and Marcus Wallenburg (2011), people are a relevant input to companies seeking innovation, followed by physical and financial resources. Commitment and internal integration of employees, before external, reinforced by management at a strategic level, are rather important for the success of the supply chain and mitigation of barriers (Alfalla-Luque *et al.*, 2015).

2.2 Importation process

Importation is the process of managing the purchase of products from a foreign origin until its final destination. Research regarding importation started in the early 1960s, with a

procedural article written by O'Connell and Benson (1963) discussing the idea that for it to be profitable, it would require personnel abroad, foreign products and processes, foreign internal partners and supplies from abroad. According to Aykol *et al.* (2012), at that time, foreign products and processes stood out in successful companies as reasons for market share gains. Low prices and improvements in products were mentioned as an importation trend, explaining the external supply competitiveness, as well as the concept of partners, which allowed an importation increase in the 1960s, even though in a small proportion. Flexibility was the key driver indicated at that time for importation activities.

The importation process can be considered an interdependent process that is quite complex by itself. As a result, there are many critical aspects involved in it. Segalis (2015) say that importation is subject to governmental control, through fiscal, administrative, foreign exchange or operational norms and procedures. According to David and Stewart (2010), each country defines its complex customs procedures, rules and regulations for the entry of goods, and there can be a lot of pitfalls and paperwork involved. This explains why countries do not like to import, thus acting in accordance with this principle. The operation of the local customs system involves importation duties, classification of goods, customs valuation, country-of-origin rules, importation taxes definition and also non-tariff barriers, such as importation quotas or limits, pre-shipment inspections and the request for complex documents.

2.2.1 Innovation in importation. In importation, according to the *Oslo Manual* (OECD, 1997), process innovation refers to new and significantly improved processes, whereas technological process innovation is characterized by the implementation/production or commercialization of new or improved methods, which may involve changes in equipment, human resources, working methods or a combination of these. Technological innovation occurs in the characteristics of process performance. It depends on how important these characteristics and innovations are for the sales of the company. TPP (technological product and process) innovation activities are the scientific, technological, organizational, financial and commercial steps aimed at the implementation of technologically new or improved processes, which may be innovative or not, yet they are required for the implementation. As per the *Oslo Manual* (OECD, 1997), a company innovates when it has a cost advantage over its competitors on processes that elevate productivity and allow a greater margin with more market share and profitability.

Information is the basis of importation processes, which depends on technological infrastructure that affects the competitive advantage of the companies (Porter, 1989; Luo, 2010; Lieb and Bentz, 2005). Freeman (2004) indicates factors that modify the infrastructure and generate a competitive advantage related to innovation. It involves quality, research, development, design and manufacturing attributes. The author indicates that innovative leadership comes from a combination of public investment in technological infrastructure and intellectual capital as the basis for economic development.

2.3 Third-party logistics

Logistics agents operate logistics services, which depend on the inputs of information about their origins and destinations (Flint *et al.*, 2008). They act in logistics services offering complete solutions for their customers, allowing them to focus on their core business activities rather than on the flow of materials, as described by Vasiliauskas and Jakubauskas (2007). Hertz and Alfredsson (2003) said that the TPLs manage, control and deliver logistic activities. The services and benefits obtained depend on how the provider balances the activities and resources of several clients, in addition to the level of adaptation to the client itself. Halldórsson and Skjøtt-Larsen (2004) described how important it is for the

logistics management to have a clear main objective when hiring a TPL, whether it is cost efficiency, service improvement or focus on the company's business, developing complementary competences this way. According to Sakchutchawan *et al.* (2011), companies need to closely build and manage long-term relationships with customers, mutually benefiting the business relationship, in which not only financial matters but also relational ones are included.

Regarding the types of TPLs and their relationship with the customers, Hertz and Alfredsson (2003) described the adaptation level considering two driving forces: competitiveness at an international level and outsourcing that ranges from a standard TPL, which offers services to a large number of customers, to a complex one that works at a consultant level with fewer clients. Vasiliauskas and Jakubauskas (2007) explained TPL activities starting at 1PL and going until 5PL. According to them, a 1PL offers transportation services for small local businesses; a 2PL is an agent with a small number of assigned roles added; a 3PL is the one that integrates the operation; a 4PL integrates the network and operational point of contact; and, finally, a 5PL is the one that provides complete solutions for the whole supply chain.

Su *et al.* (2014) said that the major contributions of the TPLs are related to specialization, outsourcing, logistics strategy, globalization, lead time improvement and customer orientation, reduction of transit times and customer orientation. Trust is especially important for the relationship between TPLs and customers when they decide to outsource activities such as information integration, relationship building, TPL selection criteria and performance evaluation criteria, which are significantly and positively related to the company's performance, as per Jayaram and Tan (2010). Tsai *et al.* (2012) pointed out the risks in TPLs' relationship with customers, highlighting relevant communication, competences, abilities, human resources and information as the ones with the largest impact.

2.3.1 Innovation through third-party logistics. Despite the integration, little is known about the synergy between TPLs and customers in terms of project innovation or about the benefits that can be gained from such activities, according to Wagner and Sutter (2012). Innovation in TPLs is a subject in its initial stage of discussion. Factors like integration, new services, complementary investment relationship and benefit-sharing agreement are the factors that influence an innovation project, as per Wagner and Sutter (2012) and Su *et al.* (2014).

Concerning innovation management in TPLs, according to Lin (2008), it is the concept of a new product or service that is used to offer a new solution, which supports an activity of the company to offer a new product, as a design or as a way of advertising the product. Schumpeter (1934) said that creative destruction is a healthy process for a developing economy, with recession being an inevitable factor for it. For this article, innovation is understood as the degree to which customers perceive solutions in terms of services offered by TPLs as being new and useful, as proposed by Wagner and Sutter (2012).

From Laursen and Salter's (2006) point of view, companies that search for strategies in depth are more open, create their own network and tend to be more innovative. Because technology [like e-logistics automation systems (Sakchutchawan *et al.*, 2011)], market maturity and network support innovation expansion, more actors within the innovative system retain specialized knowledge (Laursen and Salter, 2006). Isaksson *et al.* (2010) highlighted the importance of making innovation visible through the use of process performance indicators. Logistics is a source that renders products or services technologically efficient and whose activities involve acquisition of data technology, information technology, storage technology and transport technology (Lin, 2008).

Abramovici and Bancel-Charensol (2004) explained that the transformational impact on the whole management system of a company depends on how much the client is able to absorb new activities and follow directions. Efficiency and effectiveness are expected from the innovation management of TPLs through new and optimized systems, in addition to innovative equipment (Busse, 2010). Vasiliauskas and Jakubauskas (2007) pointed out the importance of an efficient logistics system from a social point of view, which offers possibilities for reducing road congestion and pollution, for example. Lin (2008) said that the survival of a company in the knowledge age depends on how it improves its innovative organizational capacity. According to the author, adopting new technologies can make it easier for TPLs to improve their skills and to take advantage of the knowledge to innovate in terms of products and services.

Busse (2010) affirmed that innovation in TPLs is less frequent, because they use little research and development, and it seems to be costly owing to their specific context. Abramovici and Bancel-Charensol (2004) suggested that four elements are necessary for the adoption of innovation: customer value recognition, participation, training methods and external communication. Busse and Marcus Wallenburg (2011) and Soosay and Hyland (2004) added that the fight for innovation precedes its inputs. As per the latter authors, there are internal (shareholders and employees) and external (customers and competitors) factors that pull (customer demands and performance improvements) and push (employees, knowledge of competitors and aggressive positioning) innovation. Those four factors operate together because their impact depends on the organization's environment and operation, according to Soosay and Hyland (2004).

3. Method

The present study intends to deal with the interpretation of the reality of TPLs, avoiding numbers, according to Bauer and Gaskell's (2010) definition of a qualitative investigation. Stake (2010) indicated that a qualitative research examines what is current, relying on human perception and understanding about how people or companies are doing their thing, guiding through professional practical issues in the search for improvement. This kind of research depends on many factors such as the data collected from interviews, the research tools and the theoretical assumptions that make significant changes aimed at a more comprehensive ideal. Considering the many variables involved, the little control over the events and how contemporary the phenomenon is, a case study was chosen as the research strategy for this work, wherein four TPLs were considered owing to their different approaches to logistics services, which characterizes it as a multiple case study (Yin, 2001) and a descriptive research (Köche, 1997).

The criteria used to choose the cases were adopted from ILOS (Logistics and Supply Chain Institute, www.ilos.com.br), a specialized institute in Brazil dedicated to the generation of knowledge in this area. Each year, this institute gives an award to the best TPLs in Brazil based on a survey carried out, with around 300 logistics professionals from the largest industries in the country who indicate their favorite TPLs in a free form. The ten most-voted companies in 2014 formed that annual ranking, which was the one used in this search to define the four units of analysis. The accessibility to such companies owing to the author's current professional position was also taken into consideration.

Because one of the companies hesitated in disclosing its name, it was determined that none of the names of the companies was to be disclosed. Thus, the cases were called A, B, C and D. Regarding the research subjects, CEOs (chief executive officers), superintendent directors, commercial and operational managers – those responsible for the continuous improvement departments and international managers – were invited to the interviews.

Because details in the data collected from Companies B and C were very similar, there was an opportunity to seek additional information to reinforce the sources of evidence in data collection and analysis as suggested by Yin (2001). The saturation criterion was applied, as recommended by Godoi and Mattos (2006), by inviting three subjects from a client of these two companies for interviews to validate their opinion about the innovative solutions indicated by Companies B and C. In total, 19 interviews were conducted via teleconference (majority) or in person.

For data collection, it was considered that case studies usually have a wide range of sources and those are important to allow convergence and divergence in research when using triangulation of information as a tool (Yin, 2001). The data were collected through semi-structured, in-depth interviews and by the analysis of the companies' websites and brochures and other materials provided. The author also had the opportunity to test some mobile applications.

The script of the interviews was elaborated on the basis of research objectives, theoretical background and proposed method. It was validated by the article advisor and an academic and professional jury, composed of two PhD professors and a vice president of operations in Latin America from a TPL provider, who criticized and helped improve the script at each validation stage, also checking if it really had the proper measurement capacity. The invitations for the national and international interviews were sent by e-mail (to the USA, Panama and Germany), along with a researching scheme to illustrate it. The script was developed considering the multiple variables that may be present connected to the research problem within its categorization. The interviews began in September 2015 and finished in November 2015. They were all recorded, as previously authorized by the interviewees, and notes from each answer were manually taken by the author to be reviewed during the content analysis stage.

For data analysis and interpretation, content analysis was applied to the collected data, seeking to understand the use of the language, in addition to the analysis of documents (Vieira and Zouain, 2005), the environment variables such as regulatory and economic (Kolbe and Burnett, 1991) and establishment of relationships between these results with the ones in the literature. Content analysis is a personal interpretation based on the researcher's perception of the data and also the context in which they are analyzed, according to Moraes (1999). The present work fits the category directed to the characteristics of the message, that is, to the question "To say what?" which focuses on describing the content from the data collection. It also uses content analysis because it provides empirical insights for new research evidence about the nature of the data, according to Kolbe and Burnett (1991).

Throughout the content analysis in this research, three steps were followed, aligned with Bardin (2006) and as described by the authors Mozzato and Grzybovski (2011): pre-analysis, exploration and categorization of the material and interpretation of the data. In the data pre-analysis step, brochures, presentations and website information were gathered and organized for the analysis. In the exploration and categorization step, it was favorable for the research to previously plan the analysis, with the careful preparation of the scripts based on theory, which facilitated the preparation of the case study report (Yin, 2001). Data categorization is shown in Table I.

For the analysis and interpretation of the data (Moraes, 1999), *a priori* categories were defined and grouped according to content similarity based on the theoretical background. To facilitate the development of the structure of the analysis report, an interview scripts table was used to compile all the interviewees' answers (Yin, 2001), thus creating a complete database, filled according to the defined categories for each company and interviewee.

Concept	Main authors	Content analysis categories
Innovative logistics solution	Busse (2010), Busse and Marcus Wallenburg (2011), Cui *et al.* (2010), Isaksson *et al.* (2010), Prest and Sopher (2014), Sakchutchawan *et al.* (2011), Schumpeter (1934), Su *et al.* (2014), Wagner and Sutter (2012)	Innovative logistics solution definition and importance
Logistics innovation	Aykol *et al.* (2013), Busse (2010), Busse and Marcus Wallenburg (2011), Isaksson *et al.* (2010), Luo (2010), Prest and Sopher (2014), Sakchutchawan *et al.* (2011), Schumpeter (1934), Stock *et al.* (2010), Tsai *et al.* (2010), Wagner and Sutter (2012)	International innovative logistics services examples
Innovation investments and revenue	Busse (2010), Busse and Marcus Wallenburg (2011), Isaksson *et al.* (2010), Prest and Sopher (2014), Sakchutchawan *et al.* (2011), Su *et al.* (2014), Wagner and Sutter (2012)	Innovation investments and measurement
Barriers to innovate	Busse (2010), Busse and Marcus Wallenburg (2011), Cui *et al.* (2010), David and Stewart (2010), Isaksson *et al.* (2010), Prest and Sopher (2014), Sakchutchawan *et al.* (2011), Su *et al.* (2014), Wagner and Sutter (2012)	Barriers to innovate
Innovation pulling factors and performance indicators to its measurement	Fitzsimons (2000), Hayes and Wheelwright (1984), Monroe *et al.* (2014)	Problems that pull innovative logistics solutions and performance indicators
Import barriers	David and Stewart (2010)	Factors that complicate innovative logistics solutions and how to mitigate them
Factors that push innovation	Su *et al.* (2014), Wagner and Sutter (2012)	Contributing factors to innovative logistics solutions

Table I.
Content analysis categories

Table I lists the categories of the content analysis used in this paper and the main authors that inspired them.

In the data interpretation phase, the interview template was completed after listening to the recorded interviews for the second time, and the answers were transcribed after a third listening. A cross analysis was conducted, with the notes taken during the interviews for a first triangulation of the data collected through brochures, presentations and all the other materials, including website content analysis, to use all the available sources of evidence in the data triangulation phase, highlighting the critical analysis according to the interpretations done (Yin, 2001; Mozzato and Grzybovski, 2011). A general structure was developed (Yin, 2001) with the compilation of the data collected following the defined categories. The data analysis allowed the creation of an explanation for the analytical strategy (Yin, 2001), which constructed an explanation and did not conclude but developed ideas to analyze the data.

Next, each case was completely analyzed according to the logic of replication for each company (Yin, 2001). For the each company analysis, points of convergence and divergence found in the data collection were used. After the singular case analysis, a comparative section was created using the same criteria, which was the focus of this work through grouping into content analysis categories, compiled when crossing the results of all the companies. Finally, the results were presented in the form of a conceptual map of Soosay and Hyland (2004), representing the factors that impact innovation in importation logistics.

These factors are described as internal and external to the organization and those that pull and push the innovation in international logistics to explain the TPL's role in it.

4. Cross-case analysis

4.1 Contextualization of cases, third-party logistics activities and customer service

Table II presents the contextualization of the four companies studied in this paper. All the companies provide services to major segments of the industry (pharmaceutical, automotive, electronics, technological, retail, aviation and food industries) and freight forwarders. As per Vasiliauskas and Jakubauskas' (2007) definition of TPLs regarding the main services provided by the companies analyzed, Companies A and D were considered 4PLs, i.e. operational integrators, whereas Companies B and C were 3PLs, adding more than just the transport activities. Further, Companies B and C could also work as 1PLs, with transport services or 2PLs, offering some other simple services. Company D, when considering its range of services, had the potential to act as a 5PL as well, by working on supply chain management.

In terms of customer service strategy, according to Aykol *et al.* (2013), apart from Company B, all the others were organized by the size of their customer base or industrial sectors segmented by customer service. In addition, the types of cargo (Companies B and C) and means of transport (Company A) were also used to define the customer service divisions.

In the case of Companies A, B and C, some specific clients have the understanding need for customers' supply chain from the commercial and operational areas, while in Company D, this detailed knowledge depends on the action of the customer service personnel. Concerning the internal competences highlighted by Halldórsson and Skjøtt-Larsen (2004) and Tidd *et al.* (2008), all the companies in the present study reported making it possible for the team to be trained nationally and even internationally, as well as offering international careers (Company A), opportunities in capacitation programs (Company C) and international competences as mentioned by the interviewee of Company D.

4.2 Innovative logistics solutions: meaning and examples

As presented in Table III, for all the four companies, the creation of value related to the solution of a problem and the reduction of costs is pointed out as the meaning of an innovative logistics solution. It is aligned with Prest and Sopher (2014), Porter (1989) and Kaplan and Norton (2008). This was also suggested by the technology interconnections via the system, which appeared in the data source of three of the four cases, in consonance with Luo (2010), Wagner and Sutter (2012), Prest and Sopher (2014) and Freeman (2004).

As with the importance of innovation, issues regarding competitiveness as reported by Yang (2012), appeared in all the companies described in different ways. The main examples of innovative logistics solutions were from information technology tools, as shown in Table III, which can affect the competitive advantage of the companies, aligned with Porter (1989). Examples in common among the companies involved online quote tools, transport applications, enterprise resource planning (ERP) and electronic data interchange (EDI) systems, integrated systems and the provision of Web-based logistics services such as cargo tracking. As examples of innovation in international cargo transport, larger ships were observed in the case of Companies A and B, which are also related to sustainability issues highlighted in the data of Company C and pointed out by Prest and Sopher (2014). Container optimization emerged in the data from Companies A and D, while Companies C and D mentioned coastal navigation. Drones were also considered innovation examples by Companies A and D, and so were 3D printers, which according to Prest and Sopher (2014),

Table II.
Cases contextualization

Company context	A	B	C	D
Origin	Swiss German	Denmark	Brazil Germany	Germany
Customers	Industry segments	Industry segments Freight Forwarders	Industry segments Freight Forwarders	Industry segments
Activities	National and International multimodal transportation Customs clearance Supply chain management International insurance Technology information	Containers cargo transport Multimodal transport Coast navigation	Containers cargo transport Multimodal transport Coast navigation Containers warehousing	Door-to-Door services Freight Forwarding Customs clearance Supply chain management
Customers attending strategy	Commercial: vertical structure for industry segments Operation: industry segment and kind of service	Commercial: customer type Operational: cargo type (dry, reefer)	Commercial: customer and industry type Operational: cargo type (dry, reefer)	Commercial: customer and industry type Operational: customer type
Customer's supply chain understanding	Sales team	In new business	In the coast navigation	Depending on the team acting level
Customer service teamwork competences	Training Product community International carriers	National and international trainings Segment specializations	Training programs	Trainings International competences

Company	Meaning	Examples
A	Competitiveness/Value creation, Maturity/Brand perpetuation, Market survival/Technology	Transport applications/Temperature control devices, Drones/ERPs/EDIs, Online freight quotation tools/ 3D printers, Bigger vessels/One file concept, Special containers optimization/Documents storage systems/ Control towers/"Uber" cargo transport
B	Efficiency/Value creation, Mutual gains/Intermodal operation/ Sustainability, Technology	ERPs/EDIs/Online freight quotation tools, Web documents print/Web containers release, Bigger vessels/Insurance against damage, Remote terminals/Control towers/Terminal triangulation
C	Value creation/Trust/Cost reduction/Competitive advantage/ Holistic view	Panamá channel opening\bacute\aé channel opening/Transport applications, Coast navigation/ Climate control solutions, *ERPs/EDIs*/Dedicated vessel sailings, Seasonal ocean services/ Sustainability
D	Value creation/Efficiency/Needs understanding/Flexibility/Product/ Cost reduction/Market survival/ Problems solution/Technology/ Competitive advantage	Transport applications/Big data/Coast navigation, Computerized call center/Shipping boxes with electronic key/Liquid containers/Temperature control devices/Drones/ERPs/EDIs/Service structure/IT incidents risk management and monitoring/3D printers/Continuous improvement/ Smart glasses in warehouses/Tracking/Scanners/ Hubs technologies/Container optimization techniques/Domestic transportation/"Uber" cargos transport/Intelligent vehicles

Table III.
The meaning and examples of innovative logistics solutions.

are an emerging innovation. Table III presents a summary of the examples and meanings of innovative logistics solutions raised in the cases studied, with some additional specific ones of the companies.

4.3 Investment and measurement of innovation

All companies replied affirmatively and without hesitating when questioned whether they invested in innovative logistics solutions, even though they avoided disclosing specific amounts. Company A pointed out that the biggest investments in terms of innovation in services occur in information technology, just as suggested by Porter (1989) and Freeman (2004), while Company B informed it is important for them to maintain their world leadership in a sustainable way, and it is part of their company's main five strategies. They affirmed, however, that sustainability is measured by the company's headquarters abroad as it is more of a high-level strategy. For Company C, in addition to investments in information systems for ships, investments are also made in infrastructure on land. Customer recognition was indicated by them as the best way to measure innovation, in accordance with Abramovici and Bancel-Charensol (2004). Actually, the respondents of Company D were more superficial on the topic, indicating that these investments are high and, because of that, they need to follow the market to come up with solutions.

The gains and financial goals to reach innovation measurement through key performance indicators appeared in all the cases, the same as those suggested by Isaksson *et al.* (2010). In addition, the evidence presented in the cases also indicates intangible gains, which are difficult to measure, according to data obtained for Companies A, C and D.

4.4 Barriers that pull innovation and indicators

Companies A, B and C indicated that the focus on cost was the main barrier to innovating in supply chain, as suggested by Prest and Sopher (2014). In addition to cost, the companies remarked resistance to change, internally and externally, as a barrier, as mentioned by Busse and Marcus Wallenburg (2011) and Alfalla-Luque *et al.* (2015), who talked about the need to manage a company's inputs by having people who are committed and have high performance abilities.

The problems that require innovative logistics solutions, besides costs, are the lack of visibility/traceability as mentioned by the interviewees and specified by Alston and Kelly (2012), as well as the bureaucracy in Brazil. It is also related to pro-activity and reliability in the services, according to Company B, which is in agreement with Cui *et al.* (2010), who say that innovation is a way to reach it. In Company C, this was also mentioned as a way for greater participation in the customers' supply chain, as they already do in coastal transportation. Company D stated that information agility for the analytical supply chain is one of the strategic priorities, as cited by Prest and Sopher (2014). When asked about the key performance indicators used, all companies expressed, without hesitation, that these are very important for process management and for information and customer service, agreeing with Soosay and Hyland (2004). The ones that were indicated in common were those that can measure the quantities of mistakes in each importation process part. In addition, Companies A, B and D mentioned customer satisfaction. Table IV summarizes those category topics and adds some more specific ones, as suggested by the companies.

4.5 Factors that hinder or facilitate logistics innovation

Regarding the convergent factors that hinder innovation in international logistics, the companies pointed out that customers do not care about improvements, only about costs, as mentioned by Yang (2012), Prest and Sopher (2014) and Flint *et al.* (2008) and as suggested by Companies A and B. Resistance to changes and customers' lack of participation were issues raised by Companies A, B and D, making it necessary to consider the relational

Company	Barriers	Problems that pull innovation and indicators
A	Bureaucracy/Cost/Confidence Verticalized hierarchy/Changing resistance	Problems: Cost/Visibility Indicators: Process divergences/Customer satisfaction score/Stages process time/Cargo volumetry
B	Cost/Maturity/Changing resistance	Problems: Cost/Bureaucracy/Inflexibility/ Proactivity/Containers time utilization/Visibility Indicators: Programming confidence/Process divergences/Customer satisfaction score/ Malfunctions percentage/Customer forecast/Vessel reservations/Customer attendance time/Stages process time
C	Bureaucracy/Confidence/Cost Medium term expectations/Infrastructure/ Mindset/Changing resistance	Problems: Programming confidence/Cost/Visibility Indicators: Vessel's scales cancellation
D	Countries not integrated database/ Cultural barriers/Bureaucracy/Cost Infrastructure/Maturity/Changing resistance/Time	Problems: Bureaucracy/Communication/Process divergences/Not prepared air transport for some products/ Visibility Indicators: Process divergences/Customer satisfaction score/Quantity and types of shipment/ Stage process time

Table IV.
Barriers, problems that pull innovation and indicators

aspects as reported by Sakchutchawan *et al.* (2011). All cases converged to the Brazilian infrastructural, regulatory and bureaucracy issues as factors that hinder innovation in international logistics, in agreement with Sakchutchawan *et al.* (2011), David and Stewart (2010) and Freeman (2004).

In relation to what they do to mitigate such factors, Companies A, B and C addressed the transformational impact, mentioned by Abramovici and Bancel-Charensol (2004), as a detailed, step-by-step work, taking information to the client and respecting their learning curve. In addition, there is the relationship and trust, as indicated by Hertz and Alfredsson (2003) and Jayaram and Tan (2010). An example given by Company C illustrates that it avoids negotiating only with the procurement department, which is focused on saving. Acting institutionally and developing intelligent and local solutions were also observed in the case of Companies C and D.

On the other hand, regarding the factors that facilitate innovation, the analytical work for decision-making was a common factor mentioned in all cases that contribute to the development of innovative logistics solutions, as well as clear communication, as mentioned by Abramovici and Bancel-Charensol (2004) and by Companies A, B and D, and information, as mentioned by Companies A and B. Relationship appears in the case of Companies B and D. Moreover, Companies A and B brought up customers' understanding of the solutions. Engagement in supply chain partnerships was highlighted by O'Connell and Benson (1963) in the 1960s and by Laursen and Salter (2006), avoiding weak communication, and, as suggested by Tsai *et al.* (2012) and identified by Companies A, B and C, is aligned with cost, details and delivery focus as indicated by Company C. Under an internal company eye, the case A bring the persistence, the teamwork and the companies values that Soosay and Hyland (2004) reinforce. The case B, presents common sense and confidence, while the C case bring the defined processes, team's commitment, networking and staff know how, resources that Tidd *et al.* (2008) and Alfalla-Luque *et al.* (2015) also point out.

And finally, within Company D, from their center of innovations in Germany, the following factors were identified: having a center of innovations, where they have the opportunity to work similarly to a start-up and having the freedom to work on projects – as Laursen and Salter (2006) describe. These factors make it possible to work in a way that avoids processes and also applying "creative destruction" as proposed by Schumpeter (1934), by using prototypes, constantly obtaining feedback from customers with the possibility of a quick return to them, as indicated by Tidd *et al.* (2008). Table V shows the factors that hinder or facilitate the development of innovation in international logistics, including the convergent ones and a few more specifics, according to the data collected from the companies.

4.6 Discussions and implications

According to the innovation drivers described by Soosay and Hyland (2004), Companies A, B, C and D were reconstructed in the same matrix on the basis of the analyzed data from the push/pull and internal/external conditions for the development of innovative logistics solutions in Brazilian importations, under the TPL role. Figure 1 presents the reproduction of the mentioned drivers.

As per Figure 1, the role of the TPLs is seen as that of a customer integrator owing to its position in different customers' supply chains; one of the interviewees described it as "to seek for a logistic chain instead of many separated actors" (Interviewee 1 of company C). It is a fundamental and possible role considering all the pushing/pulling, internal and external approach factors, according to the data collected. Understanding the real needs of the client is presented in three of the four quadrants, indicating a starting point, based on internal

Company	Factors that complicate innovation	Factors that make innovation easier
A	Bureaucracy/Consensus/Customs/Culture/Cost Internal customer no alignment/No expectations alignment/Maturity/Resistance to change To mitigate: Involving others people in the customer's company/Persistence/Respect the learning curve/Institutional work	Opening/Communication/Engagement/ Maturity/Innovative profile/Persistence/ Planning/Relationship
B	Cost/Collaboration resistance/Changing resistance To mitigate: Customer's knowledge/ Information/*Networking* with the supply chain partners/Cost reduction/Relationship/ Institutional and detailed work	Opening/Engagement/Communication/ Information/Networking with supply chain partners/Relationship
C	Bureaucracy/Infrastructure/Reservations disengagement To mitigate: Customer's knowledge/Intelligent solutions development/Avoiding negotiations just with procurement department/Institutional and detailed work	Crises/Cost/Dedication/Engagement/Results/ Company values/Detailed eye
D	Bureaucracy/Customer's knowledge/Countries no alignment/Need's understanding/Budget and financial resources/Changes resistance To mitigate: Internal process review/Presenting success cases/Communication/Intelligent actions development/To innovate/Relationship/ Institutional and detailed work	Opening/Expectations alignment/Attitude/ Clarity/Communication/Engagement/ Technological innovation/Maturity/ Relationship/Persistence/Defined processes Regarding the Germany Innovation Center: Freedom to innovate/No procedures following/ Prototyping/Fast feedbacks/To have an innovation center

Table V.
Factors that hinder and facilitate innovation on the TPL cases

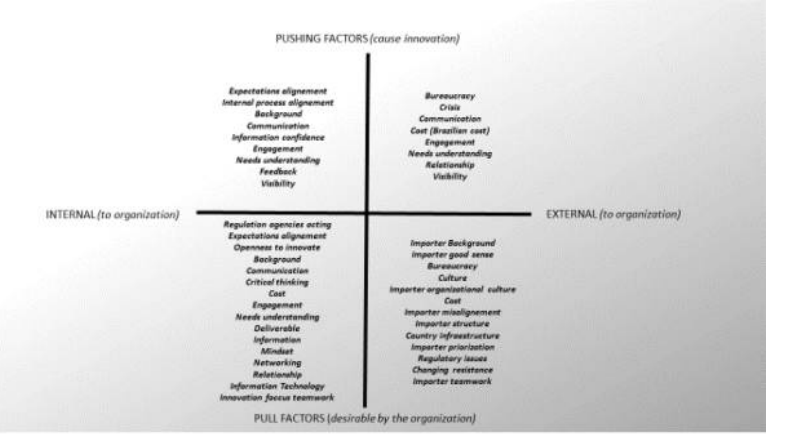

Figure 1.
Reproduction of TPLs innovation drivers

Source: Adapted from Soosay and Hyland (2004)

background, pro-activity, communication and personnel, that is, internal factors of the organization that can be directed toward the contribution of the TPLs in the generation of innovative logistics in Brazilian importations.

It can be seen that even external factors such as logistical background, internal misalignment in importation and even regulatory issues can be handled by the TPLs under the same internal factors like communication, consulting in logistics, personnel, pro-activity and action with the regulatory bodies, thus, gathering the understanding of customers' needs with the relationship factor according to Halldórsson and Skjøtt-Larsen (2004). Interviewee 2 of Company B mentioned that "when we have a better relationship it is easier to sell the idea that, what we are doing, is for the customer's benefit." Considering that it pulls innovation, the TPLs could really act in the innovative international logistics solutions for importation. It was also acknowledged by the TPLs, as mentioned by Interviewee 1 of Company C, "it is a process in which we have to work on educating, showing the potential gains in many levels of the company in order to achieve success."

In addition to this factor, working internally, with the teams, developing a background in logistics as recommended by Prest and Sopher (2014) and Busse and Marcus Wallenburg (2011) and acting institutionally as suggested by Laursen and Salter (2006) are some examples of external factors on which the TPLs cannot directly act.

Given this analytical role, when facing importation, TPLs are able to act primarily in innovative logistics solutions via information technology tools, the most common type of logistics innovation that emerged in the collection of data, and as suggested by Luo (2010), Wagner and Sutter (2012), Porter (1989), Prest and Sopher (2014), Freeman (2004) and Lin (2008). Examples of such solutions are online quote systems, transport mobile applications, ERPs and EDIs and integrated networking systems with other Web-based logistics services, such as cargo tracking.

5. Conclusions and final considerations

The main goal of this study was to understand, from the perspective of Companies A, B, C and D, the role of TPLs in the development of innovative logistics solutions for importation in Brazil. To that end, positive and negative factors were raised in a convergent way, as well as others, found specifically in each case. Regarding the implications of the present study, no specific theoretical reference was found on the subject in terms of the importation process, but rather related to information technology, which has been presented.

The first and second specific objectives were met, presenting the TPLs' cases and their understanding about innovation in importation through the different sources of data collected and a cross-case analysis. First, lack of clarity was observed in the concept of innovation in international logistics services. The term is often confused with process improvement, so depending on the case and the subject, the understandings are different.

The third specific objective of this study was met by presenting the following factors that facilitate or hinder the development of innovative logistics solutions. In Brazil, the factors that hinder innovation are focus on cost, resistance to change by importers, bureaucracy and infrastructure. On the other hand, the factors that contribute to innovation are analytical work, communication, information, relationship, the real understanding of customers' needs, partnerships with other agents in the supply chain, teamwork and engagement.

To meet the fourth specific objective of this study, Companies A, B, C and D suggested solutions for the development of innovation in international logistics, such as effective communication, joint analytical work, prototyping of solutions, development of a

relationship with clients, real understanding of their demands, partnerships and internal/external engagement.

According to the data obtained, it is concluded that the study presented a fundamental role of TPLs in the development of innovative logistics solutions in importation, meeting the general objective proposed. This role is based on trust and relationship, internal and external to the organization. Some ways to achieve trust are critical action to understand the customer supply chain and their real needs, together with a thorough and constant internal work in communication, people development, background in logistics, institutional performance and pro-activity. It is suggested that TPLs increasingly approach clients prepared to study each context, taking advantage of the fact that their strategic position in the supply chain allows them to meet the needs of several customers, to propose innovative holistic solutions in importation.

This study, instead of focusing on procedural issues, intended to focus on two important theoretical and practical drivers: innovation in the importation process and strengthening of intangible factors, suggesting a change of mind-set and a differentiated background in importation logistics is developed by TPLs.

It is known that trading conditions and geographical proximity have an impact on importation, but they were not discussed here because of the subject delimitation of the present study. On the other hand, the subject innovation in importation logistics provides opportunities for future studies to further explore examples presented herein, because much of the current study addresses the supply chain as a whole, not a singular process such as importation. In addition, the same case study presented here, through convergent factors, can be replicated/validated in other companies and countries.

Further studies can also focus on the extended value chain of the TPLs and customers with their intersections, to find where innovation in logistics takes place in the specific stages of the import process. Another suggestion is to develop studies on team competences and innovation in outsourcing of logistics services. Lastly, the recommendation is that, even though it is difficult, factors inherent to politics of emerging countries may be isolated in future research, for it was noted in this study that these factors tended to justify, in some cases, the development of innovative logistics solutions in importation.

Note

1. MDIC – Brazilian Ministry of Development, Industry and Foreign Trade.

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