

Third Party Logistic a possible orchestrator of CPFR

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Abstract

Purpose

Third party logistic (TPL) companies contribute to develop more effective and efficient logistic operations. One way to help this development is having a TPL company can be the orchestrator of a collaborative systems and implementations to do the SCM more efficient to the participants.

Design/methodology/approach

A bibliometric study about the main researches of TPL companies from the last 2 decades is presented, and an exhaustive literature review to understand the possibilities of TPL companies as enablers for collaborative systems among the supply chain players.

Findings

There is a gap in the literature to have a new research line where the TPL companies can be the protagonist of the next level of sophistication and add value in the future SCM.

Originality/value

This study reveals a new line for future researches and the opportunity for the TPL companies to gain a major role in the SCM.

1. Introduction

Supply Chain Management (SCM), as a integration of key business processes in the supply of products, services and information, which add value, from suppliers to the end user, has an important dimension due to its emphasis on communication and cooperation between all parties (among the company or to other companies in the value chain).

The actual research considers that the SCM field of study is quite new and still growing in relevance among other business study fields. This is reflected in the increasing number of papers, research, conferences and new academic careers in said field.

It must be considered that the field of SCM has evolved in a dramatic way since the globalization era, thus the factors of innovation, sustainability, and technology have a significant impact in the development of this area. These changes

raise challenges not only to higher education institutions, but also to students, organizations, employees, and third parties like SCM related professional bodies (Sinha et al., 2016), to understand and fill the gap that the differences in society are generating in the SCM field. To be able to meet the upcoming challenges, the SCM industry has had to face them through the usage of strategies as Collaboration practices. The Collaboration in supply chain is understood as the two or more independent companies working jointly to plan and execute supply chain operations with greater success than when acting in isolation. It can occur in many ways and is commonly divided into two main categories (1) vertical, when collaborating with customers, internally (across functions), service providers and with suppliers; and (2) horizontal, between different supply chains when cooperating with competitors and with non-competitors (Barratt, 2004). To sum up, according to Tafuri et al. (2013) horizontal cooperation projects aim to identify and achieve win-win situations among two or more firms operating at the same level of the supply chain, competitors or not, similar or different in terms of size or products. Hence, such a collaboration let companies to reach superior performances in comparison with them without a that kind of strategy. These companies can be manufacturers or suppliers, retailer companies, wholesalers, etc.

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Horizontal Collaborative Practice

Collaborative Planning, Forecasting, and Replenishment (CPFR), based upon supply chain collaboration standards established by the Voluntary Interindustry Commerce Solutions (VICS) Association, “are information systems that enable partnering firms to integrate their inventory planning, forecasting and replenishment processes by sharing information, developing joint forecasts and jointly crafting replenishment plans” (Panahifar et al., 2015).

VICS is a worldwide, non-profit organization that focuses on improving product and information flow throughout the supply chain. It is responsible for establishing rules and guidelines for the supply chain management, in general, focusing in inventory reduction, processes efficiency, and collaboration strategies among companies like Collaborative Planning, Forecasting and Replenishment (CPFR®), when customer and supplier decide to work together. Companies around the globe follow their standards and guidelines voluntarily, looking for benefits in their supply chains.

Although conceptually simple, CPFR implementations are complex in practice as they require exchange of large amounts of data for forecasting a wide range of products. They must account for varying promotional activities, involve multiple functional areas from multiple firms, take an extended period of time to implement, and integrate possibly incompatible business processes between CPFR partners (Yao et al., 2013).

Since 1998, when VICS first adopted a set of standards for CPFR information systems, more than 300 companies have engaged in CPFR practices leading to substantial benefits to suppliers, such as Procter and Gamble and Kimberly-Clark and retail chains, such as Wal-Mart and Best Buy (VICS, 2007).

Before those main implementations in big retailers companies, Ireland & Bruce (2000) present the concept of CPFR as the driver to enhance horizontal collaboration between companies, in order to have an evolutionary stage of supply chain transformation.

As Attaran & Attaran in 2007a conclude, collaborative supply chain management practices, especially CPFR, are firmly establishing themselves as the way forward for successful and sustainable business operations. By following CPFR companies can dramatically improve supply chain effectiveness with demand planning, synchronized production scheduling, logistic planning, and new product design. CPFR will force suppliers to innovate, building on strong one-to-one relationships that will drive smarter ways of doing things.

The main challenge with respect to frameworks supporting business systems integration is to extend them with implementation functionality to better support business system application development (Hvolby and Trienekens, 2010). An example of this is customer requirement fulfillment processes such as product development and order fulfillment. Not only do they cross the borders of the company's departments (sales, logistics, purchasing, etc.) but also various companies in the supply chain. Despite this development, business integration across systems and borders are still not matured and to a large extend based on human interaction.

As Sanchez Rodrigues et al. (2015) presented, the Horizontal Logistics collaboration (HLC) is an area recently researched, even though the great potentiality it represents in order to create a logistic business revolution. They present a study where the HLC is possible between several retailer companies, providers and TPL companies, improving their KPIs and general performance of the supply network, concluding that the TPL companies can be enablers to support the orchestrator companies.

Third Party Logistic

On the other hand, it should be added that the importance of customer service is increasing with the impact of globalization. In any company that embraces the supply chain philosophy, logistics plays a key role in customer service. As the complexity of logistics in global commerce increases, companies need novel and innovative concepts such as the support of outsourced logistics companies (Selviaridis & Spring, 2007a).

Is this last concept, the third party logistic (TPL) companies where this research is focused in. The amount of studies regarding this specific area has been increased extremely in the last decade.

There are several studies about the partnerships with external companies to improve the productivity or just cost reduction. The partnerships with Third Party Logistics (TPL) has been studied but just from a customer's point of view, and not a service providers side of the joint partnership (Lambert et al., 1996; Núñez-Carballosa & Guitart-Tarrés, 2011).

At the beginning of the 2000's decade, the research and publications in TPL has steadily increase. This can be explained by the growing trend of outsourcing logistics activities in a wide variety of industrial sectors (Zacharia et al., 2011). The continuous wave of consolidation within the 3PL industry has also resulted in the emergence of large companies' that have the capabilities to offer sophisticated logistics solutions on a large scale (continental or global).

Such logistics service providers strive to assume a more strategic role within the supply chain of clients, expanding their scale and scope of operations, but also look for different business opportunities to offer their customers better and more complete services (Selviaridis & Spring, 2007b).

Furthermore, Selviaridis and Spring (2007) report that even TPL offer more sophisticated services as consulting, information systems integrations (in the whole supply chain), contract manufacturing and purchasing, customers prefer to have these kind of services and activities under internal control and just outsource transport and/or warehousing.

Accordingly, the objective of this research is a to show the results of first, a Bibliometric study about the research of TPL as a sub-specialized area in the SCM area of study and second, an exhaustive content analysis analysis, where the main field is about how the TPL companies could have impact and/or improved into the supply chain efficiency or results.

Nevertheless, to the best of the authors knowledge, there are just a few studies regarding the horizontal collaboration between providers and customers through a TPL as enabler (Hingley et al. 2011), and none of them presenting the implementation of a CPFR practice.

Regarding this, the research question proposed to be addressed is the following:

Based on the published literature, is there any collaborative practice that improves efficiency in the supply chain that can be implemented through the third-party logistics companies to boost their business and rise to the challenge of the new markets?

The structure of this study is as follows. First, there is a Bibliometric analysis of the publications about SCM and TPL and also a comparative analysis between the thematic, methodology and sectors studied to understand the status of research about this topic. Second, there is the extensive content analysis to understand the possibility to implement a Collaborative System as CPFR through a TPL company.

2. Bibliometric Analysis

Bibliometric Analysis: General Review

The Supply Chain Management (SCM) is a mixture of different disciplines and activities, in relation with processes that range from logistics and transportation, operations management, materials management, distribution, commercialization, procurement management, information technologies (IT), warehousing and packaging, and documentation processes (Gómez-Cedeño, 2014). Summarizing, the SCM ideology take one or more of this functions to determine a global supply chain strategy to get better business results.

Nonetheless, some authors consider the SCM study as a fragmented study field, focusing the research in the productivity. The SCM is considered a joining of several processes, infrastructure, systems and people knowledge, and the literature has been focused, mostly in systems and processes efficiency, as an internal value for companies (Burgess et al., 2006), but just a few in the implementation of new processes or innovations to improve the efficiency.

Giunipero et al. (2006) found that supply management professionals need to assume a more strategic role in the future. There is the need for building strategic relationships, focusing on total cost and strategic cost reduction, yet collaborating and integrating with suppliers. And also, that supply chain managers of the future need to acquire strategic skills that add value and enable effective alignment with key business functions at a senior decision-making level.

Giunipero et al. (2008) presented a solid and deep bibliometric study about the progress of the supply chain management for several journals. The results show the main research lines and topics, and the methodology used in them. Even though the research lines are diverse, there is no evidence of specific studies about Third party logistic companies as relevant participant of the supply chain.

If 3PL offers outsourced logistics services for a company, and 4PL integrates and gather resources, capabilities and technology of its own and other organizations to build and execute solutions for the supply chain. With the 4PL development, the logistic industry is in the development of the concept of the Fifth Logistic provider (5PL), meaning, full-scale of e-procurement realization. In other words, it can be described as the e-logistics agent or a provider of e-solutions. In a similar way, another 5PL function should be to aggregate the demands of the 3PL in bulk volume to negotiate better prices with transport companies (airlines and shipping), regardless of which generation of logistics solution belongs to all. Even another newer term is emerging, the Seventh Logistic Provider (7PL), that is nothing else that the fusion of a well-established 3PL with the concept of the 4PL. It can be a fusion of physical and process expertise of 3PLP with the enhanced macro-strategic consulting and IT capabilities of 4PLP (Vinay et al., 2009).

Bibliometric Analysis: Research Steps

Bibliometrics Research has become a standard tool of science policy and research management in the last decades. All significant compilations of science indicators heavily rely on publication and citation statistics and other, more sophisticated bibliometric technique search (Glänzel, 2003).

A two-steps process was used in this this research.

Step One, the data collection, in order to create a data base with academic articles information within the SCM field,

focused on the third party logistic companies' participation and the benefit to the whole chain. For this, four main databases were used, (1) Emerald, (2) Science Direct, (3) Scopus, and (4) Web of Science, the most used databases in Business academic studies. There were also used three key words (a) "Third Party Logistic", (b) "Supply Chain", and (3)

"Efficiency", looking for them in title, content and keywords of the research articles. There was also a filter applied for language (English and/or Spanish), and type of document (research article). This first step brought 457 research articles within the filters mentioned before, published between 1991 and June 2020.

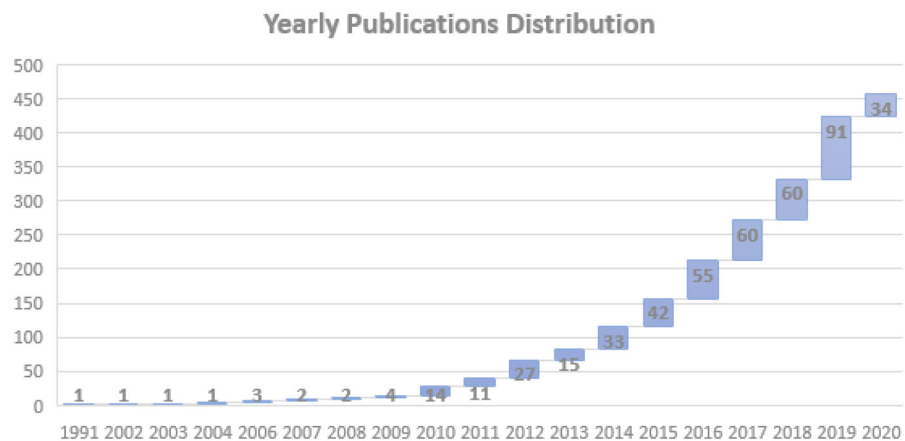
Table 1 Papers by Database
**Authors own development*

Data Base	Count of Articles
Emerald	51
Science Direct	301
Scopus	26
WoS	79
Grand Total	457

With a basic accumulative graph (Graph 1) is it possible to analyze how have been increasing the number of articles focus on the TPL companies during the last decade. As mentioned before, there have been an increase in the

literature about SCM and TPL companies during the last decade, presenting the 93,6% of the studies found in the last 10 years (2011 – 2020).

Graph 1 Papers published by year
**Authors own development*



Step Two, in depth revision of the topic for the research articles gathered in Step One. There was a double check of the research topics based in the key words analysis, to understand if there were more than only keyword, or a mention of them in the title or abstract. After a deep revision of the data base, there were qualified only 56 articles that were developing the research of TPL companies in the development of the supply chain, or in the chain efficiency improvement. These articles where read at Introduction, methodology and conclusion levels in order to get the Thematic topic analyzed, the methodology used and the sector targeted by each study.

As shown in Table 2, there is a classification of the topics of the 457 articles as (i) "All", all three topics found in the article, (ii) "3PL/Eff", Third party logistic companies and

efficiency topics found in the article, (iii) "3PL/SCM", Third party logistic companies and Supply Chain Management topics found in the article, (iv) "3PL", only Third party logistic companies topic found in the article. There are 56 articles focused in the the third party logistic companies in total. For the rest of the articles, the classification is as (v) "SCM/Eff", Supply chain management and efficiency topics found in the article, (vi) "SCM", only Supply chain management topic found in the article, (vii) "Eff", only Efficiency topic found in the article, and finally (viii) "None", none of the three topics found in the article, meaning that the main argument of those researches were from another topic, and had one of the three keywords because they were related as a secondary matter.

Table 2 Thematic table
regarding topic addressed
by research

**Authors own development*

Keyword Combinations	Count of Articles
All	3
3PL/Eff	5
3PL/SCM	31
3PL	14
Total 3PL	53
SCM/Eff	4
SCM	142
Eff	3
None	255
Grand Total	457

Bibliometric Analysis: Preliminary Results

These 53 articles are taking in consideration for the next steps of the analysis, focusing in the TPL companies

literature. The same first analysis by database can be done for the 53 articles as shown in Table 3.

Table 3 Papers by Database:
after filtering by topic

**Authors own development*

Data Base	Count of Articles	% articles v/s first analysis
Emerald	1	2.0%
Science Direct	8	2.7%
Scopus	13	50.0%
WoS	31	39.2%
Grand Total	53	11.6%

In Table 3 there is also a percentage comparison between the articles remaining after the filter of the topics of main research in the articles. This means that only 2,0% of the articles found with the keywords in Emerald database are focused in the topic as main classification, 2,7% in Science Direct Database, but on the other side, it is a big percentage in Scopus and Web of Science databases, 50,0% and 39,2% respectively. Lastly, only the 11,6% of all the 457 papers found are in this group. This can be a first approach to understand the accuracy of the classification and the search

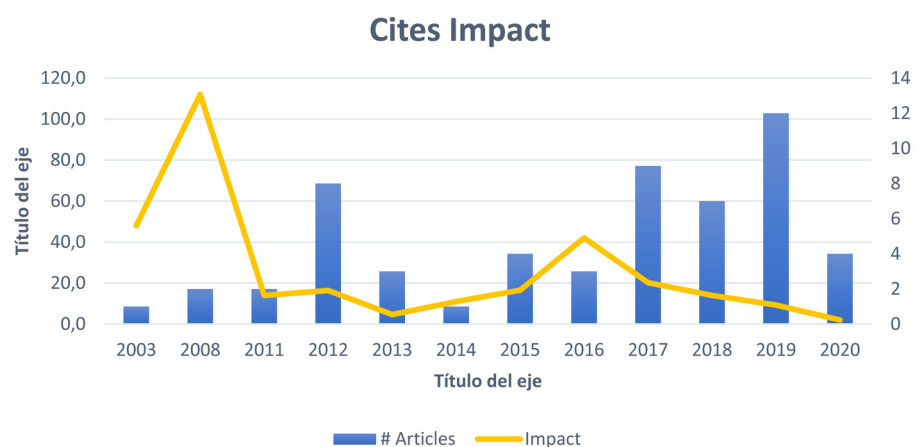
engine from each database.

The impact shown in Graph 2, presents the number of articles by year and the impact (calculated as the number of cites divided by the number of articles per year). With this ratio, it can be observed that there are 3 main peaks in the impact, in year 2003 with an average of 48 cites by article published, in year 2008 with an average of 112 cites by article published and, in year 2016 with an average of 42 cites by article published.

Graph 2 Papers published

by year: after filtering by

Authors own development



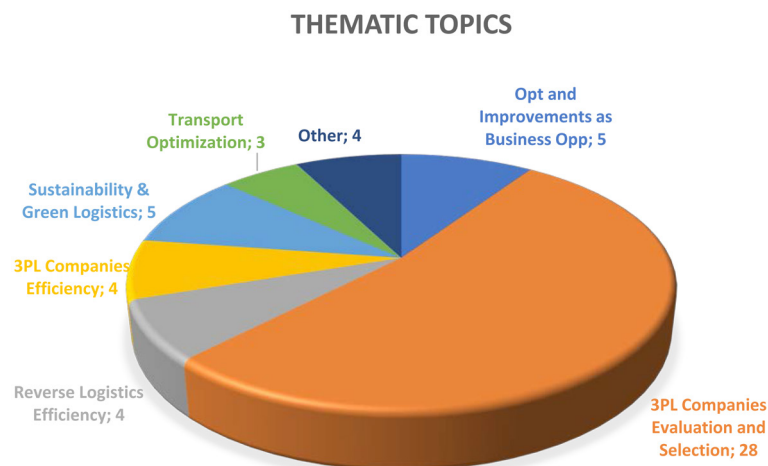
After analyze the 53 research articles there are 3 basic results: the thematic topic of the research, the methodology used in the study, and the analyzed sectors.

For the Thematic Analysis there are 7 characteristics' groups to categorize all the 53 papers. The standardization of this groups are: Optimization and Improvements as Business Opportunities, where the main topic is about optimizing some existing process or business, or looking to include a new business opportunity for the company analyzed; 3PL Companies Evaluation and Selection, this is the main thematic in the researches, where the authors uses different tools to analyze evaluate and present a selection tool to choose between different 3PL companies; Reverse Logistics Efficiency, where a specific process of reverse logistics is analyzed in different perspectives, or evaluate different 3PL

companies only through their reverse logistic capacities; 3PL Companies Efficiency, measures the efficiency of one specific process or the main behavior of one or more 3PL companies or logistic environment using different analytic tools; Sustainability & Green Logistics, where the study focused in the sustainability point of view of a 3PL company or a supply network and it is compared or analyzed against others ;Transport Optimization, when the focus of the study is about the optimization of the transport process or even the transport opportunities for a 3PL company or logistics network ;and Others, where the research where very specific and unrelated subject to any of the prior categories or even among them (there are 4 research paper in this category).

In graph 3 there are presented the thematic topic analysis by each research paper, indicating the number of papers within each category.

Graph 3 Thematic analysis
 Authors own development



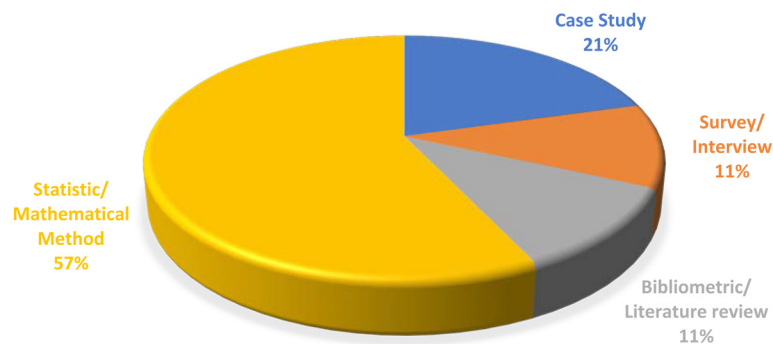
The Methodology used in each research were 4, and several of them combined among them. The main methodology used are Case Study, when the research focused in one or more companies study as a target, comparing their general behaviors/results or analyzing some particular process in them; Survey/Interview, even the authors used surveys or guided interviews to gather information and then analyzed with some models or any other mean; Bibliometric/Literature review, when the methodology was a bibliometric study or an exhaustive literature review to understand the state of art of some specific topic or the published researches; Statistic/

Mathematical Method, when the methodology used is any statistical model or tools, or any mathematical model such as Ordinary Least Sqaure, Fuzzy Analytical Hierarchy Process, Linear Programming Model, Data Envelopment Analysis, etc. This last methodology group is a combination of Conceptual models, Simulations and Modeling as presented by Panahifar et al. (2015).

In graph 4 there are presented the methodology groups by each research paper, indicating the percentage of papers within each group.

Graph 4 Thematic analysis
 Authors own development

METHODOLOGY



Since there are several papers that use more than one methodology even between the groups shown above in

Graph 4, Table 4 is presenting the combination for all the papers studied.

Table 4 Methodology groups
 * Authors own development

Methodology Groups	Count of papers
Bibliometric/Literature review	6
Case Study	6
Case Study - Statistic/Mathematical Method	10
Statistic/Mathematical Method	24
Survey/Interview	2
Survey/Interview - Bibliometric/Literature review	3
Survey/Interview - Statistic/Mathematical Method	2
Grand Total	53

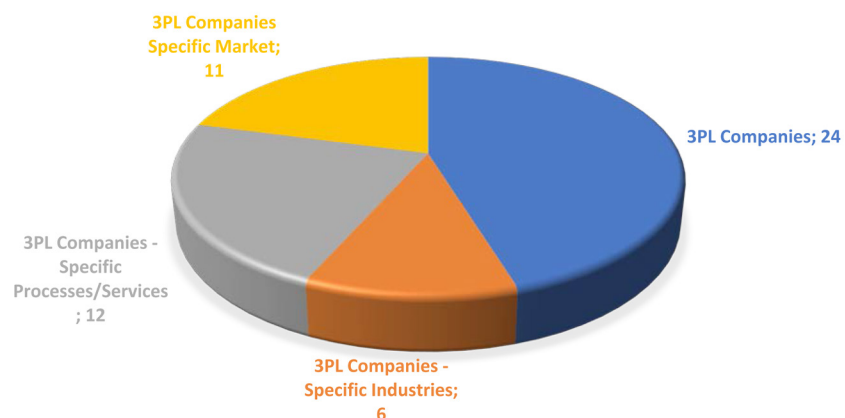
Lastly the Analyzed Sector is the type of industry or business analyzed in each research, finding 4 different groups of them. 3PL Companies, when the research point to 3PL companies in general, regarding processes or relationships with customers or other companies, without being explicit in the type of industry; 3PL Companies in Specific Industries, when the research focuses, explicitly, on a specific industry for the study; 3PL Companies in Specific Processes/Services,

when the research focuses on specific processes of their internal functions or services that a 3PL company may offer to their customer; 3PL Companies Specific Market, when the research point to a specific market where a 3PL company operates.

In Graph 5 are shown the number of papers within each analyzed sector group.

Graph 5 Analyzed Sectors
 * Authors own development

ANALYZED SECTORS



It can be inferred from the above bibliometric study that the majority of the 3PL company researches have been made on evaluation and selection topics, using statistical or mathematical models, being 68% of the studies (in combination with other methodologies or by themselves). Is on the authors knowledge, after this exhaustive review, that there has not be published any effort to look for new methodologies, process or business models to be integrated in a 3PL company as enabler for future collaborative practices.

3. Content Analysis

Content Analysis: State of Art

The Third Party Logistic (TPL) companies offer different solutions trying to fulfill their customer's needs. Regarding this, TPL's uses different strategies to offer all kind of services (Hertz & Alfredsson, 2003). These strategies bring several benefits to the TPL customers, as transportation savings and service improvement, packaging, and distribution network management. These factors are improved when a company decides to partnership with a TPL in the medium and long term (Hsiao et al. 2010). Following this affirmation, Rabinovich et al. (1999) proposes that firms can improve customer service and reduce costs when they outsource different logistic activities, supporting that in the TPL "know-how" and economies of scale capabilities that they represent. The TPL also presents benefits in international supply chains, assuming roles as forwarders or using their connections and partnerships with external freight forwarders (Vasiliauskas & Jakubauskas, 2007).

Furthermore, Sinkovics et al. (2018) examine a set of relationships among the TPL's resource commitment, collaboration and innovation, and their performance outcomes, finding that collaboration between the manufacturers and the TPLs mediates the relationship between resource commitment and innovation, and performance. TPLs are becoming much more of a collaborative partner which supports the idea of a value co-creation strategy. The authors proved that there are positive relationships between TPLs resource commitment and manufacturer performance, and between TPLs innovative attitude and practices, and manufacturer performance. For commitment aspects they look at financial resources, physical assets, technological resources and managerial resources assigned to the manufacturer account. For innovation aspects they look at the introduction new of technology for the industry and the company, and the offering of unique services among the competency (other TPLs). To measure the performance, they open the concept in 3 different ways; (1) operating level performance such as cycle time, service level, etc., (2) market performance such as company's overall performance in market, competitiveness of the manufacturer firm due to improvements given by the TPL, etc., (3) relational performance to share the benefits of working together as venture for the TPL company and the

customer (manufacturer firm).

Despite all the benefits that operating with an external logistic service provider can bring to companies, one of the main focuses that TPL needs to have is flexibility and the introduction of new services to their customers to offer a holistic service solution. Hartmann & De Grahl (2011) proved the effect that collaboration and flexibility contribute to customer loyalty (loyalty from TPLs company's customers) regarding three components; (1) retention as the contract or services renovation, (2) extension such as the hiring of new services to the TPL from their customers, (3) referrals to other customers in the industry to enlarge the TPL market and customers.

TPL has attracted considerable research attention in the recent past. These companies are specialized partners that participate in the logistic operations of their customers (warehousing, transport, packaging, forwarding, among others), giving a solid experience in this area. The contributions in this specific field of the SCM and Operations study had rise in the last 20 years (Marasco, 2008), appearing as a "sub-field" to research.

Also, Selviaridis & Spring (2007) reveal that TPL research is meanly empirical-descriptive, nut lack a theoretical foundation. The main methodology is survey research, aligned with the positivism research tradition within logistics. Nonetheless, the authors present several propositions for future research in this field regarding the findings.

- Studies should be focus directed towards more normative, theory-driven and qualitative method-based studies.
- Further empirical research in relation to TPL design/implementation and fourth party logistics services is needed

Regarding the improvement in performance and services offered, Subramanian et al. (2016) present different elements that the TPL companies must follow looking at the globalization and the present and future needs of industrial and distribution companies. The main elements are flexibility, innovation and collaboration. The TPL companies need to be flexible to adapt their operations to different type of customers, integrate with them, and absorb several characteristics from their operations. Also, present innovative solutions to have a differentiator factor from the competency.

After the content analysis the following research proposition can be presented:

There is enough evidence in previous researches that can support the concept of a TPL company as enabler to implement evolved collaboration systems as CPFR into a supply network.

4. Content Analysis: Methodological approach

After the bibliometric analysis presented in the prior chapter, about the state of art of the literature for TPL companies, an analysis of the literature content should give a base of evidence that bear the concept of a TPL company as enabler to implement evolved collaboration systems as CPFR into a supply network, in order to support or decline the research proposition.

As mentioned before, “the objective of this research is a to generate relationship conceptual with the gathered insight from an exhaustive content analysis, where the main field is about how the TPL companies could have impact and/or improved into the supply chain efficiency or results”.

This content analysis pretends to answer the research question “Based on the published literature, is there any collaborative practice that improves efficiency in the supply chain that can be implemented through the third-party logistics companies to boost their business and rise to the challenge of the new markets?”

With this objective in mind, a content analysis is developed, looking for the concepts that relates the TPL companies with their customers, and the kind of relationship they should have to improve their services. There were found 39 articles that point to 29 different concepts. These concepts were grouped by 8 basic topics, getting a parallel as evolving steps in the relationships from TPL and their customers as Hertz & Alfredsson (2003) describe, focusing on how the different services and processes help to relate them in a more strategic plan.

These 8 topics are described below:

- TPL participation in Logistic Operations is a topic highly researched in the SCM area, as Bolumole (2003) explains about his study to evaluate the logistic providers role in the supply chain management.
- TPL participation in the supply chain optimization, as shown in their research with the CEO of main TPL companies in North America in Lieb & Lieb (2011) study the progress of these firms and the new services they present to their customers to optimize the supply chain.
- TPL participation with customers is a concept studied by Goudarzi K. (2015), where they provide an un-

derstanding of the role of the customers in the supply chain.

- TPL participation in logistic strategy has been studied not only from a logistic provider business perspective, but also how can affect their new strategies to their customers and to the market, as Kim, Yang, & Kim (2008) and Hertz & Alfredsson (2003). In both studies there are available different approaches to the participation of TPL in logistic strategy; in the first one through an analysis using new business strategies for logistics operators markets, and the second as the development and evolution of the concept of TPL as it is known.
- TPL participation with vendors is studies by Zacharia, Sanders, & Nix (2011) with the logistic provider as an orchestrator of different aspects in the supply chain, being a connection and enhancer of the relationships with other actors as the vendors.
- TPL improves SC efficiency, as Min & Joo (2006) studied how the efforts of logistic providers to improve their own efficiencies reverberates in the whole supply chain efficiency.
- Collaborative models improve SCM efficiency, as Keller & Daugherty (2001) provide evidence that the fact that there is collaboration between logistics operators and their respective customers is the first step towards an effective collaboration and efficiency relationship within companies and in their supply chains.
- Implementing CPFR from TPL improve efficiency in SCM is a non-studied topic yet as the best of the authors knowledge.

5. Results and Discussion

Regarding the methodology approach exposed in the previous chapter, and to answer the research question, in this chapter are described and exposed the results obtained in the content analysis research.

The content analysis is designed to get information and define a theory-based model for further research analysis. As shown in Table 5, the main 8 topics with detailed concepts to get deep understanding of the relationship between them, presented as evolving steps from basic relationships to the more complex.

Table 5 Topic and Concepts

*Source: self-research

Topic	Concept	Reference
TPL participation in Logistic Operations	The TPL is essential to give a Good Customer Service.	(Sahay, 2006) (Bhatnagar et al., 1999)
	The TPL support the warehousing processes of the company.	(Baruffaldi; Accorsi; Manzini, 2019)
	The TPL support the freight processes of the company.	(Power et al., 2007)
	The TPL support the logistic coordination processes of the company.	(Chen Liu; Baofeng Huo; Shulin Liu, 2015) (Hertz & Alfredsson, 2003)
	The TPL support the inventory management processes of the company.	(Cheong, 2004)
TPL participation in the supply chain optimization	The TPL has total system integration with the company ERP.	(Mortensen & Lemoine, 2008) (Sheikh & Rana, 2011)
	The TPL has knowledge of the company inside operations.	(Chen et al., 2011) (Mellat-Parast & Spillan, 2014)
	The TPL contribute with ideas and solutions for the business processes optimization.	(Rollins et al., 2011)
	The TPL participates in the demand planning forecast of the company.	(Min, 2013)
TPL participation with customers	The TPL participates in the join demand forecasting with the Customer.	(Trentin, 2011)
	The TPL generates purchase orders for the customer replenishment process.	(Graves et al., 2011)
	The TPL coordinates follow up meetings and activities within customer, the company and the Warehouse.	(Skjoett-Larsen, 2000)
	The TPL has system integration with customers.	(Chow et al., 2007)
	The TPL has total visibility of inventory levels, demand forecast and goods movements in the whole chain.	(Daugherty et al., 2006) (Holcomb et al., 2011) (Liu & Kumar, 2003) (Simatupang et al., 2002)
TPL participation in logistic strategy	The TPL participates and contribute in the company logistic strategy.	(Hong Bo et al., 2011)
	The TPL participates in the logistic relationship and logistic strategy with customers.	(Hong Bo et al., 2011)
	The TPL participates in the logistic strategy implementation.	(Hoi Yan Yeung et al., 2006) (Stank et al., 1999)
	The TPL measures and generates periodic reporting for the logistic operations.	(Domingues et al., 2015)
TPL participation with vendors	The TPL participates in the negotiation with vendors.	(Zhan-feng & Yong, 2008)
	The TPL administrates the vendor management.	(Ali et al., 2014)
TPL improves SC efficiency	Using a TPL benefits the supply chain management of the company	(Zacharia et al., 2011)
	The TPL delivers value to SCM processes	(Power et al., 2007)
Collaborative models improve SCM efficiency	VMI improves the delivery and inventory level efficiency in the supply chain	(Claassen et al., 2008)
	CPFR improves inventory levels, replenishment lead-time and planning	(Claassen et al., 2008)
Implementing CPFR from TPL improve efficiency in SCM	TPL has the know-how to implement CPFR	(Vivaldini et al., 2008)
	TPL has the resources to implement CPFR	(Qureshi et al., 2008) (Zacharia et al., 2011)
	TPL can offer CPFR methodology to many customers	(Vinay et al., 2009)
	TPL has staff training capacity for CPFR implementation	(Sanches Flores & Primo, 2018)
	TPL has the technical knowledge and capabilities to a system integration with multiple platforms	(Hanus, 2013)

Referred to the topics presented in Table 5, each one of them are associated with several concepts:

- TPL participation in Logistic Operations: the TPL companies must be part in the logistic operations not only executing them but also planning them. It is essential to have a good customer service that the at the execution level have clear the priorities. The TPL has to be part of the warehousing administration, since they should have experience and know how that can be useful in the own warehouse, the same as the expedition process, even there are the own TPL freight or other carrier companies. The internal logistic coordination processes should be advised by the TPL, helping reduce the inefficiencies or process gaps. Finally, the inventory management should be done coordinating efforts between the company and the TPL.
- TPL participation in the supply chain optimization: the supply chain optimization points to organize the whole process in the network, pointing to reduce gaps and inefficient processes. To do this, the TPL companies should participate, or at least advise in the system integration through all the network, meaning, company, TPL, customers (if available). There is also recommended that the TPL understand the internal processes in the company, so they can really be part of the network giving ideas or supporting the business. Finally, the TPL should be part of the demand planning forecast process in the company so they are aware of the volume and/or mix changes, seasonality, etc.
- TPL participation with customers: the TPL should participate in the processes where the impact is directly into the customer service, such as join demand forecasting (company, TPL and last customer), being part of the replenishment through the purchase process, managing periodic meetings with the company, customer and warehouse to agree inventory levels, check service levels, etc., integrate systems in the whole network (end to end), and keep tracking of all the inventory and transit visibility across the supply network.
- TPL participation in logistic strategy: when the strategy of the company includes a TPL for the administration of the full supply chain, or only as a part of it, the TPL should be part of the strategy to contribute to the logistic strategy, help to establish strategic relationship with the customers, and keep track on the logistic operations thorough reporting and indicators to look for improvements.
- TPL participation with vendors: there is also an opportunity to improve the relationship with the vendors, where the TPL could participate in the negotiations and

administration the relationship with them, helping in the purchasing or replenishment process.

- TPL improves SC efficiency: the supply chain could be more efficient when is operated by a TPL, since they might have synergies with other companies, carriers and in the warehousing.
- Collaborative models improve SCM efficiency: there are different horizontal collaborative models to improve the delivery and inventory level efficiency as the Vendor Management Inventory (VMI), and also some others that point to improve inventory levels, as well, replenishment lead time and planning as CPFR.
- Implementing CPFR from TPL improve efficiency in SCM: since the efficiency in the SCM can be improved when implementing CPFR, when it is done from a TPL company this can bring more benefits since TPL companies have the know-how in implementing collaborative systems, they have resources to implement several operations among supply networks, they can reply the CPFR methodology to several customers at the same time, and they have the capacity to train and lead a workforce strong enough to face a challenge as implementing a system like this. Finally, a TPL has the technical knowledge and capabilities to a system integration with multiple platforms, facilitating a multi-customer integration.

Therefore, this research shows the possibilities that a TPL company can offer to the market as an enabler and orchestrator of the implementation of a sophisticated methodology like CPFR.

6. Conclusions

Regarding the presented research proposition “There is enough evidence in previous researches that can support the concept of a TPL company as enabler to implement evolved collaboration systems as CPFR into a supply network” it can be concluded that since the evidence is partially presented by several researches in different years, as exposed in Table 5, it is not enough to prove it entirely. There are highlights of evidence, but it is necessary to do a future research to analyze the relationship between TLP companies and their customers and check the opportunities that can be taken by them in order to evolve into a more collaborative supply network.

As a result of the content analysis there is the following conclusion table (Table 6), summarizing the main ideas of all the articles reviewed:

Table 6 Conceptual
Integration and Conclusions
*Source: self-research

Topic	Reference	Conceptual Integration and Conclusions
TPL participation in Logistic Operations	(Sahay, 2006) (Bhatnagar et al., 1999)	Authors present how companies are looking to improve their Customer Service Level by integrating TPLs in their own operations.
	(Baruffaldi; Accorsi; Manzini, 2019)	Authors present how TPLs should participate in the different internal operations processes of the company to improve their services, such as warehousing (about location and specifications for the proper warehouse), freight (through local or multinational carriers), internal logistic processes (like information flow, system integration, etc.), and inventory management processes.
	(Power et al., 2007)	
	(Chen Liu; Baofeng Huo; Shulin Liu, 2015) (Hertz & Alfredsson, 2003)	
	(Cheong, 2004)	
TPL participation in the supply chain optimization	(Mortensen & Lemoine, 2008) (Sheikh & Rana, 2011)	Authors present a specific integration pointing into the ERP systems or any other electronic communication between the companies areas, supported by the TPL as enabler for this capabilities.
	(Chen et al., 2011) (Mellat-Parast & Spillan, 2014)	Authors present specific knowledge and participation from the TPL in the customers supply chain optimizations, participating in the different business processes (not necessary in the daily operations but in the organization of the general process, as well as the demand planning process.
	(Rollins et al., 2011)	
	(Min, 2013)	
TPL participation with customers	(Trentin, 2011)	Authors present a participation of the TPL with customers from a management point of view, where there is a role in the joint demand planning for the whole network (vendors, company and customers), participates in the purchasing and replenishment process and finally participates in the coordination for periodic follow-up meetings between the company, their customers, and the warehouse.
	(Graves et al., 2011)	
	(Skjoett-Larsen, 2000)	
	(Chow et al., 2007)	Authors present an integration in the systems from the company to the customers through the TPL, taking their capabilities in this specific area so a total visibility can be achieved for the whole chain.
	(Daugherty et al., 2006) (Holcomb et al., 2011) (Liu & Kumar, 2003) (Simatupang et al., 2002)	

Topic	Reference	Conceptual Integration and Conclusions
TPL participation in logistic strategy	(Hong Bo et al., 2011)	Authors present how the TPL should contribute in the design of the company logistic strategy, and how the strategic logistic relationship with the customer should be to support the commercial strategy.
	(Hoi Yan Yeung et al., 2006) (Stank et al., 1999)	Authors advise how the logistic strategy should be implemented with the participation of the TPL.
	(Domingues et al., 2015)	Authors present how to do a follow-up of the strategy implementation through periodic reporting and meetings with useful indicators.
TPL participation with vendors	(Zhan-feng & Yong, 2008)	Authors present a concept where the specialized TPLs should have a better negotiating capacity since the large number of companies they work with, so this should help the negotiation with the companies vendors.
	(Ali et al., 2014)	Authors present the vendor management, placing the purchasing orders and maintaining the raw materials inventory level.
TPL improves SC efficiency	(Zacharia et al., 2011)	From a slightly different perspective the authors present how working together with a TPL a company should benefit their own supply chain management and on the other hand, how the TPL adds value to the SCM processes through constant feedback and support.
	(Power et al., 2007)	
Collaborative models improve SCM efficiency	(Claassen et al., 2008)	Authors present that there are different horizontal collaborative models to improve the delivery and inventory level efficiency as the Vendor Management Inventory (VMI), and also some others that point to improve inventory levels, as well, replenishment lead time and planning as CPFR.
Implementing CPFR from TPL improve efficiency in SCM	(Vivaldini et al., 2008)	All the authors present how a TPL should improve the efficiency in the company SCM, through different aspects. A TPL should have the know-how to implement complex processes, and the resources to implement them such as CPFR. A TPL can replicate processes and best practices through different "accounts" (the different networks where they work within the different customers and vendors), and they have the capability to train work force for different new processes. Finally, TPL has the system integration capabilities up and down to have visibility and information transferring through the supply network. At the end the TPL companies are presented as the coming orchestrators for future improvements in the SCM.
	(Qureshi et al., 2008)	
	(Zacharia et al., 2011)	
	(Vinay et al., 2009)	
	(Sanches Flores & Primo, 2018)	
	(Hanus, 2013)	

Moreover, the research question “Based on the published literature, is there any collaborative practice that improves efficiency in the supply chain that can be implemented through the third-party logistics companies to boost their business and rise to the challenge of the new markets?” shows that there are several practices already working in the market to improve efficiency in the supply chain, including horizontal collaboration practices, collaborative planning forecasting and replenishment, among others. There are also several studies about the third party logistic implementation of new services into the market to improve efficiency to their customers. However, the studies of the third party logistic companies show that there are just a few studies regarding the horizontal collaboration between providers and customers through a TPL as enabler (Hingley et al. 2011), leaving the opportunity to increase this line of research.

After developing the exhaustive content analysis, the 8 topics presented can give new lines of research by themselves or together. According to the authors knowledge there is no such grouping in the existing literature, giving the opportunity to dive in these areas as concepts to understand deeper opportunities for the third party logistic companies and the research about them.

This research presents a state of art about a TPL as a possible orchestrator to implement CPFR methodology among the supply chain, after an initial bibliometric research and complemented with a content analysis, what is a strong starting point for future researches. As Nix (2011) presents in his research “The Emerging Role of the Third-Party Logistics Provider (3PL) as an Orchestrator”, TPL companies are an important actor to improve the efficiency and open new ways to operate the supply chain.

For future researches the result of the content analysis gives a new line for investigation such as “to analyze the interaction of the 8 factors in a model applying PLS technique”. These 8 factors shown on this research present an opportunity to understand the relationship that could have all of them in order to justify a TPL company as an orchestrator to implement a CPFR methodology. This can be based on a survey and then analyze the results with a PLS model as an exploratory option.

On a managerial point of view, this research reveals that there is space to explore new services as TPL companies to offer to their customers, being enablers of an implementation of CPFR methodology. Using their capabilities to absorb this service for several customers as a differentiating advantage.

Finally, this research opens the opportunity to prove in further researches that a TPL company can offer to the market as an enabler and orchestrator of the implementation of a sophisticated methodology like CPFR.

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