# Global challenges and research gaps for third-party logistics: literature review

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**Abstract:** Most firms selling or producing goods at least use 3PLs for their domestic and global operations. However, they face several challenges both internally and externally. The purpose of this paper is to provide a better understanding and an exhaustive review, of the current state of research concerning the global challenges that the third-party service providers face in the course of their operations based on the primary themes and integrations. We conducted a systematic review approach to gather, scrutinise and synthesise data about the accuracy and values of the past articles published in the digital databases between 1990 and 2017 and selected 74 primary articles. We grouped the challenges into different common categories namely; barriers due to technological advancements, logistics flexibilities, industrial dynamics and lack of proactivity, minimising the lead time as well as customers' satisfaction and future expectations.

**Keywords:** challenges/barriers; third-party logistics; literature review; supply chain management.

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## 1 Introduction

The third-party logistics phenomenon existed over half a century ago and ever since the sector has expanded dramatically. Consolidation has taken centre stage of this industry in regards to the large third-Party logistics providers (3PLs) and mega-3PLs (Mentzer et al., 2001). In essence, several motivations seem towards achieving the scale economies and creating a one-stop shop for the 3PLs needs. Therefore, most firms selling or producing goods at least use 3PLs for their domestic and global operations. It is because of these benefits that such companies rip from the 3PLs (Langley, 2017). However, amidst the 3PLs experienced growth, they face several challenges both internally and externally. On the other hand, outsourcing is understood to be the contracting of the management and the operational control of the logistics functions to the unrelated third-party companies. In reality, they are the firms offering the contract logistics services (Lieb and Lieb, 2009).

Several definitions have been noted regarding logistics outsourcing. Christopher (1994), defined outsourcing as the strategic use of the outside firms to conduct functions traditionally operated by the internal staffs and resources. It is a viable business strategy that turns the non-core duties over to the outside suppliers to spread their risks, leverages their resources as well as concentrating on the fundamental issues that hold the future

growth of their companies. Cooper et al. (1997) noted that there are several levels of supply outsourcing such as the third-party providers and fourth party providers.

Aziz and Sherzod (2014) documented that fourth-party logistics providers (4PLs) are a relatively new model by the industry standards. They offer many of the similar services as 3PLs hence it is difficult to understand the specific distinction between 3PLs and 4PLs. Soderoa et al. (2013) defined a 4PLs as the logistics provider with an independent non-asset-based integrator. It acts as the focal point of contact for the customers in determining and assembling technology and other resources from both the organisations and other 3PLs to run a client's supply chain (Yang, 2014a). Harland et al. (2007) noted that the difference between 3PLs and 4PLs is the control and accountability that the 4PLs has over the customer's supply chain. Fourth logistics providers act instead of the customer and should remain objective in their decision-making to serving the client's best interest (Lieb and Lieb, 2010). On the other hand, Gupta et al. (2011) indicated that 5PLs construct, organise and implement logistics solutions and technologies on behalf of multiple customers. Thus, the difference between 4PLs and 5PLs is that fifth party logistics providers have an extensive focus on e-business solutions. Langley (2015) added that the 5PLs are committed to achieving the minimum cost. However, this review will concentrate mostly on the 3PL logistics providers.

According to Aziz and Sherzod (2014), third-party logistics providers, abbreviated as 3PLs, was initially used in identifying intermodal marketing firms in the 1970s. As a result, it allowed shipments from the suppliers and delivered them to the final carriers. Thus, they are the intermediate logistics providers that assume the bundled services for both the suppliers and the customers. Significantly, most of the outsourcing is done to acquire talents, resources and expertise that does not exist within the organisation such as the competitive advantage and special knowledge. However, Hertz and Alfredsson (2003) offered a different definition of the term 3PLs. They defined the 3PLs as the companies that provide goods and services that they do not own. In somewhat a related meaning, DeGroote and Marx (2013) indicate that 3PL is defined as the multiple distribution activities offered by a third party that never assumes the inventory ownership. In reality, 3PLs perform related operations that the suppliers do not manage. Further, in logistics sphere, third-party logistics considers the distribution aspects of finished or unfinished products, processed and unprocessed products, as well as raw materials. It assists the firms to enhance their customer services, operations and enhancing a complete concentration on their competencies.

Ellram and Cooper (1990), referred to 3PLs as the service firm that offers services on behalf of the shipping entity with the management, warehousing and transportation responsibilities. However, Evangelista et al. (2012) defined 3PLs regarding time and space and, thus resolved that it is an external firm that gets the products to the consumers at the right time, in the right place and at the right cost. Therefore, there are several aspects to note in the above definitions by different scholars. It is evident that 3PLs assumes broad interpretation depending on the depth of the services offered. However, it is also correct to conclude that some explanations are narrow and carry more exclusive focus. Critically, in this paper, 3PLs are defined as the external entities that offer multiple or single logistic services to the final customers and is usually contracted. Again, the producer's perspective indicates that the covers to their businesses are all-inclusive, whereas the customers perspective dictates that outsourcing is an inappropriate activity that significantly varies. In the contemporary world, outsourcing any logistics duties to the third-party providers is a broad practice that is operated globally.

Logistics has often been a significant part of every economy as well as every business entity. The global trends have facilitated the outsourcing of the logistics functions to the third-party logistics (Vishal et al., 2013). As a result, it assists them to concentrate on their essential core competencies and thus generate impressive revenues. The high 3PLs growth is an attribute to customers' needs and challenges. For instance, the logistics clients use the 3PLs' technology to bridge a gap in their internal platforms. Hence, an acquisition leaves a gap in an organisations ability to fully integrate into their network (Yang, 2014b). The strategic relations that contain information gaps can result in disruptions in supply chains. According to Zhou and Zhang (2013), the ability to quickly change distribution flow, to respond rapidly on the global basis and provision of accurate fundamental performance indicators are some of the strengths of 3PLs. At the same time, behind all these growth and success, there are quite some challenges facing the 3PLs and distribution industry. As noted by Yang (2014b), the global challenges facing the 3PLs should be paid attention to and solved for the continued logistics growth.

The 3PLs topics have immensely attracted several surveys that never existed in the early 1990s. It, therefore, indicates that the 3PLs can be useful in any industry, be in manufacturing, service or retail. It, thus, gives precedence over other innovative technologies world over. Interestingly, the 3PLs contain a substantial influence on the improvements in the logistics performance, specifically in refining the logistics quality. It can be observed in the cycle time reductions and quality improvements. Similarly, greater effects of the solutions providers on the performances indicate that such improvements are as a result of the wider logistics outsourcing that came as a result of the levels integrations. Substantially, it assists the decision makers in drawing strategic and tactical policies. The roles of the 3PLs in the supply chain in general, as well as the logistics services provision, in particular, are increasing. Again, changes in the manner in which the logistics processes are managed are matters of designing or redesigning the logistics and transport systems.

The success of redesigning or designing the logistics systems largely depends on the shippers-3PLs relationship and the ability to overcome the barriers that exist. Again, based on the assertions of Frohlich and Westbrook (2001), on their third-party provider's review, several barriers are pulling its efficiency downward. Researchers have done significant work in finding the real challenges that these 3PL firms face in the course of their operations though none has ever done a review of the same surveys. Therefore, this paper will solely review the previous literature on the barriers that 3PLs face globally.

## 2 Methodology

### *2.1 The scope of the analysis*

This review focuses on the literature relating to the third-party and supply chain integration challenges from the global perspective of the logistics management specialists as well as researchers. Articles dealing with the use of greener transportation modes and reverse logistics were, as well included in the analysis. Further, the methodology adopted the following processes, the review protocol, exclusion and inclusion, selection procedure and strategies, quality assessment and data extraction and synthesis. The processes are explained as follows. The overall surveys were fundamentally conceptual or based on the empirical literature. Only a few were based on the multi-method techniques.

## *2.2 The review process*

As indicated in the introduction, this study is a systematic literature review (SLR) – a process that combines all the existing research literature related to a particular research question or topic (Kitchenham, 2007). The prime reason for this kind of review is to collect, analyses and evaluates evidence about a particular topic of study. It allows for the observation of the existing research gaps within the existing literature as well as recommendations for further studies. As indicated by Unterkalmsteiner et al. (2012), SLR offers greater insight and deeper understanding of the subject being addressed. As a result, in this review, the authors have followed the format proposed by Kitchenham and Charters (Kitchenham, 2007). The proposal indicates that a review should consist of three phases, such as planning, conducting and reporting. However, every phase contains sub-elements such as review questions, review protocol, exclusion and inclusion, selection procedure and strategies, quality assessment and data extraction and synthesis. The processes are explained as follows.

## *2.3 Review protocol*

It is a comprehensive review protocol that would offer guidance and a clear path for the progress of the study. The review protocol is important because it specifies the approach used in undertaking the completion of the study's objectives, by minimising the research biasness (Kitchenham, 2004). The process consisted of several phases including the research setting, strategy, review objectives, criteria for the review selection process, quality assessment elements, data extraction techniques and synthesis of the extracted information (Kitchenham, 2007). The review objectives have been outlined in the previous sections, whereas the following sub-sections comprises of further information regarding the remaining listed elements.

**Table 1** Inclusion and exclusion criteria

| | |
|---|---|
| Included articles were | • Available as full-text |
| | • Published between 1990 to 2017 |
| | • Written in English |
| | • Related to the research objective |
| | • Published in the selected digital databases |
| Excluded articles | • Full-text not available |
| | • Outside the search epoch time |
| | • Containing a non-English manuscript |
| | • Not related to the research objectives |
| | • Duplicated studies |

## *2.4 Inclusion and exclusion criteria*

The main objective of applying the inclusion and exclusion criteria is to make sure that all the selected primary literature in the SLR is pertinent and related to the study. Further, the purpose of this systematic review is to understand the Global challenges facing the

3PLs. The review entailed collecting related data from the journal articles, conference papers, workshops and book chapters, published in English and in digital databases from 1990 to 2017. As a result of the peer-review process, the authors excluded research articles whose contents did not apply to the challenges facing the 3PLs. Table 1 indicates the criteria for this review.

### *2.5 Search strategy*

The literature review search methods consisted of both the automatic and manual search. Both of the search techniques were used to explore the review content further including the additional studies that could provide broader aspects. According to Kitchenham (2007), the manual search is conducted for the primary study references after the automatic search. Similarly, the automated search technique was benchmarked on the research keywords and was undertaken in the digital databases to address this review's aims. As a result, the online databases including Web of Science, ScienceDirect, IEEE explore, Scopus and ACM Digital Library were selected as the fundamental sources for this study. The listed databases were selected because they are deemed as the most relevant, offering complete information for the field of third-party logistics management.

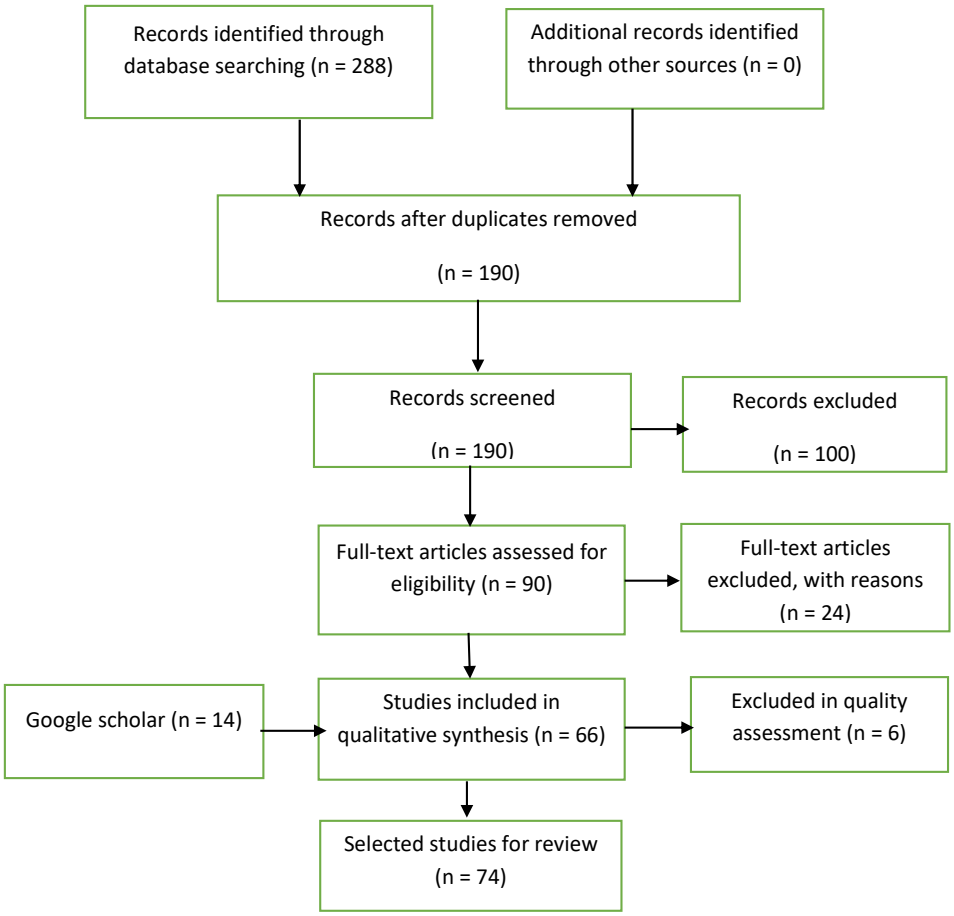
However, to establish boundaries in this study, the keywords of interest were searched for in titles of abstracts. Further, to match the identified keywords with the published research and relevant literature, a combination of 3PLs keywords were used in the selected databases. The objective of the same was to identify as many relevant articles as possible within the databases. These keywords included: '3PLs global challenges OR Barriers,' 'Global barriers facing 3PLs,' 'International Challenges facing 3PLs,' '3PLs cross-border challenges,' and 'International Logistics Barriers.' After this searching stage, the authors employed a manual search for the second stage. In essence, a forward and backward search approach was used to trace the collected references for primary literature. It boosted the fact that the review achieved its aims and answered the proposed research question. Moreover, the second manual search authenticated that the systematic search was relatively complete as well as indicating if the study missed on anything. All these assisted in sorting out the primary studies through the Mendeley application. It also made easy to remove the duplicates as well as keeping the collected literature.

### *2.6 Study selection process*

After completing the first and second stages of search processes, 288 papers were obtained as the outcome. Further, out of this total, 98 papers were duplicates and were removed accordingly using the Mendeley application. After the removal of the duplicated articles, the inclusion and exclusion criteria were applied to the remaining 190 articles, focusing on each paper's abstract and title. The objective of this was to eliminate the articles that were of no use to the study. 100 studies were excluded through this step, based on the research abstract, titles and keywords. This left a total of 90 studies. As recommended by Kitchenham (2007), all the studies that did not cover the aims included in this literature review were excluded. Further, in identifying the existence of irrelevant and unclear studies, a full-text scanning of the remaining articles was undertaken. As a result, 24 studies were excluded, leaving 66 studies. In the final stage of the review process, the snowballing approach was included as a means of scanning the references of

the primary studies. In ensuring the review accuracy, the authors applied a manual search of the horizontal and vertical techniques using the Google Scholar as a means of obtaining more reliable primary studies. Therefore, 66 articles were screened and 14 other articles were obtained. Thus, the final result of the systematic review included 80 primary articles. However, the final articles were subjected to quality assessment criteria and six articles were removed. As a result, the authors selected 74 primary articles for this particular review.

**Figure 1** Selection diagram (see online version for colours)




Moreover, the distribution of the number of the primary studies used in this review and retrieved from various digital databases during the systematic search is illustrated in Table 2. The most studies gathered before the selection process was obtained from ScienceDirect (114), followed by Web of Science (94), Scopus (40), ACM Digital Library (21) and the IEEE explore (19). Similarly, Google Scholar was not included in the initial selection stage. The second selection process indicated that most of the relevant articles were obtained from Web of Science (19), ScienceDirect (18), Scopus (15), IEEE explore (8), Google Scholar (8) and ACM Digital Library (6).

## *2.7 Quality assessment*

Kitchenham (2007) observed that the principle of quality assessment had assisted researchers in evaluating the quality of every selected review paper, using a set of certain criteria. As a result, the authors conducted a quality assessment as a means of quality and accuracy evaluation of the selected primary studies. The authors used the following QA criteria to evaluate the quality and accuracy of the primary sources.

QA1 Is the topic addressed in the paper related to global challenges facing 3PLs?

QA2 Is the research methodology sufficiently described?

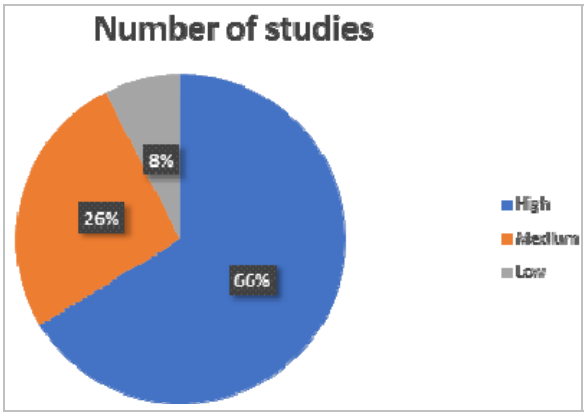
QA3 Is the data analysis method accurately evaluated in the article?

QA4 Is the research context clear?

QA5 Are the data collection methodology criteria precisely explained in the paper?

The above quality assessment questions were used to evaluate the 80 selected articles to strengthen the researchers' confidence and probable outcomes. Further, in grading the quality of the articles, three ranking criteria were used and they included, high, medium and low as depicted by Nidhra et al. (2013). Moreover, the completely fulfilled quality criteria studies were assigned a rating of 2. Partially fulfilled criteria studies were assigned 1 and equally, if a study did not meet any quality criteria, it was assigned 0. Again, this review considered the quality of the paper to be high if it was six and above. A score of five was considered as a medium quality and any score less than five was categorised as low quality. As earlier mentioned, after a quality check, eight studies did not fulfil the criteria, thus removed. Graphically, the quality assessment representation is documented in Figure 2.

**Figure 2** Quality assessment results (see online version for colours)




## *2.8 Data extraction and synthesis for SLR*

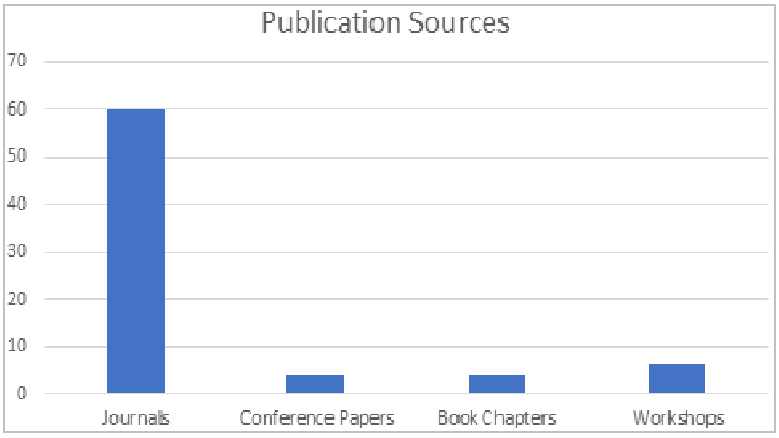
Data extraction is the most fundamental process in the systematic review. As a result, the authors developed and recorded all the information about the all 74 studies. The process involved scanning through all the papers and extracting the necessary information in line

with the Mendeley applications. The techniques adopted in this review included the research domain, research methods, theories and global challenges. Also, the study SID, paper title, year, type of paper, sources and region were also added into the review criteria. It is illustrated in Table 2.

**Table 2** Data extraction criteria

| *Extracted data* | *Description* |
|---|---|
| SID | Unique identifier for each article |
| Authors | Names of all the authors |
| Publication date | Year of publication |
| Study title | Name of the paper observed in the search stage |
| Type of paper | Book chapter, journal, conference, or workshop articles |
| Region | Countries covered by the primary article |
| Research topic | The topic of study or research theme |
| Theory | The theories adopted by the papers – motivation or social support |
| Methodology | Quantitative, qualitative or mixed methodologies |
| Context | Description of the study area, either academic or industrial settings |

**Figure 3** Publications source overview (see online version for colours)




## *2.9 Publication source overview*

A total of 74 primary articles were selected for this SLR and were published within the research field regarding the 3PLs. Further, the 74 articles were selected after the exclusion and inclusion process, after that a quality assessment. As indicated in Figure 3, the resulting primary studies consisted of 60 journal articles, four conference papers, four book chapters and six workshops. As a result, the study observed that the journal articles were the most popular publication types in this review.

## *2.10 Chronological view*

The global challenges for 3PLs contain a very brief search history as depicted in Figure 4. It illustrates the distribution of the publications in range years from 1990 to 2017. The peak of publication is between the years 2010 to 2015. It is conceivably not surprising as the concept of 3PLs peaked during the last decade. However, the study observed a chronological increase in the publications about the challenges facing the 3PLs.

**Figure 4** Article distribution per year (see online version for colours)

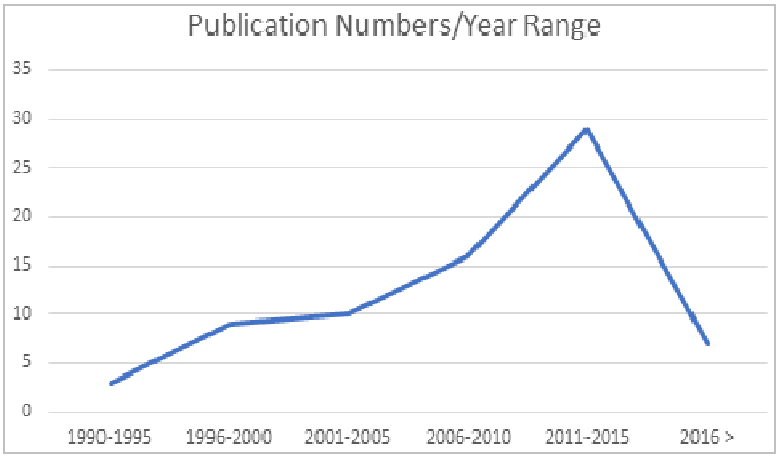
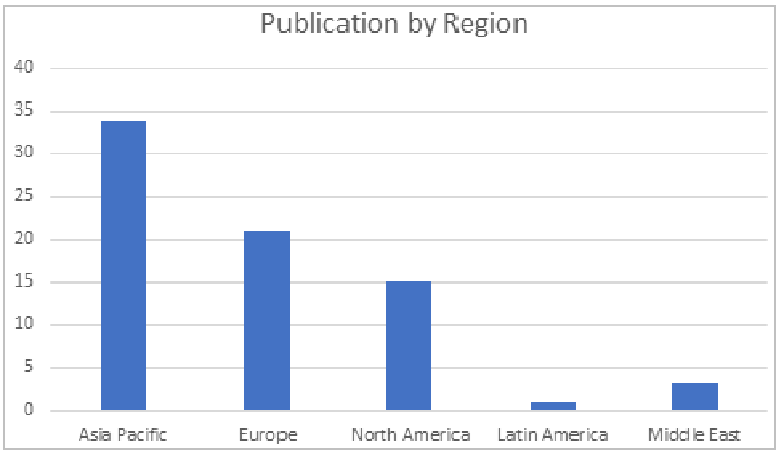



**Figure 5** Regional distribution of articles (see online version for colours)




## *2.11 Coverage of research regions*

In this systematic review, the Asia-Pacific region contributed the greatest number of primary papers (34), Europe (21), North America (15), Middle East (3) and Latin America (1). No paper from Africa was reviewed by the authors. Therefore, this outcome

illustrated that most of the papers contributing to the global challenges facing the 3PLs meeting the exclusion and inclusion criteria were fundamentally published within Asia-Pacific. Figure 5 illustrates the observation.

## 3 Research question findings

The review found and categorised some global challenges facing the 3PLs. Amongst the obstacles found, they were classified as barriers due to customers' satisfaction and future expectations, difficulties in minimising the lead time, the technological advancements, logistics flexibilities, industrial advancements and lack of proactivity.

### *3.1 Barriers to customers' satisfaction and future expectations*

The global barriers facing 3PLs are categorised and discussed as external and internal factors. Gupta et al. (2011) mentioned a number of the external factors that lead to the gaps between the expectations and satisfaction. Natural calamities, regulations and policies and the role of the institutional requirements were outlined as the external variables that widen the gap between customer's expectation and satisfaction. Various authors have also cited market forces and preferential limitations as the potential barriers to the efficient operations of the 3PLs (Naylor et al., 1999; Holguín-Veras, 2000; Kannana and Tan, 2005). Further, external enthusiasms such as specific customer demand, customer pressure and weather conditions were noted. For instance, Gupta et al. (2011) interviewed different service providers and found out that in most cases, 80 percent of the customers' expectations were unattainable. However, as a result of the changing markets forces, the services are customer based. Thus, aspects such as time, quality and preferences lead the expectation ladder.

Moreover, there are also internal factors that lead to the gaps between expectations and satisfaction. They are company based and include lack of clear bureaucracies, efficiency and cost reductions (Sahay and Mohan, 2006b; Kaynak and Hartley, 2008; Kim, 2009). The most significant reason for the widening gaps between the consumer's expectations and satisfaction was singled out as the incompatibility of the information systems between the service providers and the consumers. Therefore, focusing on the 3PLs, the adoption of the fundamental solutions that enrich the understanding between the customers and the service providers is necessary. The 3PLs need to be more information oriented and further embrace the modern technologies for the customer expectations can be met and, thus satisfied. More so, the goals should be sustainable to both the regulatory requirements as well as to the customers' demands (Kannana and Tan, 2005).

### *3.2 Barrier to minimising the lead time*

The total lead time in logistics is coined as the sum of all the processing time, transit time, as well as the opportunity spent on inventory (Muhammad et al., 2012). However, Harland et al. (2007) added that it represents the time a component requires to travel from the beginning of the supplier, through the operations into the finished product and to the end consumer. From the outbound lead time, Cheong (2001) indicated that it is the total amount of time taken when the consumer places an order for a product when it is

processed and the time it takes to reach the customer. In essence, the customer lead time is important because it outlines the accurate measure of how long the supply chain seeks to respond to the customer's demand. However, minimising the lead time is a significant challenge that the 3PLs encounter in their daily operations (Haq and Baxi, 2016; Mei and Zhang, 2011).

Minimum lead time is affected by various factors such as the availability of the required technology, required personnel and the efficiency of the production and supply chain deliveries as noted by Zajac and Olsen (1993). As a result, taking much time to deliver a service affects the total company's turnover. The literature reveals an increasing attention to minimising the lead time and service executions regarding the modern technologies and internal management strategies. From this point of view, one of the fundamental managerial approaches lies with limiting the bureaucratic channels that need to be passed before a particular service is rendered to the end customer (Selviaridis and Spring, 2007; Núñez-Carballosa and Guitart-Tarrés, 2011). Significantly, the need for departmental specialisations is necessary for all the essential service orientation productions to be achieved at the same time. Several initiatives can be identified such as sharing vehicles across multiple customer regions, increasing the machines efficiencies and reconfiguration of the transportation network strategies. Again, some policy towards minimising the lead time had been detected in the literature. Lieb and Lieb (2010) reached out for various solutions and noted that the information communication technology applications might offer more efficient operational assistance in regards to the transportation efficiency improvements.

### *3.3 Barriers due technological advancements within the logistics industry*

Satisfying the ever-shifting demands of the global logistics marketplace is a fundamental limitation for various firms currently. Advancements in technology, as well as globalisation, are forcing the decision-makers to analyse their decisions, operations and policies to attain new efficiencies. Thus, many top 3PLs around the globe are significantly leaning on the technologies (Zhu and Geng, 2013; Selviaridis and Martin, 2007). However, several kinds of literature emphasised the difficulties to keep up to date with the ever advancing technological innovations. In reality, keeping up to date with the necessary technologies in the logistics field has also changed the service deliveries of many 3PL firms. Again, most of the 3PL businesses lack the motivational factors to their workforce. Hence, no efficient conveyances and satisfaction achieved. Still, most of the third-party providers are never flexible to handle any other logistics services with changes in the technology. Therefore, the 3PL companies must be well-aligned in the future (Kim, 2009; Langley, 2015). Other studies also observed that the industry faces acute shortages of the talents in the workforce. Lack of appropriate talents in the workforce leads to reduced turnover and firm productivity. The changing technological factors in the logistics products pause a more significant challenge to the service providers. Further, the adoption of the e-commerce into the supply chain performance is always slower than hypothesised. The other challenges associated with the technological barriers included poor strategic alignment of the information dissemination, weak managerial leadership, lack the provider's awareness about the fundamental significance of IT adoption and the organisational thrifts (Harland et al. 2007; Mathiyazhagan et al., 2016).

On the other hand, the existence of the internal advantages of information integration within the supply chain integration is incompatible among the 3PLs and gives rise to other several challenges. Some of the common challenges that the 3PLs facing include the confidentiality of the information disseminated, the cost of achieving specific technologies, the regulation issues on the anti-trust and authenticity of the lines of information. Sahay and Mohan (2006b) identified lack of innovation caused by the adversarial relationships amid the logistics service providers and the customers as the most challenging factor. Hence, no complete understanding of the needs and necessities for the supply chain is streamlining. Incoherence within the 3PLs levels results to higher overhead expenditures, a factor that Chee-Chuong and Chew-Been (1999) observed when they noted that lack of service differentiation among the logistics provider firms and changes in the markets regarding technologies demanded vast sums of capital. Therefore, lack of priority objectives and emphasis on lack of trained personnel are a setback to the logistics industry.

### *3.4 Barriers due to logistics flexibility*

Customers are often the executives in the market. Thus, businesses must respond to their changing demand preferences. They require special consideration in production, packaging and delivery. Therefore, efforts are necessary to eliminate the possible challenges and build a competitive advantage within the logistics industry. Forthwith, logistics flexibility is defined as the ability of the business or organisation to respond in time and efficiently to the ever-changing customer preferences regarding deliveries, services and support (Naylor et al., 1999). Logistics flexibility is what the supply chain requires in their systems and processes to keep pace with the rapid changes within the business industry. However, it is connected to the 3PLs through the value proposition offered to the customers (Mentzer et al., 2001).

Organisational capacities in the face of the uncertainties offer flexible solutions to the 3PLs. It flexes up or down to bring the necessary resources as well as the business strategies that are necessary to support the rapid changes (Sahay and Mohan, 2006a; Li et al., 2006). Further, Kaynak and Hartley (2008) noted that customers are more concerned about the solution tests rather than the level of technology that a firm contains. Equally, Lee (2000) noted that one area where flexibility is fundamentally important is transport management. In fact, Langley (2015) expanded on the flexibility in 3PLs and argued that the components of flexible transportation solutions contain the delivery model, functionality, as well as services. In essence, the delivery model incorporates the software that fosters rapid developments outside the major four walls of the logistics business and injecting the financial benefits by matching costs and savings.

A similar idea was observed when Kim (2009) concluded that customers need not purchase software, they are interested in the results that include costs reductions, revenue growths, increased market share, productivity improvements and improved working capital. Further, most of the 3PLs are exhausted by the ever-increasing complexities and changes brought about by supply chain fragmentations. Significantly, buying and implementing supply chain equipment is the easiest thing nowadays, the main challenge is acquiring the right talented personnel to operate all of the pieces together to deliver significant business value. Though, after all the elements are connected, customers always have the zeal to look for the flexible service bundles that best present their preferences. Nonetheless, all the components change over time and it, therefore, means

the decision-makers must be flexible in their pricing and delivery strategies (Kannana and Tan, 2005; Li et al., 2006; Mei and Zhang, 2011; Mentzer et al., 2001).

Logistics flexibility cuts across the board, with some internal and external factors that the customer neither experiences nor observes. Perotti et al. (2012) argued that 3PLs suffer from the threats originating from the security umbrellas. In understanding the regulations, Gupta et al. (2011) indicated that the 3PLs need to be flexible in moving the products without misinterpretations and having the correct value additions to the customers. Failure of such regulations results in contractual breaches and inability of the firms to satisfy particular customer requirements. In fact, an inflexible 3PL lacks adequate exemplary reporting systems, inadequate infrastructural facilities, inefficient collaboration channels and insufficient security and control (Selviaridis and Spring, 2007).

As a result, the firm may not utilise the innovation platform that bridges the customer's internal platforms. For instance, the communication systems such as TMS cannot effectively communicate with the potential vendor. Again, an acquisition grants a loophole in the firm's abilities to integrate into the changing networks. Similarly, the information gaps that result from the strategic relationships cause the disruptions within the 3Pls supply chain. However, customers often change their geographical manufacturing activities. For example, lack of customer responses entailing the movement from a single distribution point to the local terminus. Because of these, most of the suppliers are still in the process of shifting the managerial structures to influence the responsibilities played by the 3PLs. And as a result, these effects bring imbalances in networks, complexities in management and business uncertainties (Zajac and Olsen, 1993; Tan et al., 2014; Yang, 2014a; Huo et al., 2017).

### *3.5 Barriers due to industrial dynamics*

The logistics industry composes several components regarding transportation as well as service provision. Most of the reviewed literature demonstrated various aspects of the logistics industrial dynamics. The literature touched on the market integrations, information integration, organisation relationship linkages, coordination, as well as the resources sharing. 3PLs assumed the coordination challenges through the cropping of the omnichannel distributions and business models' expansions to retail stores. It increases the coordination breadth that requires well trained and experienced workforce to implement (Skjoett-Larsen, 2000; Lanfeng, 2011; Cheong, 2003). As a result, it leads to the bullwhip demand distortion that limits the effective service dissemination. As noted by Lieb and Lieb (2009), the omnichannel distributions and bullwhip effects affect the infrastructural developments that disable the companies in utilising the shared information effectively and efficiently.

On the other hand, misalignment of the information systems, reduced inventory and trust factors are the dynamics within the organisational relationship linkages. Therefore, the integration of the supply chain contains several dynamic challenges and need significant work to overrule the traditional barriers. Inefficient resource sharing among the internal organisational setups are the main cause of low profitable turnovers within the 3PLs industry. It is usually intertwined between the diminishing profit margins and the limited lean time that the firms need to protect the new customers (Hinson, 2005; Dhayanidhi et al., 2011; Williams, 2014; Khan, 2017). All these lead to the logistics

uncertainties, probing and experimenting, risk-taking as well as testing of the limited resources. Therefore, the 3PLs are at risk-averse and are unlikely to invest large capitals to innovations. Langley (2017) confirmed that 3PLs require the necessary resources to facilitate real-time actions, real-time solutions and real-time mitigations of the consequences that disruptions cause within the logistics industry. However, communication systems fit amidst all these challenges as it enhances the sharpness and quickness in responding to the risks and operational objectives.

Further, uncertainties can be experienced all over the logistics markets and thus acts as a stumbling block in the public and private sectors. However, Abbasi and Nilsson (2016) observed that curbing uncertainties require channelling several bureaucratic procedures within the decision-making processes. It is, in itself a dynamic challenge that affects the 3PLs. Also, taxations and policies of the off-peak deliveries limit the scope of the 3PLs. Nonetheless, hitches in decision-making lead to lack of coordination in the process of integration, poor managerial skills, inadequate logistics innovative capacities and insufficient information sharing systems. According to Skjoett-Larsen (2000), the already mentioned challenges fall under the internal logistics dynamics, though Abdulrahman et al. (2014) categorised them as conflicts of culture among the suppliers and service providers.

Overburdened markets, underfunded government firms, regional protectionism and poor physical infrastructures are classified as the external dynamic challenges facing the logistics industry. They prevent the 3PLs from undertaking businesses globally with lots of ease. Therefore, they result in high management costs, ambiguous logistics overhead expenditures and delivery times delays between the suppliers and the service providers (Ansari and Modarress, 2010; Zhou and Zhang, 2013). It means that better selection and structured approach would enable the 3PLs to improve their service deliveries.

### *3.6 Barriers due to lack of proactivity*

Several kinds of literature reviewed observed the differences amid the shippers and the third-party service providers' perceptions on the contemporary proactive behaviour developments. It is evident that the shippers' desire for the entrepreneurial stance of the 3PLs contains a significant difference with regards to the expected future developments within the logistics industry. As observed by Pumpinyo and Nitivattananon (2014), the shippers view the third-party service providers as being on average reactive rather than proactive. However, in-depth observations indicate that third-party service providers as well perceive themselves as being pro-active than the shippers. Though, some literature that pondered on the subject confirmed that the 3PLs can perceive their potentials for further involvement substantially within the industry. It acts as a double edge though, the magnitude of the 3PLs' proactivity in setting the customer's service strategies as well as the system integration are reflected (Jiang, 2002; Marasco, 2008; Kunaka and Guillermo, 2009; Raja and Muhammad, 2014; Mustafa and Ahmed, 2015). Again, the shippers regard the 3PLs in the service implementation, with the exception of installations of the equipment and facilities, as more proactive than reactive.

Fawcett et al. (2008), Marchet et al. (2014) and Núñez-Carballosa and Guitart-Tarrés (2011) supported such sentiments as the providers appear to observe themselves as more proactive. However, since the measuring scale of the goals of proactivity, is the shippers' perception. It is becoming clear that the 3PLs overrate their magnitude of the proactivity behaviour. Nonetheless, in some of the reviewed literature, it was achieved regarding the

process execution and process control. Sheu and Talley (2011) connected the argument with the explanation of the limitations in the process execution that exists as a result of lack of the resources owned by the 3PLs. In fact, this aspect could as well be implemented in considering the 3PLs misunderstanding of the proactivity within the process control. Perotti et al. (2011) cited a breakthrough as the 3PLs were observed to be partially aware of their lack of proactive character especially in the strategic elements of the logistics systems. Again, several kinds of literature confirmed that the 3PLs seemed convinced that they would be capable of matching their clients' expectations concerning more proactivity in all the aspects of the logistics management in their near future (Perotti et al., 2015; Vishal et al., 2013). Though, their daily operations do not convince the shippers on the same sentiments.

## 4 Conclusions

In conclusion, the systematic review outlined in this paper involved 74 research contributions on the challenges facing third-party services providers from the global perspective. The articles were published between 1990 and 2017. Further, the surveys were evaluated and analysed depending on their characteristics and contents. Several barriers have been identified in the literature among the 3PL firms. Some of the barriers highlighted include widening the gap between the satisfaction and expectation with regards to the 3PL capabilities, decrease in their profit margins, limited lead time to source for new customers and increased regulations and requirements.

Other limitations included incapability to satisfy the shipper's logistics requirements, insufficient security and control, as well as the incompatibility of the information systems providers between the shippers and 3PLs. Again, keeping up to date with the new technologies and lack of the motivational factors to the workforce were listed. It was also evident that this topic has been researched by several authors showing the increased interest in this field. Concerning methodology, the review observed that many of the evaluated articles are either conceptual surveys or empirical studies. Thus, the contributions observed were based on the analytical and simulation modelling. 3PLs is still a significant trend in the logistics service provision, though more attention needs to be put on building long-term contractual relationships with the customers.

## 5 Future research

Most of the reviewed pieces of literature do not offer a very detailed discussion and analysis of the work specialisation and challenges in particular divisions. In-depth analysis, as well as information, is necessary to understand better the third-party logistics challenges in specific sectors. It is a gap that needs to be surveyed to understand what areas are most affected and how it should be remedied. Third-party service providers should conduct individual analysis about their barriers to efficient service deliveries. Emphasis should be cantered on the confusion of the 4PLs' concepts and insufficient terminologies of information and capital justifications. Again, the in-depth future study can be coined from the above listed essential barriers to examine specific areas such as operation practices, managerial, financial and strategic obstacles within the third-party

service providers. Significantly, case studies could be conducted to ascertain the specific solutions to the existing challenges among the 3PLs.

Limited research has been conducted on the rise of the omnichannel marketplace. It is an important strategy that affects the 3PLs need for high powered IT capabilities. As a result, the clients and practitioners would understand the obstacles and opportunities for the 3PLs as they attempt to adopt more top value technologies. Again, it would point out what the leading 3PL companies are doing right to add greater customer value via technology. Also, minimal research has been conducted in the green logistics arena in regards to the 3PLs global challenges.

Further, there are several gaps with regards to the logistics network configuration. For example, the literature does not inform about the assignment of warehouses to demand points, allocation of warehouse capacities, transfer of plants to warehouses. More information is needed in understanding the coordination with upstream to coordinate production and inbound transportation and the challenges facing them and the problems associated with the full coordination with upstream and downstream material flow. This review could also point out gaps leading to study information sharing for collaborative forecasting from 3PL provider's point of view. Moreover, much should be done to explore ways for 3PL firms to share information, address the kinds of data to be shared, types of technology to use, impact assessment and value in sharing information. Finally, further research should be conducted to ascertain the behavioural complexities among the 3PLs functions.

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## References

Abbasi, M. and Nilsson, F. (2016) 'Developing environmentally sustainable logistics: exploring themes and challenges from a logistic service providers' perspective', *Transp. Res. Part D Transp. Environ*., Vol. 46, No. 4, pp.273–283.

Abdulrahman, M.D., Gunasekaran, A. and Subramanian, N. (2014) 'Critical barriers to implementing reverse logistics in the Chinese manufacturing sectors', *International Journal of Production Economics*, Vol. 147, pp.460–471, DOI: 10.1016/j.ijpe.2012.08.003.

Ansari, A. and Modarress, B. (2010) 'Challenges of outsourcing logistics to third-party providers', *Int. Journal Logistics Systems and Management*, Vol. 7, No. 2, pp.198–218.

Aziz, M. and Sherzod, A. (2014) 'Supply chain management concepts: literature review', *IOSR Journal of Business and Management*, Vol. 15, No. 6, pp.60–66.

Chee-Chuong, S. and Chew-Been, T. (1999) 'The strategic posture of logistics service providers in Singapore', *International Journal of Physical Distribution and Logistics Management*, Vol. 29, No. 9, pp.588–605, MCB University Press, 0960-0035.

Cheong, M.L.F. (2001) *Logistics Outsourcing and 3PL Challenges. Singapore-MIT Alliance, N2-B2C-15*, Nanyang Technological University, Nanyang Ave, Singapore, pp.1–8.

Cheong, M.L.F. (2003) *Logistics Outsourcing and 3PL Challenges*, Singapore-MIT Alliance, N2-B2C-15, Nanyang Technological University, 50, Nanyang Ave, Singapore 639798, pp.1–8.

Christopher, M. (1994) *Logistics and Supply Chain Management*, pp.57–80, Pitman Publishing, New York, NY.

Cooper, M.C., Ellram, L.M., Gardner, J.T. and Hanks, A.M. (1997) 'Meshing multiple alliances', *Journal of Business Logistics*, Vol. 18, No. 1, pp.67–89.

DeGroote, S.E. and Marx, T.G. (2013) 'The impact of IT on supply chain agility and firm performance', *International Journal of Information Management*, Vol. 33, No. 4, pp.909–916.

Dhayanidhi, K., Azad, A. and Narashiman, K. (2011) 'The use of third-party logistics services – a literature review', *International Journal of Operations System and Human Resource Management*, Vol. 1, Nos. 1–2, pp.29–43.

Ellram, L.M. and Cooper, M.C. (1990) 'Supply chain management, partnerships and the shipper-third-party relationship', *International Journal of Logistics Management*, Vol. 4, No. 2, pp.1–10.

Evangelista, P., Mogre, R., Perego, A., Raspagliesi, A. and Sweeney, E. (2012) 'A survey-based analysis of IT adoption and 3PLs performance', *Supply Chain Management: An International Journal*, Vol. 17, No. 2, pp.172–186, DOI: 10.1108/13598541211212906.

Fawcett, S.E., Magnan, G.M. and McCarter. M.W. (2008) 'Benefits, barriers and bridges to effective supply chain management', *Supply Chain Management: an International Journal*, Vol. 13, No. 1, pp.35–48.

Frohlich, M.T. and Westbrook, R. (2001) 'Arcs of integration: an international study of supply chain strategies', *Journal of Operations Management*, Vol. 19, No. 2, pp.185–200.

Gupta, R., Sachdeva, A. and Bhardwaj, A. (2011) 'Criteria for selecting 3PL provider: a literature review', *World Academy of Science, Engineering and Technology*, Vol. 59, No. 11, pp.2020–2024.

Harland, C., Caldwell, N., Powell, P. and Zheng, J. (2007) 'Barriers to supply chain information integration', *Journal of Operations Management*, Vol. 25, No. 6, pp.1234–1254.

Hertz, S. and Alfredsson, M. (2003) 'Strategic development of third-party logistics providers,' *Industrial Marketing Management*, Vol. 32, No. 2, pp.139–149.

Hinson, R.A. (2005) 'The role of third-party logistics (3PL) providers in produce', *Journal of Food Distribution Research, Food Distribution Research Society*, July, Vol. 36, No. 2, pp.1–8.

Holguín-Veras, J. (2000) 'Off-peak freight deliveries challenges and stakeholders' perceptions', *Transportation Law Journal's Special Issue on Intermodal Transportation*, Vol. 27, No. 3, pp.453–473.

Huo, B., Wang, Q., Zhao, X. and Hua, Z. (2017) 'Barriers to third-party logistics integration: empirical evidence from China', *Industrial Management & Data Systems*, Vol. 117, No. 8, pp.1738–1760, https://doi.org/10.1108/IMDS-08-2016-0344.

Jiang, B. (2002) 'How international firms are coping with supply chain issues in China', *Supply Chain Management: An International Journal*, Vol. 7, No. 4, pp.184–188.

Kannana, V.R. and Tan, K.C. (2005) 'Just in time, total quality management and supply chain management: understanding their linkages and impact on business performance', *The International Journal of Management Sciences*, Vol. 33, No. 2, pp.153–162.

Kaynak, H. and Hartley, J.L. (2008) 'A replication and extension of quality management into the supply chain', *Journal of Operation Management*, Vol. 26, pp.468–489.

Khan, S. (2017) 'Third-party logistics: a literature review', *International Journal of Management Information Technology and Engineering*, Vol. 5, No. 7, pp.9–14.

Kim, S.W. (2009) 'An investigation of the direct and indirect effect of supply chain integration on firm performance', *Int. Journal of Production Economics*, Vol. 119, No. 2, pp.328–346.

Kitchenham, B. (2004) *Procedures For Performing Systematic Reviews*, Vol. 33, pp.1–26, Keele University, Keele, UK.

Kitchenham, B. (2007) *Guidelines for performing Systematic Literature Reviews in Software Engineering*, EBSE Technical Report, Vol. V2, pp.1–65, Keele University and University of Durham.

Kunaka, C. and Guillermo, A. (2009) *Logistics in Lagging Regions Overcoming Local Barriers to Global Connectivity*, Policy Research Working Paper 4843, World Bank, Washington, DC.

Lanfeng, Y. (2011) 'Logistics barriers to international operations: a case study of the Japanese firm in China', *International Conference on Economics and Finance Research IPEDR*, Vol. 4, No. 7, pp.374–378.

Langley, J. (2015) *The State of Logistics Outsourcing; Results and Findings of the 20th annual Study*, 2016 Third-Party Logistics Study, Capgemini.

Langley, J. (2017) *The State of Logistics Outsourcing; Results and Findings of the 22nd annual Study*, 2018 Third-Party Logistics Study, Capgemini.

Lee, H.L. (2000) 'Creating value through supply chain integration', *Supply Chain Management Review*, Vol. 4, No. 4, pp.30–36.

Li, S., Nathan, B.R., Nathan, T.R. and Rao, S.S. (2006) 'The impact of supply chain management practices on competitive advantage and organizational performance', *The International Journal of Management Sciences*, Vol. 34, No. 2, pp.107–124, Bowersox.

Lieb, R.C. and Lieb, J.K. (2009) 'The North American third-party logistics industry in 2009: the provider CEO perspective', *International Journal of Physical Distribution and Logistics Management*, Vol. 50, No. 8, pp.40–52.

Lieb, R.C. and Lieb, J.K. (2010) 'The North American third-party logistics industry in 2010: the provider CEO perspective', *International Journal of Physical Distribution and Logistics Management*, Vol. 49, No. 2, pp.53–65.

Marasco, A. (2008) 'Third-party logistics: a literature review', *International Journal of Production Economics*, Vol. 113, No. 1, pp.127–147, DOI: 10.1016/j.ijpe.2007.05.017.

Marchet, G., Melacini, M. and Perotti, S. (2014) 'Environmental sustainability in logistics and freight transportation', *Journal of Manufacturing Technology Management*, Vol. 25, No. 6, pp.775–811, DOI: 10.1108/jmtm-06-2012-0065.

Mathiyazhagan, K., Haq, A. N. and Baxi, V. (2016) 'Analysing the barriers to the adoption of green supply chain management – the Indian plastic industry perspective', *International Journal of Business Performance and Supply Chain Modelling*, Vol. 8, No. 1, p.46, DOI: 10.1504/ijbpscm.2016.076000.

Mei, C. and Zhang, Q. (2011) 'Supply chain collaboration: impact on collaborative advantage and firm', *Journal of Operations Management*, Vol. 29, No. 3, pp.163–180.

Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D. and Zacharia, Z.G. (2001) 'Defining supply chain management', *Journal of Business Logistics*, Vol. 22, No. 2, pp.1–26.

Muhammad, D.A. Gunasekaran, A. and Subramanian, N. (2012) 'Critical barriers to implementing reverse logistics in the Chinese manufacturing sectors', *International Journal of Production Economics*, Vol. 147, No. 1, pp.460–471.

Mustafa, S. and Ahmed, S.S. (2015) 'Third party logistic (3PLPs): impact and challenges', *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, Version 3, July, Vol. 20, No. 7, pp.62–65.

Naylor, J.B., Naim, M.M. and Berry, D. (1999) 'Legality: integrating the lean and agile manufacturing paradigms in the total supply chain', *International Journal of Production Economics*, Vol. 62, Nos.1/2, pp.107–118.

Nidhra, S., Yanamadala, M., Afzal, W. and Torkar, R. (2013) 'Knowledge transfer challenges and mitigation strategies in global software development – a systematic literature review and industrial validation', *International Journal of Information Management*, Vol. 33, No. 2, pp.333–355.

Núñez-Carballosa, A. and Guitart-Tarrés, L. (2011) 'Third-party logistics providers in Spain', *Industrial Management and Data Systems*, Vol. 111, No. 8, pp.1156–1172, DOI: 10.1108/02635571111170749.

Perotti, S., Micheli, G.J. and Cagno, E. (2015) 'Motivations and barriers to the adoption of green supply chain practices among 3PLs', *International Journal of Logistics Systems and Management*, Vol. 20, No. 2, p.179, DOI: 10.1504/ijlsm.2015.067255.

Perotti, S., Zorzini, M., Cagno, E. and Micheli, G.J. (2012) 'Green supply chain practices and company performance: the case of 3PLs in Italy', *International Journal of Physical Distribution and Logistics Management*, Vol. 42, No. 7, pp.640–672, DOI: 10.1108/09600031211258138.

Pumpinyo, S. and Nitivattananon, V. (2014) 'Investigation of barriers and factors affecting the reverse logistics of waste management practice: a case study in Thailand', *Sustainability*, Vol. 6, No. 10, pp.7048–7062, DOI: 10.3390/su6107048.

Raja, I.S. and Muhammad, I. (2014) 'Levels and barriers to supply chain integration: a conceptual model of supply chain performance', *International Journal of Management Science and Business Administration*, Vol. 1, No. 1, pp.52–59.

Sahay, B.S. and Mohan, R. (2006a) '3PL practices: an Indian perspective', *International Journal of Physical Distribution and Logistics Management*, Vol. 36, No. 9, pp.666–689.

Sahay, B.S. and Mohan, R. (2006b) 'Managing 3PL relationships', *International Journal of Integrated Supply Management*, Vol. 2, Nos. 1/2, pp.69–90.

Selviaridis, K. and Martin, S. (2007) 'Third-party logistics: a literature review and research agenda', *The International Journal of Logistics Management*, Vol. 18 No. 1, pp.125–150, Emerald Group Publishing Limited 0957-4093, DOI: 10.1108/09574090710748207.

Sheu, J. and Talley, W.K. (2011) 'Green supply chain management: trends, challenges and solutions', *Transportation Research Part E: Logistics and Transportation Review*, Vol. 47, No. 6, pp.791–792, DOI: 10.1016/j.tre.2011.05.014.

Skjoett-Larsen, T. (2000) 'Third Party logistics from an inter-organizational point of view', *International Journal Of Physical Distribution and Logistics Management*, Vol. 30, No. 2, pp.112–127.

Soderoa, A.C., Rabinovich, E. and Sinha, R.K. (2013) 'Drivers and outcomes of open-standard inter-organizational information systems assimilation in high-technology supply chains', *Journal of Operations Management*, Vol. 31, No. 6, pp.330–334.

Tan, A.W.K., Yifei, Z., Zhang, D. and Hilmola, O. (2014) 'State of third-party logistics providers in China', *Industrial Management and Data Systems*, Vol. 114, No. 9 pp.1322–1343.

Unterkalmsteiner, M., Gorschek, T., Islam, A.M., Cheng, C.K., Permadi, R.B. and Feldt, R. (2012) 'Evaluation and measurement of software process improvement – a systematic literature review', *IEEE Transactions on Software Engineering*, Vol. 38, No. 2, pp.398–424.

Vishal, V.B., Nitin, P.B., Satiish, B.C. and Nishant, G.J. (2013) 'Third party logistical obstacles in manufacturing industries', *International Journal of Engineering Science and Innovative Technology*, Vol. 2, No. 3, pp.190–194.

Williams Jr., D.F. (2014) 'An investigation of the barriers to innovation and the factors necessary to overcome those barriers in third-party logistics service providers', *Electronic Theses and Dissertations*, pp.1152.

Yang, J. (2014a) 'Supply chain agility: securing performance for Chinese manufacturers', *International Journal of Production Economics*, Vol. 150, No. C, pp.104–113.

Yang, X. (2014b) 'Status of third party logistics – a comprehensive review', *Journal of Logistics Management*, Vol. 3, No. 1, pp.17–20.

Zajac, E.J. and Olsen, C.P. (1993) 'From transaction cost to transactional value analysis: implications for the study of the inter-organizational strategies', *Journal of Management Studies*, Vol. 30, pp.131–145.

Zhou, S. and Zhang, L. (2013) *Drivers and Barriers to Cold Chain Logistics in Chinese 3PL Companies: A Case Study on two Chinese 3PL Companies*, Master Thesis, Hogskolan University, pp.1–56.

Zhu, Q. and Geng, Y. (2013) 'Drivers and barriers to extended supply chain practices for energy saving and emission reduction among Chinese manufacturers', *Journal of Cleaner Production*, Vol. 40, pp.6–12, DOI: 10.1016/j.jclepro.2010.09.017.