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Published in: Adapting to the Future:
Carlos Jahn, Wolfgang Kersten and Christian M. Ringle (Eds.)
ISBN 978-3-754927-71-7, September 2021, epubli

Barriers to the implementation of 4PL in developing countries

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Purpose: *Fourth-Party Logistics (4PL) involves sharing non-core activities with an external service provider, which can bring about a variety of benefits for the outsourcer. However, there can be a variety of constraints identified from the mini-cases e.g., stagnant management, resistance to change, and a lack of knowledge. These barriers may have a greater weighting if the 4PL concept is implemented in an emerging economy. Therefore, it is crucial to identify which barriers are present for adopting 4PL in developing countries, and then to consider initiatives to overcome these.*

Methodology: *First, a literature review containing best practices of 4PL in countries across Asia and Europe is presented. Qualitative findings through a series of interviews with specialists were analysed, discussed, and compared with recommendations/existing practices from other developing countries, and then were cross-checked by a specialist using 4PL in Europe.*

Findings: *As a result of our interviews, we identified several managerial barriers in the implementation of the 4PL concept.*

Originality: *The literature review has shown that there is a lack of qualitative research regarding the use of 4PL in developing countries. Therefore, the impact of the results of this paper can be vital for academic knowledge.*

First received: 24. Apr 2021 *Revised: 29. Aug 2021* *Accepted: 31. Aug 2021*

1 Introduction

The last decade has demonstrated a growing tendency to use outsourcing logistics (Lieb and Bentz, 2005; Deepen et al., 2008; de Grahl, 2012) for a variety of reasons including: cost optimisation, adaptability and to improve profit margins (Aertsen, 1993; Langley et al., 2005). On the flow of the goods, services and data, the role of the Logistics Service Providers (LSP) is vital to connect the buyer and supplier in terms of fulfilling and delivering orders On Time and In Full (OTIF) (de Grahl, 2012).

However, the COVID pandemic has changed the way businesses operate, and may require a revision of concepts related to business optimization to allow organisations to focus on their core competencies. For example, Amazon tripled its profits employed 250,000 people in the third quarter of 2020 (Guardian, 2020). Sahin, et al., (2016) highlight that Third-Party Logistics (3PL) may not fulfil the technological and strategical needs of the supply chain network. Similarly, there are now many advanced, non-asset-based concepts such as Fourth-Party Logistics (4PL) providers available. Coined by Accenture, 4PL includes four main elements, architecture, intelligence, supply chain infomediary and resources (Christopher, 2016). Each element contains aspects and factors which play an essential role in the development of the integrated supply chain network, of how goods and services flow (Win, 2008; Fulconis et al., 2006). One of the 4PL success stories is Shell's collaboration with Accenture (2015). They reduced asset downtime caused by material constraints; optimised logistics costs around 25% through improved planning and use of facilities; lessen the safety coverage by reducing the routes of movements; and visualised processes to improve overall performance.

However, a variety of studies suggest that implementing 4PL in developing countries still faces comprehensive problems (Boyko et al, 2018; OECD, 2015; Guo, 2010; Qiuping, 2011; Guo-chen and Hai-peng, 2014; Kao et al., 2019; Xu, Wang and Long, 2019).

To help better understand these challenges, the authors looked to examples and cases in the available literature about existing economies currently using 4PL. These broad themes were then compared with actual responses from potential implementors of 4PL in an emerging economy, followed by a final validation interview with a 4PL specialist to help determine the applicability of the findings.

2 Research Methodology & Methods

The order in which the research activities were conducted, have also been replicated in this paper (Fig. 1). An adapted interpretive approach was used to guide the research. It uses qualitative data analysis to identify/define patterns that may be identified or reproduced in a variety of alternative settings (Collis and Hussey, 2003).

Figure 1: Research Process

First a thematic literature review was conducted in order to help guide and define the research and the authors guiding questions. Following the literature review, we proceeded to determine if the broad themes identified in the literature were applicable and/or relevant via by conducting semi-structured interviews with experienced managers and procurement/logistics specialists in potential users of 4PL in an emerging country.

A mixed analysis was carried on responses to further understand the nature of the opinions of the specialist (Vaismoradi, et al., 2013). The data was analysed by qualifying and quantifying, then triangulated with the patterns from the mini-cases in the literature review.

3 Review of thematic literature

Outsourcing logistics is the strategic utilisation of third-party services to accomplish and control the non-core activities of a company (Rushton and Walker, 2007). Rinsler (2010) describes outsourcing as an intentional sharing of the business processes with an external party that manages these activities on behalf of a company. Godsmark and Richards (2020) explain it as identifying the duty which is not a core activity and using an

efficient and cost-effective specialist. Generally, these functions regard IT (Bourlakis and Bourlakis, 2005), warehouse, supply chain network (Zailani et al., 2017) and services of a parent company and by no means a renunciation of their responsibilities.

3.1 The definitions and differences

As shown in Fig. 2, providers are divided into different categories such as 3PL, 4PL, etc., (Godsmark and Richards, 2020). The main difference between the 3PL and 4PL is that the latter is the virtual provider of services which can unite several organisations, even 3PLs.

In 1996, Accenture (2020) had coined the 4PL term to meet the need of the US clients of LSPs, with the definition:

'A supply chain integrator that assembles and manages the resources, capabilities and technology of its organisation with those of complementary service providers to deliver a comprehensive supply chain solution' (Accenture, 2020).

It was updated by Saglietto (2013) as sovereign firms which aimed 'to design, organise and coordinate the client's entire logistics, documentary and regulatory chains'—also known as a Supply-Chain-as-a-Service (SCaaS) (Leukel et al, 2011).

Existing LSPs identify 4PL as a non-asset-based provider. Gattorna (2003) argues that the ownership of assets does not matter; productivity does. They pointed out that 3PL can be part of a 4PL network or vice versa. Large 3PL companies can set up a 4PL itself for enhancing opportunities. Gattorna (2003) highlights that 'technology' is the crucial difference between the 3PL and 4PL, regarding the capabilities of the latter. Hosie, et al. (2012) contradicts Gattorna (2003), suggesting 'non-assets' are a fundamental aspect of 4PL and adding that neutrality in a selection of shippers is also a crucial feature.

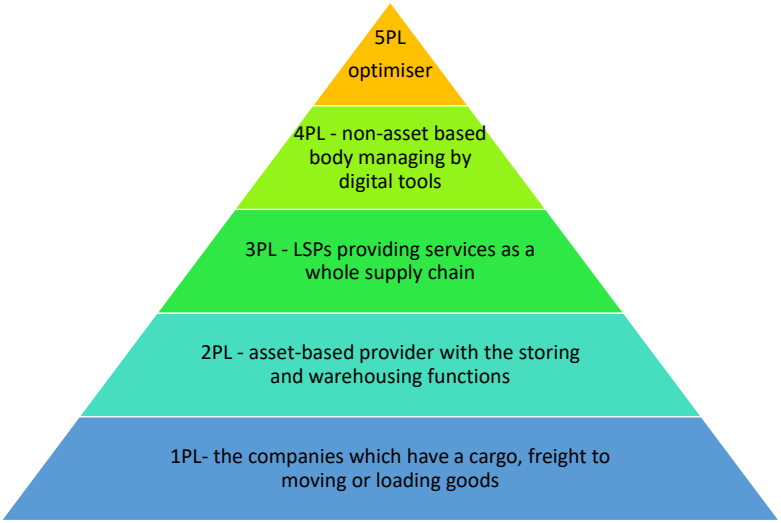

Figure 2: The hierarchy of LSPs. Sources: (GEFCO, 2020; John Good Logistics, 2020; Chetak Logistics, 2015)

The 4PLs can integrate a wide range of participants providing IT solutions and platforms for developing business in a win-win situation. For example, one of the successful firms in Europe, 4PL Central Station, provides sustainable optimisation of logistics operations by consulting, analysing, and coaching. They are promising up to 23% savings on planning, 8-10% on transparent e-procurement process and around 22% on operating transportation and cost management and 10% on the data control (4PL Central Station, 2020).

3.2 Reasons and barriers

There are a variety of reasons for outsourcing logistics in terms of warehousing, procurement, and vehicle costs, etc. Developing countries can have an advantage from using LSPs, through their vast investment and infrastructural influences on purchasing and delivering. For example, Romanian small and medium-sized enterprises (SME) are

working on these aspects to become more profitable and efficient (Fulconis and Paché, 2018). However, they can also be affected negatively by the risks of control and private variable incomes (Kherbach and Mocan, 2016).

In terms of outsourcing IT-based platforms, despite the time differences of about a decade, studies show that there might be a hidden cost that can lessen the gains from outsourcing (Reitzig and Wagner, 2010; Barthélemy, 2001). Some studies show that pricing of LSPs has become a vital aspect of the selection of the 3PL provider (Langley et al., 2005). In contrast to previous users which may have been chosen by value-adding activities and reductions of lead times (Fernie, 1999).

The barriers of outsourcing logistics can be a lack of trust and perceived delivery delays due to overlapping management. It can be a corporate view that unique goods and services should not be shared with external services. Kremic, et al., (2006) highlight unrealised savings, low supplier sourcing, environmental and uncertain external factors and workforce issues are some of the barriers. Some studies emphasise the risks of outsourcing logistics for the buyer-supplier relationship (Tsai et al., 2012). The authors conclude that the threat from the unsuccessful relationship can deteriorate both asset and capability risk.

Conversely, risks are associated with assets, when a company is worried about priceless specific assets such as strategic personnel and IT capabilities. Most of these risks are summarised as the 'seven deadly sins of outsourcing' by Barthélemy and Adsit (2003): (1) outsourcing actions what you need to do in-house; (2) choose a wrong partner; (3) do not work out the terms of the contract; (4) overlooking staff issues; (5) lose control over subcontracted actions; (6) underestimate the full cost of outsourcing; (7) do not prepare an "exit strategy". Such failures often do not occur, as companies are reluctant to report such results.

To mitigate risks on the outsourcing logistics Wang et al., (2003) propose measures in which the results of outsourced logistics work eliminate asymmetric data exchange, introduce appropriate performance tactics and develop customer relationship management. Rinsler (2010) highlighted that before deciding on outsourcing, the board should have a SWOT analysis or any other examination to identify any weaknesses and strengths. There should be comparisons on the competitors' capability and the LSPs

distribution network on agility, profitability, and opportunity to strengthen the business. There are risks of dependability on the LSP and responsibility on the top management of a company.

However, a company can work from any place in the world, thus identifying the challenges by countries seems more appropriate. Our three mini-cases were chosen from three countries that have vital routes on the international logistics network and are trying to develop the distribution of goods and services.

4 Mini cases

4.1 Country A

Boyko, et al., (2018) state that the logistics outsourcing share in Country A is around 20% due to a lack of infrastructure and trust in external providers. Similarly, Kim (2019) found that the need to share trade secrets is a major barrier and emphasises that increased electronic sales and transnational trade play an essential role. Karhova (2019) suggests that Country A's companies prefer the current economy, using direct storage and transportation costs. This view is supported by the ex-CEO of Itella, preferring local logistics, and perhaps not being aware of the costs of having a warehouse and fleet (Grinberg, 2015). It has been argued even small companies use mini-trucks and drivers instead of outsourcing logistics. This kind of small organization is often without any warehouse management system and often do not worry about storage conditions. In Country A, the majority of active 3PLs and 4PLs are joint ventures with international LSPs. They operate in terms of high competition, sensitivity to logistics efficiency and cost optimisation.

Despite the high cost of conversion (Khalyn, 2018) and the reluctance to delegate core functions to third parties; There are prerequisites for the development of 4PL in Country A, such as a fast-growing warehouse and distribution network; sales and investments from foreign LSPs; access to a highly qualified employee in local companies (Boyko et al., 2018). Kim (2019) adds due to the import of goods and following the labelling requirements of the Eurasian Economic Union (EAEU); it is actually more effective to use

LSPs services due to additional administrative processes. Other essential aspects include seasonality and lack of traffic transmission to and from the European Union (EU) according to bilateral and multilateral treaties. Due to the annual reduction of cargo traffic quotas for non-EU countries, the throughput of 4PLs from the EU may be the solution to this problem (Blogactiv, 2019). Kim (2019) recognize the importance of the 4PL in the optimisation of logistics in Country A, but it requires time to build trust between the buyer and the 4PL operator. The development of logistics in Country A depends on the geographical length of the territory, which can be solved by delivering goods to regional Distribution Centres (DC) (Khalyn, 2018). According to Khalyn (2018), the effectiveness of the supply chain is related to the innovative components of storing, handling and transporting services. However, new logistics solutions are not fully adapted to Country A's realities in the regions.

4.2 Country B

In 2005, Aktas and Ulengin published a paper in which they described that the firms underestimated outsourcing logistics and the 3PL services were classified under transportation (Aktas and Ulengin, 2005) There are a variety of factors such as delivering damage-free items, distribution security, OTIF delivery, reputation, quick response, etc., that affect the choice of the 3PL provider. Aktas and Ulengin (2005) concluded that despite understanding the factors for outsourcing logistics in Country B, development is still in its initial stages.

Investment Support and Promotion Agency (ISPAT, 2013) states that Country B is building logistics villages that can assist in lower-cost transportation. Though the quality of highways can vary in comparison to other countries, thus affecting the price of logistics (Gencer, 2019). The Government is investing heavily in creating logistics corridors for international logistics, and it is expected that by 2023, $500 billion worth of cargo will be transported in these centres (ISPAT, 2013). To decrease the logistics costs and dependence on road transportation, investments in the railways is being encouraged and the Government has liberalised the rail transport system (OECD, 2015). Consequently, it can be attractive for international LSPs to invest in infrastructure and create effective 4PL services.

On the other hand, leading foreign LSPs are concerned about cargo safety due to growing political issues such as sanctions (Gencer, 2019). Therefore, according to an Agency in the early 2010s, there were just a few 4PL companies and no 5PL companies, and it did not change in 2018 (Kalkan and Aydin, 2018).

4.3 Country C

Almost all of the studies considered in this case mention that the development of 4PL in Country C is related to e-commerce. Demand for timely deliveries and cross-border operations have challenged asset-based LSPs to enhance their ability with IT solutions (Kao et al., 2019). Local 3PL companies often cannot afford to have an air fleet; therefore, they must outsource these kinds of cross-border express deliveries.

Guo (2010) lists the obstacles and risks that challenged the development of 4PL in Country C such the essence of trust and checking contracts . Kao, et al., (2019) state that the 3PL is comparatively more established than 4PL, which still is not popular among numerous LSPs. Thus, a transition strategy from 3PL to 4PL is vital for these enterprises. Most of the shortcomings in the 4PL formation process are similar to the problems identified earlier.

Tan (2009) illustrates the global logistics problem in Country C with several factors. First, it is the simple and non-value-adding services and logistics capabilities of local enterprises and their supply chain network. Thus, they cannot satisfy the need of the manufacturers and transnational companies. In Country C, there are few alliances between supply chains, which leads to a limited selection of international LSPs with a full range of services. As a relatively new phenomenon, there is a shortage of specialists with a background in outsourcing logistics by IT solutions.

Kao, et al., (2019) offer several steps to identify Country C's 3PL capabilities for 4PL conversion, such as classifying the skills, determining beneficial and deteriorating aspects, seeking advanced principles, and making strategies based on previous actions.

4.4 Focal Economy

Raimbekov, et al., (2016b) documents the increase of freight flow through Kazakhstan, though there is no rise in the use of LSPs services. Transport companies are still operating on their own due to high tariffs and a lack of capacity. In 2012, the Union of Kazakhstan transport workers “KAZLOGISTICS”, predicted it would jump from 86th to 40th amongst the Custom Unions. However, in 2018 it is ranked at 77th providing plenty of scope for improvement (Arvis et al., 2018). Only a few subsidiaries of the foreign LSPs can provide comprehensive logistics services.

One of the main reasons for this might be due to the low density of the population and irregular DCs in the country. Warehouse and logistics hubs are located near big cities such as Nur-Sultan and Almaty. Also, the length of destinations between the regions is can be more than 3,000 kilometres, and the routes are often not directly connected between areas. Raimbekov, et al. (2016a) divide the possible development of logistics hubs by regions because of the specific scope of the regional economies.

There is some evidence to suggest that despite more businesses interests using platforms like ERP, WMS, etc., the Kazakhstani logistics sphere is far from understanding the benefits of logistics novelties. For example, the subsidiary of DPD in Kazakhstan provides a full range of 3PL services and aims to cover demand from e-commerce distribution. DPD's aim is to keep a balance between cost and speed, as well as to encourage e-commerce, and to reduce the reliance of in-house delivery departments by replacing them with outsourcing logistics (Forbes Kazakhstan, 2013). Surveys have shown that 34% of respondents highlight the high cost of LSP services (Syzdykbayeva et al., 2019). About 19% of respondents want to understand the nature of these costs, and 16% indicated the absence of a cargo control system. As for the improvement, 25% of specialists see it in building infrastructure, and only 5% of respondents emphasized the quality of logistics services (Syzdykbayeva et al., 2019).

Raimbekov, et al. (2016a) suggest that the Government should treat infrastructural development as the primary driver of the economy. Later in 2018, Raimbekov et al. (2018) add that for the development of logistics, the country should use an integrated approach to enhance international trade as the bridge between China and Europe.

Syzdykbayeva, et al. (2019) list some activities which can advance logistics hubs such as, creating regional freight handling and storing logistics centres; the integration transportation capabilities of the freight forwarding companies; ‘creating a unified organizational, legal, informational, technical and technological base for relations between transport infrastructure services and market structures involved in the transport process. By reducing logistics costs and customs fees, regulating the legal framework in industry and training employees to use high-effective technologies, the country can increase the effectiveness of the logistics and consequently it may attract the implementation of 4PL companies.

Table 1. The comparison of the implementation of 4PL in different countries. Sources: (Khalyn, 2018; Aktas and Ulengin, 2005; Grinberg, 2015; Boyko et al., 2018; Kalkan and Aydin, 2018; ISPAT, 2013; Karhova, 2019; Xu et al., 2019; Guo-chen and Hai-peng, 2014; Kao et al., 2019; Guo, 2010)

	Country A	**Country B**	**Country C**
Prerequisites	- Development - E-commerce - Traffic	- Incentives - Workforce	- E-commerce - Infrastructure - Traffic
Barriers	- Trust - Infrastructure - Cost	- Underestimation	- Trust - Infrastructure
Recommendations	- Training - Investment	- Investment - Transparency	- Integration. - Investment - Training

5 Empirical Research: Description, Analysis and Synthesis

5.1 Structured Interviews: Findings and analyses

Data obtained from semi-structured interviews was then compared with the findings

from literature and mini-cases to identify/confirm 4PL barriers. It was also important to understand the pre-requisites in the Kazakhstani market for the implementation of 4PL. The respondents provided qualified data on their experiences which can help to understand the absence of the 4PL concept in Kazakhstan. The results of the interview with a 4PL specialist are also provided.

5.1.1 Barriers to making managerial and business decisions in Kazakhstan

One of the significant, obstacles to the introduction of 4PL in Kazakhstan is the lack of knowledge amongst managers, specialists, and businesses about the 4PL concept. Even skilful participants of the interviews found it difficult to answer about the presence of 4PL.

One of the problems is that companies with established managers are unlikely to be willing to change their approach for innovation and tend to rely on middle management to make decisions. In this case, middle managers who are unfamiliar with the 4PL concept are unlikely to help advise and apply this tool in the company. In a broader meaning, it can relate to the shortage of specialists and lack of experience of local LSPs. The need for supply chain managers was apparent in some of the interviews (GM2, PM2, LM1). PM2 states that it may be due to a lack of supply chain management programmes in universities, and perhaps, be solved by the valuable graduates.

From this point, another barrier appears which is the lack of experience available and limited time to develop it. In turn, it is about the background of the local companies which cannot easily sign a long-term contract with the big companies in Kazakhstan, which usually are joint ventures with foreign investors. In such conditions, on the freight forwarder selection process, they will prefer to have an agreement with the supplier with high expertise.

- *'To do 4PL activities, Kazakh companies… Still do not have a proper relationship, and accordingly, they did not have experience. But to work it out, you need enough time.' [GM1]*

PM2 assumes that if the first company implements 4PL in Kazakhstan, it will most likely be significant oil and gas companies; and GM1 stated that such large subsoil users value

reputation and experience. The scale and reputation are a matter.

- *'In such large projects, the risk should be relatively minimal, precisely in terms of the delivery risks. Reputation for companies is quite a challenging thing'. [GM1]*

It is possible to hypothesise that these conditions are less likely to occur in local companies in such a short period. The tender procedures often include the requirement of about 10-15 years of experience as said by GM1. Hence, another issue related to experience is trust and reputation. Trust as a barrier appeared in conversations regarding the data security of the businesses. Consequently, it is also associated with technological barriers such as IT integrations and the use of ERP systems.

5.1.2 Validation Interview with 4PL Specialist

As emphasised by a qualified 4PL specialist (GSM1), if a company wants to outsource its logistics and other functions, it should trust the LSP. It is a critical process, and trust is the basis of the 4PL concept, and without it, nothing can be done.

- *'You need to trust; you are part of the dependency, and that's a risk. Right? So, if you are not ready to take that, even though gain other benefits, so, you are not going there'. [GSM1]*

It is a clear view of the GSM1, and the opinions of Kazakh employees shows some of the contrast in the approaches between the two.

- *'Such purchases are usually not given, it is, a trade secret'. [PM1]*

A possible explanation for these results may be due to the lack of good collaboration of expertise and essential requirements of the company regarding data protection. Despite this, some companies can select suppliers through comprehensive processes and logically, these suppliers have a trustworthy reputation.

Transparency, which is another barrier, is one of the critical aspects of the 4PL concept. As stated in GSM1, it is the most crucial issue, showing the whole buying and supplying procedures transparently and crystal clear for the stakeholders. It is a foundation of the trust and buyer-supplier relationship.

- *'So, don't hide any margins or something, anywhere and try to, and this is what a 4PL is doing. Right. You bring transparency to the supply chain. And with that*

transparency, we can have open discussions on issues, improvement, which helps to stabilise the global business partnership'. [GSM1]

That is transparency. According to GSM1, it can be higher if the companies outsource their functions to 4PL companies; however, not all participants agree with it. For example, GM2 thinks that transparency from outsourcing can be a double-edged sword that can harm the quality of the services or goods, due to the price. The large-scaled LSP can take a massive discount from the original manufacturers and bring the customer the best prices. It does not seem a natural barrier to implement the 4PL concept in Kazakhstan; however, just started local LSPs might not offer such kind of benefits. PM2 adds that there are no large LSPs that can provide a full type of services and big-scale players who would be the primary customer in Kazakhstan. Thus, the volume and scale of customers and suppliers are likely to become barriers.

GSM1 also emphasises that neutrality is a keystone of the 4PL concept.

- *'We have a concept of being a complete neutral 4PL, which means we don't have any financial or physical relations to any 3PL or carrier. In our commercial model, as we get to get a service fee for what we are doing, we don't put any margins on transport, which enables us to be transparent to a client'. [GSM1]*

5.2 Empirical Research: Discussion

5.2.1 Triangulation with literature, cases, and interviews.

First and foremost, the lack of trust and data-sharing process was highlighted as the main barrier for Country A and Country C (Guo, 2010). The result of a survey piloted by Syzdykbayeva, et al. (2019) also shows the worries of Kazakh manufacturing specialists about the unclear pricing policy of the LSPs which does not add further trust in the relationship. The respondents also agree that the lack of trust between partners is one of the most difficult barriers in using 4PL. Surprisingly, there is no information about trust as a barrier in Country B. Unethical supplier selection process and lobbying is also a challenge in some territories around the globe (Guo, 2010). It is consistent with the interviewees' opinion that a biased choice of the customers cannot guarantee the transparency of the purchases.

Second, the studies highlighted the outdated infrastructure and the shortage of capabilities to fulfil the flow of international freight. Boyko, et al., (2018) suggest that the small share of the outsourcing logistics explains the lack of infrastructure. Khalyn (2018) adds that there is an issue about the length of the country which can play a significant role in the implementation of 4PL in Country A. Gencer (2019) believes that the condition of the roads in Country B can impact the pricing of logistics. Despite the massive investments in the economy in Country C, Tan (2009) claims that the basic local LSPs and shortage of facilities lead businesses to choose international LSPs. These factors also exist in Kazakhstan, visible through the intermodal and multifunctional transport systems and outdated techniques (Syzdykbayeva et al., 2019)

Another important finding was the willingness of companies to apply IT solutions. As has been proved by analyses of findings the IT integration level of SMEs is far away from ideal in Kazakhstan; there are only big companies correctly utilising Enterprise Resource Planning (ERP).

The shortage of qualified specialists is an important barrier preventing the development of outsourcing logistics. Like Country A (Karhova, 2019), companies in developing economies may be reluctant to invest in IT solutions.

5.2.2 Recommendations

The barriers at the managerial level can be addressed by activities within the company. The obstacles in the application of the 4PL concept such as unfamiliarity and shortage of specific specialists show the lack of knowledge present (see Table I). Thus, one solution is to hire well-trained and competent people (GSM1). However, due to the lack of such specialists in the country, there are also proposals to invest in the knowledge of employees, their training and popularisation (GM2). Moreover, Tan (2009) suggests developing talent management by creating collaborations between manufacturers and universities.

Most barriers to implement 4PL are cross-linked and have mutual dependence; thus, enhancing the trust and transparency of the local companies depends on each other (see Table I). Without trust, experience is hard to attain, which is vital for the tender procedures. To trust each other supplier selection process should be thoroughly and with the in-depth market, analyses to understand the capabilities of the stakeholders (GSM1). As stated by Baily et al., (2008) supplier selection process is not just choosing the right supplier; it is about the collaboration with existing and potential suppliers in the market. The advancement of mutual dependence and trust allows for further optimisation of logistics cost and expertise (Tan, 2009).

Furthermore, the managers should be better informed by detailed guidelines and be made aware of the effectiveness of the 4PL concept. Transparency of the procurement process is vital and will require considerable work in some territories around the world. Ineffective management is also a significant obstacle on all levels of governance and management as stated by the specialists. It can be mitigated by minimising the tender procedures with the one-source supplier selections procedure.

There is always a risk of meeting an unscrupulous supplier who is trying to mislead the buyer through non-compliance with deadlines and lower quality of services and goods (GSM1). However, creating a strategic document as a Code of Conduct and standards for both suppliers and the staff may mitigate the unethical consequences of the sourcing. The transparency of the shipment should be followed by the tracking technologies (GSM1) and allow customers to see the process holistically.

In terms of barriers related to technology, which is an important element of the 4PL concept, can be caused by a lack of IT solutions and database integration. The implementation of business processes optimisation software as ERP is dependent on the willingness of the managers to invest in such tools. Thus, one recommendation is to apply IT solutions such as ERP, SAP, and TMS (GSM1). Managers can be trained about the need to invest in a comprehensive tool instead of using limited software such as 1C. While the cost of technologies can be another barrier, the trade-off is with improved future optimisations and benefits in warehouse management and transport fleet (Grinberg, 2015). There is a connection with the training scheme above as there will be a need for specialists with IT backgrounds (Tan, 2009); thus, it might be beneficial to hire or train more versatile specialists (GSM1). The findings can help researchers to set up a baseline regarding the prerequisites and barriers of outsourcing logistics.

5.2.3 Research limitations

This study only examined responses from the oil and gas sector. Though, the first probably users of 4PL will most likely be subsoil users. The recommendations above are intended to help to prepare businesses and authorities to be aware of the relevant decision-making processes needed to be to make effective decisions to help outsource activities.

6 Conclusion

This paper aimed to identify possible barriers to introducing 4PL in developing economies and to establish a set of recommendations on first using 4PL. Due to the vast scope of the work, we have listed points directed to managers in business.

First, organisations need to maintain or increase employee training and knowledge attainment (also at managerial levels), which can be a good start in preparing the foundation for 4PL implementation. Training and acquiring further knowledge through collaborations between manufacturers and universities is also recommended. Certification by professional bodies is widely welcomed.

Second, companies should be encouraged to increase the transparency in their procurement processes via ethical supplier selection. For this purpose, they can create strategic documents such as the Code of Conduct and Corporate Social Responsibility, plan of actions and processes for the whole supply chain network.

Thirdly, investing in the technologies and solutions such as ERP and TMS. Using IT specialists who can integrate and digitalise a system will be hugely beneficial. Especially when applying traceable technologies to the logistics functions in supply chains.

These recommendations do not have clear-cut boundaries and may not be fully addressed by the management of a company alone. Government initiatives can also help to accelerate the implementation of 4PL in emerging economies. One of our aims in this research was to encourage further consultation of the items we have raised, potentially as a checklist for analysing the readiness of the business to outsource their activities in emerging economies.

Acknowledgements

The authors would like to thank WMG, at the University of Warwick for their support and willingness to publish this paper.

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