

Relationship between 4PL providers and carriers: A tale of a love-hate relationship

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Introduction

Companies are restructuring their business practices to facilitate 'mass customisation' processes ultimately in the pursuit of sustainable competitive advantage (Capineri et al., 2006). In fact, customers are 'co-creating' value across the supply chain through phenomenon such as 'omni-channel revolution' (Christopher, 2016) by contribution in information, research and innovation. Linked this trend, 'Fourth Party Logistics' (4PL) emerged as the new paradigm to deliver greater value to the customer by providing comprehensive end-to-end SC solutions (Christopher and Holweg, 2011).

The customer driven market environments are erratic in nature (Angkiriwang et al., 2014). These fluctuations are countered using flexible mechanisms (Seebacher and Winkler, 2013). Though 4PL provides these advanced mechanisms, it can only be achieved by 'effective collaboration' (Balcik et al., 2010). 4PLs ought to act in co-ordination with different operations to ensure stability in a relationship and not be simply just another operating agent (Audy et al., 2012). Although there is a plethora of literature around 'what a 4PL should do?' and the 'rules of 4PL', little is published on the complexities in a 4PL relationship. Indeed, the abundant literature focuses on partnerships purely as a medium to reduce costs and very little can be found in 4PL and carrier synergistic collaboration (Vivaldini et al., 2008). Papadapoulou et al (2013) proved that 4PLs have failed to execute effective carrier selection templates. This study attempts to add value to the literature by answering the following research questions:

- RQ1: What factors should be considered before a 4PL embarks on a partnership with carriers?
- RQ2: What are the challenges involved in a 4PL relationship with carriers in obtaining and forwarding positive results to its customers in the supply chain?
- RQ3: What type of flexibility do 4PLs establish with their carriers to construct a successful partnership?

This paper attempts to contribute by addressing this gap and aims to develop a 4PL collaboration model with carriers through the application of a longitudinal case study is conducted, in a leading 4PL located in Milton Keynes, UK. This 'Company Y' operates in 16 European countries with 400 facilities. The paper proceeds with a review of relevant literature followed by the methodology section. Subsequently, the findings are presented and the main highlights of the study are discussed in the conclusions section.

4PL literature – gaps and opportunities

4PL is a non-asset based logistics provider which engages in value creation by leveraging the resources of partners. 4PLs can enable vertical and horizontal collaboration across supply chains and markets to achieve 'synergistic collaboration' (Sanchez Rodrigues et al., 2015). 4PL serves a 'one stop hub' to provide value-added supply chain solutions to all its participants which on one hand requires close cooperation with the 3PLs and at the same time needs a trusted relationship with the customer (Fairchild, 2016). The typology adapted from Hingley et al. (2011) offers a methodological process for 4PL to determine the nature of service offering via the type of collaboration (X-axis) while suggesting enhanced value for the customer (Y-axis). The types of relationships 4PL can offer are:

- Type I – Non-critical relationships: 'transactional oriented' and is a low value adding, which includes sub-contractors in providing informational advantages from the ground
- Type II - 'lean flow' – 3PLs providing process efficiency improvements
- Type III – 'agility' – provision of flexibility to response to uncertainty

- Type IV – ‘leagile’: common industry innovators providing mass customised and highly resilient logistics Critical Success Factors in a Logistical relationship

Appendix 1 summarises the critical success factors for an effective logistics collaboration from SC literature starting 2007 to present (2016). It is seen that the most important factors for a successful SC collaboration are Information sharing & IT systems, Trust and Commitment, Sharing Resources and Risks along with Innovation initiatives, followed by Service differentiation/Flexibility, the need for Goal alignment and finally, Costs and Investments.

Conceptual Framework

A study conducted by Naesens et al (2007) suggested that lack of strategic support framework is one of the key challenges in an effective collaboration, while Matopoulos et al (2007) called for a more nuanced understanding of the SC because of the multiple elements that interact with each other. In retrospect, a systematic procedure has been drawn to analyse the depth of the 4PL relationships in accordance with Ye and Wu (2015) i.e. the key variables for a 4PL partnership should be deciphered and evaluated with respect to different suppliers. Hence, a multi-criteria decision making framework is proposed to identify the most suitable relationship model tailored that reflects the true relationship of cause and effect based on the factors described in Figure 2. Further, the sub-criteria need to be identified that may support root cause analysis and initiate surgical intervention. Therefore, a model is developed (Figure 5) as a mediation for 4PL collaboration with the carriers which will form a base for a critical evaluation.

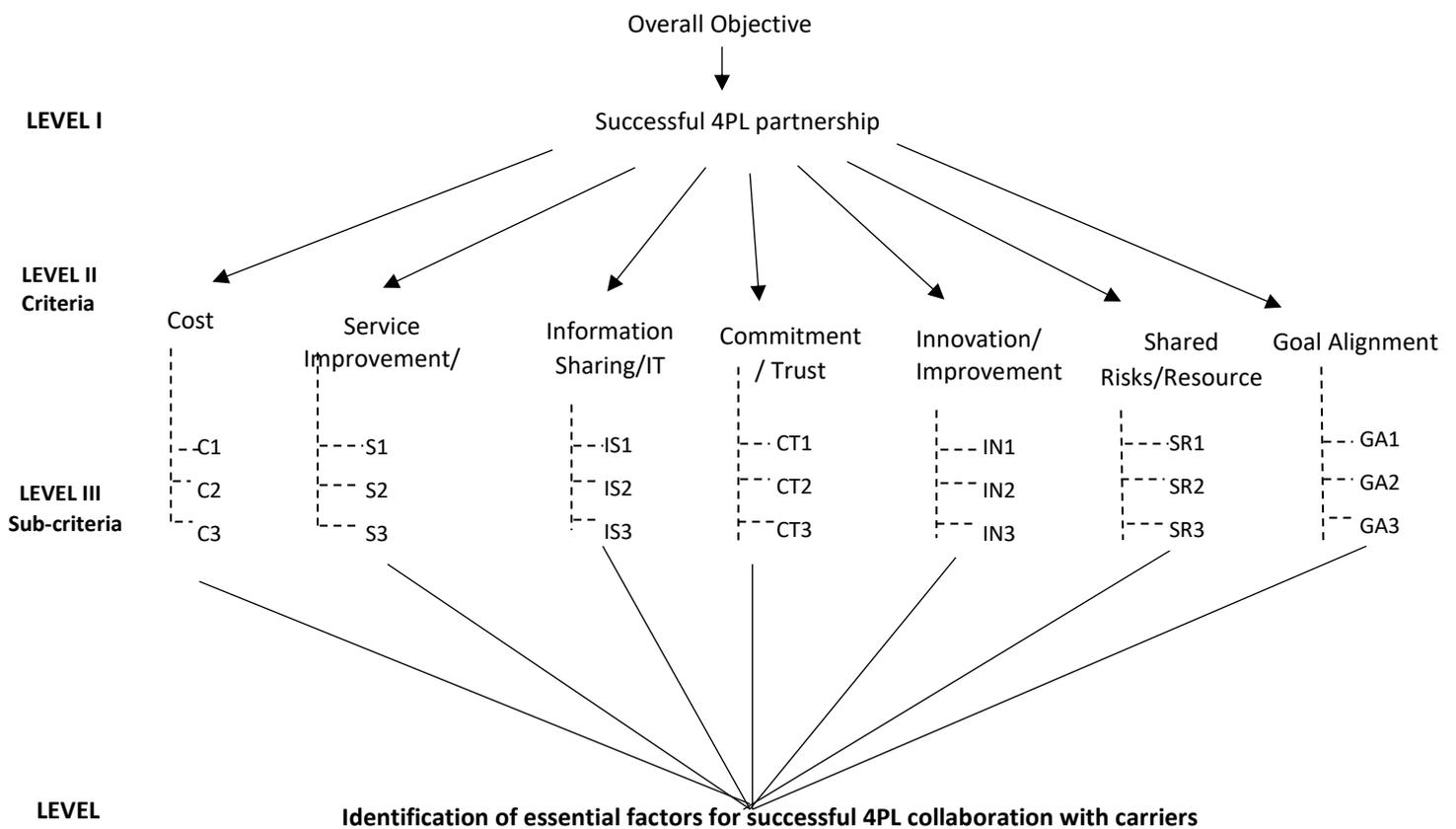


Figure 5 - Proposed Conceptual Framework for evaluating factors for successful 4PL collaboration

Methodology

The case study of a leading 4PL (named Company Y) based in the UK is chosen. Company Y has 60 years’ experience in the industry with 475 offices worldwide. It is currently involved in liaising with a leading pharma client for 16 European countries. According to Yin (2009), a case study approach is a systematic

research tool that allows an in-depth and a thorough examination of the subject for a fair production of analytical conclusions. Further, within the main case study, multiple embedded case studies of the individual carriers were carried out across three phases to provide a holistic and a detailed picture of the organisational culture and strategy (Yin, 2009). Phase 1 included pilot study with a focus group of 10 respondents from company Y. In Phase 2, the semi-structured telephonic interviews were conducted with company Y and its 4 European In-market secondary distribution carriers across three countries (Germany, France and Italy) over a period of 4 weeks. In Phase 3 follow-up interview, the themes identified from Phase 1 and 2 were cross-checked with company Y. The interviews lasted between 45 minutes to 2 hours. The details of the data collection are seen in Table 2.

Findings gathered from the study

In analysing the data, we could identify 28 sub-criteria under the main criteria initially identified in Chapter 2. Besides the main factors such as Sharing Risks/Resources, Information Systems, Innovation, Service Improvement/Flexibility, Commitment & Trust, Goal orientation and Cost, other key factors such as Power Asymmetry and Role Ambiguity caused due to the carrier's previous or existing relationship with the customer were identified as summarised in Table 4. Further, the mechanisms identified for each factor will be further outlined in detail.

Outset consideration factors: Synergies and Mismatches

The major area of concern was the 'Information Sharing' cluster. Carrier F1 points that the opaqueness of the contracts and the confidentiality of the key timelines between Y and the customer was the main issue. Further, carrier G thinks that "they [company Y] sometimes want to know more things than we can provide". Moreover, in 'sharing risks and resources', the biggest challenge according to F1, was to share with the Y the main picture of the activities. On the other hand, there was a good level of cohesive decision-making especially for carriers like G, I and F2. Further, Carriers G and F1 were seen having problems in 'trusting' company Y. F1 believes that the Y becomes a competitor when F1 gets in direct contact with the customers. In the case of G1, it was seen that there is no mutual trust mainly because of the loose accountability structure.

In terms of Service and flexibility the best case was Carrier I which provided a tailored service for company Y. Carrier F2 and G shared high levels of service exchange with Y, though it was not 'dedicated' specifically for a single customer. Also, it was commonly seen that some carriers (F1, G) expressed problems with the sub-contractor service. Innovation and continuous improvement is significant for a 4PL sustenance. Positively, all the carriers were involved in various innovation initiatives such as renewable energy (G, F2, G) green solutions (F2, G) temperature control designs (F1) and GPS systems (I, G). However, when it came to 'continuous improvement' few carriers (G, F2 and F1) believed there were no significant improvements at all. In fact, F2 stated that their main job is the depository business and therefore finds no difference. 4PL and carriers work for a common goal i.e. customer. However, the response from F1 was not convincing and in fact, emphasised the need for "alignment" 13 times during the whole interview. Whereas, Carrier I and F2 showed high levels of goal alignment and dedication towards Y. Lastly, all carriers preferred quality over cost. It was seen that most of the carriers subjected to cross docking consolidation mechanisms to reduce cost. However, F1 points that the industry best practices regarding costs and quality consolidation needs to be shared amongst the stakeholders which is lacking.

The interview with company Y showed that there was a gap in terms of support and proactivity from the side of the carriers. It was identified that factors like 'carrier relationship with the customer' played a cascading effect on the existing mutual relationship between Y and carriers. This means that such "triangular" relationships lead to loss of role clarity. Moreover, in few cases, (Carrier F1 and I) it was found that this factor led to a 'Power Asymmetry' which was a potential hindrance for an effective collaboration. It was found that in some cases, Y hits a "brick wall" with the carriers. Further, F1 expects Y to be more visible with the information while G is hesitant to leverage excess information to Y.

<i>Outset Consideration Factors</i>	<i>Carrier G</i>	<i>Carrier I</i>	<i>Carrier F1</i>	<i>Carrier F2</i>
Sharing Risks/Resources				
Risk handling	Green	Green	Green	Green
Joint Problem Solving	Green	Green	Red	Green
Sharing concerns	Green	White	Red	White
Meeting Frequency	White	White	Red	Green
Information Systems				
Information sharing	Red	Green	Red	Green
Culture & Personality	Yellow	White	White	Red
Communication	Red	Red	Red	Green
Reporting Structure	Yellow	Green	Red	White
IT	Yellow	Green	Green	White
Innovation				
Initiatives	Green	Green	Green	Green
Sustainability	Green	Green	Green	Green
Continuous Improvement	Red	Green	Red	Yellow
Service Quality				
Service Improvement	Green	Red	Red	White
Flexibility/Reverse Logistics	Green	Green	Green	Green
Dedicated Service	Yellow	Green	Green	White
Subcontractor Management	Yellow	Yellow	Yellow	Yellow
Commitment & Trust				
Trust/Openness	Red	Green	Red	Green
Transparency	Green	Green	Red	White
Visibility	Red	Green	Red	White
Commitment	Yellow	Green	Yellow	White
Competitiveness	Green	Green	Yellow	Green
Goal orientation				
Goal/objective alignment	Yellow	Green	Red	Yellow
Cost				
Investment	Yellow	White	White	White
Cost Control	Green	Yellow	Yellow	White
Others				
Management Involvement	Yellow	Green	Green	Green
Legal & Compliance	Green	Green	Yellow	Yellow
Power Balance	Green	Yellow	Red	White
Role Ambiguity (relationship with customer)	Red	Green	Red	Yellow
		Best case	Worst case	

4PL -carrier collaboration

Outset Consideration factors = 7
Sub-themes (categories) = 28

No concern → Synergies
 Little concern
 Grave concern
 No mention

} → Mismatches & Challenges

Table 4 - Key areas of synergies, mismatches & challenges between the Company Y (4PL) and the carriers

To summarise, there were few strengths in the relationship such as 'Innovation' and 'Service' clusters, whereas the main weaknesses were in the 'Information', 'Trust' and 'Sharing' clusters. 'Cost' received a tepid response whereas the explanations in 'goal alignment' cluster were not convincing. The challenges were mainly due to 'Other factors' that were identified such as 'Role ambiguity' and 'Power Imbalance' which rose because of carriers' relationship with the customer. These factors had a direct effect on having a flexible relationship which was least for F1, moderate for G and the highest for I and F2.

Conclusions

The research contributes to the literature by determining the factors necessary before 4PL embarks on a partnership with carriers, thereby answering the gap earlier pointed by Papadapoulou et al (2013). It can be concluded that Trust and Commitment is the most important factor in a relationship between 4PL and a carrier. This is primarily because the relationship dimensions in a 4PL is complex owing to its multiple parties and operating structures and hence demands greater collaboration through deeper commitment. This will further enhance other key factors like information sharing and Risk sharing and resource leverage. Moreover, lack of effective barriers within a relationship may also increase trust. Further, additional factors such as 'Power Symmetry' and 'Role clarity' were identified which was caused due to the carrier's (direct or previous) relationship with customer. 4PL may fail to forward positive value to the customer due to the lack of cohesive support from the carriers. One major factor is the 'skewed' relationships owing to the 'tripartite relationship structure' which may cause plausible drawbacks like competition, parochialism, dyadic partnership and goal dichotomy between the involved parties.

Further, the supply networks of the successful 4PL-carrier partnerships are agile focussed. The models have shifted from yesteryears' lean or cost oriented structures to a more responsive agile synergy models. This helps develop capacity to tackle fluctuations caused due to the changing needs of the customer; for instance, by building an effective reverse logistics system. Also, alignment and adaptability leads to greater agility. Finally, by establishing a mutual agile relationship value can be continuously delivered and replenished to the customer. Lastly, as long as the customer seeks value, 4PLs will need to collaborate efficiently with carriers. Though 4PLs and carriers have sufficient reasons to love and hate each other, however, it may be concluded that one is indispensable for the survival of the other and their collaboration is inevitable for the future of the SC.

Although the critical factors have been discussed previously in literature, this study provides new insights by addressing those additional factors which may reduce the impact of possible inevitable disruptions in intermediary partnerships. This study provides managers enough ground and guidance to revisit strategies before 4PL ventures to collaborate with the carriers. This will improve flexibility and increase scope to tackle complexities by surgical intervention. This will further better horizontal collaboration and higher asset utilisation through mutual trust and commitment to serve a single vision i.e. customer. This strategic alignment within the upper tiers or management level will improve operational efficiencies on ground through efficient information sharing, visibility, greater resource leverage and reduce costs and lag time. This insight is particularly relevant to managers in sourcing: another carrier may offer better price however, it may or may not last long term in terms of sufficing strategic expectation of the 4PL. However, negotiations should be aimed towards achieving longevity of relationships and hence short-term shift in bargaining power towards carriers may be strategically ignored. Moreover, clients and carriers may use this study as a medium to holistically analyse the complex network models of an intermediary in a SC.

To examine the autonomy that a client provides to a 4PL future research may look at studying the relationship between 4PL and client. Also, the companies investigated were under the pan - European leg. It would be beneficial to conduct a cross-case research from diverse range of industries across geographies to increase validity. An 'Action Research' may be conducted to increase the depth as well as breadth (scope) of the critical factors considered for 4PL evaluation. A meta-analysis approach may be

considered to conceptually integrate results from multiple studies using statistical tools. Also, this research mainly deals with a pharma client and future research may be particularly directed towards the 'inventory heavy' fashion retailing and beverage industries (Win, 2008) because these industries are specifically modelled for in-house regional clusters than conventional 4PLs.

References

- Angkiriwang, R., Pujawan, I.N. and Santosa, B., 2014. Managing uncertainty through supply chain flexibility: reactive vs. proactive approaches. *Production & Manufacturing Research*, 2(1), pp.50-70.
- Audy, J.F., Lehoux, N., D'Amours, S. and Rönnqvist, M., 2012. A framework for an efficient implementation of logistics collaborations. *International transactions in operational research*, 19(5), pp.633-657.
- Badea, A., Prostean, G., Goncalves, G. and Allaoui, H., 2014. Assessing risk factors in collaborative supply chain with the analytic hierarchy process (AHP). *Procedia-Social and Behavioral Sciences*, 124, pp.114-123.
- Balcik, B., Beamon, B.M., Krejci, C.C., Muramatsu, K.M. and Ramirez, M., 2010. Coordination in humanitarian relief chains: Practices, challenges and opportunities. *International Journal of Production Economics*, 126(1), pp.22-34.
- Bhatti, R.S., Kumar, P. and Kumar, D., 2010. A loss function based decision support model for 3PL selection by 4PLs. *International Journal of Integrated Supply Management*, 5(4), pp.365-375.
- Cao, M., Vonderembse, M.A., Zhang, Q. and Ragu-Nathan, T.S., 2010. Supply chain collaboration: conceptualisation and instrument development. *International Journal of Production Research*, 48(22), pp.6613-6635.
- Capineri, C., Leinbach, T.R. and Gips, D., 2006. Freight transport, seamlessness, and competitive advantage in the global economy. *European Journal of Transport and Infrastructure Research*, 6(1), pp.23-38.
- Christopher, M. and Holweg, M., 2011. "Supply Chain 2.0": managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management*, 41(1), pp.63-82.
- Cruijssen, F., Dullaert, W. and Fleuren, H., 2007. Horizontal cooperation in transport and logistics: a literature review. *Transportation journal*, pp.22-39.
- Fairchild, A.M., 2016. What is the Role of Third Party Logistics (3PL) Partners in an Omni-Channel Strategy?. *International Journal of Operations Research and Information Systems (IJORIS)*, 7(1), pp.22-32.
- Fawcett, S.E., Jones, S.L. and Fawcett, A.M., 2012. Supply chain trust: The catalyst for collaborative innovation. *Business Horizons*, 55(2), pp.163-178.
- Fawcett, S.E., Wallin, C., Allred, C., Fawcett, A.M. and Magnan, G.M., 2011. Information technology as an enabler of supply chain collaboration: a dynamic-capabilities perspective. *Journal of Supply Chain Management*, 47(1), pp.38-59.
- Flyvbjerg, B., 2004. Phronetic planning research: Theoretical and methodological reflections. *Planning Theory & Practice*, 5(3), pp.283-306.
- Guan, W. and Rehme, J., 2012. Vertical integration in supply chains: driving forces and consequences for a manufacturer's downstream integration. *Supply Chain Management: An International Journal*, 17(2), pp.187-201.
- Ha, B.C., Park, Y.K. and Cho, S., 2011. Suppliers' affective trust and trust in competency in buyers: Its effect on collaboration and logistics efficiency. *International Journal of Operations & Production Management*, 31(1), pp.56-77.
- Hammervoll, T. and Bø, E., 2010. Shipper-carrier integration: overcoming the transparency problem through trust and collaboration. *European Journal of Marketing*, 44(7/8), pp.1121-1139.
- Hingley, M., Lindgreen, A. and Grant, D.B., 2015. Intermediaries in power-laden retail supply chains: An opportunity to improve buyer-supplier relationships and collaboration. *Industrial Marketing Management*, 50, pp.78-84.
- Islam, S. and Olsen, T., 2014. Truck-sharing challenges for hinterland trucking companies: A case of the empty container truck trips problem. *Business Process Management Journal*, 20(2), pp.290-334.
- Jüttner, U., Christopher, M. and Godsell, J., 2010. A strategic framework for integrating marketing and supply chain strategies. *The International Journal of Logistics Management*, 21(1), pp.104-126.
- Maon, F., Lindgreen, A. and Vanhamme, J., 2009. Developing supply chains in disaster relief operations through cross-sector socially oriented collaborations: a theoretical model. *Supply chain management: an international journal*, 14(2), pp.149-164.
- Matopoulos, A., Vlachopoulou, M., Manthou, V., & Manos, B. 2007. A conceptual framework for supply chain collaboration: empirical evidence from the agri-food industry. *Supply Chain Management: An International Journal*, 12(3): 177-186.
- Naesens, K., Gelders, L. and Pintelon, L., 2007. A swift response tool for measuring the strategic fit for resource pooling: a case study. *management Decision*, 45(3), pp.434-449.
- Nyaga, G.N., Whipple, J.M. and Lynch, D.F., 2010. Examining supply chain relationships: do buyer and supplier perspectives on collaborative relationships differ?. *Journal of Operations Management*, 28(2), pp.101-114.

O'Byrne, R., 2014. The future of logistics outsourcing. *MHD Supply Chain Solutions*, 44(4), p.58.

Olhager, J. and Prajogo, D.I., 2012. The impact of manufacturing and supply chain improvement initiatives: A survey comparing make-to-order and make-to-stock firms. *Omega*, 40(2), pp.159-165.

Papadopoulou, E., 2013, November. Collaboration with a 4PL Provider for the Improvement of Information and Inventory Flows in the Transportation Process. In 1st Logistics International Conference Belgrade, Serbia.[online] Available at:< <http://logic.sf.bg.ac.rs/wp-content/uploads/Papers/ID-43.pdf>>[Accessed 20.10. 2014].

Ramanathan, U. and Gunasekaran, A., 2014. Supply chain collaboration: Impact of success in long-term partnerships. *International Journal of Production Economics*, 147, pp.252-259.

Richey, R.G., Roath, A.S., Whipple, J.M. and Fawcett, S.E., 2010. Exploring a governance theory of supply chain management: barriers and facilitators to integration. *Journal of Business Logistics*, 31(1), pp.237-256.

Sanchez Rodrigues, V., Harris, I. and Mason, R., 2015. Horizontal logistics collaboration for enhanced supply chain performance: an international retail perspective. *Supply Chain Management: An International Journal*, 20(6), pp.631-647.

Seebacher, G. and Winkler, H., 2013. A citation analysis of the research on manufacturing and supply chain flexibility. *International Journal of Production Research*, 51(11), pp.3415-3427.

Soosay, C.A. and Hyland, P., 2015. A decade of supply chain collaboration and directions for future research. *Supply Chain Management: An International Journal*, 20(6), pp.613-630.

Stawiarska, E., 2015. The Role of TSL Sector in Provision of Services to the Automotive Supply Chains/Networks. In *Forum Scientiae Oeconomia* (Vol. 3, No. 2, pp. 17-28).

Subramanian, N., Gunasekaran, A., Papadopoulos, T. and Nie, P., 2016. 4th party logistics service providers and industrial cluster competitiveness: Collaborative operational capabilities framework. *Industrial Management & Data Systems*, 116(7), pp.1303-1330.

Thatte, A.A., Rao, S.S. and Ragu-Nathan, T.S., 2013. Impact of SCM practices of a firm on supply chain responsiveness and competitive advantage of a firm. *Journal of Applied Business Research*, 29(2), p.499.

Vivaldini, M., Pires, S. and de Souza, F.B., 2008, June. Collaboration between 4PL and 3PL: a study within the fast food industry. In 7 International Meeting for Research in Logistics AVIGNON (pp. 24-26).

Walker, H. and Jones, N., 2012. Sustainable supply chain management across the UK private sector. *Supply Chain Management: An International Journal*, 17(1), pp.15-28.

Win, A., 2008. The value a 4PL provider can contribute to an organisation. *International Journal of Physical Distribution & Logistics Management*, 38(9), pp.674-684.

Wu, L., Chuang, C.H. and Hsu, C.H., 2014. Information sharing and collaborative behaviors in enabling supply chain performance: A social exchange perspective. *International Journal of Production Economics*, 148, pp.122-132.

Zeng, Y., Wang, L., Deng, X., Cao, X. and Khundker, N., 2012. Secure collaboration in global design and supply chain environment: Problem analysis and literature review. *Computers in Industry*, 63(6), pp.545-556.

Ye, Y. and Wu, Y., 2015. 4PL Suppliers Evaluating Indicator System Based on Grey Correlation Model. *Open Cybernetics & Systemics Journal*, 9, pp.816-820.

Yin, R.K., 2009. *Case study research: Design and methods* 4th ed. In United States: Library of Congress Cataloguing-in-Publication Data.

Authors →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	Description
Attributes																											
Costs & Investment	X					X	X			X					X		X		X			X			X	9	There exists a need to support a unified systematic structure for lower support and operations costs
Sharing Resources/Risks					X			X	X	X		X					X	X	X	X	X		X	X	X	14	It is pointed that risk/benefit sharing enhances cooperative business, improves supplier participation in joint decision making. This increases performance overall.
Management Involvement														X		X										2	Partnership sometimes relies on organisation-wide employee involvement through commitment & interest
Performance measurement										X						X					X					3	Sometimes there is a need to evaluate performances to better understand the interactions, barriers, influences and factors effecting performance
Simplification & Role distinction	X														X	X										3	A unified systematic structure with simplicity is more important than large size comprehensiveness
Power Balance		X	X														X									3	Power balance is required for long-term orientation and relational behaviours toward partners
Common Goal alignment			X	X				X	X	X	X				X			X				X	X			10	Collaboration occurs when entities form a coalition with the goal or objective of making decisions or synchronising activities that will generate mutual benefits
Service differentiation/ Flexibility	X	X				X	X			X	X		X		X		X					X			X	11	Increased value is reflected in the interdependence of organisations in achieving shorter lead times, greater quality of services, flexibility & responsiveness
Legislation/ Compliance/Check															X			X			X					3	In few cases, adherence to security and legal compliance becomes critical depending on the distribution network
Sustainability & Innovation	X	X	X			X			X												X				X	14	Innovation is a critical capability to enterprise business (or environmental) success through radical or incremental innovation. While radical is 'Disruptive', 'incremental' is continuous improvement to develop capacity to to address the rapid changes in the customer demand.
Continuous Improvement						X			X	X	X		X	X									X				
Info sharing and systems integration		X	X		X		X	X	X		X	X	X		X		X	X	X	X		X	X			25	A unified technology solution is critical to maximize clients' value which requires a collaboration between consulting, technology and logistics companies to realize the full desired design, implementation and operation.
Control systems/ IT sharing solutions	X			X	X	X				X	X	X				X								X			
Trust and Commitment		X	X		X			X		X		X	X		X		X	X	X	X	X					18	Trust has a significant influence on collaboration which further improves logistical efficiency. Involving strategic suppliers to get full visibility/ transparency to Inbound information and networks is critical. Mutual trust play an important role in achieving long-term relationship.
Transparency /Visibility	X	X			X			X											X								

Source: 1 - Ye and Wu (2015); 2 - Wu et al. (2014); 3 - Soosay and Hyland, 2015; 4 - Papadopoulou et al., 2013; 5 - Sanchez Rodrigues et al., 2015; 6 – Thatte et al., 2013; 7 - Guan and Rehme, 2012; 8 – Ha et al., 2011; 9 – Cao et al., 2010; 10 – Richey et al., 2010; 11 - Fawcett et al.,2012; 12 – Jüttner et al., 2010; 13 - Olhager and Prajogo (2012); 14 – Maon et al., 2009; 15 - Win (2008); 16 - Fawcett et al.,2011; 17 - Crujssen et al., 2007; 18 – Audy et al.,2012; 19 – Nyaga et al., 2010; 20 - Hammervoll and Bø, 2010; 21 – Zeng et al., 2012; 22 – Islam and Olsen, 2014; 23 – Badea et al., 2014; 24 – Ramanathan and Gunasekaran (2014); 25 – Subramanian et al.,2016

Appendix 1- Summary of the Critical Success Factors for an effective Logistical partnership in a Supply Chain

