Performance Measurement of India-based Third Party Logistics Sector: An Empirical Study of User versus Provider Perspectives

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Abstract

The global third-party logistics (3PL) market was valued at US $802 billion in 2016, and is projected to exceed US $1.1 trillion by 2022. It has becoming increasingly essential for the 3PL service providers' and 3PL service users' to adjust their future logistics strategies and operations to be part of a wider eco-system featuring digital infrastructure involving Internet of Things (IoT), big data, localized systems of value creation, which is likely to result in a distributed manufacturing paradigm. To enable development of effective future logistics strategies, which deals with the challenges mentioned above - we collected data by conducting 600 structured interviews from 300 senior management, middle management and front-line managers based at 3PL Service Providers', and 3PL Service Users' via a matched-pair design. The respondents were located in India and had a PAN-India geographical and industrial coverage. We present an analysis of the current differences in the current capabilities, and requirements of 3PL service providers' and service users, and by assessing how these differences can be bridged, to develop the necessary capabilities of being able to respond to a distributed manufacturing paradigm environment, which is being driven by IoT and encompass smart city products, and 'hybrid' technologies and products.

Keywords: Performance measurement, Third-Party Logistics, Service quality, Developing countries, India

1. Introduction

The last two decades have witnessed a paradigm shift in the process adopted by organisations to deliver goods to the end-customer. Organisations producing or selling goods have started to collaborate with independent companies called 'logistics service providers' to deliver the goods to the end-customer, rather than set-up processes to deliver the goods themselves. The most commonly used type of logistics service providers' are called: 'Third-party logistics service providers' (3PL). Previous research (Rajesh et al. 2011; Sahay and Mohan 2006) has shown that an average organisation can obtain approximately 9% savings and 15% improvement in capacity and quality, through outsourcing their logistics activity to 3PL service providers'. Research by Arroyo, Gaytan, and De Boer (2006) has that noted that use of 3PL service providers' for delivering goods to the end-user high-speed is a global phenomenon. They note that approximately in 2006, about 60% of US firms, 67% of European firms, and 50% of Chilean and Brazilian firms were using 3PL service providers'. Since then, the market for 3PL has witnessed exponential growth globally. In 2007 - it was estimated that the global market 3PL services was valued as a $390-billion industry (Rajesh et al. 2011). Recent data on the size of the 3PL market by the leading international supply chain consultancy - Armstrong & Associates has revealed that global third-party logistics market reached US $802 billion in 2016, and is expected to exceed US $1.1 trillion by 2022 (Berman 2017). Estimates for logistics costs (in-terms of % of a countries' Gross domestic product) are around 8% for developed countries, and around 15% for developing countries (Arroyo, Gaytan, and De Boer 2006). 3PL service providers' are regarded to be a crucial component of 3PL service users' logistics and distribution strategy, especially in enabling 3PL service users' to respond to supply chain disruptions' (Liu and Lee 2018; Nel, de Goede, and Niemann 2018).

1.1 Need for Research on 3PL service providers' and service users' in the Indian Context

Though, there is a rich body of literature focusing on 3P - much of this existing research on 3PL has been focused predominantly either on 3PL service providers' or 3PL service users', with substantial research undertaken in western countries. Limited interest has been undertaken on how 3PL service providers' and service users' relationships develop strategically (Hertz and Alfredsson 2003). It has been argued that 3PL research domain would benefit from "*research designs aimed at identifying and explaining integrative processes that serve to bond partners and strengthen relationships*"(Marasco 2008, p.142). Previous research by Liu and Lyons (2011) has also noted that most "empirical studies that have been undertaken, have usually concentrated on logistics management in a single region. Other authors (Liu and Lyons 2011; Luo, van Hoek, and Roos 2001; Murphy and Poist 2000) have noted that the focus of 3PL research in the Western context has meant that there has been relatively little attention given to empirical studies of 3PL service providers' and service users' in developing countries. In this context Arroyo, Gaytan, and De Boer (2006, p. 660) have further argued that "*to establish more firm conclusions, studies must conduct parallel (multi-region) studies, with the same sample design and questionnaire. Such studies will be very important for understanding how context influences the outsourcing practice and shapes 3PL services*". This view is supported by Liu and Lyons (2011, p.548), who have argued that "*there is still insufficient evidence to conclude that outsourcing practices in a Western country such as the UK have exactly the same effect in a non-Western country*". Prasad and Singh (2015) have argued that China and India are two countries which regarded as being indispensable to the strategy of most international corporations, especially when international corporations seek to "start a new manufacturing operation, to enter a joint venture or to sell to a growing domestic market China and India", and consequently "*are often are compared in the same breath by western executives weighing sites for expansion or outsourcing*". Sahay and Mohan (2006, p.667) have argued that the

research on third party logistics services are widely prevalent in North America, Europe, and have also been examined in other geographical context such as "Bulgaria, South Africa, Australia Korea, Asia Pacific, Singapore and Indochina and "*there has been no comprehensive study reported in the literature that has focused on third party logistics services in India*". Other researchers - e.g., Mothilal et al. (2012); Rajesh et al. (2011); Thurer and Avittathur (2017) agree with this assessment and say that it is important to carry out empirical studies on third-party logistics services in India and highlight that the size of the Indian retail and logistics sectors. Previous research by (Liu and Lyons 2011; Murphy and Daley 1999; Rajesh et al. 2011) has also highlighted that there is a need for comparative studies involving both 3PL service providers' and service users' perception and cognitions relating to logistics relationship. To our knowledge, there has been only one empirical investigation into 3PL service providers' and service users' perception and cognitions relating to logistics relationship in the Indian context. Therefore, as empirical research on 3PL service providers' and service users' in the Indian Context is scant - the aim of this study is to undertake empirical research via a matched pair design involving 3PL service providers' and 3PL service users', so as to compare the differences in perceptions of key success factors for enabling development of effective future logistics strategies, for 3PL service providers' and 3PL service users'.

The paper is organised as follows: Section 2 presents the literature review including the theoretical foundations including a brief description of the Indian logistics 3PL sector. Section 3 offers an explanation and justification of the research methodology. Section 4 discusses the results of the data collected from the respondents via face-to-face interviews and details the key results from the statistical analysis, and outlines a critical discussion. Section 5 offers managerial implications and outlines key conclusions.

2. Theoretical foundations

2.1 Outsourcing and Evolution of 3PL

According to The Council of Supply Chain Management Professionals Glossary – a 3PL organisation is "A firm [that] provides multiple logistics services for use by customers. Preferably, these services are integrated, or "bundled" together, by the provider. The key services 3PLs provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding (Council of Supply Chain Management Professionals 2017). Bartolacci et al. (2012) have observed that 3PL enable the connection between the point of origin (production) of the product with the point of consumption. 3PL services are the backbone of an economy, providing the efficient, cost-effective flow of goods and services on which other commercial sectors are dependent. Christopher (1998, 2016) notes that 3PL firms play a key role in the competitiveness of the organizations whilst creating value by providing time and place utility. The primary focus of 3PL service providers' across the globe has traditionally been towards low – cost, high quality, reliable products with greater design flexibility. The manufacturing efficiency improved with the development of just- in- time model and resulted in reduced cycle time with the supply chain. Lummus and Vokurka (1999) research on manufacturing observed that organization seek opportunities for mass production with a minimization of production costs as the primary operation focus, as evidenced by growth of the emerging economies as manufacturing hubs for western based organizations', lead to growth of the 3PL sector, both in developed and developing countries. Lummus and Vokurka (1999) analysis revealed that that work in progress inventories could minimize manufacturing costs, improve quality and that collaborative relationship beyond and within organizations had its advantages.

This worldwide trend globalizations of product and services accompanied with the rapid growth of IT have further provided an impetus has led to many companies outsourcing their logistics function to 3PL companies, to focus on their core competencies (Lewis and Talalayevsky 2000). Outsourcing in-context of 3PL(s) can be defined as a provision of a single or multiple logistics services by a vendor on a contractual basis (Qureshi, Kumar, and Kumar 2008). It is argued that due to the process of outsourcing which involves by collaborating with 3PL, manufacturers can focus on the core business and core competencies (Akbari 2018; Chen, Goan, and Huang 2011; Kremic, Tukel, and Rom 2006; Marchet et al. 2017). Other advantages of outsourcing the process of delivery of goods to 3PL include: (a) an expansion in the so-called '*strategic flexibility*' of the manufacturer/seller, as 3PL service providers' are able to redesigning the logistics network of the manufacturer/seller by providing access to an enhanced warehouse locations and more significantly in some cases - access to and a wider national and international to international distribution networks (Hertz and Alfredsson 2003; Rajesh et al. 2011; Selviaridis and Spring 2007; Skjoett-Larsen 2000; Tyan, Wang, and Du 2003) , (b) enabling a manufacturer/seller to save committing significant amount of financial and other organisational resources in logistics-related assets to set-up and administer the delivery process, which-in-turn enables them to deploy the capital and other organisational resources to their core competencies' (Bolumole 2003; Kremic, Tukel, and Rom 2006; Marchet et al. 2017; Selviaridis and Spring 2007; van Laarhoven, Berglund, and Peters 2000). It can be argued that global phenomena of outsourcing have led to the establishment of long-term relationships between the suppliers and manufacturers/sellers'. The growth trends in the manufacturing and retail sectors have called for partnerships with companies with which they could outsource non-core logistics competencies to 3PL service providers'. In-turn, 3PL service providers' are required to recommend innovative solutions to service users' by focusing on value-added capabilities, differentiating themselves from the competitors.

In the era of globalization and technological advances, 3PL service providers' have become an important source of competitive advantage for 3PL service users', as it enables them to acquire the capabilities, and experience of the 3PL service providers' which otherwise would be difficult to acquire or costly to have in-house (Jharkharia and Shankar 2007), especially for supply chain organizations. Within the literature – the terms: customers, supply chain partners and 3PL service users' have been used interchangeably, depending on the context. This paper adopts the term 3PL service users' to include any user of a 3PL service provider, irrespective of their position in the supply chain (i.e., end-user, supply chain partner or intermediary customers). The present-day 3PL service providers' possess competencies and offer value-added services to shippers or manufacturers. It was observed that inter-organizational collaboration, use of IT and cooperative attitude had a direct impact on the contingency planning effectiveness of the organization distribution strategy (Lewis and Talalayevsky 2000). 3PL is a phenomenon of service integration which has become possible through Information Technology (IT), and in this context, Hall et al. (2012) proposed a background for the use of inter-organizational Information Technology (IT), contingency planning and its effectiveness in a supply chain system of product and services accompanied with rapid growth of IT have provided an impetus to the outsourcing of logistics services.

Carleton (2016) has emphasized that third-party logistics service providers' offer economies of scales and can offer innovative solutions to the status quo. 3PL is a value-added process adopted by organizations to enhance cooperative advantage, provide differentiated goods and services at minimum cost to the service users', managing profitability and financial balance of business operations (Domingues, Reis, and Macário 2015). Srai et al. (2016) have noted that distributed manufacturing (DM), which is characterized by "smaller (and micro-scale) manufacture much closer to the end user" has become a reality. Srai et al. (2016) further posits that the uptake of DM will result in production being in closer proximity to the point of

consumption, and this would be accompanied by: (1) greater possibilities for customization and personalization of physical products, and in (b) in the development of user-driven products that are attuned to the requirements of local markets. This would mean that 3PL will have to provide to both - consumers and retailers - fast delivery of raw materials and finished products for consumers and retailers. 3PL will have to adapt to an environment characterized by "cloud manufacturing services, rapid prototyping, and tooling, automated monitoring, control and optimization of stock and material flows and dynamic production environments" – all being interconnected by IoT. The update of distributed manufacturing has to be seen in-context of the push on smart cities as "smart city products, 'hybrid' technologies/products are part of a wider revolution towards a new and more distributed manufacturing paradigm (Kumar et al. 2016; Porter and Heppelmann 2014, 2015; Srai et al. 2015; Srai et al. 2016). Porter and Heppelmann (2014, 2015) and Kumar et al. (2016) have argued that smart cities will feature digital infrastructure involving IoT and big data, with strong linkages between supply of materials, DM and localized systems of value creation, which will result in an distributed manufacturing paradigm characterized by small plant sizes, products which are highly customized, local production chains with fewer supplier nodes which are also dispersed and which are organised by city-based demand segmentation and, focused on a collaborative urban stakeholder model. This would mean that 3PL will have to ensure that they can part of adaptive supply chains (Srai et al. 2016). We posit that rise of distributed manufacturing will require 3PL to ensure that they can ensure JIT demand and supply and provide logistics services to provide raw materials and goods for repeatable, dependable production at multiple locations, at different scales of production.

2.2 Performance management of 3PL service providers' and service users'

Performance refers to the nature and quality of an organization's behaviours' to complete their main tasks and functions and to generate profit (Sink 1991). Venkatraman and Ramanujam (1986) identified two core dimensions of business performance: operational and financial performance. Operational performance relates to a company's performance in serving service users' for service quality, responsiveness, on-time delivery, and so forth. It has been suggested that operational performance can be further classified into two major dimensions: cost performance and service performance (Baofeng et al. 2008). Cost performance is related to cost and price, while service performance is related to SERVQUAL factors of service reliability, responsiveness, tangibility, empathy and assurance (Parasuraman, Zeithaml, and Berry 1988). The SERVQUAL scale was developed and empirically validated during the late 1980s by Parasuraman, Zeithaml, and Berry (1985), and it measures customer expectations and perceptions in five dimensions (Parasuraman, Zeithaml, and Berry 1985), which are as follows.

a) Tangibility – The appearance and quality of physical facilities, equipment, and personnel.
b) Reliability – The service provider's ability to fulfill service commitments dependably and accurately.
c) Responsiveness – The service provider's willingness to help service users' and provide prompt service.
d) Assurance – The knowledge and courtesy of service provider employees and their ability to convey trust and confidence.
e) Empathy – The service provider's caring and attentive response to individual service users'.

The SERVQUAL scale was designed for application across a wide range of service industries to measure customer expectations of service quality, and customer perceptions of the service

quality of actual service (Zhao, Bai, and Hui 2002). Performance Management in the logistics sector has mainly been focused on operational measures. Panayides and So (2005) have argued that less attention has been placed on the influence of organizational factors, despite the advocated need for greater inter-organizational integration among supply chain partners. Taylor and Taylor (2014) have noted that there is substantial consensus that a balanced approach to performance management is desirable, and therefore should comprise of a blend of financial and non-financial measures which are internal and external, and should encompass short and long-term time-scales. We posit that rise of DM will require 3PL service providers' and users to ensure that they can ensure just-in-time (JIT) manufacturing demand and supply and provide logistics services to provide raw materials and goods for repeatable, dependable production at multiple locations and at different scales of production. Customer-specific adaptation and integration of their systems and procedures to specific requirements of the service users' to ensure high-relationship performance by logistics service providers' is an important prerequisite to 3PL performance. It has become essential for the service providers' to adjust their logistics strategies and operations to meet the demands from 3PL service users' capabilities concerning manufacturing and logistics alignment systems. We extend the body of work by presenting an analysis of the current differences in the needs and requirements of 3PL service providers' and 3PL service users' capabilities. We then assess how these differences can be bridged, to develop the necessary capabilities within 3PL service providers' and service users' of being able to respond to a DM environment, wherein DM is being driven by IoT and encompasses smart city products, and 'hybrid' technologies/products. We therefore used 5 SERVQUAL dimensions of service quality: (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility to examine four gaps in the relationships between 3PL service providers' and service users', with emphasis on service quality performance management (see Fig. 1).

Further details of the four gaps are appended below. A detailed literature review on the need for comparative studies involving both 3PL service providers' and service users', particularly in the Indian context is presented in section 2.3 and 2.4. For a detailed discussion on the adaption of the SERVQUAL factors of service reliability, responsiveness, tangibility, empathy, and assurance, please see appendix 1 and section 3.2.

Gap 1: The difference between 3PL service providers' expectations of service quality and service quality actually provided by the 3PL service providers' (3PL service providers' expectations – 3PL service providers' actual experiences)

Gap 2: The difference between Expected Quality of Service by the 3PL service users', and Perceived Quality of Service actually received by the 3PL service users' (3PL service users' expected experiences - 3PL service users' actual experiences).

Gap 3: The difference between actual 3PL service users' expectations and 3PL service providers' expectations (3PL service providers' expectations – 3PL service users' expectations).

Gap 4: The difference between 3PL service providers' and 3PL service users' perception of service delivery (3PL service providers' actual experiences – 3PL service users' actual experience).

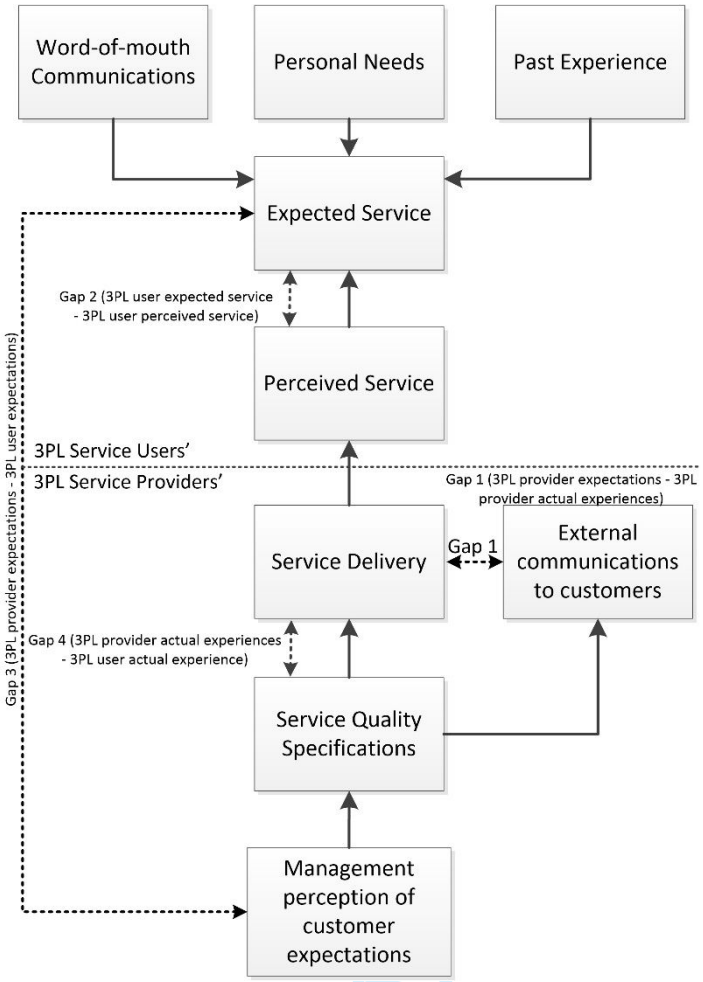

Figure 1 – Theoretical framework

2.3 Need for comparative studies involving both 3PL service providers' and service users'.

Murphy and Daley (1999), p214 "*while comparative studies involving service providers' and service users' are best done using matched pairs samples, the difficulty in constructing such samples should not be underestimated, particularly in the transportation and logistics arena. Other industries, such as the retail or pharmaceutical industries, may be more hospitable to matched pair research*". Existing research (Soltani et al. 2012; Stanworth 2012) on the relationship between service capabilities and performance has made only a limited contribution to the correlation that exists between 3PL performance and different forms of service provision. Moreover, there has been relatively little attention given to empirical studies of both providers

and service users'. In this context, Liu and Lyons (2011) have argued research which addresses this by empirically exploring the relationships between service capabilities and performance from both a provider and customer perspective is required.

2.4 Need for empirical research involving India based 3PL service providers' and service users'

According to Prasad and Singh (2015) India is regarded a global retail opportunity as it is the greatest underserved market in the world. In 2013 - the Indian retail sector was estimated at US$ 520 billion and was among the largest employers in the country. The Indian logistics Industry has been growing at a compound annual growth rate (CAGR) of over 16% over a five year period from 2012 to 2017. Since 2014 - there have been significant improvements in functioning and operations of logistics companies in India in areas relating to logistics particularly with regard to: (a) e-commerce penetration, (b) economic growth, (C) proposed GST implementation and government initiatives like "Make in India", (d) the introduction of a National Integrated Logistic Policy, (e) allowing 100% FDI in warehouses and food storage facilities. As per the Logistics Performance Index (LPI) for 2016 prepared by the World Bank India's logistic performance index (LPI) rank has leaped by 19 places to 35th position from 54th position.

The LPI 2016 report by World Bank has also highlighted the Indian logistics industry to have an CAGR of 15-20% during 2016 – 2020 (Credit Analysis & Research Limited 2016). Due to these reasons, it is argued that by 2018, the Indian retail sector is likely to grow at a compound annual growth rate (CAGR) of 13 percent to reach US$ 950 billion. This is also supported by Government of India, who estimates - the market for Indian logistics industry is expected to be worth US$ 307 billion by 2020 (Business-Standard 2016b). The large Indian retail market will cause exponential growth in the end and logistics industry in the next three years (from 2018 to 2021). However, Government of India has highlighted that a point of concern is India is

spending around 14.4% of its GDP on logistics and transportation, as compared to less than 8% spent by the other developing countries (Business-Standard 2016b; Prasad and Singh 2015).

It is argued that India is losing about 1-2% growth in GDP every year due to a poor logistics management (Prasad and Singh 2015). A study by ASSOCHAM-Resurgent India has noted India can save up to USD 50 billion, if logistics costs are lowered from 14% to 9% of India's GDP, which would also make it possible to India based manufactures/sellers to be more competitive in global markets (Business-Standard 2016a). The report also highlighted that "The 'Make in India' campaign will see investments made in the Indian logistical landscape, which would enable India based manufactures/sellers to have access to global production networks, which would lead to more growth opportunities for logistics operations in India. However, the report highlighted that "Growth in logistics sector would imply improved service delivery and customer satisfaction" (Business-Standard 2016a).

This is an area that India 3PL firms are currently struggling and would require further inputs. It is therefore important to undertake research which identifies, details and relates how the critical success factors on the relationship between 3PLs and their service users' in the Indian context (Rajesh et al. 2011). Logistics market in India is expected to be worth US$ 307 billion by 2020, Mr. Ram Kripal Yadav, Minister of State for Drinking Water & Sanitation said at an ASSOCHAM event. India spends around 14.4% of its GDP on logistics and transportation as compared to less than 8% spent by the other developing countries (Business-Standard 2016b).

3. Research Methodology

As this study was concerned with understanding existing differences in expectations and perceptions of service quality between 3PL service providers' and 3PL service users', in-order to enable 3PL service providers' and 3PL service users' with inadequate capabilities and limited resources capabilities to successful transform using IoT third-party digital platforms so as to respond to an DM environment, an quantitative methodology in-conjunction with structured interviews was considered appropriate.

3.1 Research setting and case selection

We collected data from 3PL service providers', and 3PL service users', who performed and required, respectively, typical forwarding-based and value-added services. The 3PL service providers' and users were located in the main logistics' hub locations of Mumbai, Delhi (NCR) and Chennai, across different industries, to have a PAN-India geographical and industrial coverage. Data was collected by conducting 600 structured interviews from 300 senior management, middle management and front-line managers based at 3PL Service Providers' and 3PL Service Users' via a matched-pair design.

3.2 Rationale for using a matched-pair design

Matched Pairs is a type of research design in which subjects (i.e. respondents) are in two distinct groups, and subjects are matched on specific characteristics (Vogt 2005). A key aspect of creating a matched-pair design requires the research team to ensure that each individual subject (i.e. respondent) in a sample is matched to another subject (i.e. respondent) possessing similar attributes in the sample (Leustek 2017). This is done deliberately, so as to ensure that each individual subject (i.e. respondent) in a group is "equivalent in terms of certain characteristics (e.g., age or gender) to the group to which it will be compared" (Cheslack-Postava 2008). Examples of using a matched-pair design for comparing Users' and Providers' within logistics and supply chain management research literature can be found in the works of

(Knemeyer and Murphy 2005; Murphy and Daley 1999; Murphy and Poist 2000; Nel, de Goede, and Niemann 2018; Stuart 1997; Wasti, Kozan, and Kuman 2006). Given the gap in knowledge on the drivers of relationship success for at 3PL Service Providers' and 3PL Service Users' in an developing country context (see section 2.3 and 2.4 for an detailed rationale) - we examined matched-pair relationships to identify specific differences in perception between 3PL Service Providers' and 3PL Service Users' in an Indian context. The benefit of using a matched-pair design is that via this study – one can compare perceptions of 3PL Service Providers' and 3PL Service Users', in a developing country context (i.e. India) to explain the antecedents and dynamics of their relationship performance by comparing Service Providers' and Service Users perceptions of the their common relationships. The paper specifically examines how antecedents of perceived relationship success for 3PL Service Providers' differ from those of 3PL Service Users' within SERVQUAL factors of service reliability, responsiveness, tangibility, empathy, and assurance. Consequently – this study shows the similarities and differences between 3PL Service Providers' and 3PL Service Users' in their perceptions on SERVQUAL factors of service reliability, responsiveness, tangibility, empathy, and assurance.

3.3 Data collection of Providers' and Users' of 3PL Services via matched-pair design

The study consisted of three phases: an exploratory phase, a pilot phase, and an inferential phase. The first phase was an exploratory phase, which consisted of focus group interviews with 30 industry experts and academic professionals. The second phase, was the pilot phase, and commenced after incorporating feedback from the first phase (i.e., the exploratory phase). The revised questionnaire was further pilot tested on a 3PL company, and included both company employees and service users'. Four sets of questionnaires were administered. A total of 40 questionnaires were distributed. The breakup of the 40 questionnaires for the pilot-study is as follows: 10 expected and actual questionnaires were administered to employees of a 3PL

company and 10 expected and actual questionnaires were administered to the business partners of a 3PL company. A copy of the questionnaires', a covering lettering explaining the purpose of the pilot study, were personally administered to the respondents. The purpose of the pilot test was to obtain feedback and to test the content validity and clarity of the measurement scale. The third and final phase of data collection was an inferential phase. In this phase - 10 3PL service providers' were selected for this study, who performed typical forwarding-based and value-added 3PL companies in India, and were willing to forward contact details and offer an introduction of their service users', so as to facilitate data collection from their service users'. The 10 3PL service providers' provided similar forwarding and 3PL services to their service users', and thus were able to provide similar content for this study, wherein initial contact was made by telephone, followed by an email comprised of general research information and consent sheets. These questionnaires were distributed to the 3PL service users' and the internal staffs of the 10 3PL service providers' in India. The 3PL service providers' located in the main hub locations of Mumbai, Delhi (NCR) and Chennai have been surveyed for this study. This study is designed to measure the perceived and actual performance of logistics service providers' provided to their 3PL service users'. Accordingly 2×2 sets of completed questionnaires were collected to gain information on the perceived performance [3PL service provider perceived, n=150], the actual performance [3PL service provider actual, n=150], the perceived performance as per the 3PL service users' [Customer perceived, n=150], and the actual performance that were received from the 3PL service providers' [Customer Actual, n=150]. Data was collected data by conducting 600 structured interviews from 300 senior management, middle management and front-line managers based at 3PL Service Providers', and 3PL Service Users' via a matched-pair design to determine the gap between the actual and the perceived performance of the service providers' in terms of the supply chain partner. The structured interview is a "*quantitative research method with the aim of ensuring that each*

interview is conducted with exactly the same questions in the same order" (Cornell, Johnson, and Schwartz 2013), p.137. On average, each of the 600 structured interviews lasted about 15 minutes. To avoid potential information bias, only the key respondents from each 3PL service provider and their supply partners were considered. This was inspired by (Teo and King 1997) to avoid potential perceptual discrepancies between respondents. Apart from interviewing the respondents face to face as part of the structured interviews, there were repeated follow-ups in order to obtain more relevant and comprehensive information and to ensure the accuracy of the data provided. The secondary sources were the articles published in online journals and other materials, i.e. newspaper, internet and other publications.

3.4 Research Instrument & Respondents

Part I of the questionnaire was designed to gather the demographic details of the respondents. The demographic distribution of the respondents is shown in Table 1 to 3. It reflects that majority amongst the service providers' deal in a variety of products and services. The most offered and availed supply chain service is freight forwarding. Majority of service users' have long-term association with current 3PL service providers' (over 4 years). Part II consisted of 12 measurement items that examine the service quality of 3PL service providers' using the SERVQUAL scale of tangibility, reliability, responsiveness, assurance, and empathy. The respondents were asked to evaluate the extent to which they agreed or disagreed with statements that addressed the service quality in targeted 3PL service providers' on a seven-point Likert scale that ranges from "1" (strongly disagree) to "7" (strongly agree).

Table 1. Demographic Profile of the Respondents – Industry Profile

3PL service providers' (n=150) Code 1			3PL service users' (n=150) Code 2		
Category	**Sub Category**	**Frequency**	**Category**	**Sub Category**	**Frequency**
Company	Limited	53	Company	Limited	52
	Public Listed	25		Public Listed	32
	Partnership	2		Partnership	8
	JV/M&A	0		JV/M&A	6
	Sole Prop.	0		Sole Prop.	14
	Pvt. Ltd.	70		Pvt. Ltd.	38
Type of Goods imported/ exported	Automotive	33	Basic Nature of Company/ Industry	Automotive	11
	Chemical	36		Chemical	9
	Construction	36		Construction	2
	Electrical	35		Electrical	6
	Electronics	8		Electronics	14
	IT	0		IT	2
	Med./Health	25		Med./Health	8
	Plastics	4		Plastics	7
	Service	29		Service	7
	Textile/Cloth	5		Textile/Cloth	30
	Grocery/cosmetics	1		Grocery/cosmetics	5
	All	74		All	49
Number of Employees	<50	2	Number of Employees	<50	30
	50-99	6		50-99	39
	100-199	25		100-199	32
	200-499	25		200-499	20
	500-999	59		500-999	9
	>1000	33		>1000	20
Role in Supply Chain	Customs Broker	30	Availed Supply Chain service	Customs Broker	12
	NVOCC	30		NVOCC	71
	Transporter	40		Transporter	117
	Freight Forwarder	101		Freight Forwarder	123
	Shipping Line	0		Shipping Line	0
Organization	Asset Based	35	No. of service providers' used	1-2	43
	Non-Asset Based	20		3-4	53
	Both	95		Above 4	4
Management Position	Senior Management	39	Years (have been using current the service providers')	1	6
	Middle Management	103		1-2	19
	Front-line Manager	8		2-3	30
	Front-line Staff	0		3-4	42
				Over 4	53
Transportation Service and Capabilities of Organization	Small Package	0	Mainly Outsourced functions	Assembly, repair, packaging	3
	Air Cargo	29		Bonded Warehousing	44
	< Container Load	0		Custom Clearance	88
	Truckload	12		EDI Capability	21
	Intermodal	0		Export & Import	78
	Ocean	54		Order processing	4
	Rail	0		Oversees sourcing	7
	Bulk	0		Pickup & Delivery	56
	Dedicated Contract Carriage	12		Reverse Logistics	3
	Fleet Acquisition	0		All the above	25
	Equipment/Driver	0			
	All	84			

Table 2. Demographic Profile of the Respondents Organizational Hierarchy

Position in the Company	3PL Service users expected frequency (%)	3PL service users' actual frequency (%)	3PL service providers' actual frequency (%)	3PL service providers' expected frequency (%)
Senior management	36(24)	38(25.33)	45(30)	39(25.5)
Middle management	82(54.7)	82(54.7)	96(64)	103(67.32)
Front-line manager	32(21.4)	30(20)	9(6)	8(5.33)
Total	150(100%)	150(100%)	150 (100%)	150 (100%)

Table 3 Logistics Services Outsourced to 3PL service providers'

Logistics Services Outsourced to 3PL service providers'	Frequency(percent)
Assembly, repairing and packaging	3(2%)
Bonded warehousing	44(29.33%)
Custom clearance	88(58.67%)
EDI capability	21(14%)
Export and Import Operations	78(52%)
Order processing	4(2.67%)
Overseas sourcing	7(4.67%)
Pickup and delivery	56(37.33%)
Reverse logistics	3(2%)
All	25(16.67%)

4. Data Analysis and Findings

Paired-sample t-tests were used to measure whether there was a significant difference in the mean scores between 3PL service providers', and 3PL service users' expectations of service quality to be provided, and perception of service quality actually provided. This was done by collecting data from 600 respondents, which collected in 2×2 sets, to undertake an analysis of the four gaps mentioned in the theoretical framework (see figure 1). The 2×2 sets were:

(1) [3PL service providers' expected performance, n=150]

(2) [3PL service providers' actual performance, n=150]

(3) [3PL service users' expected performance, n=150]

(4) [3PL service users' actual performance, n=150].

48 Individual Paired sample t-tests on data collected from 600 respondents (in 2×2 sets as detailed above) were carried out, for each of the 12 performance measures relating to SERVQUAL factors of: (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility. Paired samples t-test is suitable for examining how a group of participants, which are measured on two different occasions, or under two different conditions differ from each other. Paired samples t-test was particularly suitable for our research objective of examining the four gaps (for details of the four gaps - see Figure 1) in the relationships between 3PL service providers' and service users', with emphasis on service quality performance management. Tables 4 to 7 presents the mean difference, standard deviation, 95% confidence interval, t-value, p-value and the eta^2 value for each test for paired-sample t-test. Effect size analyses was undertaken using eta-squared using the paired t-test value approach (Balestrini and Gamble 2006; Pallant 2010), in accordance with the guidelines given by (Cohen 1988), wherein Cohen's $d \geq 0.2$ is considered a 'small' effect size, $d \geq 0.5$ represents a 'medium' effect size and $d \geq 0.8$ is considered a 'large' effect size. Paired-sample t-tests (see Table 4) which examined Gap 1, which was the difference between expected service quality by 3PL service providers', and actual service quality provided by 3PL service providers' indicated that 3PL service providers' felt that they were not able to deliver the service to their own standards. The results in Table 4 show that the mean differences between the values for expected service quality by 3PL service providers', and actual service quality provided by 3PL service providers' were highly statistically significant, with $p < 0.001$ for all the 5 dimensions of Service Quality (i.e. (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility). However, only the eta squared values for two variables of the tangibility dimension showed a medium effect size. The paired samples t-test conducted to evaluate the impact of Equipment in the Tangibility dimension showed a mean difference of 1.100 with 95%

confidence interval ranging from .946 to 1.254. The eta squared statistic (.58) indicated a medium effect size. From Table 4, we can conclude that that there are significant differences between the expected and the actual services provided by the 3PL service providers' themselves, in-terms of facilities such as warehouses, distribution centers, and tracking and transport facilities, and that there is a small perceptual gap between reliability, responsiveness, assurance, and empathy. This finding is consistent with that of Durst and Evangelista (2018) who noted that 3PL service providers' do not take advantage of a broad number of external parties for knowledge creation, and that generally 3PL service providers' prefer to develop their knowledge in-house.

Table 4: GAP 1. 3PL expected service quality - 3PL actual service quality

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	.453	.756	.062	.331	.575	7.344	.000	.266*
Reliability: Service Punctuality	.520	.932	.076	.370	.670	6.833	.000	.239*
Reliability: Error-free service	.913	1.036	.085	.746	1.080	10.799	.000	.439*
Responsiveness: For Help	.787	1.078	.088	.613	.961	8.937	.000	.349*
Responsiveness: To Requests	.633	1.508	.123	.390	.877	5.144	.000	.151
Assurance: In-transit security	.573	1.276	.104	.367	.779	5.502	.000	.169
Assurance: Knowledge	.980	1.108	.090	.801	1.159	10.832	.000	.441*
Empathy: customer service	.673	.993	.081	.513	.834	8.303	.000	.316*
Empathy: Convenient contact	.553	1.721	.140	.276	.831	3.939	.000	.094
Empathy: Customer needs	.693	1.609	.131	.434	.953	5.277	.000	.157
Tangibility: Equipment	1.100	.954	.078	.946	1.254	14.127	.000	.573**
Tangibility: Employees	1.407	1.062	.087	1.235	1.578	16.215	.000	.638**

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Paired-sample t-tests (see Table 5) which examined Gap 2, which was the difference between expected service quality by 3PL service users' and actual service quality received by 3PL service users' indicated that 3PL service providers' were not able to deliver the service to their standards demanded by 3PL service users'. The results in Table 5 show that the mean

differences between the values for 'expected service quality' by 3PL service providers' and 'actual service quality provided' by 3PL service providers' were highly statistically significant, with $p < 0.001$ for all the 5 dimensions of service quality (i.e. (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility). In-addition, the eta-squared values for 4 of the five service quality dimensions showed a large effect size, which clearly reinforced the clear gap between expectations of the 3PL service users' and the service that they received from 3PL service providers'. For example - the paired samples t-test conducted to evaluate the impact of providing an error-free service in the reliability dimension showed a mean difference of 2.127 with 95% confidence interval ranging from 1.977 to 2.277. The eta squared statistic (.84) had a large effect size. From Table 5, we can conclude that there is a significant difference, with large effect sizes, in the experience on the 3PL service users' in-terms of expected service quality and the service quality actually received. The only exception, being the ability to contact the 3PL service provider to discuss any aspects of the service.

Table 5: GAP 2. Expected service quality by 3PL service users' - Actual service quality received by 3PL service users'

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	1.667	.816	.067	1.535	1.798	25.000	.000	.807***
Reliability: Service Punctuality	1.933	.739	.060	1.814	2.053	32.049	.000	.873***
Reliability: Error-free service	2.127	.929	.076	1.977	2.277	28.037	.000	.841***
Responsiveness: For Help	1.753	.794	.065	1.625	1.881	27.054	.000	.831***
Responsiveness: To Requests	1.767	.798	.065	1.638	1.895	27.121	.000	.832***
Assurance: In-transit security	1.647	1.037	.085	1.479	1.814	19.445	.000	.717**
Assurance: Knowledge	1.707	1.167	.095	1.518	1.895	17.904	.000	.683**
Empathy: customer service	1.753	.867	.071	1.614	1.893	24.782	.000	.805***
Empathy: Convenient contact	1.393	1.456	.119	1.158	1.628	11.722	.000	.480*
Empathy: Customer needs	1.573	.907	.074	1.427	1.720	21.235	.000	.752**
Tangibility: Equipment	1.827	.865	.071	1.687	1.966	25.863	.000	.818***
Tangibility: Employees	1.833	.951	.078	1.680	1.987	23.604	.000	.789**

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Paired-sample t-tests (see Table 6) which examined Gap 3, which was the difference between service quality that 3PL service providers' expected to provide and service quality expectations of 3PL service users'. Table 6 indicated that 3PL service providers' have very similar expectations with regard to the demands of 3PL service users'. The results in Table 6 show that the mean differences between the values for expected service quality by 3PL service providers', and expected service quality demanded by 3PL service users' were not statistically significant, with $p < 0.05$ for all the 5 dimensions of Service Quality (i.e. (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility). In-addition, the eta squared values for all the five service quality dimensions did show any effect size. The only exception was the paired samples t-test conducted to evaluate the impact of providing a punctual service in the reliability dimension, which showed a mean difference of -.127 with 95% confidence interval ranging from -.181 to -.073. The eta squared statistic (.13) did not indicate any effect. In practical terms - this meant that both 3PL service providers' and users felt that service punctuality was extremely important, with service users' were more focused on delivery time promised. This meant that From Table 6, we can conclude that there is a small perceptual gap in responsiveness, assurance, and empathy between the expectations of 3PL service providers' and the 3PL service users', and that there is different perception of the interpretation of a punctual error-free fulfillment of service commitments between 3PL service providers' and 3PL service users'.

Table 6: GAP 3. 3PL Providers' service quality expectations – 3PL service users' service quality expectations

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	-.060	.452	.037	-.133	.013	-1.625	.106	.017
Reliability: Service Punctuality	-.127	.334	.027	-.181	-.073	-4.649	.000	.127
Reliability: Error-free service	0.000	.418	.034	-.067	.067	0.000	1.000	.000
Responsiveness: For Help	-.040	.432	.035	-.110	.030	-1.135	.258	.009
Responsiveness: To Requests	-.060	.907	.074	-.206	.086	-.811	.419	.004
Assurance: In-transit security	0.000	.803	.066	-.130	.130	0.000	1.000	.000
Assurance: Knowledge	.053	.842	.069	-.082	.189	.776	.439	.004
Empathy: customer service	-.007	.357	.029	-.064	.051	-.229	.819	.000
Empathy: Convenient contact	-.093	1.363	.111	-.313	.127	-.839	.403	.005
Empathy: Customer needs	-.053	1.041	.085	-.221	.115	-.627	.531	.003
Tangibility: Equipment	-.033	.772	.063	-.158	.091	-.529	.598	.002
Tangibility: Employees	-.033	.798	.065	-.162	.095	-.512	.610	.002

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Paired-sample t-tests (see Table 7) which examined Gap 4, which was the difference between service quality provided by 3PL service providers', and service quality perceived to have been received by 3PL service users' indicated that 3PL service providers' had over-estimated their service quality to their service users.' The results in Table 7 show that the mean differences between the values for service quality provided by that 3PL service providers', and service quality perceived to have been received by 3PL service users' were statistically significant, with $p < 0.001$ for all the 5 dimensions of service quality (i.e. (1) reliability, (2) responsiveness, (3) assurance, (4) empathy and (5) tangibility). However, the eta-squared values for almost all the five service quality dimensions only showed a small effect size. The only exception was the paired samples t-test conducted to evaluate the impact of providing a punctual service in the reliability dimension, which showed a mean difference of 1.287, with 95% confidence interval ranging from 1.109 to 1.464. The eta-squared statistic (.58) indicated a medium size effect. From Table 7, we can conclude that there exists a small, but significant difference

between the service quality provided by that 3PL service providers', and service quality perceived to have been received by 3PL service users'. This means that the 3PL service providers' should take corrective measures to check and ensure the improvement of their service quality to ensure a long-term relationship with the 3PL service users'. These findings extend the work of (Dubey et al. 2018) in explaining how which supply chain skills areas need to prioritized for development.

Table 7: GAP 4. 3PL actual service quality – 3PL service users' actual experience of service quality

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	1.153	1.041	.085	.985	1.321	13.569	.000	.553**
Reliability: Service Punctuality	1.287	1.101	.090	1.109	1.464	14.311	.000	.579**
Reliability: Error-free service	1.213	1.251	.102	1.012	1.415	11.879	.000	.486*
Responsiveness: For Help	.927	1.216	.099	.731	1.123	9.336	.000	.369*
Responsiveness: To Requests	1.073	1.466	.120	.837	1.310	8.967	.000	.351*
Assurance: In-transit security	1.073	1.419	.116	.844	1.302	9.261	.000	.365*
Assurance: Knowledge	.780	1.437	.117	.548	1.012	6.647	.000	.229*
Empathy: customer service	1.073	1.210	.099	.878	1.269	10.863	.000	.442*
Empathy: Convenient contact	.747	1.489	.122	.506	.987	6.141	.000	.202*
Empathy: Customer needs	.827	1.487	.121	.587	1.067	6.808	.000	.237*
Tangibility: Equipment	.693	1.164	.095	.506	.881	7.295	.000	.263*
Tangibility: Employees	.393	1.247	.102	.192	.595	3.862	.000	.091

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

5. Conclusions and suggestions for further research

5.1 Theoretical contributions

3PL research has been focused predominantly on the perspective of a 3PL service providers' or on a 3PL service users', and these studies have been carried out in Western countries. What is less understood is how a shared understanding of the perceptions and cognitions between 3PL service providers' and 3PL service users' may lead to the development of better logistics

relationships in developing countries. This study integrates both the communities: 3PL service providers', and 3PL service users', by using a matched-pair design to explain performance measurement in one model, and reconciles what had previously been presumed to be independent perspectives of performance measurement (i.e. : performance measurement from an 3PL service providers' perspective or , performance measurement from an 3PL service user perspective). This is a very important theoretical contribution, as these two communities were rarely studied together, despite the calls (Liu and Lyons 2011; Murphy and Daley 1999; Rajesh et al. 2011) for undertaking comparative studies involving both these communities to better explain performance measurement. There are two key empirical findings, which further signify our contribution to theory. First is how the focus on relationship management (such as the development of guanxi, trust, and commitment) drives improvements in 3PL service quality and second how better service quality enhances competitiveness of the 3PL service users'.

5.2 Linking the findings to the existing empirical literature

This study corroborates the idea that relationship management (such as the development of guanxi, trust, and commitment) between a 3PL service provider improve 3PL service quality, as efficient and effective understanding between the service provider and service users', enable appropriate identification of current customer needs and enable provision of tailor-made 3PL services. A better understanding and proper communication between parties provides more accurate 3PL services and augments a strong relationship between relationship management and organizational effectiveness of the 3PL service provider with the 3PL service user. These findings extend the work of (Beamon 1999; Elmuti 2002; Karrapan et al. 2017; Mentzer, Foggin, and Golicic 2000). Better service quality, such as reliable and accurate 3PL services, and better customer care, apart from generating sustainable profits and goodwill for a 3PL service provider, also enhance the competitiveness of the 3PL service users'. The results of this study indicate that service quality and relationship management are important factors and that

business performance of the service providers' is correlated with service design, service performance, and the ability to exercise flexibility to meet customer requirements. The results indicate that though the Indian 3PL industry initially was a transaction based service, but it has gradually evolved into a more strategic function that is integral to a 3PL service users' operational activities.

5.3 Implications for managerial practice

The first key implication for managers suggest there is a substantial variance between 3PL service providers' expectations of the quality of service delivery to their customers', and 3PL service providers' perceptions of the service actually delivered. This is an important finding as it demonstrates that the gap between the 3PL service providers' expectations and 3PL service providers' actual experiences can be attributed due to the difference in the tangibility attribute within the service quality paradigm. In Table 4 - the eta^2 value for tangibility attribute had a large effect size. This implies that the 3PL service providers' own expectations are not met fully especially with regarding the availability of warehouse facilities like MHEs, physical facilities and also in the 3PL service providers' employees efficiency in operating this equipment.

The second important implication for managers indicates that there is a substantial variance in 3PL service users' expectations and actual service received. In Table 5 - the eta^2 value of 0.805 for 'empathy: customer service' attribute had a large effect size. 3PL service users' noted that 3PL service providers' did not focus on ensuring an error-free service which was punctual and responsive. 3PL service users' observed that regarded that 3PL service providers' should provide 3PL service users' - transparency via information sharing for their shipments, and show empathy for 3PL service users' challenge of providing the end-customer an high overall customer satisfaction.

The third key implication for managers reveals that there is a substantial variance between the service quality provided by 3PL service providers', and service quality perceived to have been received by 3PL service users'. This is confirmed in Table 7, by the eta^2 value of 0.55, 0.58 & 0.49 for reliability variables relating to 'Efficient & consistent' delivery, 'Service Punctuality' and 'Error-free service', which all had a large effect size. This specific finding clearly indicates that 3PL service users' regard an 'error-free customer service' to be very important, and more significantly show that 3PL service providers' believe that they are fulfilling the needs of 3PL service users', but in-reality are actually failing. During the follow-up interviews - the 3PL service users' noted that they were unhappy, because they had to constantly follow up with the service provider to keep a track on their shipments, and were unhappy with the lack of information transparency particularly when the shipments were delayed due to transit security issues. Taken together, these results suggest that 3PL service providers' should take corrective measures to check and ensure the improvement of their service quality by adopting innovative technologies (e.g., IoT) to ensure a long-term relationship with the 3PL service users'.

Consequently, the present paper had added to the existing literature by comparing 3PL service providers' and service users' in their service quality performance measurement. This is important as: (1) relatively little attention has given to empirical studies of 3PL service providers' and service users' in developing countries, and (2) there is a particular paucity of empirical investigations into 3PL service providers' and service users' perception and cognitions relating to service quality performance measurement as an integral component of their logistics relationship in the Indian context.

5.4 Implications for managerial policy

The findings of this study have several implications for research as well as for practice. First, in a complex phenomenon such as developing effective future logistics strategies to respond to a distributed manufacturing paradigm environment, studies that rely on a single perspective

cannot provide the necessary information. This study expanded our knowledge by using a matched-pair design to include both the communities: 3PL service providers', and 3PL service users'. Therefore this study contributes to the establishment of a more comprehensive and integrated model developing effective future logistics strategies to respond to a distributed manufacturing paradigm environment. Second, the current research considered 3PL service providers', and 3PL service users' as two important but distinctive behavioral sets. By developing a comprehensive model that includes both usage behaviors, in a single study, using matched pairs, this study contributes to knowledge by illustrating that the monolithic view of general 3PL service usage or use for 3PL service provision only cannot tell the whole story. Thus, it sheds more light not only about how the 3PL community' members can provide and contribute their knowledge but also how they can acquire knowledge and gain performance benefits from the community.

5.5 Future Research

To conclude, this study has provided a unique insight into the managerial perspective on the integration and collaboration benefits and challenges facing 3PL service providers' and 3PL service users' for developing effective future logistics strategies. The sampling frame of this study which comprised of 600 structured interviews from 300 senior management, middle management and front-line managers based at is the first large-scale matched-pair study of 3PL Service Providers', and 3PL Service Users' from India. The study findings may not be generalizable to other economies with different characteristics, and may not apply to other cultures. Future research may also contribute to knowledge by accounting for the factors mentioned above, and by extending and integrating (or substituting) other service quality or related factors (e.g., adoption of IoT).

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Appendix 1: Abridged version of questionnaire for 3PL service providers'

Key of scale: (1 represents strongly disagree and 7 represents strongly agree)

7	6	5	4	3	2	1
Strongly agree	Agree Moderately	Agree	Neutral	Moderately disagree	Disagree	Strongly disagree

Service Quality

My Company:	7	6	5	4	3	2	1
i) Provides efficient and consistent services							
ii) Is punctual with service commitments							
iii) Provides error-free service (target) assistance							
iv) Expresses a consistent willingness to help							
v) Is responsive to requests and consistently courteous							
vi) Provides in-transit security (ensures minimal transit loss)							
Vii) Provides customised customer service							
viii) Has convenient office hours							
ix) Has updated equipment and employees							
x) Is perceptive of customer needs and problems							
xi) Has updated equipment							
xii) Has updated employees							

Appendix 2: Abridged version of questionnaire for 3PL service users'.

Importance of Service Quality when selecting 3PL service providers'**.** Key of scale: (1 represents strongly disagree and 7 represents strongly agree)

7	6	5	4	3	2	1
Strongly agree	Agree Moderately	Agree	Neutral	Moderately disagree	Disagree	Strongly disagree

Service Quality

Logistics Service Provider:	7	6	5	4	3	2	1
i) Provides efficient and consistent services							
ii) Is punctual with service commitments							
iii) Provides error-free service (target) assistance							
iv) Expresses a consistent willingness to help							
v) Is responsive to requests and consistently courteous							
vi) Provides in-transit security (ensures minimal transit loss)							
Vii) Provides customised customer service							
viii) Has convenient office hours							
ix) Has updated equipment and employees							
x) Is perceptive of customer needs and problems							
xi) Has updated equipment							
xii) Has updated employees							

Table 1. Demographic Profile of the Respondents – Industry Profile

3PL service providers' (n=150) Code 1			3PL service users' (n=150) Code 2		
Category	**Sub Category**	**Frequency**	**Category**	**Sub Category**	**Frequency**
Company	Limited	53	Company	Limited	52
	Public Listed	25		Public Listed	32
	Partnership	2		Partnership	8
	JV/M&A	0		JV/M&A	6
	Sole Prop.	0		Sole Prop.	14
	Pvt. Ltd.	70		Pvt. Ltd.	38
Type of Goods imported/ exported	Automotive	33	Basic Nature of Company/ Industry	Automotive	11
	Chemical	36		Chemical	9
	Construction	36		Construction	2
	Electrical	35		Electrical	6
	Electronics	8		Electronics	14
	IT	0		IT	2
	Med./Health	25		Med./Health	8
	Plastics	4		Plastics	7
	Service	29		Service	7
	Textile/Cloth	5		Textile/Cloth	30
	Grocery/cosmetics	1		Grocery/cosmetics	5
	All	74		All	49
Number of Employees	<50	2	Number of Employees	<50	30
	50-99	6		50-99	39
	100-199	25		100-199	32
	200-499	25		200-499	20
	500-999	59		500-999	9
	>1000	33		>1000	20
Role in Supply Chain	Customs Broker	30	Availed Supply Chain service	Customs Broker	12
	NVOCC	30		NVOCC	71
	Transporter	40		Transporter	117
	Freight Forwarder	101		Freight Forwarder	123
	Shipping Line	0		Shipping Line	0
Organization	Asset Based	35	No. of service providers' used	1-2	43
	Non-Asset Based	20		3-4	53
	Both	95		Above 4	4
Management Position	Senior Management	39	Years (have been using current the service providers')	1	6
	Middle Management	103		1-2	19
	Front-line Manager	8		2-3	30
	Front-line Staff	0		3-4	42
				Over 4	53
Transportation Service and Capabilities of Organization	Small Package	0	Mainly Outsourced functions	Assembly, repair, packaging	3
	Air Cargo	29		Bonded Warehousing	44
	< Container Load	0		Custom Clearance	88
	Truckload	12		EDI Capability	21
	Intermodal	0		Export & Import	78
	Ocean	54		Order processing	4
	Rail	0		Oversees sourcing	7
	Bulk	0		Pickup & Delivery	56
	Dedicated Contract Carriage	12		Reverse Logistics	3
	Fleet Acquisition	0		All the above	25
	Equipment/Driver	0			
	All	84			

Table 2. Demographic Profile of the Respondents Organizational Hierarchy

Position in the Company	3PL Service users expected frequency (%)	3PL service users' actual frequency (%)	3PL service providers' actual frequency (%)	3PL service providers' expected frequency (%)
Senior management	36(24)	38(25.33)	45(30)	39(25.5)
Middle management	82(54.7)	82(54.7)	96(64)	103(67.32)
Front-line manager	32(21.4)	30(20)	9(6)	8(5.33)
Total	150(100%)	150(100%)	150 (100%)	150 (100%)

Table 3 Logistics Services Outsourced to 3PL service providers'

Logistics Services Outsourced to 3PL service providers'	Frequency(percent)
Assembly, repairing and packaging	3(2%)
Bonded warehousing	44(29.33%)
Custom clearance	88(58.67%)
EDI capability	21(14%)
Export and Import Operations	78(52%)
Order processing	4(2.67%)
Overseas sourcing	7(4.67%)
Pickup and delivery	56(37.33%)
Reverse logistics	3(2%)
All	25(16.67%)

Table 4: GAP 1. 3PL expected service quality - 3PL actual service quality

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	.453	.756	.062	.331	.575	7.344	.000	.266*
Reliability: Service Punctuality	.520	.932	.076	.370	.670	6.833	.000	.239*
Reliability: Error-free service	.913	1.036	.085	.746	1.080	10.799	.000	.439*
Responsiveness: For Help	.787	1.078	.088	.613	.961	8.937	.000	.349*
Responsiveness: To Requests	.633	1.508	.123	.390	.877	5.144	.000	.151
Assurance: In-transit security	.573	1.276	.104	.367	.779	5.502	.000	.169
Assurance: Knowledge	.980	1.108	.090	.801	1.159	10.832	.000	.441*
Empathy: customer service	.673	.993	.081	.513	.834	8.303	.000	.316*
Empathy: Convenient contact	.553	1.721	.140	.276	.831	3.939	.000	.094
Empathy: Customer needs	.693	1.609	.131	.434	.953	5.277	.000	.157
Tangibility: Equipment	1.100	.954	.078	.946	1.254	14.127	.000	.573**
Tangibility: Employees	1.407	1.062	.087	1.235	1.578	16.215	.000	.638**

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Table 5: GAP 2. Expected service quality by 3PL service users' - Actual service quality received by 3PL service users'

	Paired Differences							
Service Quality variables	Mean	Std. Dev	Std. Err Mean	95% CI Lower	95% CI Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	1.667	.816	.067	1.535	1.798	25.000	.000	.807***
Reliability: Service Punctuality	1.933	.739	.060	1.814	2.053	32.049	.000	.873***
Reliability: Error-free service	2.127	.929	.076	1.977	2.277	28.037	.000	.841***
Responsiveness: For Help	1.753	.794	.065	1.625	1.881	27.054	.000	.831***
Responsiveness: To Requests	1.767	.798	.065	1.638	1.895	27.121	.000	.832***
Assurance: In-transit security	1.647	1.037	.085	1.479	1.814	19.445	.000	.717**
Assurance: Knowledge	1.707	1.167	.095	1.518	1.895	17.904	.000	.683**
Empathy: customer service	1.753	.867	.071	1.614	1.893	24.782	.000	.805***
Empathy: Convenient contact	1.393	1.456	.119	1.158	1.628	11.722	.000	.480*
Empathy: Customer needs	1.573	.907	.074	1.427	1.720	21.235	.000	.752**
Tangibility: Equipment	1.827	.865	.071	1.687	1.966	25.863	.000	.818***
Tangibility: Employees	1.833	.951	.078	1.680	1.987	23.604	.000	.789**

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Table 6: GAP 3. 3PL Providers' service quality expectations – 3PL service users' service quality expectations

	Paired Differences							
Service Quality variables	Mean	Std. Dev	Std. Err Mean	95% CI Lower	95% CI Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	-.060	.452	.037	-.133	.013	-1.625	.106	.017
Reliability: Service Punctuality	-.127	.334	.027	-.181	-.073	-4.649	.000	.127
Reliability: Error-free service	0.000	.418	.034	-.067	.067	0.000	1.000	.000
Responsiveness: For Help	-.040	.432	.035	-.110	.030	-1.135	.258	.009
Responsiveness: To Requests	-.060	.907	.074	-.206	.086	-.811	.419	.004
Assurance: In-transit security	0.000	.803	.066	-.130	.130	0.000	1.000	.000
Assurance: Knowledge	.053	.842	.069	-.082	.189	.776	.439	.004
Empathy: customer service	-.007	.357	.029	-.064	.051	-.229	.819	.000
Empathy: Convenient contact	-.093	1.363	.111	-.313	.127	-.839	.403	.005
Empathy: Customer needs	-.053	1.041	.085	-.221	.115	-.627	.531	.003
Tangibility: Equipment	-.033	.772	.063	-.158	.091	-.529	.598	.002
Tangibility: Employees	-.033	.798	.065	-.162	.095	-.512	.610	.002

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

Table 7: GAP 4. 3PL actual service quality – 3PL service users' actual experience of service quality

	Paired Differences							
				95% CI				
Service Quality variables	Mean	Std. Dev	Std. Err Mean	Lower	Upper	t	Sig. (2tailed)	eta^2
Reliability: Efficient & consistent	1.153	1.041	.085	.985	1.321	13.569	.000	.553**
Reliability: Service Punctuality	1.287	1.101	.090	1.109	1.464	14.311	.000	.579**
Reliability: Error-free service	1.213	1.251	.102	1.012	1.415	11.879	.000	.486*
Responsiveness: For Help	.927	1.216	.099	.731	1.123	9.336	.000	.369*
Responsiveness: To Requests	1.073	1.466	.120	.837	1.310	8.967	.000	.351*
Assurance: In-transit security	1.073	1.419	.116	.844	1.302	9.261	.000	.365*
Assurance: Knowledge	.780	1.437	.117	.548	1.012	6.647	.000	.229*
Empathy: customer service	1.073	1.210	.099	.878	1.269	10.863	.000	.442*
Empathy: Convenient contact	.747	1.489	.122	.506	.987	6.141	.000	.202*
Empathy: Customer needs	.827	1.487	.121	.587	1.067	6.808	.000	.237*
Tangibility: Equipment	.693	1.164	.095	.506	.881	7.295	.000	.263*
Tangibility: Employees	.393	1.247	.102	.192	.595	3.862	.000	.091

Degrees of freedom were 149. Cohen's d * is a small effect size, ** medium effect size, *** large effect size

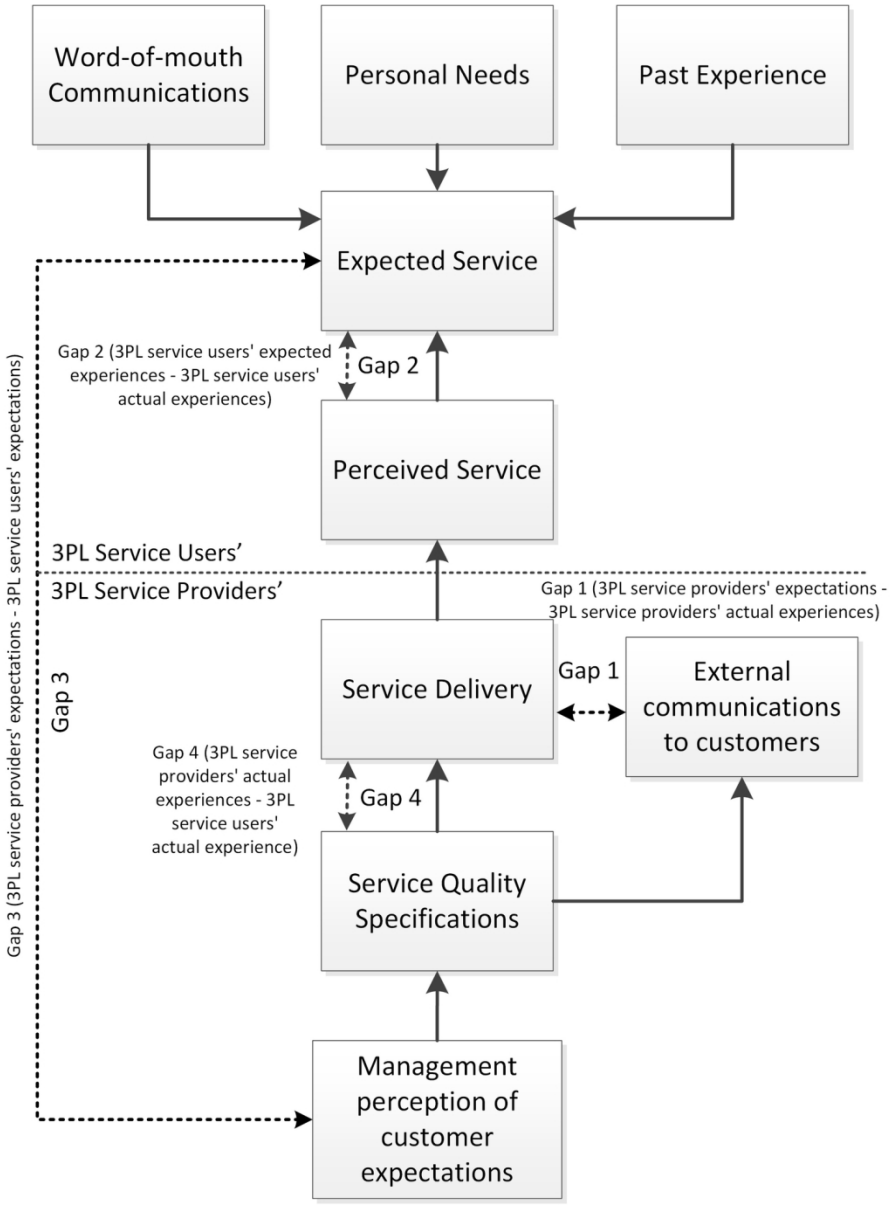

Figure 1 – Theoretical framework

129x170mm (300 x 300 DPI)