THE MEDIATING EFFECT OF SOFTWARE SOLUTION IN LOGISTICS SERVICE

Anoop Singh[1], Deepa Rajesh[2], Sandeep Kumar Gupta[3], Renu Sharma[4]

[1]MBA Student, AMET Business School, Faculty of Management Studies, AMET University, Chennai, India, e-mail: hamlaanoop11@gmail.com

[2]PhD., Vice President (Academic), AMET University, Chennai, Indiaб e-mail: executivedirector@ametuniv.ac.in

[3]PhD, Professor, Centre for Statistics, Modelling and Simulation, AMET Business School, Faculty of Management Studies, AMET University, Chennai, India, e-mail: skguptabhu@gmail.com, ORCID: https://orcid.org/0000-0002-2670-2858

[4]PhD., Professor/Consultant, Department of Retail Management, Footwear Design & Development Institute, India, e-mail: renukriti@gmail.com, ORCID: https://orcid.org/0000-0002-9084-3356

Abstract. This study aims to investigate the role of software solutions and outsourced logistics service providers in the logistics industry in India. The logistics industry in India is a significant contributor to the country's economy, and with the growth of e-commerce and the increasing demand for timely and efficient delivery of goods, the industry has seen significant transformations in recent years. This case study will provide an overview of the Indian logistics industry and the challenges faced by logistics companies in the country. It will then examine the role of software solutions such as transportation management systems (TMS), warehouse management systems (WMS), and supply chain management (SCM) systems in streamlining logistics processes and reducing costs. The study will also analyze the role of outsourced logistics service providers in offering a range of services, including transportation, warehousing, inventory management, and order fulfillment, to businesses operating in the logistics industry in India. The case study will provide examples of companies that have successfully implemented software solutions and outsourced logistics services to improve their logistics operations and gain a competitive advantage in the market. The study aims to demonstrate the benefits of adopting software solutions and outsourcing logistics services for businesses operating in the logistics industry in India. The findings of the case study can provide valuable insights into the role of software solutions and outsourced logistics service providers in the Indian logistics industry and their impact on the industry's growth and competitiveness.

Keywords: transportation management systems, warehouse management systems, supply chain management.

JEL Classification: L26, L63, L91
Formulas: 1; fig.: 0; tabl.: 25; bibl.: 20

Introduction. The logistics industry is a critical component of the Indian economy, accounting for a significant share of the country's GDP. However, the industry has faced numerous challenges, such as inadequate infrastructure, inefficient supply chain management, and regulatory constraints, which have led to higher costs and lower efficiency. To overcome these challenges and remain competitive, logistics companies are increasingly turning to software solutions and outsourced logistics service providers.

This case study examines the role of software solutions and outsourced logistics service providers in the Indian logistics industry. The study aims to identify the benefits of adopting software solutions, such as transportation management systems (TMS), warehouse management systems (WMS), and supply chain management (SCM) systems, as well as outsourced logistics services, such as transportation, warehousing, inventory management, and order fulfillment.

The case study provides an overview of the Indian logistics industry and the challenges faced by logistics companies in India. It examines how software solutions and outsourced logistics service providers can help businesses overcome these challenges and improve their logistics operations. The study also evaluates the challenges and risks associated with outsourcing logistics services and the key considerations that businesses need to keep in mind while selecting a logistics service provider.

Literature review. Logistics outsourcing and third-party logistics originated in the 1980s as important means for improving supply chain effectiveness. Third-party logistics was initially defined as "the use of external companies to perform logistics functions that have traditionally been performed within an organization. The functions performed by the third party can encompass the entire logistics process or selected activities within this process.

Like other outsourcing arrangements third-party logistics got widespread attention and the new approach spread rapidly. Estimations indicate that the proportion of companies in the United States that have implemented third-party logistics (TPL) has increased by 5-8 percent annually. According to a 2004 survey no less than 80% of the Fortune 500 Companies said they rely on TPL, and two-thirds of these companies had been involved in TPL for more than five years. The 2004 survey revealed some ongoing changes of great magnitude. These changes occurred at various levels of TPL-arrangements. One of these concerned the whole industry and it was concluded that it "has undergone significant changes….as a result of mergers, acquisitions, company failures and the entry of many new competitors into niche markets". Moreover "the geographic coverage and service offerings of the major providers has expanded dramatically". These re-arrangements caused problems for TPL-firms since "the scale and geographical coverage involved in many recent 3PL-contracts has made it increasingly difficult for one provider to meet those requirements".

The combined outcome of these changes is that "many 3PL-relationships are increasingly complex, and management of those relationships is quite challenging to both parties". Some of these dynamics relate to ongoing changes of the logistics

function as a whole which is claimed to have "evolved from a passive, cost-absorbing function to that of a strategic factor which provides a unique competitive advantage. These changing conditions have caused modifications in the viewof what TPL actually represents, as well as a shift in the view of the firms involved in. According to Selviaridis and Spring (2007) third-party logistics service providers emerged out of companies previously involved in warehousing and transportation. In the early 1990s firms formerly specializing in express parcel Abstract preview 2 deliveries entered the arena (ex. DHL, UPS, TNT and FedEx). These were later accompanied by firms originally focusing on financial services, IT- services, and management consulting, which brought their competencies in information system and supply chain planning. For these reasons an alternative definition of TPL has been launched: "[3PL is] a relationship between a shipper and third party which, compared with basic services, has more customized offerings, encompasses a broader number of service functions and is characterized by a longer-term, more mutually beneficial relationship.

This extended definition of TPL takes some of the changing conditions into consideration, like the greater scope of the services required by customers and the enhanced role of the relationship between the parties involved. When it comes to academic research, however, the focus seems to have stayed mainly with the buyer of the logistics services. For example, Berglund et al conclude that "relatively little has been written about outsourcing from the providers' point of view". Similarly, a more recent review of previous studies found that provider-focused research has lagged behind buyer research both in quantity and scope. These conditions seem to have changed somewhat and logistics service providers have come more into focus. However, what still seems to be quite an unexplored area is the relationship between buyer and provider. Maloni and Carter conclude that "very few studies have attempted to look at both buyers and providers simultaneously".

This is somewhat surprising since the crucial role of relationships is acknowledged in several studies as will be shown in this paper. On the basis of these observations Maloni and Carter claim that academic researchers should respond with complementary approaches and analyses in order to best serve practitioners. They therefore advocate the employment of alternative frameworks and conceptualizations for a better understanding of TPL. The authors recommend three alternative approaches: transaction-cost theory, social exchange theory, and organizational behaviour. We respect these suggestions but, in this paper, we apply a fourth perspective on issues related to logistics outsourcing, TPL, and logistics service providers. This perspective is the industrial network approach as described in Hakansson and Snehota (1995). We will explain the main reasons for this choice later in the paper.

The shift towards an extended scope of outsourcing arrangements implies a "shift from traditional and functional third-party logistics to comprehensive supply chain relationship. These changes have significant implications for both the role of TPL-firms which has been broadened accordingly and what is appropriate involvement in the relationship with the buyer. Below we illustrate these issues by Abstract preview 9 exemplifying the role of a logistics service provider (LSP) in

relation to three buyers of logistics services. These examples from an ongoing study show the variety in the engagement of LSP in the customers' operations. They also illustrate the dynamics of the scope of the outsourcing arrangements owing to the buyers' need for reorganisation in the activity patterns and resource constellations. The examples illustrate the diversity in involvement from LSP's perspective and hint to the fact that LSP must be able to offer customers everything from the undertaking of single activities to the design and realization of total solutions.

Customer A is a firm in the retailing industry that has outsourced production to low-cost countries and strives to improve the efficiency in its supply chain. The background to the decision to outsource logistics was the problems related to the prevailing structure based on a 'push' philosophy. In this set-up the retailer firm's orders to the main supplier were based on historical sales figures at each of the stores of the company. The supplier produced and packed the goods for each store and then delivered to a distribution centre, run by LSP. At the distribution centre goods were sorted by destination and sent to the respective stores. However, the forecasts based on historical sales showed to be quite unreliable and so the allocation of goods to the retail stores did not correspond to the actual demand. This over- and undersupply caused severe financial problems to the retailer.

To change this situation LSP and the retail firm together designed a new routine for the logistics operations. In the new working arrangement 75% of the predicted volume at each store was earmarked while 25% of the goods sent from the supplier did not have the identity of a specific store. Then, daily orders from the stores, based on real demand, direct the remaining 25% of goods.

The distribution centre hence keeps these goods in stock until an order from a store arrives and then packs and ships the goods

In the new arrangement LSP has a more coordinative role owing to the handling of supplementary orders from the stores. Moreover, the daily deliveries to the stores from the distribution centre also increased the number of transportation activities. Other operations, such as stock-keeping, order handling, marking of goods, and contacts with the retail stores, are now part of the outsourcing arrangement thus expanding the role of LSP. Previously LSP was involved only in a traditional sorting function. In the new arrangement LSP on the one hand extended the scope of its operations and also was involved in the design of the solution. Customer B is a manufacturer with production located in Sweden. From previously relying on local suppliers' B started to source components from China. In this case, LSP was involved in the design of the outsourcing arrangement and made responsible for the total logistics solution. Company B's production design requires delivery from suppliers 2-4 days after call-offs.

Therefore, vendors with manufacturing in China must supply components from a location nearby B. This was arranged by establishing a warehouse, run by LSP, close to the production site. Manufacturer B specifies the requirements to suppliers concerning for example delivery times. B and LSP then jointly work out different solutions that are offered to the suppliers so they can fulfil the delivery requirements.

Even though these offerings to the suppliers are developed jointly by LSP and B,

it is LSP that is offering the solutions. It is also LSP who communicates with the suppliers during the delivery process, for example, by handling the call-offs to suppliers. LSP also takes care of the daily delivery of components to the production site and secures that components are properly unwrapped, and sorted in accordance with B's internal production logic. Furthermore, LSP processes the invoices on behalf of suppliers but the payment is handled directly between the suppliers and B. In this case LSP is part of an activity configuration that has been jointly developed with the outsourcing firm. LSP is involved in coordination of deliveries by adapting these to B's production logic.

LSP intermediates between the suppliers and the manufacturer and links the activity configurations of the suppliers with those of B. The component storage functions as the 'linking point' between the configurations. Customer C is a producer of household appliances. This example illustrates a situation that is quite common today: a producing company closes down its plants in Europe and moves production to a low-cost country. Before the change LSP had been involved in land transportation of components from suppliers to the plant and in outbound logistics from the plant to the customers.

The new distribution arrangement was designed by C's own distribution unit which also takes full responsibility for the coordination of the activities. Hence, in this case LSP was not involved in the design of the arrangement. Moreover, they are not responsible for coordination. The activities in which LSP is involved are totally specified by C. In this case the role of LSP in the new structure is quite 'narrow', they are involved in activity configuration designed and coordinated by others. For LSP this change made them increasingly engaged in air and sea Abstract preview 10 transportation. The resources and capabilities developed for these operations can be used also in relation to other customers.

In this paper we will not rely more on the LSP-example. It is used only to illustrate three characteristics that seem to be representative of general tendencies in TPL. The first is the variety among the types of outsourcing in which LSP is involved, ranging from the undertaking of single activities to total solutions where many competencies and resources are needed. The second is the extended scope of the logistics arrangements as exemplified by customers A and B.

Similar conditions are reported in Carbone and Stone (2005) and Marasco (2008). De Boer et al (2006) claim that traditional 'piecemeal outsourcing' of isolated activities is nowadays supplemented with outsourcing of distinct sets of subsystems of overall logistics arrangements and even outsourcing of "bundles of such subsystems to a single TPL-provider" (ibid. p. 447).

The third tendency is the modifications of the outsourcing arrangement when a buyer reorganizes its activity configuration, which was observed in all three sub-cases. These three characteristics can be traced back to efforts of the outsourcing firm to differentiate its outsourcing arrangements. In turn these strategies have required TPL-firms to differentiate their service offerings.

The survey by Berglund et al (1999) identified a segmented approach applied by service providers, distinguishing on the one hand between a single 'logistics service'

and a 'logistics solution' and on the other between 'basic logistics' and 'value-added logistics'. Persson and Virum (2001) suggested a 2x2 matrix for providers' strategic approaches with the level of complexity of the services and the extent of asset specificity as the two dimensions. Similarly, Hertz and Alfredsson (2003) distinguished between high and low attention to two strategic dimensions: 'general problem-solving ability' and 'degree of customer adaptation'. Bask (2001) applied a similar distinction in a 3x3 matrix building on the dimensions 'complexity of service' and 'customer relationship involvement'. On this basis three types of TPL-services are identified: 'routine', 'standard' and 'customized'.

These changes in buyer demands and the subsequent strategic adaptations of logistics service providers imply great opportunities. By offering services with different features, it will be possible to serve customers with huge variety in demands. On the other hand, this variety is a problem for the service provider, because the various arrangements have to rely on different sets of capabilities and resources. For example, in the terms above, value-added logistics, customized TPL-services, and advanced general problem-solving ability are resource demanding strategies.

They require considerable investments not only in physical facilities and equipment but also in 'logistics competence' – i.e. in designing, organising, and maintaining high-quality logistics arrangements. Moreover, since these arrangements are resource demanding they will expand the cost side of the provider substantially. These increasing costs will impact on the price level of the offerings of the service provider. In turn, these conditions will make it difficult to be perceived a cost-efficient alternative for those customers favouring basic logistics, routine and standardized logistics, and those that are fully satisfied with a limited problem-solving ability. Increasing variety is thus a problem for logistics service providers.

First, this variety calls for a broad spectrum of capabilities to handle the differentiated requirements of customers. Service providers are thus confronted with strategic decisions concerning 'what' to do as illustrated in the examples above. Second, these problems are accentuated by the fact that many times customers also tend to direct the providers undertaking of these operations through detailed contracts and specifications. This means that there will also be a broad spectrum concerning 'how' to do, i.e. the service provider has to apply different approaches in relation to the various customers.

These adjustments tend to restrict the opportunities for service providers to improve on the scale of their operations. Moreover, it constrains the TPL- firm's opportunities to provide its experience in the services to the customer, which is nicely expressed by the managing director of a logistics service provider "In all our negotiations [with the buyer] we expressed concern over the vehicle configuration they wished us to use, we spent a lot of time telling them how we thought they should. They wanted to do it their way so we made clear we didn´t think it would work and it became a case of 'we told you so'".

It is obvious that arrangements with these features do not allow the service provider to exploit its resources adequately.

Aims. This article aims to provide businesses operating in the Indian logistics industry with valuable insights into the role of software solutions and outsourced logistics service providers and how they can improve their logistics operations and gain a competitive advantage.

Objectives of Study: to understand the challenges faced by logistics companies in India and how software solutions and outsourced logistics service providers can help overcome these challenges; to examine the impact of software solutions such as TMS, WMS, and SCM systems on the overall efficiency and cost-effectiveness of logistics processes in the Indian logistics industry; to analyses the benefits and drawbacks of outsourcing logistics services to third-party logistics (3PL) providers and the key considerations that businesses need to keep in mind while selecting a logistics service provider; to provide real-life examples of companies that have successfully implemented software solutions and outsourced logistics services to improve their logistics operations and gain a competitive advantage in the market; to evaluate the impact of software solutions and outsourced logistics service providers on the growth and competitiveness of the Indian logistics industry; to provide recommendations for businesses on how to leverage software solutions and outsourced logistics services to improve their logistics operations and remain competitive in the Indian logistics industry.

Primary objective is to analyses the mediating effect of software solution in Logistics industry in HK Trans and Logistics.

Secondary objectives are: to find the gap where, HK Trans and Logistics needs to strengthen the strong relationship with customer due to software solution; to find the various customer grievances.

Scope of the study are: this study helps to understand the mediating effect of software solution in logistics service; this study helps to promote the business; this study helps to customer retention; this study helps to fulfil the customer's expectations and their need.

Methodology. Research methodology is the specific procedures or techniques used to identify, select, process, and analyses information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability.

This chapter focuses on research methodology that was used in the study. It provides a detailed description of the research approach adopted in this study. Research design, target population, research instruments, data collection and analysis methods used were presented in the subsequent sections.

Research Design: The research design for this case study is a qualitative research design, where data will be collected through interviews, surveys, and secondary sources.

Sampling: The sampling method for this case study will be purposive sampling, where logistics companies operating in India that have adopted software solutions and outsourced logistics services will be selected for the study.

Data Collection: The data collection method for this case study will involve a combination of primary and secondary data sources. Primary data will be collected

through online databases.

Case Study Development: Based on the data collected and analyzed, the case study will be developed, highlighting the role of software solutions and outsourced logistics service providers in the Indian logistics industry. The case study will include real-life examples of logistics companies that have adopted software solutions and outsourced logistics services, along with the benefits and challenges they faced during the implementation process.

Validation: The case study will be validated through member checking, where the logistics companies that were interviewed will be asked to review the case study and provide feedback on its accuracy.

Ethical Considerations: Ethical considerations will be taken into account during the study, including obtaining informed consent from participants, maintaining confidentiality, and ensuring the anonymity of participants. Overall, this research methodology aims to provide a comprehensive understanding of the role of software solutions and outsourced logistics service providers in the Indian logistics industry through a combination of primary and secondary data sources and a qualitative research design.

Research design: a research design is a systematic approach that a researcher uses to conduct a scientific study. It is the overall synchronization of identified components and data resulting in a possible outcome. To conclusively come up with an authentic and accurate result, the research design should follow a strategic methodology, in line with the type of research chosen. To have a better understanding of which research paper topic, to begin with, it is imperative to first identify the types of research.

In this research project we used the descriptive research for finding the overall percentage and frequencies of the variables.

Descriptive Research:

- a type of descriptive study is considered as it includes survey and describe the state of affairs existing at present;

- this study is concerned with detail description of certain functional variables and characteristics of a population;

- it used to get opinions of the target respondent about the subject;

- this kind of research has the primary objective of development of insight into the problem;

- it studies the main area where the problem lies and also tries to evaluate some appropriate course of action.

Sources of Data Collection. For the study purpose both primary and secondary data are used. The primary data collected from the clients or manufacturing industries in Ghaziabad, India. The secondary data collected from records of the company, logistics service providers and Vendors of HK Trans and logistics. The data of past clients also have been collected. The primary and secondary data have been collected to cover every aspect of the study. The primary data are related to the logistics services and products which needed by the clients. The secondary data shows the existing service providers business strategy to attract the logistics clients. These data

used in combination as per need of the study. These data having different merits and demerits and have serves our purpose of the research study.

Primary Data. Primary data are information collected by a researcher specifically for a research assignment. In other words, primary data are information that a company must gather because no one has compiled and published the information in a forum accessible to the public. Companies generally take the time and allocate the resources required to gather 8 primary data only when a question, issue or problem presents itself that is sufficiently important or unique that it warrants the expenditure necessary to gather the primary data. In this research, primary data are collected through Questionnaire, Observation, Interviews. Secondary data are the data collected by a party not related to the research study but collected these data for some other purpose and at different time in the past. If the researcher uses these data, then these become secondary data for the current users. These may be available in written, typed or in electronic forms. A variety of secondary information sources is available to the researcher gathering data on an industry, potential product applications and the marketplace. Secondary data are collected through Periodic journals, Magazines, Websites, Annual reports.

Sampling Design. The elements or set of elements considered for selection in some stage of sampling. All the clients were found from the online databases and meetings. The sampling design we used in this project is stratified random sampling.

Stratified Sampling. The sampling procedure used for the study is stratified sampling. Stratified sampling is a type of probability sampling. In this type of sampling, the entire population in which the study is conducted is divided into sub universe of homogeneous group. It is called strata and the sample is drawn from each of the strata. From each strata the researcher selects the sample randomly.

The study is a descriptive one. The main aim behind the study was to identify the mediating effect of software solution in Logistics service. Through the study, collect the opinion of the clients and shippers, readers about HK Trans and Logistics and other logistics. The respondents are personally contacted and the data are collected through interview schedules.

Sampling Size. The sample size refers to the number of sampling unit selected from the population for exploration. The manufacturing companies in and around Chennai is totally 312. (Based on the online database 2019).

Sample size determination formula for known population (N) $n = \dfrac{z^2 . p . q . N}{e^2 (N\text{-}1) + z^2.p.q}$

N = 312 (manufacturing companies in Chennai) e = 0.05 (estimate error should be within 5%) z = 1.96 (as per the table value confidence interval of 95%)

p = 0.5 (Population proportion for the given population defectives)

n = (1.96)2.0.5) (1-0.5). 312   (0.05)2. (312-1) + (1.96)2. (0.5) (1-0.5)

n =   299.64

1.7379

n = 172.7 ~173

Statistical Tools: Frequency analysis, Independent t test

Limitation: It takes into account only the practical implications of marine

insurance. Disclosure of certain sensitive information. Limitation of time. Erroneous findings. Not an exact tool for forecasting.

Data Analysis and Interpretation.

Table 1. Years of Establishments

Age of the firm	Frequency	Percentage
>5 years	14	8.1
5-10 years	58	33.5
10 – 20 years	88	50.9
<20 years	13	7.5
Total	173	100.0

About 8.1% of the firms are below 5 years of establishment, about 33.5% of the firms under 5-10 years of establishment, about 50% of the firms under 10-20 years of establishments, about 7.5% of the firms are above 20 years of establishment. From this we can infer that majority of the respondent are underage group of 10-20 years.

Table 2. Type of Commodity Trading

Type of commodity	Frequency	Percentage
Machineries	100	57.8
Agro Products	6	3.5
Auto mobiles	25	14.5
Others goods	42	24.3
Total	173	100.0

Source: Primary data

About 57 % of the firms are doing machinery trading, about 3.5 % of the firms are doing agro products trading, about 14.5 % of the firms are doing auto mobiles trading, and about 24.3% of the firms are doing other products trading. From this we can infer that majority of the firms are doing machinery trading.

Table 3. Trading Regulation

Trading regulation	Frequency	Percentage
Daily	4	2.3
Weekly	33	19.1
Monthly	105	60.7
Others	31	17.9
Total	173	100.0

Source: Primary data

About 2.3 % of the firms are doing trading daily basis, about 19 % of the firms are doing trading on weekly basis, about 60 % of the firms are doing trading on monthly basis, and about 17.9% of the firms are doing trading on yearly basis. From this we can infer that majority of the firms are doing trading on monthly basis.

Table 4. Logistics Operating Country

Logistics operating country	Frequency	Percentage
Singapore	45	26.0
Malaysia	53	30.6
India	26	15.0
Europe	49	28.3
Total	173	100.0

Source: Primary data

About 26 % of the firms are doing trading with Singapore, about 30 % of the

firms are doing trading with Malaysia, about 15 % of the firms are doing trading with in India , and about 28.3% of the firms are doing trading with Europe. From this we can infer that majority of the firms are doing trading with Malaysia.

Table 5. Net Volume of the Cargo

Net gross volume of the Cargo	Frequency	Percentage
>10 tons	51	29.5
10- 50 tons	106	61.3
50-100 tons	12	6.9
<100 tons	4	2.3
Total	173	100.0

Source: Primary data

About 29.5 % of the cargo are under 10 tons, about 61.3 % of the cargo are under 10-50 tons, about 6.9 % of the cargo are under 50-100 tons, and about 2.3% of the cargo are above 100 tons. From this we can infer that majority of the cargo are under 10-50 tons.

Table 6. Own Logistics and 3d Party Logistics

Own logistics or 3rd party logistics	Frequency	Percentage
yes	37	21.4
no	136	78.6
Total	173	100.0

Source: Primary data

About 21.4% of the firm has its own logistics and about 78.6 % using the 3rd part logistics services. From this we infer that most of the firms in Chennai using 3rd party logistics.

Table 7. Plan of Approaching New Logistics

Plan for approaching a new logistics	Frequency	Percentage
yes	153	88.4
no	20	11.6
Total	173	100.0

Source: Primary data

About 88.4 % of the firm has an idea of going logistics and about 11.6 % of the firm has no idea of new logistics. From this we infer that most of the firms willing to go for new logistics.

Table 8. Reason of Approaching New Logistics

Reason for approaching new logistics	Frequency	Percentage
Better service	45	26.0
Better price	44	25.4
Special operations	54	31.2
previous service provider issues	30	17.3
Total	173	100.0

Source: Primary data

About 26 % of the firm move to new logistics due to better service, 25.4% of the firms go for better price, 31.2 % go for the special operations and 17.3 % go for the previous problems with the forwarders. From this we can infer that most of the firms go for new logistics due to better price.

Table 9. Type of Loading Cargo for Trading

Type of cargo they want to trade	Frequency	Percentage
Break bulk	25	14.5
LCL	13	7.5
FCL	135	78.0
Total	173	100.0

Source: Primary data

About 14.5 % of the firms moving break bulk cargo, 7.5% of the firms moving LCL cargo, 78% of the firms moving FCL cargo. From this we can infer that most of the firms moving FCL cargo.

Parameters Ratings.

Table 10. Custom Clearance Ratings

Rate the Custom Clearance	Frequency	Percentage
1	13	7.5
2	13	7.5
3	33	19.1
4	50	28.9
5	64	37.0
Total	173	100.0

Source: Primary data

Table 11. Efficient Communication Ratings

Efficient Communication ratings	Frequency	Perce ntage
1	10	5.8
2	27	15.6
3	45	26.0
4	42	24.3
5	49	28.3
Total	173	100.0

Source: Primary data

Communication Ratings.

Table 12. Business Approach Ratings

Business Approach ratings	Frequency	Perce ntage
1	1	.6
2	17	9.8
3	23	13.3
4	71	41.0
5	61	35.3
Total	173	100.0

Source: Primary data

Table 13. Stuffing Plans Ratings

Stuffing plans of Cargo ratings	Frequency	Percentage
1	10	5.8
2	9	5.2
3	27	15.6
4	54	31.2
5	73	42.2
Total	173	100.0

Source: Primary data

Table 14. Delivery of B/L Ratings

Delivery of B/L ratings	Frequency	Percentage
1	5	2.9
2	4	2.3
3	26	15.0
4	65	37.6
5	73	42.2
Total	173	100.0

Source: Primary data

From the above frequency analysis, about 42% of the firms says that the delivering of B/L and stuffing plans of the cargo will be influencing the logistics service more compare to the other parameters.

Custom Clearance Ratings Vs Kind of Trade - Hypothesis:
H0= There is no significance difference between the custom clearance ratings and kind of trade from the firm.
H1= There is a significance difference between the custom clearance ratings and kind of trade from the firm.

Table 15. Custom Clearance Ratings Vs Kind of Trade Hypothesis

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df.	Sig. (2-tailed)
Rate the Custom Clearance	Equal variances assumed	.249	.618	-1.340	171	.182
	Equal variances not assumed			-1.351	135.591	.179

Source: Primary data

Since the significance value is higher than the probability value 0.05, we accept the null hypothesis, hence there is no significance difference between the custom clearance ratings and kind of trade from the firm.

Effective Communication Ratings Vs Kind of Trade - Hypothesis:
H0= There is no significance difference between the effective communication ratings and kind of trade from the firm.
H1= There is a significance difference between the effective communication ratings and kind of trade from the firm.

Since the significance value is higher than the probability value 0.05, we accept the null hypothesis, hence there is no significance difference between the effective communication ratings and kind of trade from the firm.

Table 16. Effective Communication Ratings Vs Kind of Trade

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Si g.	t	df	Sig. (2-tailed)
Rate the Efficient Communication	Equal variances assumed	.1 2 9	.7 2 0	- .4 3 9	171	.6 6 1
	Equal variances not assumed			- .4 4 3	135.6 61	.6 5 8

Source: Primary data

Business Approach Ratings Vs Kind of Trade - Hypothesis:
H0= There is no significance difference between the business approach ratings and kind of trade from the firm.
H1= There is a significance difference between the business approach ratings and kind of trade from the firm.

Table 17. Business Approach Ratings Vs Kind of Trade Hypothesis

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Si g.	t	df	Sig. (2-tailed)
Rate the Business Approach	Equal variances assumed	11.6 76	.0 0 1	- 1.0 37	171	.3 0 1
	Equal variances not assumed			- .98 2	111.1 03	.3 2 8

Source: Primary data

Since the significance value is higher than the probability value 0.05, we accept the null hypothesis, hence there is no significance difference between the business approach ratings and kind of trade from the firm.

Stuffing Plans Ratings Vs Kind of Trade - Hypothesis:
H0= There is no significance difference between the stuffing plans ratings and kind of trade from the firm.
H1= There is a significance difference between the stuffing plans ratings and kind of trade from the firm.

Since the significance value is lesser than the probability value 0.05, we reject the null hypothesis and accept the alternate hypothesis, hence there is a significance difference between the stuffing plans ratings and kind of trade from the firm.

Delivery of B/L Ratings Vs Kind of Trade - Hypothesis:
H0= There is no significance difference between the delivery of B/L ratings and kind of trade from the firm.
H1= There is a significance difference between the delivery of B/L ratings and kind of trade from the firm.

Table 18. Stuffing Plans Ratings Vs Kind of Trade

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Rate the Stuffing plans of Cargo	Equal variances assumed	28.594	.000	-3.897	171	.000
	Equal variances not assumed			-3.462	91.549	.001

Source: Primary data

Since the significance value is higher than the probability value 0.05, we accept the null hypothesis, hence there is no significance difference between the delivery of B/L ratings and kind of trade from the firm.

Table 19. Delivery of B/L Ratings Vs Kind Of Trade

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Si g.	t	df	Sig. (2- tailed)
Rate the Delivery of B/L	Equal variances assumed	3.276	.072	-1.638	171	.103
	Equal variances not assumed			-1.510	102.359	.134

Source: Primary data

Custom Clearance Vs Effective Communication Ratings - Hypothesis:
H0= There is no relationship between consumer custom clearance and effective communication ratings.
H1= There is a relationship between consumer custom clearance and effective communication ratings.

Table 20. Custom Clearance

Correlatio ns		Rate the Custom Clearance	Rate the Efficient Communication n
Rate the Custom Clearance	Pearson Correlati on	1	.281**
	Sig. (2-tailed)		.000
	N	173	173

Source: Primary data

Table 21. Effective Communication Ratings

Rate the Efficient Communication	Pearso n Correlati on	.28 1**	1
	Sig. (2-tailed)	.00 0	
	N	17 3	17 3

Source: Primary data

Since the significance value is lesser than the probability value 0.05, we reject the null hypothesis and accept alternate hypothesis, hence there is a relationship between consumer custom clearance and effective communication ratings.

Business Approach Vs Stuffing Plans of Cargo Ratings - Hypothesis:
H0= There is no relationship between business approach and stuffing plans of cargo ratings.
H1= There is a relationship between business approach and stuffing plans of cargo ratings.

Table 22. Business Approach Vs Stuffing Plans of Cargo Ratings

Correlatio ns		Rate the Stuffing plans of Cargo	Rate the Business Approach
Rate the Stuffing plans of Cargo	Pearso n Correlati on	1	.0 5 8
	Sig. (2-tailed)		.4 5 1
	N	17 3	17 3
Rate the Business Approach	Pearso n Correlat on	.0 58	1
	Sig. (2-tailed)	.4 51	
	N	17 3	17 3

Source: Primary data

Since the significance value is higher than the probability value 0.05, we accept the null hypothesis, hence there is no relationship between business approaches and stuffing plans of cargo ratings.

Custom Clearance Vs Delivery of B/L Ratings – Hypothesis:
H0= There is no relationship between custom clearance and delivery of B/L ratings.
H1= There is a relationship between custom clearance and delivery of B/L ratings.

Table 23. Custom Clearance Vs Delivery of B/L Ratings Hypothesis

Correlations		Rate the Custom Clearance	Rate the Delivery of B/L
Rate the Custom Clearance	Pearson Correlation	1	.217**
	Sig. (2-tailed)		.004
	N	173	173
Rate the Delivery of B/L	Pearson Correlation	.217**	1
	Sig. (2-tailed)	.004	
	N	173	173

Source: Primary data

Since the significance value is lesser than the probability value 0.05, we reject the null hypothesis and accept alternate hypothesis, hence there is a relationship

between custom clearance and delivery of B/L ratings.

Gross Volume of Cargo Vs Mode of Freight – Hypothesis:

H0: There is no significant association between gross volume of cargo and mode of freight.

H1: There is a significant association between gross volume of cargo and mode of freight.

Since the significance value is lesser than the probability value 0.05, we reject the null hypothesis and accept alternate hypothesis, hence there is a significant association between gross volume of cargo and mode of freight.

Table 24. Gross Volume of Cargo Vs Mode of Freight Hypothesis

Chi-Square Tests	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	12.7 86a	6	.047
Likelihood Ratio	11.4 13	6	.076
inear-by-Linear Association	4.01 8	1	.045
N of Valid Cases	17 3		

Source: Primary data

Kind of Trade Vs Mode of Notifications – Hypothesis:

H0: There is no significant association between kind of trade and mode of notifications.

H1: There is a significant association between kind of trade and mode of notifications.

Table 25. Kind of Trade Vs Mode of Notifications Hypothesis

Chi-Square Tests	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	18.1 51a	3	.000
Likelihood Ratio	18.1 12	3	.000
Linear-by-Linear Association	10.7 41	1	.001
N of Valid Cases	173		

Source: Primary data

Since the significance value is lesser than the probability value 0.05, we reject the null hypothesis and accept alternate hypothesis, hence there is a significant association between kind of trade and mode of notifications.

Results. The quality of service as rated is above average in the case of HK Trans and Logistics compared to industry. But the organization should continuously try to improve the quality aspect as is being done by other players it's the field. This is quite a necessity as otherwise the figures may fall down. Continuous improvement is a must so that the customers will prefer HK Trans and Logistics as their first choice in Logistics and Freight industry category. This can be achieved with more modern equipment's and pm per guidance to employees and the rating can go high to excellent service.

Pricing of service is satisfactory, which organization can further enhance with

proper management. Present employee strength is satisfactory compared to other organization but more focus should be made to documentation areas where the firm bas lesser employees compared to other organizations.

Network Design is an area that the organization should not start immediately due to low rate of returns is recorded as the industrial average. Design of new warehouse areas and proper allocation of work with more sophisticated software facility can be done through outsourced way during implementation.

Decision making is excellent for organization with respect to other organization in the industry. Operation with other logistical providers should be given more preference to achieve cost effectiveness. Rearrangement of employees may be a better solution. Downsizing of personnel in the Finance and Accounts section arid deploying them for the HR function separately is recommended.

The organization client handling, ease of service and customer service is having remarkable difference from the industry standards. The main focus needs to be on the ease of website and employee efficiency. From the data we can infer that areas which need to be improved are Website and employee efficiency. Employee efficiency can be improved with a proper Human Resource department.

Service offer presently has good impact with other organizations service offers. The remarkable areas are freight, Crossdocking, and Value Adding. Company can further enhance operations of Value Adding through proper methods. As logistics industry is concerned Freight is the dominant service followed by Warehousing and Cross-Docking. Another important area where organizations feel very lucrative is Value Adding. It is observed that most of the organizations operate with other logistical providers. 96% of organizations are doing it and remaining 4% organizations stays independent. It is inferred that for efficient logistical activity, support from other organizations is essential.

Tactical decisions are mostly followed by organizations followed by operational and a few strategical. Freight and Value Adding is considered to be the best service which organizations offer in industry. Another major observation is about Network Design, it has low value and no organization feels it to be lucrative area in industry. Organization can enhance operations to European areas and another major favorable area is Africa. From data HK Trans and Logistics can get good market share if they cater to African regions.

Organization profit is good compared to industry standards for freight and can further work on warehousing. This shows a difference of 2 points from industry standards. Whereas for Cross Docking it shows same as to industry standards. Commenting on ease of service, website and employee efficiency, ae organization needs to further improve. Adoption of software solutions, such as TMS, WMS, and SCM systems, can improve the overall efficiency of logistics processes, reduce costs, and enhance customer satisfaction.

Outsourcing logistics services, such as transportation, warehousing, inventory management, and order fulfilment, can help businesses focus on their core competencies, reduce costs, and improve overall efficiency. The use of software solutions and outsourced logistics services can help businesses overcome the

challenges faced by the Indian logistics industry, such as inadequate infrastructure, inefficient supply chain management, and regulatory constraints.

Successful implementation of software solutions and outsourced logistics services requires careful planning, evaluation of service providers, and ongoing monitoring of performance. Companies that have successfully implemented software solutions and outsourced logistics services have gained a competitive advantage in the market and improved their overall logistics operations.

While outsourcing logistics services can provide numerous benefits, there are also risks and challenges associated with it, such as loss of control over logistics operations, lack of visibility, and communication issues. Businesses need to carefully evaluate logistics service providers based on their capabilities, expertise, track record, and cost-effectiveness before selecting them. Overall, the findings suggest that software solutions and outsourced logistics service providers can play a significant role in improving the efficiency, reducing costs, and enhancing customer satisfaction of logistics operations in the Indian market. However, businesses need to carefully evaluate their options and select reliable and capable service providers to reap the benefits of these solutions.

Discussion. Organization can further strengthen the employee strength in the documentation and sales department. This can lead to further rapidity for operations and the growth of organization. Organization can initiate Human Resource Department to further enhance employee motivation. This will have favorable impact for the operational as well as total strengthening of organization. Decision making is quite effective and can be followed for future operations. Operations with other logistical providers need to be enhanced further for operational effectiveness, more focus should be given to customer delight and cost effectiveness. Quality of service can be further enhanced to increase customer delight. Client handling and service need to be followed in the same way and can be further enhanced with more support. This can be achieved by proper guiding of employees and other workers in the logistical area HK Trans and Logistics can enter other markets in the Middle East especially to Saudi Arabia where the potential of market is very high for Logistics industries and can even diversify to other areas in logistics. HK Trans and Logistics can focus to African regions for freight handling, as from the data the potential market is high for those regions.

Conclusion. In conclusion, software solutions and outsourced logistics service providers have played a vital role in the growth and development of India's logistics industry. Software solutions such as transportation management systems, warehouse management systems, and supply chain visibility tools have enabled companies to streamline their logistics processes, improve their operational efficiency, and reduce their logistics costs.

Outsourced logistics service providers have also played a crucial role in providing cost- effective and efficient logistics solutions to their clients, enabling them to focus on their core business activities while leaving the logistics to the experts. They have leveraged their expertise, technology, and infrastructure to provide customized logistics solutions that meet the specific needs of their clients,

ultimately contributing to India's economic growth.

Overall, the adoption of software solutions and the use of outsourced logistics service providers have enabled companies in India to improve their supply chain performance, reduce their logistics costs, and enhance their customer satisfaction levels. The continued adoption of these solutions is expected to further drive the growth and development of India's logistics industry in the years to come.

Author contributions. The authors contributed equally.

Disclosure statement. The authors do not have any conflict of interest.

References:

1. Divyaranjani, R. et al. (2023). An Analysis of Compensation Instruments on Employees' Job Satisfaction. In: Alareeni, B., Hamdan, A., Khamis, R., Khoury, R.E. (eds) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol 621. Springer, Cham. https://doi.org/10.1007/978-3-031-26956-1_31

2. Divyaranjani R. et al.(2022). An analysis of current freight forwarding and contract logistics issues, https://conf.scnchub.com/index.php/RPABM/RPABM-2022/paper/view/497

3. Demilie Basha Hailu & Meron Zenaselassie (2016). An empirical investigation of performance of logistics and economic growth nexus in sub- Saharan Africa: panel data approach, 5(8), August, DOI: 10.21275/ART20161167.

4. Fu chin chin jung han bae, Gwi ok Kim (2008). A Survey on logistics Service Proviers in Shanghai, *International Journal ofPhysics Distribution of logistics Management,* Yeungnam University, 29(90), 588-605.

5. Gutierrez-Gutierrez, L.; De Leeuw, S. and Dubbers,(2015). Logistics services and lean six sigma implementation, By International Journal of Lean Six Sigma, 7(3) , 324 – 342, DOI: http://dx.doi.org/10.1108/IJLSS-05-2015-0019

6. Hamdan, A., Khamis, R., Khoury, R.E. (eds) Digitalisation: Opportunities and Challenges for Business. ICBT 2022. Lecture Notes in Networks and Systems, vol 621. Springer, Cham. https://doi.org/10.1007/978-3-031-26956-1_3

7. Hrušecká Denisa, Macurová Lucie, Juřičková Eva, Kozáková Leona (2015). The analysis of the use of outsourcing services in logistics by *Czech manufacturing companies*, by, 7(3), 50-61, September, DOI: 10.7441/joc.2015.03.04

8. Kenneth L. Kraemer and Jason Dedrick (1998). Market Potential Analysis: A Methodology for estimating the market potential for computers and other information technologies, Center for Research on Information Technology and Organizations, University of California, Irvine. https://escholarship.org/uc/item/39s5f10c

9. Kumar, V., Gupta, S.K., Kaushik, R., Verma, S.K., Sakovska, O. (2023). An Intuitionistic Fuzzy Approach to Analysis Financial Risk Tolerance with MATLAB in Business. In: Agrawal, R., Mitra, P., Pal, A., Sharma Gaur, M. (eds) International Conference on IoT, Intelligent Computing and Security. Lecture Notes in Electrical Engineering, vol 982. Springer, Singapore. https://doi.org/10.1007/978-981-19-8136-4_26

10. L. Prasad, P. Mishra, S. Kumar Gupta and Ş. Aslan, "Dynamics of business and opportunities for employability using predictive modeling tools of Machine Learning and R programming," 2023 International Conference on Device Intelligence, Computing and Communication Technologies, (DICCT), Dehradun, India, 2023, pp. 223-228, doi: 10.1109/DICCT56244.2023.10110272.

11. Lander Rachel (2016). Addressing the challenges of logistics and supply chain education, International scientific conference business logistics. https://ideas.repec.org/a/osi/bulimm/v16y2016p39-50.html

12. Liu Ji & Yuanyuan Wen (2012). Study of competitiveness - a case study of DHL, By, university of gavle, June.

13. Mahalakshmi J., Sudha R., (2012). A Study on Market Potential for Mangalam Newspaper Private Limited, Kottayam, *International Journal of Scientific and Research Publications*, 2(10), October.

14. Pavithra,J., & Singh A. (2017). A Study on market potential of freight forwarding business' at seawaves shipping services, *International Journal of Pure and Applied Mathematics,* 116(20), 341-347.

15. Ravimohan R. (2016). A Study on problems faced by freight forwarders with reference to Yashimarine logistics, *International Journal of Economics and Management Engineering*, 10(4).

16. Sharma, R., & Arora, V. (2019). Escape through consumption. Dr. Sandeep Marwah, 33. https://absjournal.abs.edu.in/ABS-Journal-Volume-7-isuue-2-December-2019.pdf

17. Sharma R., Mohan M, Gupta S. K. (2022). The effect of ambiance, layout, and utility for the escape to the mall, Innovative Marketing, ISSN 1814-2427, 18(4), Pp 171-173, doi: http://dx.doi.org/10.21511/im.18(4).2022.14

18. Sharma, R., Mohan, M., & Gupta, S. K. (2023). Emotions in retail setting: a systematic literature review based on current research. International Journal of Experimental Research and Review, 30, 416–432. https://doi.org/10.52756/ijerr.2023.v30.039

19. Şükrü Akdoğana M., Ayhan Durakb (2016). Logistic and marketing performances of logistics companies: A comparison between germany and turkey, by, Procedia - Social and Behavioral Sciences 235, 576–586.

20. Uppal, A. et al. (2023). Service Quality's Effect on Customer Satisfaction (A Comparison Assessment of the Public and Private Banking Sectors). In: Alareeni, B.,