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Factors influencing decision-making in buying process of express logistics services

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Background: Logistics is an integral component for success of an organisation. So correct decision on express logistics procurement plays a critical role in success in delivering right product at right place and right time. Procurement of express logistics service is not very straight forward, instead it requires evaluation of multiple factors.

Objective: The objective of this research is to create a framework of influencing factor on express logistics buying decision.

Method: For the study, researchers has adopted secondary research along with primary research with group of 14 subject matter experts in field of Indian logistics sector. A group of experts comprises of senior managers, consultants and academicians with deep understanding of subject. We have used ISM (Interpretive Structural Modelling) and Cross Impact Matrix Multiplication Applied to Classification (MICMAC) to drive conceptual framework for logistics buying decision.

Results: Framework shows that the decision making in logistics procurement should be highly driven by factors like network reach of Logistics Service Provider (LSP), technology followed by information sharing and strategic partnership. While service quality and cost of logistics remains as frontend factors in logistics procurement decision.

Conclusion: The model output clearly suggests that final objective in buying process of express logistics is driven towards lower cost and improved service level, but it is driven by factors which directly adds value in supply chain like time to market and reverse logistics, technology and reach.

Contribution: The model provides a framework for practitioners, which can enable them in decision making process of logistics procurement.

Keywords: logistics; express logistics; logistics buying decision; ISM; MICMAC.

Introduction

Logistics and supply chain management have gained an important role within the organisations, from the procurement of raw materials until the delivery of the final product to the client (Lambert, Pagh & Cooper 1998). In this journey, choice of logistics service partner can have significant impact on operational costs and customer service level of an organisation, which ultimately impacts customer satisfaction and performance of the organisation. Therefore, the selection of an efficient and reliable logistics service provider (LSP) is one of the most critical factors in logistics planning. Existing literature have very detailed working on few factors of logistics procurement, but limited work on comprehensive assessment of factors in decision-making of express logistics buying. This research aims to create a theoretical model for the factors impacting buying decision of express logistics services, which can also help logistics practitioners.

A selection process goes through multiple levels of decision-making in logistics, ranging from mode selection, route selection and vendor selection (Vashist & Dey 2016). The first level of choice in the overall planning is mode selection, which depends on nature of product and available modal options (Liberatore 1979). This research does not include factors of mode selection and route selection. Next level of decision-making involves the vendor selection. The process in decision-making for vendor selection in logistics involves consideration of a number of criteria. Under such scenario, evaluation of multiple parameters having different dimensions is possible (Ceballos, Lamata & Pelta 2016). Normally, logistics is not core to an organisation and is outsourced to a service provider (Razzaque & Sheng 1998), but lately logistics outsourcing has increased in order to generate efficiency. Outsourcing also helps organisations to focus on their core what they do best (Daugherty, Theodore & Rogers

1996). Broadly, outsourcing works on few key factors such as time taken in service delivery, safety and visibility, but any decision-making is not limited to such factors and logistics services buying decision requires consideration of multidimensional factors (Karrapan et al. 2017). The objective of research is to create a framework of all factors that impact decision-making of logistics procurement. The review of literature shows as many as 10 factors, which may have an impact on decision-making process of logistics procurement. The identified factors are given in Table 1.

Literature review

The efficiency of the logistics function influences business performance of an organisation and also the customer's perception about quality (Kenyon & Meixell 2014). Therefore, the right selection of logistics partner becomes critical. Cost and performance in logistics is a coherent set of tools, which supports logistics decision-making (Bokor 2008); the same is applicable for express logistics as well. The literature review shows the following factors on logistics buying.

1. *Faster delivery:* Faster delivery with minimal transit is one of the main deciding factors for customers to choose the express service provider. It is one of the powerful instruments and has a critical role to improve the performance of logistics (Nampinyo et al. 2022). Longer time taken impacts inventory carrying cost and depreciation costs (Hummels & Schaur 2012), which ultimately affects the performance of an organisation. Even in e-commerce sale, delivery time plays a critical role and for online sellers faster delivery is the most important factor (Fisher, Gallino & Xu 2015). In last mile delivery customers ask for ever-faster speed of delivery (Joerss, Neuhaus & Schröder 2016).
2. *Cost:* Cost reduction and increasing service reliability within the supply chain are among the most important factors in business (Kučera 2018). Logistics costs include components such as expenses on transport, storage and packaging. Transparent information on logistics costs at all stages of the product flow is very critical (Akoudad 2018). Logistics costs contribute major pie in supply chain cost of a company and components of logistics cost have interdependence. This may lead to a situation that changes in one part of logistics cost, increasing other part and has negative impact (Muha 2019); i.e. selection of low-cost slow mode of transportation may impact negatively inventory carrying cost. In overall cost, there may be trade-offs between logistics cost and other cost components as well (Havenga 2018).
3. *Information sharing:* In order to become agile in logistics, real-time information availability is crucial (Trzuskawska-Grzesińska 2017). Such things are not possible without technological capabilities of LSP. Information sharing promotes effective sharing between parties involved in the network in order to increase overall performance, efficiency and resilience (Sithole, Silva & Kevalj 2016). By sharing data between service provider and principle in supply chain, an organisation can step up the speed of information flow in the supply chain, which improves supply chain's efficiency and effectiveness (Li & Lin 2006). Right information availability within an organisation is enabler for improved customer service and optimised cost (Hammant 1995). Information sharing across supply chain network helps in better allocation and usage of logistics resources along with better planning of production, lower inventory holding and higher customer service level (Kembro, Näslund & Olhager 2017).
4. *Ease of reverse logistics:* With the growth of omni channel, e-commerce and direct to customer business models, reverse logistics capability becomes a factor in evaluation and selection of logistics. As per a study, reverse logistics is one of the top trends in logistics and warehousing in the 21st century (Brockmann 1999). Reverse logistics gained strategic importance in logistics and supply chain decision-making related to the design and execution because of increasing trends in recycle, reuse, exchange and manufacturing (Rubio & Jiménez-Parra 2014). Nowadays, consideration of reverse logistics capability became a part of decision-making as it is not only applicable in repairs and refurbishment but also has a role in keeping inventory fresh (Rogers & Tibben-Lembke 1999). Therefore, right vendors or partners

TABLE 1: Factors influencing buying decision of logistics.

Sr. No. Factor	Description	References
1. Faster delivery	Delivery of a shipment to a consignee in a defined time limit with minimal transit time	(Coltman, Devinney & Keating 2011; Joong-Kun Cho, Ozment & Sink 2008; Nampinyo et al. 2022)
2. Lower cost	Cost of transportation, storage and packaging to be minimum	(Bokor 2008; Kučera 2018; McGinnis, Kochunny & Ackerman 1995)
3. Information sharing	Exchange of logistics-related information between LSP and service buyer	(Madhani 2019; Trzuskawska-Grzesińska 2017)
4. Ease of reverse logistics	Ease for coordinating, planning and executing material flow in reverse direction (return, replacement, expiry, etc.)	(Meade 2022; Rogers & Tibben-Lembke 1999)
5. Network reach of logistics service provider (LSP)	Geographical reach of logistics service partner to serve	(Joong-Kun Cho et al. 2008; Nampinyo et al. 2022; Ruth et al. 2011)
6. Strategic partnership and collaboration with LSP	Relationship of strategic nature	(Banomyong et al. 2005; Razzaque & Sheng 1998; Sumantri 2017)
7. Time to market	Supplier integration, so time to market is minimal	(Cohen, Eliashberg & Ho 1996; Perols, Zimmermann & Kortmann 2013)
8. Service quality	Accuracy, reliability and responsiveness	(Banomyong et al. 2005; Bokor 2008; Joong-Kun Cho et al. 2008; Kent & Parker 1998; McGinnis et al. 1995)
9. Visibility	Capability to have accurate and timely information about the flow of goods	(Bartlett, Julien & Baines 2007; Freichel, Rütten & Wörtge 2022; Mandal et al. 2016; Peng, Loo & Lee 2013)
10. Technology	Technological capabilities of LSP to enable information exchange, visibility and process control	(Bayazit & Karpak 2013; Gil-Saura & Ruiz-Molina 2011; Ling & Lee 2015; Ling, Lee & Ho 2009)

Note: Please see the full reference list of the article, Khatri, V., Pandey, A. & Kumar, A., 2023, 'Factors influencing decision-making in buying process of express logistics services', *Journal of Transport and Supply Chain Management* 17(0), a949. https://doi.org/10.4102/ jtscm.v17i0.949, for more information.

selection for the reverse logistics becomes more important (Meade 2022).

5. *Network reach of LSP:* Network reach of the logistics partner needs to match with the requirement of shipper. Once both are aligned, the probability of improved services increases. The Delphi Survey 2005 indicates that the logistics provider's ability to extend the reach of companies will rank as dominant factors in decision-making (Ogorelc 2005). Reach of LSP becomes critical, as the objectives of logistics outsourcing target on risk reduction in logistics, optimisation of cost, flexible capacity and wider coverage (Grewal, Gill & Sareen 2008).
6. *Strategic partnership with LSP:* While making decision of logistics service, a longer-term strategic partnership view becomes a factor, which also improved time to market. With the increasing complexity of logistics, scope of strategic partnership exists out of contractual relationship of services (Razzaque & Sheng 1998). Strategic partnership with LSP provides scope of improved service quality and customer service. In logistics and supply chain, resilience is to minimise negative impacts of any possible disturbance, and resilience in supply chain is driven by four key factors: flexibility, speed, visibility and collaboration (Carvalho, Azevedo & Cruz-Machado 2012). In logistics domain, many companies have adopted practices of collaborative approach in order to achieve better results (Sandberg 2007).
7. *Time to market:* Time to market is a very important factor for sustainable competitive advantage and in order to improve time to market role of suppliers and their involvement is needed (Perols et al. 2013). Logistics service connects material suppliers with organisation and organisation with its customers via physical flow of profit. As per a study report by McKinsey, companies lose one-third of profit after-tax when their shipping of products is late by 6 months, so it is necessary to focus on time to market (Cohen et al. 1996), even from supply chain perspective.
8. *Service quality:* Consideration of logistics cost alone is not sufficient, as the emphasis has moved from cost efficiency to 'service quality and cost efficiency'. Therefore, the selection process for right LSP is also dependent upon a multiple-service-quality parameter (Kent & Parker 1998). Service quality refers to the extent of overall performance of the service provider in delivering the shipment as right product, in right quantity, with right packaging, along with right documentation, at right time and to the right customer (Madhani 2019). The higher the level of service quality, the higher is the satisfaction level of the end customer.
9. *Visibility:* Supply chain is becoming more complex due to increasing expectation of customers. Visibility of key information across organisational boundaries are viewed as prime criteria for building competitiveness (Bartlett et al. 2007; Mandal et al. 2016). In logistics & supply chain, visibility is defined as the stakeholders' ability to have accurate & timely information about the flow of goods (Freichel et al. 2022). Real time visibility of logistics is taken into consideration in decision making, as opaque system creates inefficiency and hurdle for logistics users.
10. *Technology:* In today's competitive era, the role of technology is very critical in driving efficiency irrespective of domain and logistics is no exception to it. Therefore, the use of technology in logistics has become a necessary factor to drive accuracy and efficiency (Gil-Saura & Ruiz-Molina 2011). Technologies and innovation are enhancing customer service and sharpening their competitive edge (Ling et al. 2009). Technological capability of LSP not only improves functional deliverables but also helps in value creation by eliminating inefficiencies for the logistics service user. Technologies such as Internet of things, artificial intelligence, big data and cloud computing have impacted the logistics at the operational and strategic levels (Kumar & Khatri 2022).

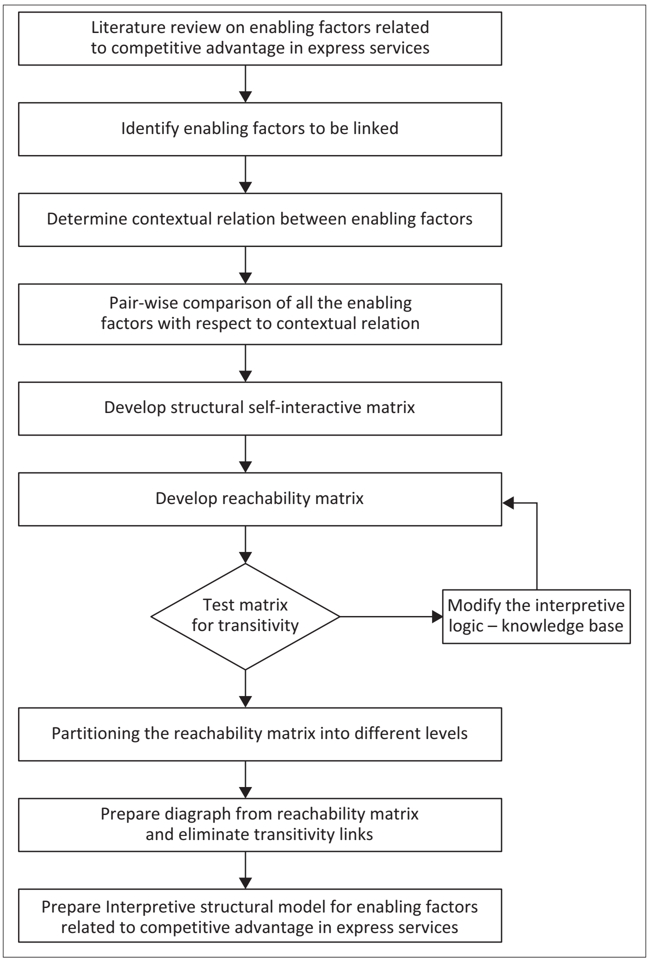
Research methods and design

The literature review enabled in identifying key factors impacting logistics buying decision. In order to validate the factors identified from literature review, input from the subject matter experts of logistics industry was also taken for finalising the major factors. Thereafter, a model has been developed using interpretive structural modelling (ISM) and cross-impact matrix multiplication applied to classification (MICMAC) analysis. The ISM provides a directional and ordered framework for complex problems and gives a realistic and clear picture of the system and its variables to decision-makers (Attri, Dev & Sharma 2013; Jiang et al. 2019). The ISM approach has been accepted as this method gives structured direction to interactions among factors that influence the entire system (Singh & Kant 2008).

In the process, a group of 14 subject matter experts comprising managers, consultants and academicians having expertise in Indian logistics sector was selected as a focused group for this study and was briefed about objective of research study. All experts possessed significant experience in managing supply chain and logistics in current scenarios. The group was consulted in identifying the contextual relationship among the factors identified by them. It is followed with pairwise comparison, development of structural self-interpretive matrix, formulation of binary initial reachability matrix (IRM), development of MICMAC and diagraph preparation leading to ISM. This model is expected to metamorphose an unclear, poorly articulated mental model into a visible and well-defined model (Sage 1977). Flowchart of ISM steps is presented in Figure 1.

Development of an interpretive structural modelling model

The ISM methodology helps to enforce order and direction on the complexity of relationships among the factors of a system (Pandey & Ghodke 2019; Sage 1977). The steps involved in ISM technique (Jadoun et al. 2021; Pandey & Ghodke 2019; Singh & Kant 2008; Yadav & Sushil 2014) are presented as follows:



Source: Adapted from Pandey, A.K. & Ghodke, M., 2019, 'Barriers to viability of Indian power distribution companies', *International Journal of Energy Sector Management* 13(4), 916–934. https://doi.org/10.1108/IJESM-10-2018-0006

FIGURE 1: Flowchart of interpretive structural modelling.

1. Identifying key factors which are related to the problem
2. Founding a contextual relationship between the key factors
3. Formulating a structural self-interaction matrix (SSIM) of key factors; this indicates pairwise relationship among the key factors
4. Framing a reachability matrix from the SSIM and checking the matrix for transitivity of the contextual relation. Transitivity refers to the fact that if element A is related to B and B is related to C, then A is related to C.
5. Level partitioning, i.e. apportioning of the reachability matrix into different levels
6. Based on the relationships developed in the reachability matrix, drawing a directed graph (digraph) and eliminating the transitivity links from it
7. Developing an ISM-based model by replacing factor nodes with the statements
8. Reviewing the model to check for conceptual inconsistencies, if any, and making the necessary revisions.

Structural self-interaction matrix

In order to analyse factors, a contextual relationship of influences or 'leads to' nature was selected between two factors. That is, when factor i leads to factor j, then this factor i will help factor j to take place. On a majority basis, a contextual relationship is developed between the identified factors. For developing SSIM, the following signs have been defined to represent the direction of relationship between factors (i and j):

- V – factor i helps in achieving factor j
- A – factor j helps in achieving factor i
- X – factors i and j help in achieving each other
- O – factors i and j are not related.

On the basis of input received from focused group, a contextual relationship has been developed between the identified factors as represented in Table 2.

Initial reachability matrix

As a next step, an IRM was developed from SSIM (Table 3). The SSIM is converted into a matrix of binary numbers by substituting V, A, X and O with 0 and 1 as per the given scenario to make IRM. This substitution of binary numbers has been performed as per rules defined as follows:

- If entry (i, j) in the SSIM is V, the entry (i, j) in IRM becomes 1 and entry (j, i) becomes 0
- If entry (i, j) in the SSIM is A, the entry (i, j) in the IRM (reachability matrix) becomes 0 and entry (j, i) becomes 1
- If entry (i, j) in the SSIM is X, the entry (i, j) in the IRM becomes 1 and entry (j, i) also becomes 1
- If entry (i, j) in the SSIM is O, the entry (i, j) in the IRM becomes 0 and entry (j, i) also becomes 0.

Final reachability matrix

The final reachability matrix is developed by incorporating transitivity as detailed in the previous step, if any (Table 4). The driving power and dependence power have been derived from transitivity matrix. The total number of factors (including itself), which it can impact is the driving power for that factor, while the total number of factors (including itself), which it can impact is the dependence power for that factor.

From the final reachability matrix, the reachability and antecedent set for each factor have been derived. The reachability set contains all factors, which it may impact including itself. The antecedent set contains all factors that may impact it including itself. The intersection of both sets is derived for all the factors. The factors having the same value of the reachability and intersection sets occupy the top level in the ISM model hierarchy. The top-level factors will not lead to any other factors above their own level. On identification of the top factor, it is not taken into consideration for next repeat cycle. The same methodology is repeated for the factors in the next level. This process is continued until assignment of each factor takes place (Table 5). These levels help in building the final model (Singh & Kant 2008).

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

TABLE 2: Structural self-interaction matrix.

Factors (i)	Factors (j)									
	F10	F9	F8	F7	F6	F5	F4	F3	F2	F1
F1	A	A	V	V	A	A	O	A	V	-
F2	A	O	A	A	A	A	A	A	-	-
F3	A	V	V	V	X	O	V	-	-	-
F4	A	A	V	X	A	A	-	-	-	-
F5	O	O	V	V	V	-	-	-	-	-
F6	A	V	V	V	-	-	-	-	-	-
F7	A	A	V	-	-	-	-	-	-	-
F8	A	A	-	-	-	-	-	-	-	-
F9	A	-	-	-	-	-	-	-	-	-
F10	-	-	-	-	-	-	-	-	-	-

F1, faster delivery; F2, lower cost; F3, information sharing; F4, reverse logistics; F5, network reach; F6, strategic partnership; F7, time to market; F8, service quality; F9, visibility; F10, technology.

'i' denotes row and 'j' denotes column.

TABLE 3: Initial reachability matrix.

Factors	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
F1	1	1	0	0	0	0	1	1	0	0
F2	0	1	0	0	0	0	0	0	0	0
F3	1	1	1	1	0	1	1	1	1	0
F4	0	1	0	1	0	0	1	1	0	0
F5	1	1	0	1	1	1	1	1	0	0
F6	1	1	1	1	0	1	1	1	1	0
F7	0	1	0	1	0	0	1	1	0	0
F8	0	1	0	0	0	0	0	1	0	0
F9	1	0	0	1	0	0	1	1	1	0
F10	1	1	1	1	0	1	1	1	1	1

F1, faster delivery; F2, lower cost; F3, information sharing; F4, reverse logistics; F5, network reach; F6, strategic partnership; F7, time to market; F8, service quality; F9, visibility; F10, technology.

TABLE 4: Final reachability matrix.

Factors	Factors										Driving power
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	
F1	1	1	0	1†	0	0	1	1	0	0	5
F2	0	1	0	0	0	0	0	0	0	0	1
F3	1	1	1	1	0	1	1	1	1	0	8
F4	0	1	0	1	0	0	1	1	0	0	4
F5	1	1	1†	1	1	1	1	1	1†	0	9
F6	1	1	1	1	0	1	1	1	1	0	8
F7	0	1	0	1	0	0	1	1	0	0	4
F8	0	1	0	0	0	0	0	1	0	0	2
F9	1	1†	0	1	0	0	1	1	1	0	6
F10	1	1	1	1	0	1	1	1	1	1	9
Dependence	6	10	4	8	1	4	8	9	5	1	-

†, After incorporating transitivity.

F1, faster delivery; F2, lower cost; F3, information sharing; F4, reverse logistics; F5, network reach; F6, strategic partnership; F7, time to market; F8, service quality; F9, visibility; F10, technology.

Results

Study analysis

The contextual relationships among the key enablers as depicted in SSIM were analysed using the ISM approach and an ISM model for implementation is developed as per the flowchart in Figure 2.

In MICMAC analysis, the dependence and the driving power of the barriers are sorted into four clusters such as: (1) autonomous factors, (2) dependent factors, (3) linkage factors and (4) driving factors as shown in Figure 3.

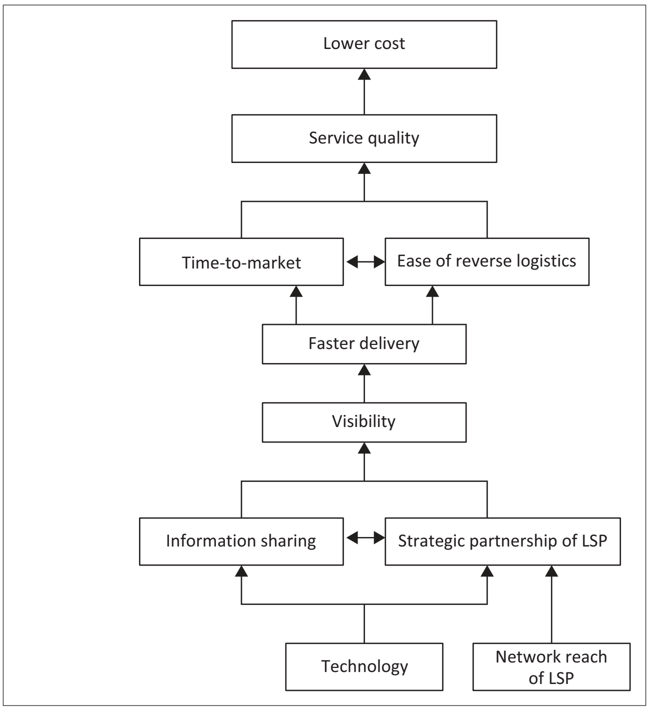
TABLE 5: Partitioning of the final reachability matrix into different levels.

Barriers	Reachability set	Antecedent set	Intersection set	Level
(a): Iteration-1				
F1	1, 2, 4, 7, 8	1, 3, 5, 6, 9, 10	1	
F2	**2**	**1, 2, 3, 4, 5, 6, 7, 8, 9, 10**	**2**	**I**
F3	1, 2, 3, 4, 6, 7, 8, 9	3, 5, 6, 10	3, 6	
F4	2, 4, 7, 8	1, 3, 4, 5, 6, 7, 9, 10	4, 7	
F5	1, 2, 3, 4, 5, 6, 7, 8, 9	5	5	
F6	1, 2, 3, 4, 6, 7, 8, 9	3, 5, 6, 10	3, 6	
F7	2, 4, 7, 8	1, 3, 4, 5, 6, 7, 9, 10	4, 7	
F8	2, 8	1, 3, 4, 5, 6, 7, 8, 9, 10	8	
F9	1, 2, 4, 7, 8, 9	3, 5, 6, 9, 10	9	
F10	1, 2, 3, 4, 6, 7, 8, 9, 10	10	10	
(b): Iteration-2				
F1	1, 4, 7, 8	1, 3, 5, 6, 9, 10	1	
F3	1, 3, 4, 6, 7, 8, 9	3, 5, 6, 10	3, 6	
F4	4, 7, 8	1, 3, 4, 5, 6, 7, 9, 10	4, 7	
F5	1, 3, 4, 5, 6, 7, 8, 9	5	5	
F6	1, 3, 4, 6, 7, 8, 9	3, 5, 6, 10	3, 6	
F7	4, 7, 8	1, 3, 4, 5, 6, 7, 9, 10	4, 7	
F8	**8**	**1, 3, 4, 5, 6, 7, 8, 9, 10**	**8**	**II**
F9	1, 4, 7, 8, 9	3, 5, 6, 9, 10	9	
F10	1, 3, 4, 6, 7, 8, 9, 10	10	10	
(c): Iteration-3				
F1	1, 4, 7	1, 3, 5, 6, 9, 10	1	
F3	1, 3, 4, 6, 7, 9	3, 5, 6, 10	3, 6	
F4	**4, 7**	**1, 3, 4, 5, 6, 7, 9, 10**	**4, 7**	**III**
F5	1, 3, 4, 5, 6, 7, 9	5	5	
F6	1, 3, 4, 6, 7, 9	3, 5, 6, 10	3, 6	
F7	**4, 7**	**1, 3, 4, 5, 6, 7, 9, 10**	**4, 7**	**III**
F9	1, 4, 7, 9	3, 5, 6, 9, 10	9	
F10	1, 3, 4, 6, 7, 9, 10	10	10	
(d): Iteration-4				
F1	**1**	**1, 3, 5, 6, 9, 10**	**1**	**IV**
F3	1, 3, 6, 9	3, 5, 6, 10	3, 6	
F5	1, 3, 5, 6, 9	5	5	
F6	1, 3, 6, 9	3, 5, 6, 10	3, 6	
F9	1, 9	3, 5, 6, 9, 10	9	
F10	1, 3, 6, 9, 10	10	10	
(e): Iteration-5				
F3	3, 6, 9	3, 5, 6, 10	3, 6	
F5	3, 5, 6, 9	5	5	
F6	3, 6, 9	3, 5, 6, 10	3, 6	
F9	**9**	**3, 5, 6, 9, 10**	**9**	**V**
F10	3, 6, 9, 10	10	10	
(f): Iteration-6				
F3	**3, 6**	**3, 5, 6, 10**	**3, 6**	**VI**
F5	3, 5, 6	5	5	VII
F6	**3, 6**	**3, 5, 6, 10**	**3, 6**	**VI**
F10	3, 6, 10	10	10	VII

F1, faster delivery; F2, lower cost; F3, information sharing; F4, reverse logistics; F5, network reach; F6, strategic partnership; F7, time to market; F8, service quality; F9, visibility; F10, technology.

Cluster 1: The first cluster is for autonomous factors that have a weak driver power and weak dependence power as well (Dubey et al. 2015; Jiang et al. 2019). These factors are not connected with the system. In this case, there are no autonomous factors.

Cluster 2: The second cluster is for dependent factors that have weak driver power but have strong dependence



LSP, logistics service provider.

FIGURE 2: Interpretive structural modelling model for implementation.

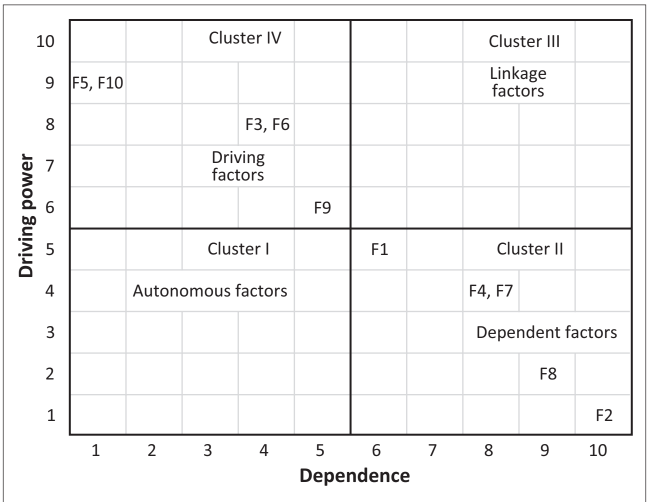


FIGURE 3: Driving power and dependence diagram.

(Dubey et al. 2015; Jiang et al. 2019). In this case, the factors F1 (faster delivery), F2 (lower cost), F4 (reverse logistics), F7 (time to market) and F8 (service quality) are dependent factors.

Cluster 3: The third cluster is for linkage factors that have strong driving power and strong dependence power. Normally, these factors are not stable and an action on linkage factor will have impact on other factor and feedback on same (Dubey et al. 2015; Jiang et al. 2019). In this case, there is no linkage factor.

Cluster 4: The fourth cluster is for driver factors that have strong driving power and weak dependence power (Dubey et al. 2015; Jiang et al. 2019). These are most fundamental factors. In this case, factors F3 (information sharing), F5 (network reach), F6 (strategic partnership), F9 (visibility) and F10 (technology) are driver factors.

Discussion

In the process of logistics buying decision, technology and network reach are driving factors. These factors clearly indicate the basic strength area of a service provider, on which LSP creates its service capability and differentiation for offering efficient services. Technology is enabler for efficient logistics ecosystem and better workflow management systems. Transport Management System, Vehicle Tracking Systems, Application Program Interface and others at service provider end significantly improves operational activities in logistics system. While in the absence of robust technology platform, information sharing between LSP and service buyer will not be efficient. Improved technology platform provides base and confidence to service buyer for the strategic partnership between both. Prime role of LSP is to serve the service buyer for its inbound and outbound logistics requirements in an efficient manner, which is not possible without adequate reach of service provider. If any LSP has a deep network reach coupled with good service levels, customers would choose such LSP to be their strategic partner. Information sharing and strategic partnership have two-way relationship. As foundation of strategic partnership lies on transparency, which is possible by way of enhanced information sharing between both. It gives higher degree of confidence to share information to logistics service provider and logistics service user. Higher degree of information sharing and strategic partnership between LSP and service user helps in improving visibility across supply chain. In present era, real-time information availability is one of the prerequisites for driving efficient supply chain, which not only enables management of logistics activity but also helps in proactive planning. Better visibility about movement of goods drives faster deliveries through proactive or real-time resolution of any bottle neck in flow of material. Logistics play a small part in any product’s time to market. At best, faster deliveries can help companies that deal with products of cut-throat competition and high demand. Research also indicates that lesser time in delivery leads to better time to market. On the other side, faster deliveries facilitate faster customer response on merchandise and so ease of reverse logistics. Ease of reverse logistics is also dependent on preceding factors such as technology and network reach of LSP. Presently when most of the company’s distribution model is moving towards omni channel and serving B2C and D2C channels, efficient reverse logistics is a sought-after service offering for such shippers. As accuracy and timeliness are key parameter of reverse logistics, faster delivery leads to ease of reverse logistics. Time to market and reverse logistics have a direct impact on service quality. Normally in logistics, two basic parameters of service quality are on time and accurate pickup and delivery. Therefore, service quality is driven by time to market in case of forward movement and ease of reverse in case of reverse movement. Normally, service quality becomes a key tangible factor in logistics service buying decision, which is driven by multiple factors at LSP's end. Logistics cost remains a prominent factor, but this cost is not only direct cost but also includes all direct and indirect costs linked to logistics services. In logistics and supply chain, cost is dependent not only on deliveries but also includes costs related to transportation, warehousing, inventory, leakages, etc. Better service and fewer errors lead to lower overall cost of logistics.

Conclusion

As per the objective of research to create a model for the factors impacting buying decision of logistics services, which can also help logistics practitioners, the model output clearly suggests that final objective in decision-making process of logistics procurement is driven towards lower cost and improved service level. But it is driven by factors that directly add value in supply chain such as time to market and reverse logistics. These factors such as technology and network reach of LSP are key towards driving final objective. Therefore, in decision-making of logistics buying, network reach of the LSP and technology are the key drivers followed by information sharing and strategic partnership approach, which need due consideration.

Implications

This research has theoretical and managerial implications. This research will add to the knowledge on buying process of express logistic industry, which is an underresearched area. The study also helps in framing a structured framework for the managers for express logistics buying decision.

Limitations

The study is applicable for strategic sourcing of logistics only. However, it may not be applicable for transactional buying in logistics. This model suggests a theoretical model based on inputs of few experts, which needs to be tested with a larger sample set of respondents. The research has been conducted with limited subject matter experts, in order to make a theoretical model. In order to validate the finding, next step will be confirmatory test analysis with a larger set of respondents.

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Competing interests

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Authors' contributions

V.K. was responsible for data collection, analysis, article writing, discussion; A.P.: was responsible for analysis and ISM modelling; A.K. was responsible for the literature review and correction in ISM modelling.

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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