World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:5, No:11, 2011

Criteria of Selecting 3pl Provider: A Literature Review

Rajesh Gupta *, Anish Sachdeva ,Arvind Bhardwaj

***Abstract*—**Shippers are concentrating on the core competency to stay competitive and outsourcing the logistic activities to the third party who is expert in this field. This third party logistics (3PL) is drawing the due attention at government, industrial, academicians and practitioner's levels. If the logistics cost in India can be brought down from the current level of 13% of GDP to 9% (level in the U.S.), the savings would be around Rs 3 lakh crore approximately per annum. But the problem with the shippers is to select the suitable 3PL provider. Various criteria for selection of 3PL have been listed in the literature which are discussed in the present literature review. Every shipper will select the criteria suitable to its own requirement which have to be dynamically reviewed time to time so as to fit in the ever changing environment.

***Keywords*—**3PL, criteria, shipper, outsourcing

I. Introduction

THIRD-PARTY logistics (3PL), which is growing around the world is drawing the due attention at government, industrial, academicians and practitioner's levels. The worldwide trend in globalization has led many companies to outsource so as to focus on their core competencies.

The annual logistics cost in India is estimated to be 13% of India GDP in comparison to less than 9% of their respective GDPs in the developed countries such as the U.S. and Germany (Source: http://www.worldbank.org). The annual logistic cost in India is around USD 160 billion (Indian GDP is USD 1232.7 billion in 2008 ranked 5th in the world). World wide logistics is about 2 Trillion US dollars. For any country, the logistics cost are estimated to be between 9 – 20% of GDP [1]. If the logistics cost in India can be brought down from the current level of 13% of GDP to 9% (level in the U.S.), the savings would be around $64 billion (Rs 3 lakh crore approximately) per annum. In order to handle its logistics activities effectively and efficiently, a company may consider the following options.

(1) It can provide the function in-house by making the service.
(2) It can own logistics subsidiaries through setting up or buying a logistics firm.
(3) It can outsource the function and buy the service.

Currently, a growing interest in the third option, i.e., outsourcing has been indicated by the volume of writings on the subject in scholarly journals, trade publications and popular magazines.

*Department of Mechanical Engineering, Giani Zail Singh College of Engineering & Technology, Bathinda, Punjab-151001, India
Department of Industrial and Production Engineering, Dr. B.R.Ambedkar National Institute of Technology,Jalandhar, Punjab-144001, India
* Corresponding author e-mail:- rg91@rediffmail.com

The present literature review has been conducted to understand the concept of 3PL and the research done so far on the criteria for the selection of outsource partner or 3PL provider.

II. What is third party logistics (3PL)

A 3PL is a logistics service provider, usually asset-based, which focuses on specific elements of the supply chain in order to optimize the physical movement of goods from the point-of-origin to the end-user [2] and the customer return of defective products to their supplier [3].

III. Logistics activities outsourced

Logistics activities mainly involve B2B (business-to-business) relationships. Logistics services are regarded as basic logistics service and more complex advanced logistics services. The degree of complexity depends upon factors such as the number of services included (single or multiple bundled services), the tangibility of the service definition i.e. whether focus is on handling or value adding, on execution of activities or management and the service is pre-defined or the development and re-engineering is part of the scope [4] (Table : 1).

A study conducted by (CLM, 2003)[5], involving 400 representatives from North America, Western Europe and Asia Pacific concluded that logistics outsourcing is a growing business globally. It is moving in two directions: (1) increase in the number of buyers of logistics services, and (2) increase in the extent of usage of logistics services. The extent of usage includes number of activities outsourced, geographical coverage, nature and length of contract, percentage of total logistics budget allocated to 3PL companies and level of commitment [6]. A total of 1,568 logistics executives located in 61 countries from North America, Europe, Asia Pacific and Latin America, South Africa and the Middle East participated in the survey conducted [7]. Respondents indicate a greater propensity to outsource freight bill auditing and payment, transportation. management in North America and Europe respectively. Asia Pacific and Latin American organizations have a greater incidence of outsourcing customer service, forwarding and customs clearance outsourcing than in the rest of the world. Warehousing, Transportation, Freight Forwarding, Customs Clearance, Freight Consolidation, Freight Brokerage, Break Bulk Operations, Cargo, Insurance Packaging/Labeling, Distribution, Reverse Logistics, Consulting Services Import/Export Management, NVOCC(Non-Vessel Operating Common Carrier), Inventory Management Order Processing, Payment Collection, and Vendor Management are the activities being outsourced in India in 2008 [8].

The exceptions are the activities payment collection, sales promotion, vendor management, chartering of vessels, port operations and cross docking, which were also mentioned in 2004 survey [9].

IV. Criteria for Selection of 3PL Provider

The selection of a supplier for partnership is perhaps the most important step in creating a successful alliance. Rushing into buyer–supplier relationship without adequate preparation or understanding of partners' needs often lead to the failure of relationships [10].

Logistics managers may face several issues like, how to decide the criteria for the selection of 3PL services providers? How to prioritize the criteria? How to develop hierarchical relationship among the selection criteria? How to exploit, the knowledge of experts from the field for maximum benefit? Moreover such a process is time consuming and costly. Hence, a model for the identification and classification of selection criteria, for 3PL services providers is desirable to facilitate logistics managers [11].

The literature offers several techniques for selecting partners: (1) matrix or weight approaches, and mathematical programming approaches such as, linear programming, mixed integer-programming, goal programming, multiple objective programming, non-linear programming and multiple criteria decision-making methods [12], [13]; (2) probabilistic methods and artificial intelligent techniques such as genetic algorithms, neural networks, and fuzzy logic [14],[15]; and (3) integrated approaches [16]. The criteria for the selection of 3PL chosen by various researchers have been listed in the table II. According to [17], in order to establish a reliable and cost-effective partnership, efforts should be made in two stages; 3PL provider selection and contract signing. The 31 selection criteria were categorized in seven factors for the selection of the carrier. The success of relations requires extreme information sharing and mutual confidence.

Supplier selection decisions are complicated by the fact that various criteria must be considered throughout the decision making process. Analysis of such criteria and measuring suppliers' performances has been the focus of many researchers for approximately four decades [18].

In 2003, the International Warehouse Logistics Association (IWLA), that comprises more than 550 logistics companies of North America, conducted an exploratory study with several 3PL customers. Their study showed a major change in the selection criteria's rankings [19](reprinted from: iwla.com).

The five steps involved in selecting an effective 3PL which are: making decision on the need to use or not a 3PL, developing criteria and objectives which the provider should meet, weeding out process by making a list of possible 3PL, determining the top prospect to meet the potential 3PL, and beginning the new partnership with the chosen provider [20].

The study on 128 Swedish firms concludes that the main objectives for the design of supply chains are resource utilization and cost minimization [21].

The complexity of the selection of a proper provider increases with an increase in the number of selection criteria [3]. An eight-point plan for the selection and implementation of logistics outsourcing services was suggested [4].

Some of the problems which are specific to the selection of a provider are: lack of persons with in-depth knowledge of outsourcing related issues, lack of complete information about the prospective providers, incomparable request for proposal (RFP) as many providers suggest many different solutions, non clear definition of the requirements by the users, comparing various providers on many criteria of varying importance and time taken for the election process.

TABLE I
FACTORS INFLUENCING DEGREE OF COMPLEXITY OF THE LOGISTICS SERVICES

Basic Logistics Service		Advanced Logistics Service
Single services Of solution	⟷	Multiple and bundled services
Tangible service definitions Definitions	⟷	Intangible outcome requirements
Handling focus	⟷	Value adding focus
Execution of activities		Management
Stable service definition	⟷	Development and reengineering
Degree of complexity of service ⟷		

With the ever changing requirement of the end customers, the criteria once selected will not be sufficient to sustain in the dynamic environment of the present era. So a mathematical programming model was proposed which considered the change in supply capabilities and customer needs over a period in time [22]. World Bank (November 25, 2007) ranks India at 39th in global trade logistics which publishes first ever Logistics Performance Index (LPI) to rank country's logistics competence, cost structure, and infrastructure (World Bank Global Logistics Report: available at SCDigest). The 3PL

market in India is least developed. A survey conducted by Frost & Sullivan estimates the logistics market in India at $298.7 million in 2003 (0.48% of the logistics cost in 2003) and it increased to USD 2 billion in 2008 (1.25% of the logistics cost in 2008) whereas world wide logistics industry is about 2 Trillion US dollars. There are very few service providers, who generate substantial revenues (more than Rs. 50 crore) in India [9]. However, things are changing for the better at a fast pace. According to a TCI-MDI survey of 130 Indian firms, 55.4% respondents indicated that their firms use 3PL services [23]. There is not much literature on logistics and supply chain practices in India. No direct observation type of studies has been published. Available literature focuses either on the best practices [24] or on re-engineering of internal operations of the firms [25], [26]. All these studies indicate that the Indian firms generally lag behind their counterparts in the developed countries.

V. Conclusion

The Indian 3PL market is set to grow tremendously in the next 5-7 years, spearheading the growth of logistics market. Several factors including government's support, increased awareness among users and the support of the technology are instrumental in this growth. The main focus should be to concentrate on the proper criteria for the selection of the 3PL provider to undergo a win-win alliance between shipper and the 3PL providers. With scenario highly favorable for them, the onus is now on 3PL service companies to offer quality services at affordable pricing and delivering consistent results to maintain the momentum. For now, surely 3PL is the way forward for Indian Logistics Market. With the ever changing requirement of the end customers, the criteria once selected will not be sufficient to sustain in the dynamic environment of the present era. So these criteria must be reviewed time and again for successful, healthy and ever growing relation among all the partners of the supply chain.

TABLE II
CRITERIA FOR SELECTION OF 3PL BY VARIOUS RESEARCHERS
CRITERIA FOR THE SELECTION OF 3PL

	[27]	[28]	[29]	[30]	[17]	[13]	[31]	[32]	[33]	[19]	[34]	[35]	[36]	[18]	[37]
Cost savings									√	√	√	√			
Specialization							√						√		
Asset reduction		√										√			√
Dedicated capacity						√								√	
Service improvement				√											
Quality of service												√			√
Increased flexibility				√				√		√		√			
Flexibility in customer inquiry					√										
Equipment flexibility						√						√		√	
Labor flexibility						√								√	
Major problem area															
Technology improvements								√							
Innovations in process						√				√					
Reliability of carrier					√					√					
Response in delivery cycle					√			√							√
Financial stability								√				√	√		√
Ease of collaboration					√							√			
Mutual trust					√							√			
Information sharing					√			√				√			
Experience in cooperation							√								
Ability to understand							√								
Experience								√					√		√
Management capability								√	√	√		√	√		
Production capacity								√							
Reputation								√		√		√	√		√

Geographical location								√		√					√
Consistency								√	√						
Relationship									√	√			√	√	
On time performance										√		√	√	√	√
Variety of services										√	√	√			
Value added services											√				√
Customised service										√					
Company size											√		√		
IT capability												√			√
Human resource mgmt															√
Breadth of services															√
Cultural fit													√		
R&D investment														√	
Environmental expenditure														√	

REFERENCES

[1] Viswanadham N. and Roshan Gaonkar, "Leveraging Logistics To Enhance Indian Economic Competitiveness", CII Logistics 2003 Theme Paper
[2] Stock, J.R and Lambert, D.M.(2001), Strategic Logistics Management; fourth edition. Boston: McGraw–Hill International Editions.
[3] Meade, L.M. and Sarkis, J.(2002), "A conceptual model for selecting and evaluating third–party reverse logistics providers", Supply Chain Management: An International Journal, Vol.7 No.2, pp.283–95.
[4] Andersson, D. and Norrman, A.(2002), "Procurement of logistics services - a minutes work or a multi–year project?", European Journal of Purchasing and Supply Management, Vol.8 No.1, pp. 3–14.
[5] Council of Logistics Management's (CLM) 2003 Annual Report, Illinois US, Sep. 2003.
[6] R. Bhatnagar, A.S. Sohal and R. Millen, "Third party logistics services: a Singapore perspective," International Journal of Physical Distribution & Logistics Management, vol. 29 No. 9, pp. 569–587, 1999.
[7] Langley Jr., C.J.(2007), "Third party logistics study: results and findings of the 12th annual study", Georgia Institute of Technology, Atlanta, GA
[8] Subrata Mitra, The 2008 Survey of Indian Third-Party Logistics (3PL) Service Providers: Comparisons with the 2004 Survey of Indian 3PLs and 2006 Survey of North American 3PLs WPS No. 633/ February 2009
[9] Subrata Mitra, A Survey of the Third-Party Logistics (3PL) Service Providers in India, WPS No. 562/ October 2005
[10] Vanhaverbeke, W., Duysters, G., & Noorderhaven, N. (2002). External technology sourcing through alliances or acquisitions: An analysis of the application-specific integrated circuits industry. Organization Science, 13(6), 714–733.
[11] Qureshi, M.N., Kumar, D. and Kumar, Pradeep (2008c), "An integrated model to identify and classify the key criteria and their role in the assessment of 3PL services providers", Asia Pacific Journal of Marketing and Logistics, Vol.20 No.2, pp.227-49.
[12] Dulmin, R., & Mininno, V. (2003). Supplier selection using a multi-criteria decision aid method. Journal of Purchasing and Supply
[13] Talluri, S., & Narasimhan, R. (2003). Vendor evaluation with performance variability: A max–min approach. European Journal of Operational Research, 146(3), 543–552.
[14] Choy, K. L., Lee, W. B., & Lo, V. (2003). Design of an intelligent supplier relationship management system: A hybrid case based neural network approach. Expert Systems with Applications, 24, 225–237.
[15] Ding, H., Benyoucef, L., & X. Xie. (2003). A simulation-optimization approach using genetic search for supplier selection. In: Proceedings of the 2003 Winter Simulation Conference (pp. 1260–1267).
[16] Kumar, M., Vrat, P., & Shankar, R. (2004). A fuzzy goal programming approach for vendor selection problem in a supply chain. Computers and Industrial Engineering, 46(1), 69–85.
[17] E. Aktas and F. Ulengin, The Journal of Enterprise Information Management, Vol. 18 No. 3, 2005 pp. 316-329
[18] Tug˘ba Efendigil, Semih Onut, Elif Kongar ,(2007)," A holistic approach for selecting a third-party reverse logistics provider in the presence of vagueness", Computer And Industrial Engineering, vol. 54, pp 269-287
[19] www.iwla.com
[20] Aghazadeh, S.M., 2003, "How to choose an effective third party logistics provider?", Management Research News, 26, 7, 50-58.
[21] Olhager, J. and Selldin, E., (2004), .Supply Chain Management Survey of Swedish Manufacturing Firms., International Journal of Production Economics, 89, (3), pp. 353-361.
[22] Hong, G. H., Park, S. C., Jang, D. S., & Rho, H. M. (2005). An effective supplier selection method for constructing a competitive supply relationship. Expert Systems with Applications, 28, 629–639.
[23] Sahay, B S and R Mohan, 2004, "Third-party logistics practices: an Indian perspective", Unpublished.
[24] Joshi, V. and Chopra, S.K. (2004), .Best Practices in Supply Chain Management at Modi Xerox., In Sahay, B.S. (ed.), Supply Chain Management for Global Competitiveness, 2nd edition, Macmillan, New Delhi, pp. 549-562.
[25] Deshmukh, S.G. and Mohanty, R.P. (2004), .Re-engineering of Supply Chain: Lessons from Select Case Studies., In Sahay, B.S. (ed.), Supply Chain Management for Global Competitiveness, 2nd edition, Macmillan, New Delhi, pp. 509-526.
[26] Kankal, R.A. and Pund, B.S. (2004), .Reengineering of Supply Chain: The Case of Crompton Greaves., In Sahay, B.S. (ed.), Supply Chain Management for Global Competitiveness, 2nd edition, Macmillan, New Delhi, pp. 527-537.
[27] van Damme, D.A. and van Amstel, M.J.P.(1996),"Outsourcing logistics management activities", International Journal of Logistics Management, Vol.7 No.2, pp.85–95.
[28] Razzaque, M.A. and Sheng, C.C., 1998, "Outsourcing of logistics functions: a literature survey", International Journal of Physical Distribution & Logistics Management, 26, 2, 89-107.
[29] Andersson, D. and Norrman, A.(2002), "Procurement of logistics services - a minutes work or a multi–year project?", European Journal of Purchasing and Supply Management, Vol.8 No.1, pp. 3–14.
[30] Arroyo, P., Gaytan, J. and de Boer, L.(2006), "A survey of third party logistics in Mexico and a comparison with reports on Europe and USA", International Journal of Operations & Production Management, Vol.26 No.6, pp.639–67.

[31] Sorkamo, Ritva 2001. Asiakasinfo. Uuden talouden It-ratkaisut. 3/2001. Novo Group.
[32] A. Petroni and M. Braglia, "A quality- assurance oriented methodology for handling trade- offs in supplier selection," International Journal of Physical Distribution & Logistics Management, vol. 30, no. 2, pp. 96-111, 2000.
[33] T. L. Freese, "Outsourcings: How to select a Third Party Operator," available at www.freeseinc.com/Monographs/Outsourcing. Pdf
[34] Tsai, M-C., Wen, C-H. and Chen, C-S., 2007, "Demand choice of high-tech industry for logistic service providers – an empirical case of an offshore science park in Taiwan", Industrial Marketing Management, 36, 5, 617-626.
[35] Qureshi, M.N., Kumar, D. and Kumar, Pradeep (2007c), "Modeling the logistics outsourcing relationship variables to enhance shippers, productivity and competitiveness in logistical supply chain", International Journal of Productivity and Performance Management, Vol.56 No.8, pp.689 –714.
[36] Gulcin Buyu kozkan, Orhan Feyzioglu, Erdal Nebol, "Selection of the strategic alliance partner in logistics value chain", Int. J. Production Economics 113 (2008) 148–158
[37] Hao-Tien Liu, Wei-Kai Wang,"An integrated fuzzy approach for provider evaluation and selection in third-party logistics", Expert Systems with Applications 36 (2009) 4387–4398