Abstract

Third party Logistics is a new type of industry where the firm's logistics activities can be outsourced. The concept of Third party logistics has been developed from the need to extend transportation services by transportation companies to its customers. Many manufacturing industries turned to logistics outsourcing to restructure their distribution networks and gain competitive advantages. This paper is an attempt to take an insight into knowing the effect of ICT, type of manufacturing segment and logistical sophistication on integration between 3PL providers and manufacturers through literature review.
1. Introduction

A supply-chain is a network of facilities and distribution points that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. In recent years, a growing number of manufacturers and retailers have adopted the supply chain management (SCM) concept in the management of their businesses. For these companies, the delivery system has become an integral part of their product, to the extent that transportation and logistics are as important as the product itself [1]. More and more companies have recognized that individual businesses no longer compete as stand-alone entities, but rather as supply chains. One of the fundamental elements of supply chain management is Logistics. “SCM is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model” [2]. It is a part of supply chain process that plans implements, and controls efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customer’s requirements. SCM is an integrated approach that is highly interactive and complex and requires simultaneous consideration of many trade-offs. SCM is the management of all key business process across a number of the supply chains. Successful SCM requires a change from managing individual function to integrating activities into key supply chain process. Operating an integrated supply chain requires continuous information flows, which in turn helps to create the best products flow [3].

Appropriate logistics strategies relating to transportation modes, warehousing, inventory management and order processing have to be implemented for moving the right materials efficiently to the right place, at the right time and at the right price across the supply chain. In order to handle logistics activities effectively and efficiently, a company may consider the following options – it can provide the function in-house by making the service, or it can own logistics subsidiaries through setting up or buying a logistics firm or it can outsource the function and buy the service. Currently, there has been a growing interest in the third option, i.e. outsourcing of logistics functions to third party logistics service (TPL) providers.

Manufacturing industries collect raw materials from suppliers and deliver finished goods to the customers. This function is executed by logistics. Logistics is a logical extension of transportation and its related areas to achieve an efficient and effective goods distribution system. It encompasses the activities of inventory management, order processing, warehouse and materials handling and physical distribution. According to the council of logistics management, logistics is the part of supply chain process that plans, implements and controls the effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customer’s requirements [4].

Outsourcing logistics activities including transportation and warehousing to outside firms, is termed as third party logistics. Third party logistics is a new type of industry where the firm’s logistics activity can be outsourced. It came into existence during the deregulation of freight transport industry in the 1980’s and has progressed in the 1990’s along with the development of IT.

2. Concept of 3 PL

TPL has many definitions and interpretations. Outsourcing, third party logistics services (3PL) and contract logistics generally mean the same thing. It involves the use of external companies to
perform logistics functions, which have traditionally been performed within an organization. The functions performed by third party logistics service providers can encompass the entire logistics process or select activities within that process. A key rationale for outsourcing of logistics functions is the intensified globalization of businesses. During the last two decades, globalization has emerged as a major force of shaping business strategies, leading firms to develop products designed for a global market and to source components globally [5].

The future usage of third party logistics services is a function of the current level of satisfaction of the firm with the logistics services provider. Only high levels of satisfaction with third party logistics services providers will translate in increased outsourcing in the future. Typically, firms start with the outsourcing of few logistics services, moving over to activities which have maximum impact on logistics performance and then increase scope of usage of logistics services with perceived and quantifiable impact on overall business performance [6].

3 PL means outsourcing logistics activities including transportation and warehousing to outside firms, which are not a consignor or a consignee. However, it is not common 3 PL practice to outsource a single activity of logistics independently, but to outsource multiple activities from the firm’s strategic point of view. Features of 3PL include integrated (or multi-modal) logistics service provider, Contract-based service provider, and consulting service provider. A 3 PL provider is regarded as an integrated logistics service provider. IT-related activities for controlling goods flow such as order processing, and inventory management, among others are also included in the function of the 3PL provider. However, the 3PL provider need not provide all the services solely. The 3 PL providers can outsource some activities to sub-contractors. A 3PL provider can be classified into the asset-based and the non-asset-based. After realizing the potential in the outsourced logistics market, 3PL service providers are expanding their basket of services. Third party logistics incorporating value-addition in their services and customizing their supply chain management solutions [7].

The reasons for Outsourcing are Focus on core competencies, Logistics cost reduction, Imbibe flexibility in operations, improved customer services, productivity improvements, Access to emerging technology, Access to unfamiliar market, diverting capital investment and to increase inventory turn’ [8]. State – of – the – art logistics networks are characterized by linked database, paperless transaction, analytic modelling and real-time tracking and tracing capabilities, all of which lead to faster time to market, lower inventories so that companies can concentrate on their core competencies. So outsourcing logistics is a better option, as it allows companies to stick to their core-competencies [9]. When a firm contracts-out logistics activities to a 3PL provider, the 3PL provider needs to establish transaction and inventory management systems involving other firms in the supply chain; i.e. supplier, manufacture and retailer, etc. the 3PL provider does not usually provide all logistics activities solely. Some activities are outsourced to subcontractors. For example, non-asset 3PL providers may outsource a transport activity. Such relationship between the 3PL provider and the sub- contractor likewise constitutes a part of the supply chain process [3].

3. Effect Of Usage Of ICT On 3PL Industry
In supply chain, while providing customized logistics services, Information and Communication Technology (ICT) plays a critical role. In highly competitive situations with time constraints, technology becomes a critical and effective tool to gain competitive advantage [10]. The logistics
service provider companies with such customized technological advantage can achieve very effective integration between various components of supply chain [11]. In case of third party logistics applications, ICT capabilities can guarantee fast customization of products and achieve very optimum lead times [12]. In large sized and small-medium sized 3PL companies, use of ICT is uneven. Big 3PL companies invested heavily in ICT and developed advanced Information Systems (ISs) whereas small 3PL companies are hesitant for investing in developing human and infrastructure capabilities in ICT. This has proved a competitive disadvantage for small 3PL companies in achieving improvement in customer service and cost reduction [13].

A major effect of use of ICT in logistics service industry is integration of transportation and warehousing with information based services like tracking, booking, routing, scheduling etc [14]. Nowadays through internet many transport and logistics providers are able to offer variety of real time information and online services to their customers [15]. The advantage of this ICT enabled web based third party service providers is to achieve added value to transport and logistics business through greater efficiency and information transparency [16].

To keep pace with rapid market changes compelled third party logistics providers look for accurate and real time information on the status of entire shipment process to improve their planning capacity customer service levels [17]. An investigation is done to find the level of ICT adoption in small 3PL providers. It was found that relatively higher level of ICT adoption is prevalent in large 3PL providers. Many barriers exist to the successful adoption of ICT by small 3PL providers [18].

4. Relationship Between Manufacturing Segment And Choice Of 3PL Companies

It is observed that different manufacturing segments show different approach or behaviours while procuring logistics services. It is found that the manufacturing companies outsourcing all supply chain functions had higher logistics cost saving than those outsourcing any individual function [19]. To cater to specific categories of customers requiring specialized competencies and cost constraints, 3PL service providers have started to segment their markets. The segmentation of third party logistics providers may be done on the basis of type of service they offer. They can be classified as follows-

1. Operational Specialist: This category includes the service providers who offer specific services like transportation, warehousing, labeling etc.
2. Integrated service providers: This category include providers offering more detailed solutions consisting a variety of services for customers in an integrated manner [20].

It is found that logistics service buyers give more weightage to core competencies of logistics service providers and favour those providers who offer customized services addressing to their needs [21]. Use of information technology to gather, analyses and transfer huge volume of information influences the speed of decision making in logistical activities. Its outcome leads to shorter operational cycles and less complicated adaptations [22].

A higher level of sophistication in the logistics function would in part reflect a top position of the chief logistics manager in the top ranks of the firm, which would facilitate the integrated management of logistics activities and more efficient choices in the function’s typical tradeoffs [23]. The flow of materials within the operations when analysed under different parameters like cost, value addition, perishability, obsolescence, number of stock keeping units (SKUs) exhibits particular situations that may influence selection of one type of provider over another. Production Systems may be classified into so called V-A-T categorization of manufacturing structures. The Table No.1
shows the classification of manufacturing structures, its characteristics and choice of logistics service providers.

Table 1: Relationship between types of firm, manufacturing segment, choice of 3PL provider

<table>
<thead>
<tr>
<th>Type of Firm</th>
<th>Type of Manufacturing structure</th>
<th>Characteristics</th>
<th>Examples</th>
<th>Choice of Logistics Service Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-type</td>
<td>Few raw materials transformed into larger number of end products.</td>
<td>1. Deal with bulk cargo of low value added items. 2. Focus is on transportation and warehousing cost rather than investment cost 3. Raw materials and end products are neither perishable nor obsolete. 4. May prefer less sophisticated technology for handling, moving and storing items to achieve greater scale of operation</td>
<td>Chemical, Steel, Oil refining, Paper, Apparel.</td>
<td>Prefer functional high scale contractors.</td>
</tr>
<tr>
<td>A-type</td>
<td>Several raw materials, components and parts transformed into few end parts.</td>
<td>1. Final products have higher value addition and cost density. 2. Prefer speedy shipment and premium transportation. 3. Characterized by smaller number of SKUs to maintain and control which reduces warehouse size. 4. Products normally subject to obsolescence than to perishability.</td>
<td>Aerospace, Appliances, Automotive, High-tech industries with assembly type operation.</td>
<td>Favor providers who can integrate several logistical functions.</td>
</tr>
<tr>
<td>T-type</td>
<td>Several products are assembled in many different ways out of similar parts and components.</td>
<td>1. Characterized by higher number of SKUs to control affecting warehouse size, technology and decentralization. 2. Final product characterized by low value addition and cost density.</td>
<td>Food, Beverages, Tobacco, Healthcare.</td>
<td>Preference of provider depends on characteristics of end product and the market served.</td>
</tr>
</tbody>
</table>

Type of manufacturing industry is considered as one of the segmentation criteria for third party logistics providers and typical categories of industries include automotive, computer, telecommunications, food items, paper etc [20]. It is investigated that whether there is any direct relationship between type of manufacturing structure, level of logistics sophistication function and choice of type of third party logistics provider. It is found that normally firms with A type production process structure prefer integrated 3PL providers whereas firms with V type and T type production process structure prefers functional 3PL providers [24].
5. Integration Between 3PL Provider And Manufacturers

The integration of business operations and efficient management of information to create value can be attained through the organizational coordination among supply chain members. It is observed that integrative practices between companies participating in supply chain are limited [25]. Only a small group of big companies are trying to form and manage a truly integrated supply chain by linking their operations with customers and suppliers [26]. Lack of integration between 3PL providers and manufacturers may be due to misinterpretation of collaboration practices [27]. Many a times ineffectiveness of ICT systems in handling and supporting flow of information also leads to lack of integration between 3PL providers and manufacturers [28]. Lack of integration is observed more between manufacturers and TPL providers than between manufacturer-supplier and manufacturer-customers [29]. In many situations TPL providers are treated as external agency and not as natural partners, so focus is always on reduction in cost [30]. Integration of supply chain elements is achieved by passing through four stages namely Baseline, Functional Integration, Internal Integration and External Integration. To make the integration concept operational requires identification of the most essential tasks to be solved in connection with SCM and the underlying activities to be performed to accomplish these tasks. Business process perspective is the most appropriate approach to achieve integration between logistic providers and manufacturers [31].

The integration between manufacturer and TPL providers will be strengthened by the effective use of ICT. Manufacturers will start outsource more specific services to TPL providers provided they get quality at less cost with use of effective ICT tool. TPL providers feel that logistical sophistication and use of ICT tools will increase the effective cooperation between manufacturers and TPL providers [32].

6. Conclusion

From the literature survey, it is observed that implementation of advanced ICT is more in big 3PL companies. It also depend on the level of Information system integration and information exchange between supply chain members. There is a direct relationship between the selection of logistics service suppliers and shipper’s manufacturing process structure and logistics function sophistication. To achieve more efficient cooperation from manufacturers, 3PL providers are ready to increase the use of ICT tools.

References

BIOGRAPHIES

1. Harshad M. Deshmukh: Mr. Harshad was born on 10 February 1966 in Amravati. He completed his M.Tech in Production Engineering and MBA in Marketing specialization. Presently he is working as Associate Professor in Department of Mechanical Engineering, Prof. Ram Meghe Institute of Technology & Research, Badnera, Amravati (M.S.), India. His teaching experience at Undergraduate and Postgraduate level is 26 years. He is a member of various professional societies like ISTE, IE (India), IIIE. His area of research interest is Supply chain Management, Quality control and Operations Management. He worked as Chairman, Board of Studies (Production Engineering), Member, Faculty of Engineering & Technology and Member, Academic Council in S.G.B. Amravati University during 2002 to 2007. He also worked as Subject expert and Moderator in Management Board, S.G.B. Amravati University. Presently he is working as Divisional Convener, Production Engineering in Institution of Engineers (India) Amravati Local Chapter. He has worked as Member in number of Local Enquiry Committee, S.G.B. Amravati University.

2. Dr. Satish V. Bansod: Dr. Satish was born on 24 October 1960 in Amravati. He completed his M.E. in Production Engineering and PhD in Ergonomics. Presently he is working as Professor in Department of Mechanical Engineering, Prof. Ram Meghe Institute of Technology & Research, Badnera, Amravati (M.S.), India. His teaching experience at Undergraduate and Postgraduate level is 30 years. He is a member of various professional societies like ISTE, IE (India), IIIE. His area of research interest is Tool Design, Ergonomics and Supply chain Management. He worked as Chairman, Board of Studies (Production Engineering), Member, Faculty of Engineering & Technology and Member, Academic Council in S.G.B. Amravati University. He is a recognized PhD supervisor in the Faculty of Engineering & Technology, S.G.B. Amravati University. Presently he is working as Member, National Executive Council, Indian Society for Technical Education. He has worked as Member in number of Local Enquiry Committee, S.G.B. Amravati University. He is a recognized PhD thesis examiner in various universities.

Aswathy Unnikrishnan, Ajesh F, Reshma S. Nair :: Detection Of Abnormal Visual Events Using HOFO And KNN