

Carrier selection determinants



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The purpose of this chapter is to review past literature that has been made available regarding the subject of carrier selection. The first section of this chapter will begin with global maritime overview. Next, the concept of logistics management and the issues related to transport and customers will be discussed. Finally, the end of the chapter will review the issues related to carrier selection including important determinants in shippers' making decision process.

2. 2 Global Maritime Overview

According to UNCTAD (2008), over 80 percent of world merchandise trade by volume carried by sea because it supports international trade and globalization. In 2007, the volume of international seaborne trade reached 8.02 billion tons. The volume increased of 4.8 percent from the previous year. Dry cargoes were the largest share of good loaded. The world merchant fleet expanded by 7.2 percent during 2007 to 1.12 billion deadweight tons (dwt) at the beginning of 2008. Major loading areas were located in developing countries which are 63.2 percent while developed countries accounted as 33.3 percent. Because of high demand for shipping capacity, vessel order increases at highest level which it is 12 times higher that it was in June 2002. The top 35 shipowning countries together controlled 95.35 percent of the world fleet. By May 2008, the world containers fleet reached 13.3 million TEUs. In addition, the containership sector is investing in larger ship to achieve economies of scale to reduce costs. However, in the year 2007, the containership market was effected by higher fuel cost, a weakening US dollar, a strengthening Euro, and an increased supply of newbuilding coming online. Oil price impacted directly to bunker cost level which resulted higher

bunker fuel price for 73 percent in Rotterdam, 76 percent in Singapore and 79 percent in Los Angeles. Furthermore, maritime transport tends to have further discussions such as security and air pollution and climate changes. The industry is more concerned on environmental issues because heavy oil burned in shipped results in higher level of sulphur oxide and nitrogen oxide emissions.

International trade is the main driver of container flow. In the year 2005, North and East Asia is the most significant driver of container trade which was accounted for 50 percent of export trade. In the year 2015, North and East Asia is expected to increase its world market share by approximately 12 percent while North America and Europe are expected to lose market share by 5 and 7 percent respectively. In other words, North and East Asia trade was the key driver of global container flow in the year 2005, and it has potential to grow until the year 2015. The estimated and forecast growth rates for full container trade (Figure 2. 1) tend to reach up to 235. 7 million TEUs in the year 2015, and the compound growth rate during the period 2005 – 2015 is 7. 6 percent per annum. This estimation is full origin-destination containers only. The empty containers are not included. According to Drewry Shipping Consultants () as cited by UNCTAD (2008), container trade is expected to reach 287 million TEUs and exceed 371 million TEUs by the year 2020.

2. 2. 1 Impacts of Credit Crisis on International trade

2. 3 Logistics Management

Logistics management is the process that relates to plan, implement and control the efficient, effective flow and storage of goods, services, and information in both the manufacturing and service sector from the point of origin to the point of consumption in order to meet customers' requirement. Logistics management is to control raw materials, in process inventory and finished goods (Stock and Lambert, 2001).

Gecowets (1979) explains about logistics concept that

“ The five rights of a logistics system are supplying the right product at the right place at the right time in the right condition for the right cost to those customers consuming the products.”

According to Quayle and Jones (2001), logistics is defined as the process that needs management and co-ordination of all activities from sourcing and acquisition, through production and through distribute channel to customers. The authors also explain that the goal of logistics is to create competitive advantage through the simultaneous achievement of high customer service levels, optimum investment and value for money. In addition, the authors explain about the business functions within the scope of logistics management or know as “ logistics mix” which include planning and marketing strategy, purchasing, production planning, storage and material handling, inventory management, warehouse and stores, transport, customer service, and technical support. Relevant to Bowersox et al. (2007), logistics relates to the management of order processing, inventory, transport, and the combination of warehousing, materials handling, and packaging (Figure 2. 2).

However, Croom, Romano, and Giannakis (2000) do research on critical literature review of supply chain, and they conclude that supply chain has lack of universal definition because the way of supply chain has been developed, so it leads to different point of view.

Business functions in logistics management:

- Facility Network
- Warehousing, Material Handling, and Packaging
- Integrated Logistics Management
- Order Processing
- Transport
- Inventory

Logistics requirement have increased to serve consumers who want and demand quicker response times and more convenient offerings. Moreover, it is also pressured by consumers related to the prices, so the company needs to control its supply chain as efficiently as possible (Coyle, Bardi, and Langley, 2003).

2. 3. 1 Importance of Logistics

Ballou (1999) explains that logistics is about creating value in terms of time and place, so good logistics management means the activities that contribute to the process of adding value. Logistics management is related directly to minimising the cost which can derive benefits to the consumers and to the firm's shareholders. Logistics management can result of the profit squeeze and potential profit leverage because it is the area to significantly

save cost which has greater impact in the firm's profitability that increasing sales volume would have (Stock and Lambert, 2001).

2. 3. 2 Challenges in Logistics Management

Meixell and Norbis (2008) claims there are many forces that bring about new challenges in logistics management. Some of them originate in the shipper community, carrier community and consumers themselves such as the growing concern for the environmental impact of the products they purchase. In the research, the authors also explain five logistics challenges that influence transport choice which are transport capacity shortages, international growth, economies of scale, security concern, and environmental and energy use concerns.

Transport Capacity Shortage

The issue is relevant to all transport modes. In motor carriers, capacity is limited due to tighter hours-of-service regulation, driver shortage, and higher toll that strain truck capacity (Meixell and Norbis, 2008). Maloni and Jackson (2005) report that international marine container volumes have increased over recent years, but North America ports and their supporting container distribution have not increased capacity accordingly. LaLonde (2004) reports that fuel cost impact the large carriers which can lead to a wave of bankruptcy and a consequence of reduction of industry capacity. The author also mentions about driver shortage which has resulted in some truck parked against the fence for the lack of drivers. Railroads are operating at or near capacity and they have been reluctant to make a huge investment, so it put more pressure on motor carrier industry and more truck on road.

International Growth

Meixell and Norbis (2008) claim that international growth is a challenge for logistics management because it involves activities related to international trade such as providing adequate transport and storage, getting items through custom, delivering to foreign location in timely fashion at an acceptable cost. According to Hines (2004), customers have become more demanding in terms of requiring special features or adaptations to a standard product. Therefore, the challenge is that suppliers have to fulfill the individual customer demand profitably by integrating the supply chain process to satisfy the demand.

Economies of Scale

The issue relate to shipment size because full truckloads can minimize the cost associated with the capital expenditure for equipment. Economies of scale also involves in handling of inventory. It is cheaper to ship cases than ship individual units and also cheaper to ship in pallets than to ship individual cases (Meixell and Norbis, 2008). The concept is similarly to Stock and Lambert (2001). The authors explain that inventory is required if a firm is to realize economies of scale in purchasing, transport, and manufacturing. Moreover, when the firm purchases material in larger volume, it reduces transport cost per unit because full truckload and rail car shipments receive lower transport rate than smaller shipments of less than truckload (LTL) or less than carload (LCL) quantities.

Security concerns

Security issue and supply chain must relate together because terrorist attack can impact the business operation (Meixell and Norbis, 2008). Sheu, Lee, and Nihoff (2006) also do research about logistics security programmes, and they claim that the efficient operation of international logistics affected by the September 11 tragedy. In United States, new security measure added cost approximately \$151 billion annually. However, the need of security and efficiency should stay balance because if the need is overwhelming, it can cause delay of logistics process.

Environmental and Energy Concerns

A growing concern over the environment and energy challenges to logistics managers (Meixell and Norbis, 2008). According to Wu and Dunn (1994), logistics is a part of firm that should become environmental friendly, and the role of logistics managers have been increasing because their decision have a major impact on environment. They should deliver the green products to consumers to maintain the good image of the firm. However, the challenges of logistics managers is that how to incorporate environmental management principles into their daily decision making process. The author also mentions about mode selection impacting on the environment. Rail and barge use less energy than road haulage and air cargo. Murphy, Poist, and Braunschweig (1994) claim that logistics managers have the greatest ability to influence environmental issue involving pollution and natural resources preservation.

According to Benson, Bugg, and Whitehead (1994), International Maritime Organisation (IMO) and similar regulatory bodies provide a wide range of study to increase environmental awareness and consequent tougher

regulatory on the environment. Marine pollution is a matter of oil pollution after accidents at sea or the deliberate discharge of pollutants in the process of washing tanks. The pollution also comes from the loss overboard of containers or deck cargoes of chemicals, fertilizers and similar products. Air pollution results from emissions, and noise pollution also come from busy roads or near major airports. In the result, companies need an environmental audit to review their operation regularly with the preparation and adoption of training programmes to create awareness of environmental issues.

2. 4 Role of Transport in Logistics Management

Transport is a major component of the logistics management because it relates to the movement or flow of goods from point-of-origin to point-of-consumption. Transport is a factor in creation of time utility because it can determine how fast and how consistently products move from one point to another (Stock and Lambert, 2001). The decisions about logistics management related to transport includes operating one's own transport versus hiring transport, mode, carrier, and service selection, method of freight consolidation, vehicle routing and crew and trip scheduling, and equipment selection, replacement, and acquisition (purchase, lease, or rent) (Vogt, Pienaar, and Dewit, 2002). According to Coyle, Bardi, and Langley (2003), transport cost represents approximately 40 to 50 percent of total logistic cost and 4 to 10 percent of the product selling price, so the authors conclude that transport decisions directly affects the total logistics costs. In logistics perspectives, three factors that are fundamental to transport performance include cost, speed, and consistency. The cost of transport is the payment for moving between two places and the expenses related to <https://assignbuster.com/carrier-selection-determinants/>

maintaining in-transit inventory. Logistical system should utilize transport that minimizes total system cost, so it means that the least expensive method of transport may not result in the lowest cost of logistics. Speed of transport is the time required to complete a specific movement. Faster transport service may charge higher, so selecting method of transport should stay balance between speed and cost of service. Finally, consistency reflects the dependability of transport which always shows as the most important attribute of quality transport (Bowersox et al., 2007). Quayle and Jones (2001) also mention similarly that firm should concern with the factors relating to reliability, time, and price.

2. 4. 1 Mode of Transport and Characteristics

Railroads

According to Ballou (1999), the railroad is a long hauler which moves the raw materials and low valued manufactured products. The author also explains that there are two legal forms which are common carriers and private carriers. A common carrier sells its transport service to all shippers, but private carriers are owned by shippers with the usual intent of serving only the owner. The advantage of railroad is to transport large tonnage over long distance, but disadvantage of railroad is having high fixed cost due to expensive equipment, right-of-way and tracks, switching yards, and terminal. However, railroad has low variable operating cost (Bowersox et al., 2007).

Motor Carriers

Motor carrier is a part of any firm's logistics supply chain because almost every logistics operation needs the motor truck from the smallest pickup truck to the largest tractor-semitrailer combination. Similarly to railroads, motor carriers have two types which are for-hire and private carriers. Motor carriers commonly transport manufactured commodities over relatively short distance. The commodities include textile and leather products, rubber and plastics etc. The major advantage is ability to provide service to any location. However, weather condition and highway traffic can disrupt motor service and effect transit time reliability. Contrary to railroads, motor carriers have high variable cost, but low fixed cost(Coyle, Bardi, and Langley, 2003).

Air Carriers

Air carriers offer a very fast and fairly expensive mode of transport. Airlines have a high fixed cost in infrastructure and equipment. The commodities are the high-valued items or time-sensitive emergency shipments that have to travel a long distance. The shipments that are less than 500 pounds including high-value but light weight and high-tech products are suited for air carriers (Chopra and Meindi, 2007). According to Benson, Bugg, and Whitehead (1944), the advantage of air carriers are direct flight possible to all ports of the world and speed much higher than any other mode of transport. However, disadvantages are high freight rate, possible delay due to bad weather, more restrictions on size and weight.

Water Carriers

Cuneo (2003) claims that more than 90 percent of world trade travels in containers aboard ocean - going ships, and about 20 million containers move <https://assignbuster.com/carrier-selection-determinants/>

through 220 ports around the world every year. Shipper can use water carriers in combination with other mode of transport. Water service on the average is slower than rail and availability and dependability can be effected by bad weather. Loss and damages cost from water carriers are considered low relatives to other modes. However, packaging is more concerned to protect goods during handling when loading and unloading operation(Ballou, 1999).

2. 4. 2 Critical Changes in Transport

According to Coyle, Bardi, and Langley (2003), there are five major areas of change which are deregulation of the U. S. ocean liner industry, intermodalism, shipment control, trade policies, and currency fluctuation. The Shipping Act of 1984 and the Ocean Reform Act of 1998 is the greater reliance on the market place to control rate. Therefore, the elimination results in more rate negotiation, the right of conference carriers to take independent action on rates and service agreement which response to the laws of supply and demand. According to Stock and Lambert (2001), the deregulation has resulted in increased inter-intrafirm competition, greater pricing freedom, flexibility in routing and scheduling. It has increased the need of marketing oriented, and shippers have more carriers to choose. Secondly, intermodalism means the use of two or more transport mode which can provide a service to the shipper-customer that appears to be seamless (Coyle, Bardi, and Langley, 2003). Intermodal transport is a combination to take advantage of the inherent economies of each and thru provide an integrated service at lower total cost (Bowersox et al., 2007). Next, shipment control means high tech communication system that can

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deliver effective communication and control system. Customer can track the progress of the shipments. In addition, trade policies can impact the way of transport. Some countries set up protective barrier to restrict import goods, so delay of custom procedure can happen which also result in delay shipments. Finally, fluctuation in world currency can significantly affect logistics decision such as choice of transport mode and carrier. Definitely, value of currency also affects freight rates and importing and exporting volume which also affect traffic of transport (Coyle, Bardi, and Langley, 2003).

2. 5 Logistics Strategies Related to Customers

Logistics and Marketing

Zinn (2000) mentions that logistic and marketing should come together because logistics management is developed to deliver value to customers and fulfill customers' need. Therefore, the need of marketing and logistics integration has been more increasing. Customer service is often the key link between logistics and marketing. Coyle, Bardi, and Langley (2003) claim that if the logistics system has problems, and customers will not receive a delivery as promised, the company could lose future sales. The logistics process is to deliver and produce the good products at the right cost, but if there are some mistakes with the process, the customers will be satisfied. Therefore, it has a link between marketing and logistics management. Innis and LaLonde (1994) found that both of logistics and marketing contribute to customer satisfaction because marketing is responsible for creating and managing demand while logistics is responsible for fulfilling demand.

The Role of Logistics in Establish Customer Service Levels

Logistics operation serves a particular important advisory function because the goal of marketing department is to increase sales, but sometimes they ignore the cost to achieve them. The logistics department can outline the alternative means of delivering products to customers and help to calculate the cost for different level of service. They can help to determine the level of customer service and pricing policies (Marphy and Wood, 2004). According to Coyle, Bardi, and Langley (2003), there are four dimensions of customer service from a logistics perspectives. They contain time, dependability, convenience, and communication. Time is related to order cycle time, lead time, and replenishment time. Order cycle should be consistent with reasonable length. Dependability is more important than lead time for some customers. It affects directly to inventory level and stockouts cost. Moreover, dependability also means safe delivery and correct order. Communication involve with accurate information and electronic flow of information. Finally, convenience is understood as flexibility. Logistics service should be adaptable for different customers.

2. 5. 1 Partnering Relationship between Carriers and Shippers

Ellram and Hendrick (1995) explain partnership as a relationship between two firms that committed for a period of time share mutual information, risks, and rewards of the relationship. Relevant to Mohr and Spekman (1994), partnership is defined as independent firms who share goals, strive for mutual benefit, and acknowledge a high level of mutual interdependent. Cooke (2000) claims that supply chain management and collaborative

transport management propel transport buyers and their service providers toward stronger mutually beneficial relationships. Dwyer et al. (1987) explain that buyer-seller relationship should have a basic list of critical success factors for strategic alliance. It includes detailed planning for future exchange, increased measurement and qualification, sharing benefits and burden, reduced uncertainty, shared efficiency and high switching costs. Ellram (1991) also identifies that trust between firm, transfer of necessary information, mutual dependence, and sharing of new technology are the key attributes of successful relationship in buyer-seller partnership.

Traditionally, relationship between shipper and carriers was arm length transaction. Each of them tries to maximize its own interests with little interest in their both relationship. However, both of them have begun to recognize the mutual benefits by developing alliance (Lambert and Stock, 2001). According to Gibson, Rutner and Keller (2002), the research found that trust, effectiveness, and flexibility are the most important determinants to develop and manage long term cooperative partnership between carriers and key shippers. Byrne (2004) explains that when fuel price are rising dramatically, carriers have no choices, but have to increase price. It can affect relationship between carriers and shippers. The solution of the problem is to increase collaboration between shippers and carriers. Carriers should have end-to-end processes such as load planning, tendering and delivery confirmation. Technologies such as sharing tracking and transaction information are also important to collaborate. Lu (2003) claims that effective services result in successful partnering relationships.

2. 6 Carrier Selection Decision

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The decision making process is the stage that includes mode choice and carrier selection which can identify relevant transport performance variables, select mode of transport and carrier, negotiate rates and service levels, and evaluate carrier performance (Monczka et al., 2005). Stock and Lambert (2001) claims that mode and carrier selection is important because shipper can reduce the number of carriers with whom they do business. When shippers have high volume, they get bigger discount and higher level of service that result in lower transport costs. Meanwhile, carriers prefer to deal with fewer shippers with large consistent volume over long period of time. Burdug and Daley (1985) claimed that the process of selection is involved with behavioural approach which includes environmental and organizational factors. The performance of the transport carrier may influence the effectiveness of the entire logistics function of a company and the process of carrier selecting is an important to the company's success. However, the research explored that regulatory and market changes are drivers for change in transport choice attributes (Norbis and Meiwel, 2008).

In addition, Gattorna and Walters (1996) claim that there are five factors that are influential to the choice of transport containing company characteristics and philosophy, market structure, product characteristics, customer characteristics, and environmental issues. Firstly, the company should concern its marketing, financial, and operation strategies. Marketing can determine customer service offer and customised to meet different customers' needs. Financial is also involved with the profit objectives. Secondly, market structure is essential consideration. In competitive market, delivery may be the key factor influencing customers' selection. Thirdly,

product characteristics are involved with weight, size, and shape. Next, customer characteristics can impact on profitability. The company should check customer profile, order cycle, and customer after-sales service requirements. Finally, environmental issues can influence transport decisions because in some countries, government is influential in transport policy.

2. 6. 1 Selecting and Making Decision Process

Figure 2. 3 Four decision stages

- Search
- Choice
- Post-choice Evaluation
- Problem Recognition

According to Stock and Lambert (2001), there are four decision stages (Figure 2. 3) occur in the mode/carrier selection decision which are problem recognition, search, choice, and post-choice evaluation. Firstly, the problem recognition is the stage that is affected by a variety of factors such as customer orders, dissatisfaction with existing mode/carrier, and changes in the distribution patterns of firm. Next, customers will come to search process which they scan a variety of information sources. The possible source can be their past experiences, carrier sales calls, existing company shipping record, printed materials such as advertising brochures, and customers. This process can take a considerable of time. Then, the important stage is choosing. There are many critical attributes concerned in this stage, and executives will choose the mode/carriers that satisfy their requirements. Finally, transport executives evaluate the choice performance. Many firms use many

techniques such as cost studies, audits, on-time pickup and delivery performance, and damage/claims reviews while some of them use statistical analysis.

2. 6. 2 Behavioural Approaches Related to Transport Study

Gray (1982) presented three assumptions associated with carrier choice. First, Economic Positivism is explained that economic value related to the firm which determines the use of transport. This approach related to price and profit. The firm attempts to maximize short term revenue and minimize short term cost in a trading. The second approach is called technological positivism which is associated between the physical aspects of commodity such as weight and volume and the transport system such as speed and frequency. The last approach is perceptual approach which related to user interpretation of the situation rather than on physical attributes.

2. 6. 3 Important Attributes in Selecting Carriers

Shipper Perspectives

To make a decision, customers need to realize value in order to make a selection, so this part will review the important attributes for shipper to make the selection carrier criteria. Lu (2003) surveyed Taiwan Shippers and found that the five most important carrier service attributes are availability of cargo space, low damage and loss record, accurate documentation, reliability of advertised sailing schedule, and courtesy of inquiry. The research also found that there is a significant correlation between timing related, pricing and warehouse service, so it can imply that to satisfy

customers, carrier service should combine these things together. Mater and Gray (1993) explored that shippers in Irish Sea market concerned the most five factors to select carriers which are a fast response to problems, on time collection and delivery, value for money price, and good relationship with carriers. According to Kent and Parker (1999), the mail survey was sent to 125 companies which divided into 50 import shippers, 50 export shippers, and 25 international containership carriers. Shippers identified the top factors for selecting carrier which are reliability, equipment availability, service frequency, rate changes, loss and damage, and financial stability. The research also found that the factors of selecting carriers between import and export shipper are different in the factor of door to door transportation rates. The research also concluded that service factor is important factor for export customers. Gibson et al. (1993) reported that the key criteria for carrier selection includes a willingness to meet service expectation, an established track record of outstanding performance, a willingness to focus on continuous improvement, the ability to handle special needs and emergencies and a willingness to meet cost goals.

Tengku Jamaluddin (1995) investigated the service attributes that are important in carrier selection process, and the result indicated the top five service factors which are knowledgeability, freight rate, cargo care and handling, punctuality and transit time, and service frequency. Chiu (1996) assessed the performance of liner shipping in shippers' perspectives. The result indicated that the six most important service attributes contains a prompt responses from a carrier to any problems, transit time, reliability, documentation services, a notice of delay, and assistance with loss and

damage claims. Lu (2007) reviewed from past research and questionnaire survey of 230 shipping executives to find out the important key of capabilities for liner shipping services. The review concluded that transit time and frequency of service are ranks as important criteria in the context of liner shipping services. Saleh and Das (1974) found that reliability of transit time, consistency in service, company image and special handling abilities are important carrier attributes. Coulter et al. (1989) reviewed the past research and used the relevant criteria to develop questionnaire. The resulted showed that reliability of performance is considered first and follow by Insurance of service provision, quality of service, personalizing factors and handling service. McGinnis (1990) found that there are six factors influent transportation choice which are freight rate, reliability, transit time, loss/damage/claims processing/tracing, shipper market consideration and carrier considerations.

Carrier Perspectives

Carriers do not really understand which selection criteria tend to influence a shipper's choice of carriers. Carriers can lose competitive advantage if they still understand differently with shippers which definitely results in a decrease in market share. Moreover, the research found many carriers' perceptions that are significantly different from what shippers want. Carriers rated personal relations with the carriers as highly important while shippers rated the factor only moderately important. Regular calls by carrier sales representatives, gift and gratuities offered are overrated by carriers, but shippers rated as slightly important or not important. In addition, the research conclude