# CONTEMPORARY LOGISTICS INNOVATION FOR COMPETITIVE ADVANTAGE: CONCEPT AND OPERATIONS

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## ABSTRACT

In global market, firms extend their customer bases through superior logistics. This paper examines the impact of multiple drivers of logistics innovation. A research model presents key dimensions of drivers of logistics innovation, logistics innovation process and the outcomes.

To examine the research model, the following research methods are adopted: (1) e-research and a survey of literature examine the effective practices of logistics innovation; (2) key constructs are defined by their essential characteristics and propositions development articulate the relationships between key constructs.

The study indicates that logistics firms will have successful operational performances and financial performances if innovation is implemented with proper knowledge management and technology, which in turn will enable firms to have effective communication networks. This innovative process will provide an excellent solution for customer demand

**Key Words:** Customer Demand, Competition, IT Usage and Logistics Innovation.
**JELCodes:** M11 and M16

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# I. INTRODUCTION

This paper proposes a concept of logistics innovation for global firms in today's competitive environment. Logistic innovation is a pervasive tool for transforming organization in the turbulent environment for the purpose of performance improvement. Improved performance is a result of the quality or value stemming relationship between suppliers and customers. Many scholars agree that innovation in organizations helps firms create proper value by developing superior systems thereby gaining competitive advantage (Golicic and Mentzer, 2006). To date, there are very few proper logistics innovations in the field in response to shippers' demand. Accordingly, this paper intends to offers a better solution. Secondly, this paper demonstrates a scholar's social responsibility to the academic community by addressing the critical issues in global logistics existing for decades and offers the proper solutions. This research also responds to the concern of the business community for improving their logistics process and the performance of firms internationally. The propositions reveal that proper implementations of logistics innovation benefited firms in term of competitive advantage, better operational performance, and better financial performance. During the past decades, several issues related to global logistics operations developed, resulting in unnecessary cost, expenses, and penalty in the process due to lack of accurate and relevant information in the logistics integration (Haughton, 2006). To investigate sources and causes of innovativeness in global logistics, this paper proposes a research model of logistic innovation for competitive advantage.

Lastly, the transport chain problem has an urgent need for efficient and flexible integration of information and logistics system. Emphasis should be placed on the provision of relevant and timely information throughout the transport procedure to provide participants enhanced knowledge about what is happening at each stage and control over what happens to their goods or cargos. The technology enables the flow of information, control, and reports to customers to avoid high overheads. This will be beneficial to logistic performance within the transport system. Practically, an effective logistics operation can provide a competitive advantage for a firm and increase a firm's market share (Mentzer et al., 2001). Execution of logistics innovation enhances customer value, and logistics executives agree that it adds value to a firm's output. Much of this value is generated from the ability to reduce costs and provide delivery solutions according to customer needs accurately.

Specific research questions for this paper are:

(1) What is the concept of the logistics innovation that is critical for the competitive advantage and operational performance?
(2) What are the key drivers of logistics innovation in the context of logistics firms?
(3) What is the impact of logistics innovation on firms after implementation?

## II. THE IMPORTANCE AND CONTRIBUTIONS OF THIS PAPER

The importance of logistics in supply chain has long been recognized because of the role that it plays in customer satisfaction. There is no doubt that global competition is forcing companies around the world to re-examine their logistics operations and systems with the objective of reducing costs and improving customer service. Logistics has become more prominent and is recognized as a critical factor in competitive advantage due to the nature of a physically distributed operations environment and global markets. In today's highly competitive environment, many companies are entering the global market to gain market share and take advantage of higher production and sourcing efficiencies. The cost of logistics and transportation has a large impact on a company's profitability. A global market, outsourcing, and operations place tremendous pressure on the logistics function to deliver the goods as quickly as possible at the lowest cost (Ngai, et al., 2007). Therefore, a key determinant of business performance is the role of the logistics function in ensuring the smooth flow of materials, products, and information throughout a company's supply chain. It is important to address those critical issues in global logistics existing for decades and to offer better options. Global logistics from sources to markets around the world yield higher cost and longer transit times. As a result, this issue is an important challenge of logistics in global trade. The challenges of logistics in global trade include but are not limited to adequate transportation and storage, clearance merchandises through customs, and delivery to foreign locations in a timely fashion at an acceptable cost. In many cases, these challenges are alleviated by the participation of third-party logistics services and partnership arrangements.

As a scholar, it is important to be able to contribute and respond to the concern of users and customers that arise include delayed and inaccurate information, incomplete services, slow and inefficient operations, and high product damage rates. This indicates the importance of accurate information exchange among different parties along the logistics value chain. Under such circumstances, the role of information technologies including the Internet, World Wide Web, and electronic data interchange in providing shared-information platforms for improving logistics performance is significant. In the current economy, which is characterized by globalization and is information intensive, the focus has been on core competencies, providing real-time information, visibility in key performance indicators, collaborating in supply chain operations and developing proper network communication.

## III. RESEARCH METHODOLOGY AND MODEL

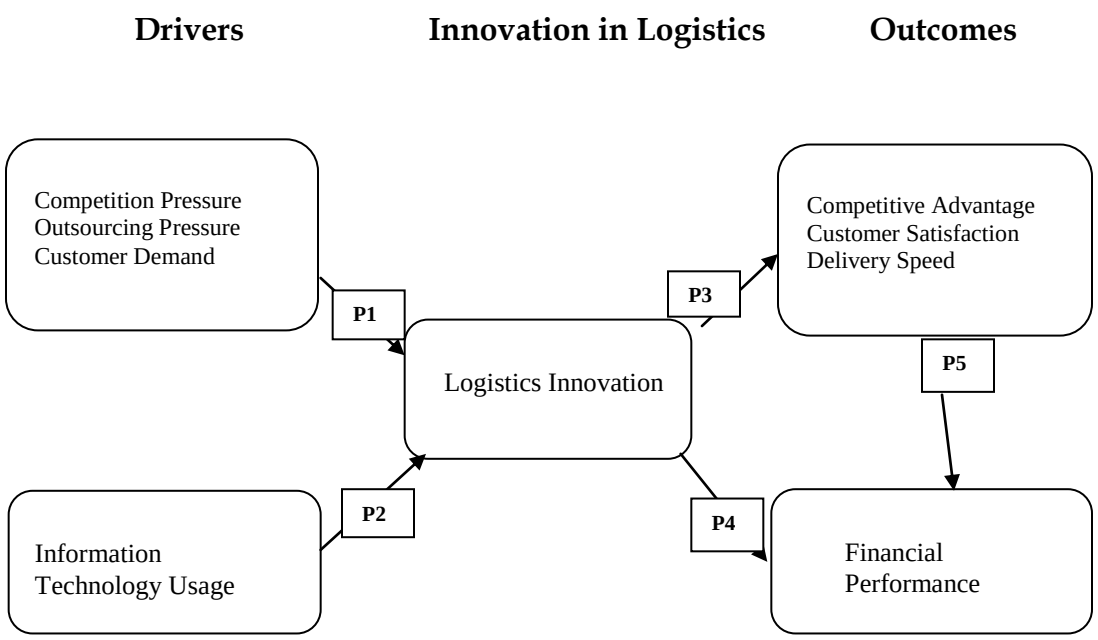
The methodology used in this research was based on e-research and a survey of the literature in the field. In this century, business research has been strongly influenced by two major trends in business: increased globalization and

rapid growth of the Internet and other information technologies. These trends will continue, and likely accelerate, as the 21st century progresses. The Internet is transforming society. Time is collapsing. Distance is no longer an obstacle (Zikmund, 2003). E-research has turned the business research upside down. Current methods of conducting some types of research soon may seem as quaint as a steam-engine train. New techniques and strategies for conducting business researches are appearing online in increasing numbers every day. The strength of E-research is it provides more rapid access to business intelligence and produces rapid development. It also gives a researcher the ability to contact the hard to reach.

To cover all researches and literature related to logistics innovation, competitive advantage in logistics, and issues in logistics. I conducted several comprehensive searches on Journal of Logistics Information Management, International Journal of production Economics, International Journal of Physical Distribution & Logistics Management, Journal of Business Logistics, International Journal of Logistics Management, and Transportation Journal. These journals were specifically selected for the review as they represent significant research in logistics. I began with a search of each journal. Within each database, the keyword "innovative logistics," "competitive logistics," and "issues in logistics" were searched for each journal. The articles were then reviewed to ensure that they addressed the required contexts properly. Each article were reviewed and utilized to develop an integrated model of logistics innovation. The review categorized five distinct aspects of logistics innovation research: environment and competitive advantage, impact of rules and regulations and problematic procedure, innovative logistics, and information communication technology capability.

Figure 1 presents a research model that defines the nature of problems and issues that this paper is addressing. This research model identifies drivers of logistics innovation, integration of logistics innovation, and key performance outcomes. The concept of innovation is valued in most organizations in order to respond to the external pressure from competition, outsourcing, and customers. Firms need to innovate in order to sustain competitive advantage and stay ahead in the business. Firms are also experiencing the internationalization of technology-driven competition, globalization of manufacturing and increasingly sophisticated customers needs and a greater integration of technologies. These challenges have compelled organizations to develop innovative strategies and processes. It is very important for firms to seek ways of adding value through innovation in order to create a better logistics function. This model displays the said factors that are driving logistics process globally. The implementation of proper logistics innovation in organizations will create the effective logistics function that results in superior competitive advantage, superior operational performance such as cost reduction, delivery speed, and payment speed. It will also create high levels of customer satisfaction and financial performance.

**Figure 1: Research Model for Logistics Innovation**




# IV. LITERATURE REVIEW AND DEVELOPMENT OF PROPOSITIONS

## A. Competition Pressure

In today's global logistics and supply chain, maintaining a competitive position is a paramount concern. Global competition in logistic industry is intense with many competitors. The ability of a firm to survive depends on how the firm takes advantage of the opportunities in the market place to satisfy its customers. Many companies have demonstrated their capabilities of being been sensitive to their customers by trying to understand customers' needs, customers' complaint, and planning long-range marketing programs to meet those needs. According to resource-advantage theory, firms also seek to use their resources gain a competitive advantage in the market, which will ultimately lead to superior financial performance. Resource-advantage theory suggests that a comparative advantage in resources results in a competitive advantage in the marketplace. Resources include a firm's assets, processes, information, and knowledge that help a firm improves efficiency and effectiveness (Barney, 1991). The ultimate goal for firms as directed by the resource-advantage theory is superior financial performance, which can only be attained by achieving a competitive advantage in the marketplace. As proposed by Hunt and Morgan, innovation plays a key role in resource-advantage theory. Firms will innovate to

improve their resource position ((Hunt and Morgan, 1996). Firms occupying positions of competitive advantage can maintain such positions by engaging in proactive innovation to ensure that their resources are comparatively better than the resources of competing firms. Firms occupying positions of competitive disadvantage can attempt to surpass advantaged firms by engaging in reactive innovation.

While Mentzer views the goal of logistics was to optimize the number, size, and geographical arrangement of plant and warehouse facilities, select transportation methods, and control distribution costs (Mentzer et al., 1999), Stalk viewed time in logistics process as a source of competitive advantage, based upon the observation that firms competing effectively on time tend to excel at improving quality, understanding evolving customer needs, exploiting emerging markets, entering new businesses, and generating new ideas and incorporating them into innovations (Stalk et al., 1992). Therefore, firms started to focus on eliminating waste in the form of time, effort, defective units, and inventory in manufacturing-distribution systems (Larsen and Lusch, 1990). Base on time and quality-based competition, logistics capabilities become critical in many firms-particularly those operating in commodity or convenience goods markets. According to Christopher and Bowersox, succeed as a result of their logistics systems, was important more than their marketing strategies (Christopher, 1998; Bowersox et al., 1995). Likewise, Lynch viewed logistics capabilities as a source of competitive advantage (Lynch et al., 2000). Day and Wensley defined superior skills as the distinctive capabilities of personnel that set them apart from the personnel of competing firms, and superior resources as more tangible requirements for advantage. They suggested firms create a competitive advantage through strategy development and execution in order to maintain a competitive advantage in logistics business (Day and Wensley, 1988). In today's competitive logistics environment, firms must be able to use their capabilities to gain, create and leverage value in the marketplace (Brewer and Hensher 2001). As a boundary spanning function in the supply chain, logistics excellence has therefore, become a powerful competence and source of competitive advantage for many firms (Stank, et. al., 2005). Companies now view logistics as more than simply a source of cost savings and embrace it as a source of enhancing product or service offerings as part of the broader supply chain process to create competitive success (Mentzer, et al., 2004). Furthermore, logistics is a resource area that both supports and enables new strategic moves effectively on the market (Abrahamsson and Stahre 2003).

The following proposition was developed from the preceding discussion:

P1a. Logistics firms have been faced with increasingly competitive pressure that leads to logistics innovation

**B. Outsourcing Pressure**

The increasing in logistics outsourcing (third party logistics) in import and export shipping business in the past few years has been stretched around the globe. According to Lieb and Bentz, this has been a significant challenge to the major carrier that owns the ocean vessels worldwide (Lieb and Bentz, 2005). How will major carriers be able to sustain their competitive edges in this highly competition against non-vessel operating common carriers? There is an increasing recognition that firms may need to build and manage closer, longer-term relationships with customers. There are many motivational factors that influence outsourcing decisions. In today's highly competitive logistics market, many companies target to increase global market shares and to take advantage of higher production and better resources. To measure the successful of business performance in logistics, we should look at logistics function, execution, and outcome. This will be positive in ensuring the smooth flow of materials, products and information throughout the supply chains system. Furthermore, logistics has become more prominent and is recognized as a critical factor in competitive advantage (Bowersox and Closs, 1996; Bowersox and Daugherty, 1995). The logistics operations process of importing and exporting includes the inputting, storing, transporting and distributing of physical goods.

The key strategy of third party logistics provider is using e-logistics networks and focusing on global operations with effective objectives such as reduce operating costs, meet demand fluctuations, and reduce capital investment. This strategy has been working very well for the third party logistics provider since there are problems that arise in major logistics carriers include delayed and inaccurate information, incomplete services, slow and inefficient operations, and a high product damaged rate. It was indicated that many major carriers are not able to provide inter-linked services. They are not flexible in responding to changing demand from customers either. A number of scholars examined those issues in a global perspective accordingly (Fawcett et al., 1993; Gary and Davies 1991; Quinn and Hilmer 1994; Welch and Nayak 1992; and Wyatt 1992). The logistics innovation will help bring firms to the full potential of its value-added activities and to gain a significant competitive advantage against non-vessel operating common carriers. It will also lead to a reduction in operational costs and an improvement in customer services (Christopher, 1998; Richardson, 1995) in order to be able to improve market shares. E-logistics is a significant weapon of third party logistics providers to take business away from major logistics carriers. E-logistics refers as the transfer of goods and services using information technology communication system such as electronic data interchange (EDI) and on line communication. This process enables logistics providers to be able to respond to customers' inquiry around the clock. Major logistics carriers must be aware that customers always look for efficiency, putting emphasis on cost compression and high service level. In recent years, outsourcings are increasingly being regarded as resources that support the

completion of logistics processes. It covers the flow of goods from suppliers through manufacturing and distribution chains to the end consumer with fundamental of E-logistics.

The above researches lead to the proposition as:

P1b. Threat from outsourcing forces major logistics carriers implement logistics innovation system

**C. Customer Demand**

There is no doubt that logistics firms always face increasing demand from their customers to improve their service. According to Gronroos, firms must compete on the basis of better services (Gronroos, 2000). The global marketplace has compelled every industry to transform itself into a truly customer-oriented, service-focused enterprise, irrespective of the products and services it sells. Most logistics firms need to be aware of the service aspects of their product-service mix, because the service component of their offerings offers the best chance of gaining sustainable competitive advantage, or, conversely, the greatest chance of losing customers through poor levels of service or reluctance to innovate. Cannon and Homburg found a supplier that enhances customer value increases its "share of customer" at the expense of suppliers who do not provide such benefits (Cannon and Homburg 2001). Beyond financial benefits, neither profit nor the firm's survival can last long by manipulating customers as competition increases. Consequently, market offerings are abundant: customers want to deal with a firm that is responsive to all their needs (Woodruff and Gardial, 1996). Thus, success in the market place rests on a firm's ability to attract, satisfy, and retain its customers by creating customer value. According to Bowersox et al., they addressed the goal of integrated logistics, both inside and outside a firm within a supply chain, are to enhance end-customer value (Bowersox et al., 2000).

Rapidly changing global customer demands and expectations lie behind firm's intense need to continuously search for differential advantage. The processes of gaining customer insights, learning, and innovating are critical. None of them are merely one department's responsibility. Responsibility, roles and awareness span functions (Flint et al., 2008). Peter Drucker, suggested firms to continue create customer value to satisfy customer demand. It will result in profits and long term survival for the firms (Drucker, 1993). The result of customer value is superior customer services which will become the recognized firms' success in the marketplace. This customer service capability includes flexibility in satisfying changing customer requirements and demands (Bowersox et al., 1999; Christopher, 1998). Logistics quality is a component of overall customer service (Mentzer et al., 2001), is defined as the ability to distribute products or materials in conformance with customer requirements and standards (Morash et al., 1996), and consists of four dimensions: timeliness, availability, delivery quality, and related communication with customers. These dimensions combine with broader service quality processes, as well as other attributes such

as price and product quality, to better explain industrial customers' purchasing patterns (Bienstock et al., 1998; Mentzer et al., 1999; 2001). When the dimensions of the demand side of logistics capabilities are mixed in a unique way over time to fend off competitors, the firm has a core competency and innovative ways of competing in the market (Olavarrieta and Ellinger, 1997). To stay ahead in the current global marketplace, logistics firms must constantly look for innovative strategies to improve their competitiveness. Logistics market competition has forced firms to incorporate modern technology into their key offerings to discerning customers who might have or might not have service loyalty. It is important to keep up with customer demand, otherwise the firms risk losing out to competitors with logistics innovation and technology (Bitner et al., 2000). Service innovations are non-technical in nature, although technology might act as the vehicle that activates and enhances the process. Innovation in services is essentially a value-creating activity that drives business performance. It is imperative that firms plan and operate with a new logistics innovation. The factors that contributed to success of firms in the past might no longer be relevant in today's turbulent business. The changing in technology has compelled many firms to think about new method in the pursuit of innovation.

The following proposition was developed from the above discussion:

P1c. Customer demand forces logistics firms implement service innovation

**D. Information Technology Usage**

Technological usage, innovations and economic uncertainties have literally changed the landscape of competition in logistics business. There is no doubt that information technology is playing an important enabling role in logistics. Several surveys have been conducted to investigate the use and importance of information technology supporting logistics operations (Hardaker et al., 1994). Clearly, information is a valuable logistics resource. The importance of the flow of information in logistics channels has been recognized alongside that of material flow. According to Closs, he addressed the information technology significantly influence the overall competence of logistics (Closs 1997). As logistics channels become longer and more complicated, involving ever more channel members, the efficient coordination of information flow is becoming the key to effectiveness. In addition, with the change in business operations from national to transnational, logistics information systems (LIS) are being recognized as an essential driver of business success in today's global marketplace (Bardi et al., 1994). Many logistics service providers (LSP) are using information technology to attain a competitive edge through reduced cost, increased productivity, and improved customer services. In order to enhance the capacities and accuracy of the logistics processes in compressing both total lead-time and total inventory from suppliers to consumers, the usage or adoption of logistics information system has become a crucial part of the process (Lai et al.,

2005). According to Christopher, logistics management has become a key to differentiating between products and services and to create a competitive advantage for logistics firms (Christopher, 1993).

Langley addresses the important of relation of information and logistics in a unique way. Langley illustrates the importance of having the right information at the right time at the right place (Langley, 1988). This popular logistical paradigm, which most often refers to physical goods, is shown to have equal relevance in the management of information. Introna demonstrates that while the logistical system converts materials into products, creating value for customers, the information system converts data into information to facilitate managerial decision making (Introna, 1991). Both of them infer that information technology is a resource to be utilized for decision making that subsequently enhances logistical effectiveness, efficiency, and flexibility. Bowersox cites that one of ten differentiators between leading edge logistics organizations and average firms is the leading edge performer's ability and willingness to invest in state-of-the-art information technologies (Bowersox, et. al., 2000). Logistics industries improve their operation efficiency by continuous implementation of information technologies according to their business plan (Mason-Jones & Towill, 1999; Sauvage, 2003). The information revolution is sweeping through current economy; it reduces cost of operation, and processing (Porter & Millar, 1985). According to Grant, technologies can be viewed as one kind of knowledge (Grant, 1996). Tsai and Ghoshal found that an organization will have higher innovative capability when knowledge can be shared more easily within the organization (Tsai and Ghoshal, 1998). The technology will influence technological innovation; technological innovation can be advanced when the technology has higher transferability. The transferability of technology is determined by the explicitness of technology. In addition to the explicitness of the technology, how the technology fits with the technologies that a firm already possesses will also be another important technological characteristic (Tornatzky & Fleischer, 1990). In the same approach, the technological innovation usually follows a technological paradigm (Teece, 1996). The cumulative nature of technologies will influence the innovation in technologies. Therefore the firms with rich experiences in the usage technologies will have superior capabilities in technological innovation and competitive advantage (Mentzer, et. al., 2003). In other word, technology has a significant influence in logistics innovation.

The above solution leads to a proposition as:

P2. Usage of information technology positively supports logistics innovation

**E. Logistics Innovation**

As the world moves from the industrial economy to the global competitive economy in form of information technology system capability, it is very important for firms to maintain their competitive advantage. In response to

this challenge, firms are seeking the proper logistics innovation that will enable them to meet an increasing variety of customer expectations while keeping costs, delays, problems, and disruptions at or near zero because it helps firms achieve competitive advantage by enabling rapid and cost-effective responses to specific customer requests. Logistics is a channel of the supply chain which adds the value of time and place utility. It is defined as the management of the flow of goods, information, service and other resources between the point of origin and the point of consumption in order to meet the requirements of consumers. According to Lin, logistics involves the integration of information, transportation, inventory, warehouse, material handling, security, and packaging. He also pointed out that it is the supply of service or product to the demander or demanding unit at the right time, with the right quantity, in the right quality, with the right cost and at right place. Innovation can occur within services, processes, or any business system (Lin 2006). It does not only emerge from the realms of logistics, supply chain management, computer science, or manufacturing. Roger pointed out innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Logistics innovation refers to any logistics-related service that is seen as new, better, and helpful to a particular focal audience (Roger, 1995). Logistics innovations can be very basic to very complex and can be applied to internal operations or services with business partners (Flint et al., 2005). According to Eisenhardt and Martin, innovation includes new product and service development. It is characterized as a dynamic capability (Eisenhardt and Martin, 2000). The dynamic capabilities framework examines the sources of wealth creation and caption by firms in an environment characterized by rapid technological change (Teece et al., 1997). Practically, an innovation does not need to be totally new to the business society. To customers, new, better or improvement service is innovative.

**F. Competitive Advantage**

In a highly competitive logistics industry, a major concern of logistics management in particular, is the strategic use of firm, innovation and distinctive competencies for competitive advantage. Logistics innovation and capabilities are those things that a firm does especially well that allow it to compete successfully and prosper in the business environment. Logistics process includes customer service, product, time advantages, low cost distribution and financial gain. Logistics innovation can make major contributions to overall firms' performance and provide the core competitive advantage by creating differentiated customer value and superior performance. This will surely lead to sustain competitive advantage over competitors.

From an operational performance perspective, Fawcett pointed out that technological innovation and logistics capabilities were positively related to the ability of firms to coordinate production activities (Fawcett, 1991). Farris and Welch proposed transit times on the water could be cut in half using new vessel

technology (Farris and Welch 1998). While transportation costs were expected to nearly double, it is suggested that the time savings will offset the additional cost. In their empirical study on reverse logistics innovation, Richey posited that innovation would be positively related to operational responsiveness (Richey et al., 2005). They argued that innovative firms would use the technology and other resources available for them to develop a reverse logistics program capable of handling varying firm and customer demands. Logistics innovation would have a positive impact on operational service quality. The use of technology and customized exception handling processes was expected to lead to higher levels of service quality. Some scholars suggested that firms are seekers of new ways of competing and, thus, should focus on market dynamics. While other scholars further suggested that competition based upon innovation is more effective than price-based competition. According to Mentzer, distinctive logistics capabilities based upon organizational learning emerge as valuable factors in the development of customer-oriented corporate strategies aimed at obtaining sustainable competitive advantage through creating customer value (Mentzer et al., 2004). The study's findings indicated that there is a positive relationship between innovation and operational service quality; innovation and operational responsiveness were not found to be significantly related. Richey et al., (2005) also examined the relationship between reverse logistics innovation and a firm's performance. In doing so, they stated that logistics innovation should improve a firm's market effectiveness and internal cost efficiency. They also stated that logistics innovations can lead to increased revenues due to added services and improved customer satisfaction. The findings indicated a positive relationship between logistics innovation and strategic performance for large firms. Together, the findings highlighted above indicate a positive relationship between logistics innovation and the development of a competitive advantage. Persson argues that logistics service innovation can provide firms with a competitive advantage. Persson also cites examples such as a firm's use of EDI to improve communications with customers, and the development of new services to open up new customer markets and add value to existing customers (Persson, 1991).

The above researches lead to the following proposition:

P3a Logistics innovation positively supports firms' competitive advantage.

**G. Customer Satisfaction**

Quality is something indicates the effective service of firms to retain their customers. The quality of service draws and maintains customers. It focuses on delivery dependability, responsiveness, order flexibility and delivery flexibility. Productivity reflects how effectively material and labor resources are used to provide service. According to Tersine and Hummingbird, they addressed time-based competition as the ability to reduce lead times relative to introducing new products to market, manufacturing an existing product, and delivering the

product to the customer (Tersine and Hummingbird, 1995). Reduction of cycle times assumes close collaboration with suppliers that can ease the cost of the innovation process. Dornier and his team explored the diffusion of technological knowledge with dominant suppliers. They concluded that the suppliers selected must be managerial, innovative and reactive (Dornier et al., 1998). Customer service is a key integrated strategic processes contributing to Logistics supply-chain time-based performance. The processes selected add value along the supply chain from the supplier to the end customer and include activities such as design of new products and processes, procurement, assembly or manufacturing, distribution and customer support. Sauvage also confirmed that the critical operational objective assigned to the logistics service provider by the majority of shippers is to improve the punctuality of delivery ( Sauvage, 2003).

Standardization of firms also increased customer satisfaction, According to Jayaram et al., standardization is the use of standard procedures, materials, parts, and or processes for designing, manufacturing and distributing a product. Standardization simplifies, thus engendering cycle time reduction (Jayaram et al., 2000). Standardization can also create focused expertise with documents, materials and processes to a point where it is much easier to identify sources of delay, discrepancies, unnecessary steps and opportunities for parallelism. Therefore, there is no doubt that the importance of logistics service quality (LSQ) has long been recognized (Perrault and Russ, 1974) because of the role that it plays in customer satisfaction. A number of empirical studies provide strong support for the link between improvements in logistics service quality and improvements in customer satisfaction (Daugherty, Stank, and Ellnger 1998; Innis and La Londe 1994; Mentzer, Flint, and Hult 2001; Stank, Goldsby, and Vickery 1999). Furthermore, LSQ has also been linked to market share through customer satisfaction and loyalty (Daugherty, Stank, and Ellinger 1998).

The above evidence leads to the following proposition:

P3b. Customer satisfaction is positively influenced by operational performance of firms in relation to logistics innovation.

**H. Delivery Speed**

The important of calculation speeds and data storage capacity have increased significantly in logistics industry. A major consequence of this is technology which accelerates data preparation and transmission times. This has increased the reaction speed to market needs. Delivery speed refers to ability to reduce the time between order taking and customer delivery to as close to zero as possible. Logistics firms must be able to respond to the needs and wants of customers as demanded. Delivery reliability is another important function for the firms to perform to exactly meet quoted or anticipated delivery dates and quantities. Logistics innovation will enable firms to be able to distribute accordingly. The research of Lai and his team members confirmed there was a great positive impact on logistics firms that use information technology for

innovation (Lai et al., 2008). Likewise, the study of Morash et al., tested and proved that logistic firms with oriented capabilities or innovation will able to effectively provide widespread and intensive distribution coverage and target selective exclusive distribution outlets, and minimize total cost of operation (Morash et al., 1996).

Practically, logistics innovation through information technology has been a superior tool to manage and control the delivery system. Therefore, this has become a key to differentiating between timely services and to creating a competitive advantage for firms (Christopher, 1998). The innovation helps user firms achieve and service advantages from logistics processes. With rising customer expectations of logistics services in timeliness and delivery speed, many logistics service providers in Hong Kong have been looking for ways to improve their services. Thus, it is essential that timely and easily accessible information that facilitates physical product flows be made available for decision making. Increasingly, many Hong Kong-based logistics service providers are counting on the potential of leveraging information technology to attain a competitive edge through reduced costs, increased productivity, and improved customer services (Lai et al., 2004). It is easy to see why logistics has become more prominent. Not only has its management become much more sophisticated in recent years, but also today's competitive landscape places a substantial premium on the types of value it delivers. For example, the concentration of power closer to the final consumer has greatly altered the way leading companies operate, forcing them to pay much greater attention to their ability to deliver products in a consistent and timely manner and at minimal cost. A custom-designed delivery system that uses cross-docking, a satellite communications system, and a private trucking fleet enables Wal-Mart to keep its shelves consistently well stocked with low-priced products. Farther up the channel. Proctor & Gamble's status as a key Wal-Mart supplier required shorter delivery lead times and a generally much higher level of logistics service than Proctor & Gamble had previously envisioned. This emphasis on reducing cycle times has become preeminent across a variety of industries and has led to the adoption of just-in-time or quick response delivery systems (Fawcett et al., 1997). There are a number of scholars who studied and investigated the relation between logistics innovation and successful performance in delivery reliability, delivery speed, timelines, order accuracy, etc. such as Jayaram et al., 2000; Morash, et al., 1996; Lai et al., 2008 and Ngai, et al., 2007). The results from those studies conclude the operational performance indicates that delivery speed and timeliness influence overall logistics competence.

The above solution leads to the following proposition:

P3c. Logistics innovation positively supports firms' performance in term of delivery speed.

**I. Financial Performance**

Successful logistics firms recognize that consistently providing superior value to customers is critical to long-term success and financial benefit. Practically, the shareholder view of the business is part of the performance measurement driver and is an external driver of innovation. Shareholders always look for high returns of their investments in the firms. That is why financial performance has led firms to minimize their costs and maximize their profits. Financial reasons are an internal performance measurement driver as the organizations focus on reducing costs and finding ways such as technology to reduce costs in innovative ways. To stay ahead in the business, firms must have successful financial performances and find innovative ways to become the best in the industry. Practically, service firms innovate because they want to improve the cost efficiency. They also target to reduce cost in line with better quality products and services as empirically proven in the changes in nature and structure of competition in the service sector. In his research, Hennart pointed out firms exist because they organize production at a lower cost by using organizational modes superior to those used by competitors. He suggested, minimizing the variable costs associated with the movement and storage of goods and minimizing the level of investment in the logistics system may easy to process (Hennart, 1994).

Richey and his team members examined financial and managerial resources as antecedents to reverse logistics innovation (Richey et al., 2005). These resources, combined with the technological resources, were argued to be crucial resources in the development of logistics innovation. Their findings indicated that there was a significant relationship between the deployment of managerial resources and the development of logistics capabilities. In further research of the relationship between financial resources and logistics innovation, many scholars agreed that there was positive relationship between financial performance and innovation (Acs and Audretsch, 1987). According to Soosay et al., the relationship of innovation and financial driver in logistics firms revealed that to become an industry leader firms must have highly effective and often innovative internal operational systems (Soosay et al., 2004). Three firms interviewed rated financial driver as most important. The managers interviewed stated that they either wanted to lower operating costs or gain higher profits in the long run, as a result of innovating. In the research of Mentzer et al., they pointed out that supply-management interface capabilities are operational capabilities that include total cost minimization and efficient logistics processes. (Mentzer et al., 2004). Total cost minimization is at the core of supply-management interface capabilities, and is the ability to minimize total system costs so that cross-functional cost tradeoffs are explicitly considered supply-management interface capabilities are also a firm's ability to find proactive, timely, and creative logistics solutions to situation emergency or customer-

specific problems, as well as the ability to simplify and standardize key logistics activities in various supply chain flows. Likewise, Lambert referred logistics as a function that was minimizing total distribution costs and logistics cost or maximizing profits, while achieving desired levels of service performance (Lambert 1993). A number of scholars have examined logistics on operational performance, cost, and competition. The findings indicated that integration of logistics with other functional areas will help bring a company to the full potential of its value-added activities and, therefore, to gain a significant competitive advantage (Quinn and Hilmer, 1994; Welch and Nayak, 1992; and Wyatt, 1992). It will also lead to a reduction in operational costs and an improvement in customer services (Christopher, 1998; Richardson, 1995). It is clear that many researchers agreed on cost as a crucial factor in any logistics firms. Firms innovate to improve cost efficiency. To manage and maintain a reasonable margin with the operations of the firm, firms must have proper innovative systems. This will provide a sound and productive outcome of practice. This also will enable the firms to be able to reap the financial benefits in the process, reducing costs and red tapes. This innovative process will in turn provide a good return on investment for the shareholders.

The following propositions were developed from the preceding researches:

P4. Logistics innovation has a direct positive impact on firms in term of cost reduction and financial benefits

P5. Effective operational performance leads to minimization of cost that leads to increasing in return of investment

## V. CONCLUSIONS

This paper presents a conceptual framework for logistics innovation based on an innovative model. This paper also responds to the concern of managers for improving their logistics process and performance of firms. The model reveals that proper implementations of logistics innovation will benefit firms in terms of competitive advantage, customer satisfaction, delivery speed, reducing logistics costs, and financial gain. The solution put forth by this study will contribute positively to firms' implementation of innovative systems. It should be noted that this paper has tackled and investigated the issues on logistics outsourcing of import and export shipping business and non-vessel operating common carriers pressure for the first time in the logistics field. This should be a challenge for replication in the future research. Additionally, the usage of information technology will create a powerful innovative communication between logistics firms and shippers. Shippers will be able to verify the status of international shipments via internet and system provided. Information required by customers will be available online for customers for verification and tracking information. These procedures will sustain competitive advantages for global firms in the logistics industry accordingly. Finally, managers need to respond to customers'

investigations in order for firms to be able to create superior logistics innovations for customers in the turbulent and competitive environment.

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