

How logistics improvements affect the economy



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Define Logistics Management and explain how logistics productivity improvement affects the economy as a whole as well as the position of individual consumer. The definition of logistics management (LM) varies from company to company but the most comprehensive definition is given by Council of Supply Chain Management Professionals (CSCMP) as “ logistics management is the part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse 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” (“ Council of Supply Chain Management Professionals,” n. d.)

Logistics Productivity Improvement and the Economy

Logistics has become an enormously important component of the gross domestic product (GDP) of industrialized nations and thus affects the rate of inflation, interest rates, productivity, energy costs and its availability and other aspects of the economy as well. Ever changing business environment due to globalization, lead time reductions, customer orientation, and outsourcing has contributed to the interest in logistics (Hertz & Alfredsson, 2003). The increase in global production sharing, the shortening of product life cycles, and the increase of global competition all underline logistics as a strategic source of competitive advantage (Arvis, Mustra, Panzer, Ojala, & Naula, 2007). Moreover, in order to remain in competitive marketplace and earn reasonable profits, organizations interest in logistics has been increased. Logistics operations have become more efficient due to technological advancements which make it possible to deliver goods on time while reducing the cost involved.

Global market access has been improved over the time with the advancement in technology and trade liberalization resulting in the economic growth and development of the countries. Patterns in the market competition situation are continuously dictating the supply chain flows (i. e. product, price and information flows) in a predictable, timely and cost-effective way. Global firm's corporate decisions regarding which country to locate in, which suppliers to buy from and which consumer markets to enter are largely based on logistics costs, quality and service level. Therefore, the countries with higher overall logistics costs are more likely to miss the opportunity of globalization.

Nearly every sphere of human activity is affected, directly or indirectly, by the logistics process. Certainly, the improved logistics is expected to have important economic effects. Lower logistics costs and services affect positively in production, distribution and trade and/or retail activities of the firms. Reduced/minimum logistics costs enable a production or distribution facility to serve a wider market area, with potential gains from economies of scale. It also means that a firm can draw supplies from a wider area with potential gains in terms of the cost and/or quality of parts and materials. Logistics costs include transportation costs, costs of owning and operating warehouses, ordering costs, and carrying costs of inventory (Consulting & Decision-Economics, 2002). To understand, how logistics productivity improvement helps in boosting economic growth, the following Figure 1 represents how investments in transportation infrastructure (a sub-sector of logistics) can lead to generative effects and growth in the national economy. It can also be drawn that reduction in shipping costs and transit time and

increase in schedule reliability can be expected to have significant impacts on inventory management at supply chain level.

Figure 1: Transportation and the Economy

Efficient Transportation

Infrastructure Investment

Increased Transportation Capacity, Efficiency, Reliability, and Level of Service

Transportation

Cost Savings

Business Expansion

(Relocation and Restructuring)

Transit Time Savings

(Reliability Improvement)

Increased Competitiveness

Increased Productivity

Increased Economic Growth

Source: (Consulting & Decision-Economics, 2002)

Consequently, the efficiency and reliability of the logistics system affects economic productivity which is the most important determinant of economic performance. Therefore, logistics industry is the artery and the basic industry of the national economic development in the world. Its development level is one of the important marks to evaluate the level of state modernization and

comprehensive national strength. Logistics is the accelerator of the economic development and growth.

The World Bank, with its professional and academic partners, has produced the Logistics Performance Index (LPI) to help countries develop logistics reform programs to enable trade and enhance their competitiveness. The LPI is a comprehensive index created to help countries identify the challenges and opportunities they face in trade logistics performance (Arvis, et al., 2007).

Logistics Productivity Improvement and the Individual Customer

In today's uncertain and changing business environment, firms must respond to changing customer need in order to remain successful. Customers expect many kinds of goods to be available with them whenever they need. When a person comes into a store with the expectation of having the desired item/article from the store and eventually walks away with or without it. If the item is either not available or in stock, there is a problem for both the retailer and the customer. The retailer loses business and the customer has to go another store/retailer for the item/article. The same situation applies to businesses buying supplies; it is costly to a business if it cannot obtain supplies when needed. To cope with this problem (i. e. stock outs) and to improve responsiveness to the customers businesses should carry inventory. But carrying inventory requires huge capital investments in constructing warehouses and insurance expenses to cover the risk of loss or damage. All of these costs are reduced if inventory can be reduced. Inventory held in

retail stores or at warehouses can be reduced if replenishment is fast and reliable.

Firms that analyze their costs carefully, find that inventory and the number of warehouses can be reduced without loss of customer service by using more flexible and efficient transportation system. Such changes in a firm's logistics set-up are sometimes referred to as a "reorganization effect" (Consulting & Decision-Economics, 2002). Businesses are constantly under immense pressure to have enough stock to satisfy customers and to reduce the cost of carrying inventory as well. To accommodate these conflicting pressures, firms are left with no option but an efficient and effective logistics system enabling them reduced inventory costs while maintaining or improving the level of customer service (that is an increase in productivity). These productivity gains will not occur unless a firm's management perceives that the logistics system is robust and reliable enough to support its plans. Zhang, Vonderembse & Lim (2005) are of the view logistics flexibility and its components: physical supply, purchasing, physical distribution, and demand management flexibilities are related to each other and to customer satisfaction. Figure 2 portrays the relationship, how flexible logistics affects the customer satisfaction.

Figure 2: Impact of Flexible Logistics Competence on Capability and Customer Satisfaction

Flexible Logistics Flexible Logistics

Competence Capability

Physical Supply Flexibility

Physical Distribution

Purchasing Flexibility

Demand Management

Customer Satisfaction

Source: (Zhang, et al., 2005)

Logistics, as a business competence, deals with the attainment of customer satisfaction at the minimum level of (logistic) costs. Customer satisfaction or improved customer service, is reached as the suppliers of goods and services succeed in achieving the growing needs of consumers to deliver their products according to the ever emerging demands of the customers, not only with regards to the physical nature of these products, but also with regards to their demands of reliability and flexibility of the logistics organization. According to Lim & Palvia (2001) a responsive and efficient logistics network helps the organization to satisfy their customers in a number of ways:

Increase in product availability i. e. high order fill rate and promised delivery date

Reduced order cycle time

Reduced distribution system malfunction i. e. accuracy of billing and product delivery

Distribution system flexibility

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Distribution system information i. e. notice of price change, new product information, shipping delay and order status information

Improved post-sale product support

Why has logistics been receiving more attention as a strategic function of the organisation? Discuss the key challenges faced by logistics today and identify what you see as the greatest area of opportunity for logistics, and explain why you chose this area. (Your answer should not exceed 2000 words).

Logistics as a Strategic Function of the Organisation

The strategic importance of logistics is well understood especially in organizations that identify customer service and not the physical product as the single output of any organization (Korpela & Tuominen, 1996). For companies successful with logistics partners, a common factor overriding all others is the recognition that this business activity is an important part of marketing strategy (Bowersox, 1990). Braithwaite & Christopher (1991) gave following reasons, why logistics is a strategic function for most of the organizations:

Extended lead-times of supply

Extended and unreliable transit times

Multiple freight mode and cost options

Intermediate component shipping with local added value

Initially, logistics was considered to have a supportive role to primary functions of organizations such as marketing and manufacturing. But now they have stretched out to cover purchasing, warehousing and transportation activities, distribution, inventory management, packaging, manufacturing, and even customer service. More importantly, logistics management has evolved from a passive, cost-absorbing function to that of a strategic factor which provides a unique competitive advantage (Bowersox & Closs, 1996). Companies committed to strategic use of logistics usually outperform the competition in speed and consistency of order cycle (Bowersox, 1990).

Organizations do have some standards, they intend the customers to rely on and expect employees to adhere to. A product marketer for example, having 95 percent order fill rate, if want to increase it to 98 percent, will require a just-in-time or quick response inventory replenishment type of business strategy. Marketers will strive not only to consistently deliver complete orders to the customers at the time and location requested but also to expand the level of service to keep customer's loyalty. By developing a high level of standards performance, the companies reduce the number of less-than-standard situations that have to be resolved. Moreover, high quality logistics service compliance is almost invariably less expensive than a procedure based on an expected percentage of failure that demands frequent correction (Bowersox, 1990).

Advances in telecommunications and information technology have given companies the way to manage the physical movement of product over long, often circuitous, routes. Many carriers (for example " DHL" , " FedEx" and "
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TCS Express Logistics” in Pakistan) have invested heavily in “ track and trace” systems to be able to establish the location of any consignment at any time, improving the visibility of the global supply chain to shippers and their customers. Also there is a growing competition among international companies to produce and deliver customized products and services fast and efficiently all over the world. Eventually, this will go hand in hand with an improvement of lead times to the extent that customized products have the same responsiveness as standardized products have now.

Logistics has become a strategic function of the business organizations by providing competitive advantage through competence in delivery speed, reliability, responsiveness, and low cost distribution. Integrating logistics into corporate strategy has a greater effect on customer value than any other process, whereas, integrating logistics into overall organizational strategy is critical to reducing costs, entering new markets, creating customer service, and gaining competitive advantage. Logistics excellence has a significant impact on corporate profitability and firms can use logistics to create a competitive advantage.

Key Challenges to the Logistics Today

As businesses become more outsourced, virtual and as global customer markets expand along with the emergence of new regional supply capabilities, the need for improved skills of procurement and logistics as well as operational transformation becomes more acute. Organizations today face great challenges because the successful provision of many goods and services requires the effective integration of logistics activities across a complicating and lengthening supply chain. In recent years, most industries

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have recognized that substantial savings are available to companies that are able to coordinate and innovate within their logistics operations. Chiu (1995) identified following challenges, logistics systems are facing:

Diversified products

Short order cycle times

Shipping in small quantities

High frequency and reliability of deliveries

Customer service orientation

Low stock level and rapid inventory turnover

Timely and accurate information requirements

Cheong (2004) on the other hand, differentiated the challenges to logistics providers by their level of tangibility i. e. Logistics Network Configuration layer (most tangible), to Material Flow layer, to Information Flow layer, and finally to Relationship Management layer (least tangible) as shown in the figure. 3. Logistics network configuration is concerned with designing the optimal network to satisfy service requirements at the minimum cost and the challenges at this level consist of decisions regarding: number, size and location of warehouses; location; their links to the distribution centers; warehouse sizing allocation; and customer points. Second layer is material flow which refers to the movement of products from the upstream entities, via the logistics provider, to the downstream entities.

Figure. 3: Layers of Challenges Faced by Logistics Providers

Source: (Cheong, 2004)

At material flow level, the decisions on: inventory management; scheduling the transport; lot sizing; warehousing; and consolidating the products are the challenging areas of logistics management. Third layer is information flow, which refers to the flow of information throughout the supply chain and includes: order processing; information sharing; IT systems integration; Internet; and visibility. The final layer, the relationship management is concerned with performance measures and contract design. The biggest challenge in inter-company coordination is information sharing and the issue of trust (Cheong, 2004).

Area of Opportunity

The status of power in logistics industry is very much important in determining the future trends. In the USA, for example, the resellers and retailers have typically occupied a weaker power position in the logistics channel than the manufacturers whereas this has not been the case in Australia where the retail chains, particularly in the grocery industry, have always held the dominant position (Gilmour, 1993; Gilmour, Driva, & Hunt, 1995). The opportunities for retail logistics are hence different from that of distributors. The most potential area of opportunity for overall logistics industry is information and computer technology in my personal view. Information and computer technology have had a significant impact on global logistics operations over recent years. Chiu (1995) identified five major information technologies which have become increasingly common in logistics:

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Point-of-Sale (POS) systems

Bar Coding

Electronic Data Interchange (EDI)

Value-Added Networks (VANs)

Electronic Ordering Systems (EOSs)

In addition, there are some other terminologies i. e. Enterprise Requirements Planning (ERP), Warehouse Management Systems (WMS), Transportation Management Systems (TMS), productivity tracking software and Activity-Based Costing (ABC) software etc. which represent the status of IT in logistics. There are many examples of the use of WMS and other technology in warehousing, such as those systems installed at Hewlett-Packard, Malaysia Airlines, Texas Instruments, and Unilever Italia. Furthermore, there are some latest equipments as well, which are being used in warehouses and distribution centres including voice synthesizer and video text, to facilitate the receipt of an order; paperless picking warehouses using radio frequency (RF), and new transport equipments such as B-doubles scheduled and monitored by on-board computers facilitate the delivery of the order.

Time-based competition has put the businesses under continuous pressure and to be successful in today's competitive environment the use of information technology has become obvious. Mentzer (1999) identified four specific strategies that organizations use in time-based competition: just-in-time (JIT), quick response (QR), vendor managed inventory (VMI) and continuous replenishment programs (CRP). Efficient consumer response

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(ECR) is another time-based competition strategy found primarily in the grocery industry that focuses on inventory replenishment, store assortment, promotion and product introduction. Collaborative, Planning, Forecasting, and Replenishment (CPFR) transfers end-customer information as far up the supply chain as possible to plan upstream supply chain activities such as distribution and production scheduling.

The future of logistics development is subject to collaborative logistics and virtual or fourth-party logistics. Collaborative logistics is described as a model relying on real-time information which flows seamlessly amongst all parts of the supply chain.

It is generally believed that collaborative logistics between companies participating in supply chain setups reduce the cost and increase the efficiency. Virtual or fourth-party logistics is described as third-party logistics providers who act as a general contractor of all logistics activities for an organization. In either of the situation, information technology has pivotal role in effective and efficient logistics.

Identify the objectives of warehousing and explain different key performance indicators for all the Warehouse activities. (Your answer should not exceed 2000 words)

Warehousing Objectives

A warehouse is simply a commercial building used for the storage of goods. Warehouses are normally used by manufacturers, importers, exporters, wholesalers, transport agencies etc. Warehousing processes include receiving, put-away, order preparation/picking, dispatching and inventory

management. In a warehouse, storing goods in an adequate space with the proper equipments by well trained personnel in a properly planned layout results in maximum protection of items (Tomkins, et al., 1996). So the objectives of a warehouse should be:

Space utilization;

Equipment utilization;

Maximize human resources utilization;

Reduce SKU handling and maintain required SKU;

Minimize company's operating expenses;

Accessibility of all materials;

Protection of all materials (including company's assets);

In order to achieve objectives of a warehouse business, the first step is to ensure right product, in right quantity, in right condition and on right time is received. Secondly, to allocate proper storage space to that inventory that maximizes the space utilization. Finally, while shipping an order, ensure right SKU, in right quantity, in right condition and at right time is dispatched. Moreover, the efficient and effective use of equipment and human resources is of prime importance. The size, architectural design, configuration and location of the warehouse, are also the major determinants of the success or failure of the company in chasing its objectives.

Key Performance Indicators (KPI's) of Warehousing

Warehouse management is an area where logisticians can focus to gain maximum efficiency for minimum cost. Usually organizations measure their performance by analyzing if the things are going in the right way or not, and if not, what were the causes of poor performance? The main instruments for assessing performance are key performance indicators (KPI's), the specific characteristics of the process which are measured in order to describe if the process is realized according to pre-established standards. Moreover, KPIs measure the business health of an enterprise and ensure that all individuals at all levels are “ marching in step” to the same goals and strategies.

Neely et al. (1995) defined performance measurement as the process of quantifying the efficiency and effectiveness of an action or activity. There are some other reasons too for measuring performance: for improving performance, for avoiding inconveniences before it's too late, for monitoring customer relations, for process and cost control and for maintaining quality.

Selecting and defining KPIs is not as easy as it sounds. In the current marketplace, while purchasing business intelligence (BI), enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM) or business performance management (BPM) systems, there is the dilemma of choosing only few KPIs from the several hundred (or thousand) metrics that are included in the package. Key performance indicators (KPI's) reflect strategic value drivers rather than just measuring business activities and processes. Key performance indicators help aligning all levels of an organization (business units, departments and individuals)

with clear targets and benchmarks to create accountability and track progress.

Furthermore, they accelerate collaborative planning across the organization to ensure that everyone is operating from the same playbook. The success of any performance management program is thus dependent on selecting the correct KPIs. Selection of the wrong KPIs can result in sub-optimized results. While selecting KPI's, it should be bore in mind that although all KPIs are metrics, not all metrics are KPIs. The trick is discerning between the two. In a study on performance measurement of a manufacturing warehouse, Birkholz (2004) used warehousing KPI's based on business processes: receiving, put-away, storage, order picking and shipping/dispatching. Warehousing KPI's were classified into five categories: financial, productivity, utilization, quality and cycle time. A summary of all the warehousing KPI's is given in Table 1.

Table 1: Warehouse Key Performance Indicators

Financial

Productivity

Utilization

Quality

Cycle Time

Receiving

Receiving cost per receiving line

Receipts per man-hour

% Dock door utilization

% Receipts processed accurately

Receipt processing time per receipt

Put-away

Put-away cost per put-away line

Put-aways per man-hour

% Utilization of put-away labor and equipment

% Perfect put-aways

Put-away cycle time (per put-away)

Storage

Storage space cost per item

Inventory per square foot

% Locations and cube occupied

% Locations without inventory discrepancies

Inventory days on hand

Order Picking

Picking cost per order line

Order lines picked per man-hour

% Utilization of picking labor and equipment

% Perfect picking lines

Order picking cycle time (per order)

Shipping

Shipping cost per customer order

Orders prepared for shipment per

man-hour

% Utilization of shipping docks

% Perfect shipments

Warehouse order cycle time

Total

Total cost per order, line, and

Item

Total lines shipped per total man-hour

%Utilization of total throughput and storage capacity

% Perfect warehouse orders

Total warehouse cycle time = Dock-to-stock time + Warehouse order cycle time

Source: (Birkholz, 2004; Frazelle, 2002)

Krauth et al. (2005) classified around 130 indicators used for assessing warehouse performance, such as storage surface, storage volume, storage racks, number and characteristics of docks, pallets per hour, pallets per square meter, opening hours, and assistance with customs etc. Liviu et al. (2009) grouped key performance indicators for warehousing into three categories: “ Inventory Management”, “ Warehouse Performance” and “ Order Fulfilment”. The summary of these warehousing KPI’s is given in Table 2.

Table 2: Key Performance Indicators (KPI’s) of Warehousing

Inventory Management

Measure

Calculation

Damaged Inventory (min.)

Total Damage (lei) / Inventory Value

Days on Hand (min.)

Avg. Month Inventory (lei) / Avg. Daily Sales/Month

Storage Utilisation (max.)

Avg. Occupied Sq. m. / Total Storage Capacity

Dock to Stock Time (min.)

Total Dock to Stock Hrs. / Total Receipts

Warehouse Performance Indicators

Orders per Hour (max.)

Orders Picked or Packed / Total Warehouse Labour Hrs

Items per Hour (max.)

Items Picked/Packed / Total Warehouse Labour Hrs

Cost per Order (min.)

Total Warehouse Cost / Total Orders Shipped

Cost as % of Sales (min.)

Total Warehouse Cost / Overall Sales

Order Fulfilment Indicators

On-Time Delivery (max.)

Orders On-Time / Total Orders Shipped

Order Fill Rate (max.)

Orders Filled Complete / Total Orders Shipped

Order Accuracy (max.)

Error-Free Orders / Total Orders Shipped

Order Cycle Time (min.)

Actual Ship Date - Customer Order Date

Perfect Order Completion (max.)

Perfect Deliveries / Total Orders Shipped

Source: (Liviu, et al., 2009)

Inventory Management measures are generally concerned with decisions regarding optimum level of inventory to be maintained. A higher value of “ Damaged Inventory” indicator shows less effective inventory management. “ Days on Hand” indicator shows the level of inventory in hand into number of days it will serve. It will have a lower value if contracts with suppliers are renegotiated and if are kept only the ones who are able to deliver products fast. “ Storage Utilization” indicator shows the level of space utilization, for example, number of layers of pallets per rack. It also describes how efficiently space has been allocated to storage, dock and office. “ Dock to Stock Time” indicates the efficiency of warehouse operations and its value can be reduced by introducing portable barcode readers and a barcode software. By solving the space related problems, both the issues related to product entry time and preparing them for delivery will be shortened.

Warehouse performance indicators simply represent the operational efficiency and contribution to the overall profitability of the organization. A maximum value of “ Orders per Hour” and “ Items per Hour” is desirable while a minimum value for “ Cost per Order” and “ Cost as % of Sales” is likely to lever the profits of the organization. Order fulfilment indicators represent the firm’s operational performance as well as its responsiveness to the customers. A maximum value of “ On-Time Delivery”, “ Order Fill Rate”, “ Order Accuracy” and “ Perfect Order Completion” and a minimum value of “
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Order Cycle Time” shows a higher level of customer satisfaction, efficiency and contribution to the company profitability.

Warehousing key performance indicators (WKPIs) can be used with benchmarking to indicate the overall state of warehouse operations. These are the meaningful measurements which can be referenced periodically to analyze the current financial, productivity, quality, and cycle time status for a warehouse facility. However, in addition to all the key performance indicators (KPI's) mentioned in Table 1 and 2, a tool is still required to automate processes in order to maximize the use of warehouse resources. This is where the integration of information technology becomes a key component in warehousing. Information technology is a key to improvement when considering world-class warehousing practices.

In nutshell, performance indicators are useful for identifying the problems related to warehouse management and abnormal values of the indicators can be used to develop an efficient control system for a warehouse. The basic use of the concept is, it helps in identifying the causes of the problems and hence to diminish their impact or eliminate the causes, before is too late. It is true “ what is measured is managed,” and, conversely, “ what is not measured merits little or no attention”.

Answer the below given questions (Each answer should not exceed 200 words):

How is logistics related to the marketing effort?

The marketing effort is based on the achieving organizational goals while focusing the target customers more efficiently and effectively than

competitors. McCarthy (1981) popularized the idea of the marketing mix of price, promotion, product and place, the later (i. e. place) is directly related to logistics management. In providing the product to its right place, logistics plays an important role. The place component of the marketing deals a lot with customer service provided by a business, undertaking such tasks as on-time delivery, high order fill rates and consistent transit times. A product or service provides satisfaction to its customer only when it is available to the customer when and where it is needed. Furthermore, how logistics operations affect the major elements of marketing mix can be easily understood from the following figure.

Product

Price

Promotion

Place Customer Service level

M

A

R

K

E

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Inventory Carrying Costs

Transportation Costs

Lot Quantity Costs

Warehousing Costs

Order Processing and Information Costs

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Product is the set of benefits or utilities or characteristics which a customer receives as a result of its purchase. In order to increase sales or due to some other strategic decisions management may decide to lower