

THE IMPORTANCE OF THE SUPPLY CHAIN NETWORK AS A PART OF THE MARKET

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Abstract. *A supply chain is the network of those involved with the production and distribution of a company's products. Supply chains involve a multitude of activities, people, entities, information and resources. They incorporate many steps and processes used to deliver products or services to the marketplace. Examples include refining raw materials, manufacturing, transportation, inventory control, finance, retailing, packaging and marketing. Supply chain management is the vital process of planning, tracking and perfecting how goods move throughout the system. Maintaining strong links within your supply chain impacts business costs and profitability.*

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Logistics is unique: it never stops! Logistics is happening around the globe, twenty-four hours of every day, seven days a week fifty-two weeks a year. Logistics is concerned with getting products and services where they are needed when they are desired. Most consumers in highly development countries take a high level of competency for granted. When they go to the store, they expect products to be available and fresh. It is very difficult to accomplish any marketing or manufacturing without logistical support. Logistics involves the integration of information, transportation, inventory, warehousing, material handling and packaging. All these areas of work provide a variety of stimulating jobs. These jobs combine to make overall logistics management a challenging and rewarding career. Because of the strategic importance of logistics performance, many successful logistics executives have been promoted to senior management.

The operating responsibility of logistics is the geographical positioning of the raw materials, work-in-process, and finished inventories where they are required at the lowest possible cost. It is through the logistics process that materials flow into the vast manufacturing capacity of an industrial nation and products are distributed through marketing channels to consumers.

Logistics adds value when inventory is correctly positioned to facilitate sale. Creating logistics value is costly. For individual firms, logistics expenditures typically range from 5 to 35 percent of sales depending on the type of business, geographical area of operation, and weight/ value ration of products and materials [1, p.15]. Logistics typically accounts for one of the highest cost of doing business, second only to materials in manufacturing or cost of goods sold in wholesaling or retailing. It is clear that logistics, while vital to business success, is expensive.

Despite these impressive cost comparisons, the true excitement of logistics is not cost containment or reduction. The excitement comes from understanding how select firms position their logistical competency to gain competitive advantage. Firms that enjoy world-class logistical competency can gain competitive advantage by providing customers with superior service. While

perfect orders are difficult to achieve, logistically sophisticated firms seek such lofty performance and are committed to continuous improvement. Leading firms typically have information systems capable of monitoring logistics performance on a real-time basis, giving them the capability to identify potential operation problems and take corrective actions prior to customer service failure. From a personal experience, I can say that through logistics, companies even if they are small, can create a competitive advantage and be a reliable partner of other international ones.

Logistical management used to be known as "physical distribution management" and now, in the more forward-thinking companies is developing into "supply chain management".

Logistics renaissance: prior to 1950, no formal concept or theory of integrated logistics existed. The three major factors that lead to neglect logistics area:

1. Computers: before computers, there was no reason to think that logistics functions could improve overall performance. Computer applications focused on improving performance regarding order processing, forecasting, inventory and transport control.
2. Economic situation: the pressure for profit improvement that began in the 1950.
3. Cost of inventory: the difficulty of identifying the true cost of inventory according to general accounting procedure lead experts to shift to logistics procedure to place a financial return on reducing inventory.
4. Influence of the military experience: before business in general showed much interest in administering logistics activities in a coordinated manner, the military was organized to carry out logistics activities. More than a decade before the beginning of the developmental period of logistics, the military carried out what was called the most complex, best planned logistics operation in history – the invasion of Europe during World War II.

These basic factors, along with the natural resistance to change plus the mentality of "Don't fix it if it isn't breaking" blocked the early logistics success. But because of little outstanding success stories the concept of logistics survived [4, pp.10-17].

Importance and Influence of Logistics

Now that we have an idea about what Logistics is, let's examine the importance of this science and its influence in the market economy.

Competitive advantage. A major theme of this research is that effective logistics management can provide a major source of competitive advantage – in other words a position of enduring superiority over competitors in terms of customer preference may be achieved through logistics. The bases for success in the marketplace are numerous, but a simple model is based around the triangular linkage of the company, its customers and its competitors – the Three C's. The „Three C's" in question are: the customers, the competitor and the company.

The source of competitive advantage is found firstly in the ability of the organization to differentiate itself, in the eyes of the customer, from its competition and secondly by operating at a lower cost hence at greater profit. Seeking a sustainable and defensible competitive advantage has become the concern of every manager who is alert to the realities of the marketplace. It is no longer acceptable to assume that good products will sell themselves, neither it is advisable to imagine that success today will carry forward into tomorrow.

Let us consider the bases of success in any competitive context. At its most elemental, commercial success derives either from a cost advantage or a value advantage or, ideally, both. It is as simple as that – the most profitable competitor in any industry sector tends to be the lowest cost producer or the supplier providing a product with the greatest perceived differentiated values.

Put very simply, successful companies either have a productivity advantage or they a „value” advantage or a combination of the two. The productivity advantage gives a lower cost profile and the value advantage gives the product or offering differential „plus” over competitive offerings.

Gaining competitive advantage through logistics: of the many changes that have taken place in management thinking over the last ten years or so perhaps the most significant has been the emphasis placed upon the search for strategies that will provide superior value in the eyes of the customer. To a large extent the credit for this must go to Michael Porter, the Harvard Business School Professor, who through his research and writing has altered managers and strategists to the central importance of competitive relativity in achieving success in the marketplace.

Logistics management has the potential to assist the organization in the achievement of both cost/productivity advantage and value advantage. As fig.1 suggests, in the first instance there are a number of important ways in which productivity can be enhanced through logistics. Whilst the opportunities for better capacity utilization, inventory reduction and closer integration with suppliers at a planning level, are considerable.

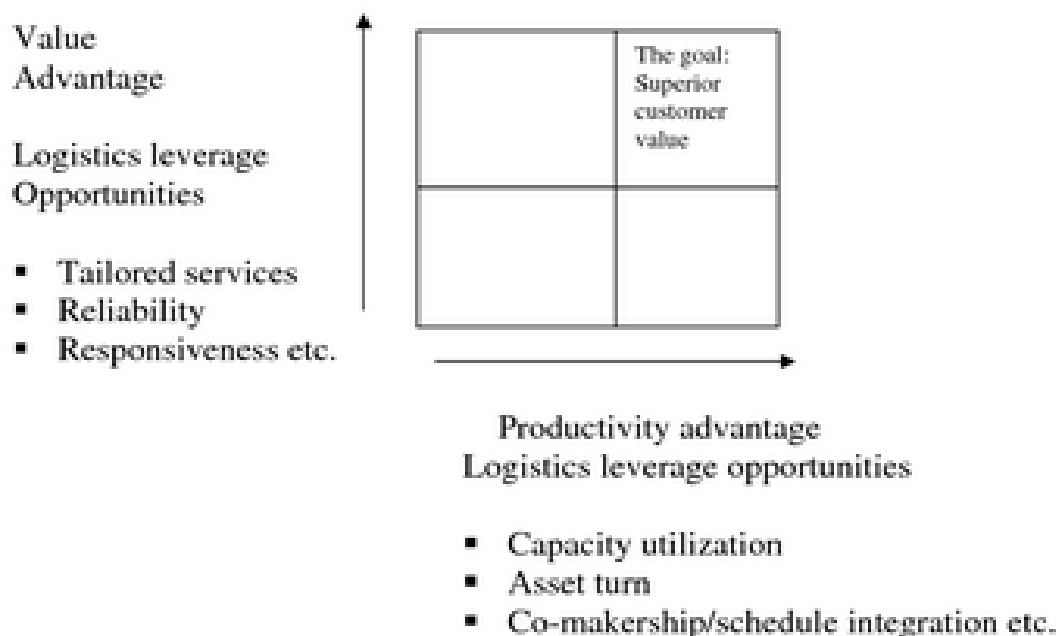


Fig. 1. Gaining competitive advantage through logistics

The summarize, those organizations that will be the leaders in the markets of the future will be those that have sought and achieved the Twin Peaks of excellence: they have gained both cost leadership and service leadership [3, p. 12].

Logistics as an influence on strategic decisions: The investigation of any market opportunity commences with marketing forecasts, which identify the potential overall and market segment volumes available. The price/volume combinations, and the profiles of both customers and resellers. From this analysis a profile of the market can be made which will identify the location and nature of demand and the service requirements of customers and intermediaries (if they are seen as an important feature in reaching overall marketing objectives).

Such a profile will identify the infrastructure best suited to maximize the opportunities available. The inclusion of logistics activities enables a broader view to be taken of how the opportunity might best be approached. If the economics of logistics activities across a range of

throughput volumes are known, it is possible for management to review a number of production options that may include total manufacturing of all components, a predominantly assembly operation or a combination of manufacturing and assembly of components. The important characteristics of the decision usually concern the relationship between fixed and variable costs, both initially and throughout the product forecast life cycle. This does require a view of the market, its competitors and an assessment of market risk. The fig. 2 illustrates the manufacturing/assembly options facing the business. Clearly much the same argument may be made concerning the distribution/logistics infrastructure. Increasingly companies are evaluating the efficacy of „make or buy” in both production and distribution activities. Operational gearing (the relationship between fixed costs and total costs) is an important decision area.

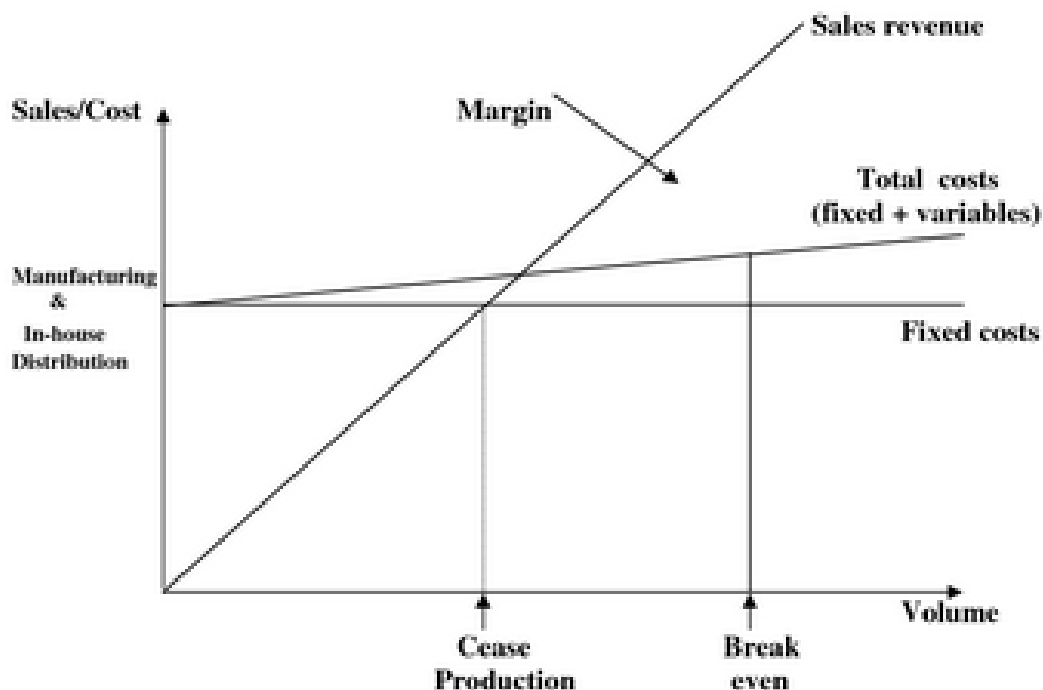


Figure 2. The implication for fixed and variable costs of the make or buy decision: operational gearing

The long-term perspectives of costs behavior are also important. Again the structure of the response (operational gearing decisions) will be influenced by the expected market trend.

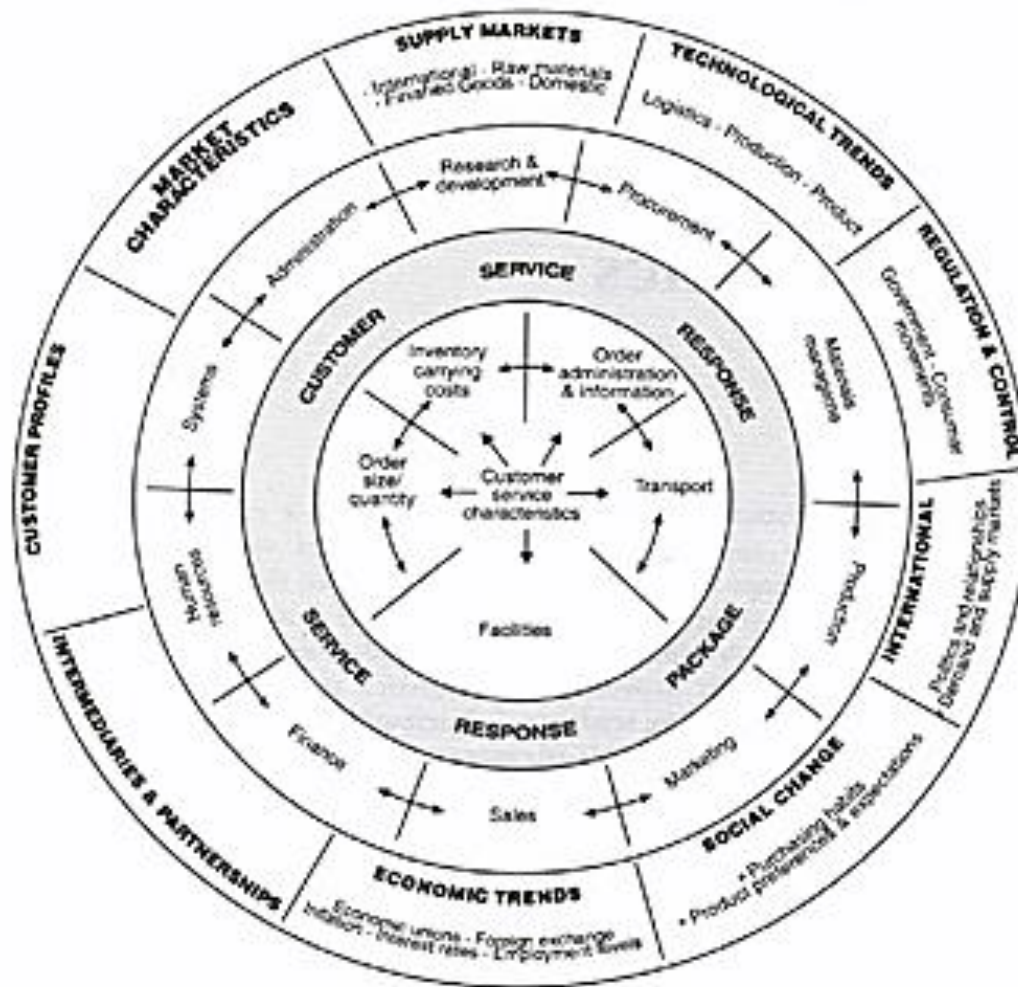


Figure 3. The environment of logistics management

The internal environment of logistics. We can view the logistics internal environment from two perspectives. First there are the activities for which the function has direct control. Second the other internal functions with which logistics is in contact and over which it exercises some indirect control or influence are the conventional business activities.

- the direct control environment

Logistics has direct responsibility for the co-ordination and control of the „logistics mix” activities (order administration, transport, facilities, order size/quantity, and inventory cost). These functions were separate activities or activities with individual managers, tasks and therefore objectives. Consequently, each function sought to maximize its own objectives: for example, order administration and information activities might attempt to process an ever-increasing number of order and inquiries. This may occur despite accuracy, and accordingly credit checks may be overlooked or superficial and order progressing inquiries serviced inductively. These and other similar „cross inefficiencies” are avoided by the creation of an overall coordinating role in the form of the logistics function.

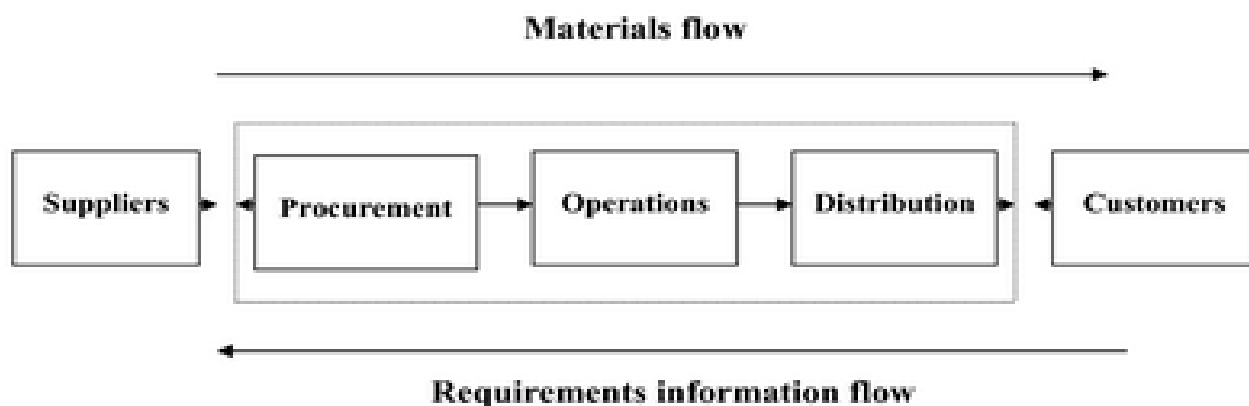


Figure 4. Logistics management process

The effectiveness of this approach can be seen by considering figure 4, which identifies the cross-functional concerns involved. In figure 4 is identified four customer service characteristics and considered the issues confronting the „logistics mix” activities. It can be seen immediately that some aspects of customer service can impose cost penalties. For example, frequent deliveries, a not uncommon requirement by customers operating JIT production systems can result in a number of problem areas.

The conclusion reached is simple, if difficult to interpret and implement: customer service decisions require careful analysis. It follows that unless it can have demonstrated that the overall benefits of a specific level of customer service exceed the overall cost, then there are obvious doubts concerning the efficacy of that particular customer service offer. The benefit of a coordination function (such as that offered by a logistics management role) is that trade-off situation across the mix can be explored. For example, the decision taken by an UK-based automobile manufacturer. During the early 1980s it was found that the costs of maintaining inventories of parts in Scandinavia were excessive in comparison with the returns obtained. Parts were transported by sea the Norway and Sweden. The entire range of service parts was maintained in a number of locations. Usage began to suggest seasonal trends and also identified the slow moving items. As a result of a study to identify cost-effective alternatives, a radical solution emerged. The range cover was reduced with only fast moving (and some medium-moving) parts being held on territory, with the remainder being serviced by air freight from the Midlands-based distribution center in the UK. This example is a good case study to demonstrate how an increase in one logistics element, in this case transportation (airfreight replaced by sea freight) can lower the overall costs of service.

- *The indirect control environment.* Considering the sequence of, Research & Development, procurement, material management production scheduling and marketing. An unsatisfied customer need may be identified to R&D were initial activities would benefit considerably if, together with a projection of market volume potential, additional information concerning „shelf life” expectancy or other supply chain characteristics were identified. This would help prescribe materials inputs, packaging, and so on, in the process of developing a product with ideal customer expectancy characteristics.

More direct is the influence that logistics management can have on sales and marketing results. Sales volume can be directly influenced by an effectively managed level of customer service and may also be enhanced by the introduction of new technology.

Material management would find itself with higher operating costs due to the fact that large than necessary storage facilities would have been built. Marketing could find that full prices for products were not obtainable owing either to excess stocks or perhaps dated merchandise. Finance, too, would be operating less effectively: excess stockholding implies a requirement for more working capital than necessary. Another example, which is not unusual, concerns the width of the product usage offer. A wide product range may give marketing the advantage of wider appeal for customers, and may also increase the size of sales transactions. However, it has a number of disadvantages. A wide product range requires a larger stockholding of raw materials (a disadvantage for procurement, materials management and production). Finance is faced with higher working capital requirements. So the overall coordination role by logistics function which uses its skills in managing stocks and flows through procurement, materials management, production and the physical distribution of finished products is invaluable at both the strategic and operational levels of business planning.

- *The external environment of Logistics.* Each of the external elements represented on the periphery of figure 1-1 has significant meaning for logistics management. Below is listed a brief review of each of these elements.

- Supply markets

There are a number of issues here and the main area of interest concern the expansion of sourcing into international markets. For a number of well-organized companies there exist structured sourcing plans which have been established on the basis of using existing skills in emerging countries. For example, there are a number of Western European manufacturers and retailers who very quickly evaluated the skill bases on the Eastern European countries as they abandoned communism. Their rationale was based on the known traditional skill levels together with the knowledge of current labor rates and assumptions concerning the medium and long-term effects of inflation. With this knowledge a procurement/sourcing plan was evolved with the help of logistics management who were able to analyze the likely logistics considerations and therefore the impact of these on costs of raw materials, components and finished goods.

- Technological Trends

Technology has made a major impact on all aspects of industrial activities. The influence of information technology has changed the nature of business operations beyond recognition. The impact on logistics has been twofold. Not only have logistics functions been required to assimilate changes such as EPOS data capture and EDI (electronic point of sales and electronic data interchange) and respond in terms of organization and operating methods, but logistics as a function has been required to change to accommodate changes in other functions. For example, IT has been basis for the introduction of JTI manufacturing methods and in marketing, lower costs of equipment and increased memory capabilities have introduced data base marketing into manufacturing and retailing. The application of technology to production processes and to products has required logistics to consider its response. In addition, the nature of many products has changed. Products have changed shape, size and value. Some have undergone complete changes of physical characteristics requiring the development of new logistics technology. Example, the food industry.

- Regulation and Control

The control of food distribution would be very difficult without the knowledge that temperature control equipment and vehicle performance reliability are at very high levels. Thus it is possible for government to impose strict requirements concerning the delivery and selling ambience of perishable

products (particularly food and drugs requiring temperature control). Quality control and customer protection across a range of product sectors have increased and there are many issues for logistics managers to concern themselves with. For example, the increased rights that have accompanied consumer legislation concerning product liability (and performance) have increased the number of return of defective products.

- International Politics and Relationships

In recent years there have been a number of changes in international relations which have influence the patterns of demand and supply markets. The removal of sanctions, subsequent to an international agreement, in South Africa has opened a market opportunity for many products and eased the situation for South Africa exports. Both require the attention of logistics management to ensure cost-effective stocks and flows systems. The general, overall reduction of tension in many parts of the globe also changes the patterns of expenditure. With less of the GDP allocated to military expenditures, more may be allocated to industrial and consumer goods thus resulting in an increase in product flows. Again these are issues of concern for logistics managers. Clearly there are situations where the reverse is occurring (the Balkans) and the logistics role may be not commercial. Rather, here is a need for the expertise (and capacity) to be applied to supporting the shipment of aid supplies.

- Social Change

The potential growth of home shopping will present logistics management with opportunities (and challenges) to develop systems which can accommodate multi-deliveries at customer designated time. The problems associated with such systems are not totally new.

- Economic Trends

As the interest of large businesses expand and become global in their nature so the impact of local economic trends became important. Logistics management is one area of management where some solutions are available. The truly global companies do have logistics systems able to respond to changes in long-term inflation and fluctuating exchange rate. Responsive logistics management is often the only way in which increasing procurement cost may be contained, either by utilizing more cost-effective transportation modes or methods; i.e. using lower cost transport modes or preferably using "partnering agreement" with other companies whose problems are similar. The growth of economic unions are likely to present new challenges to logistics management.

The expansion of the European Union, the North American free trade area, and the Asian grouping will see some interesting developments. One obvious challenge will be the aggregation of the impact of economic trends. The recent (1989/94) recession in Europe has a dampening effect on both industrial and consumer markets, and therefore on expenditure. In these circumstances there are considerable problems for business whose sales volume is concentrated within that economic area. For example, UK companies have some 70-80 per cent of their turnover within the union. A prolonged recession can, therefore, be damaging unless the variable costs of operations can be minimized. Alternatively, other markets may be considered, but these are often long term and require considerable amounts of information outlining the structure of markets and demand. However, it is a logistics task to identify the stocks and flows characteristics and to monitor the potential infrastructure and its costs in order that business take every opportunity available to spread the increased risk that the growth of trade blocs may bring.

- Intermediaries and Partnership

This aspect is concerned with identifying, as partners, companies who share mutual trade objectives, strategies and target markets (and customers) but who may have less that effective delivery systems, as marketing expand and develop in locations, which are increasingly distant, economies of scale become very significant.

- Customer Profiles

An important consideration for both marketing and logistics is an understanding of the Customer.

- Marketing characteristics

Specific markers structures usually produce expected type of behavior. For example, a monopolist may be in a position to determine levels of service to customers. Clearly they have no alternative sources of supply.

Logistics environmental assessment. A primary factor in developing a strategic logistics system is to understand the internal and external forces that will influence the functioning of this system. An important input to logistics planning is to access, monitor and evaluate environmental challenges.

- Industry Competitive Assessment

This assessment involves a systematic review of opportunities and potential limitations within a firm's specific industry based on such factors as market size and growth rate, profitability potential, critical success factors, off-shore competition, and labor issues. Analysis of competitive forces includes industry leadership influence and control, international competition, rivalry and confrontation, customer and supplier power, and core competencies of key competitors. A careful benchmarking study of competitors' logistical competency is important to understand the basic level of customer performance required being an effective industry participant.

- Geo-market Differentials

The logistics facility structure of an enterprise is directly related to customer and supplier location. Population density of geographical areas, traffic patterns, and projected demographic shifts all affect logistics facility location decisions. Demographic information such as age, income, and education is fundamental to identify and pinpoint specific marker potential. Mapping and understanding industry demographics are essential to effective logistical planning. Companies like McDonalds must stay on top of these geo-market factors to determine which retail store locations offer the most favorable market potential [5, pp. 36-51].

- Technology Assessment

Among the technology areas that influence logistical systems, the most prominent are information, transportation, material handling, and packaging. The flow of timely and accurate information is critical to an enterprise. Integrated databases capable of tracking the movement of materials, work in process, and finished goods inventory are being used to improve real-time managerial control and decision support. Soft-sided trucks, inter-modal and double-stack containers, and new routing options are examples of changing transportation technologies. Robots, computer vision, machinated storage, and an increased usage of automated-guided vehicle system (AGVS) are technological tools affecting material handling. Innovative developments in packing include stronger materials, nesting returnable containers, improved pallets, and a host of key identification technologies. The need for assessment is highlighted by the fact that most of the innovations noted above were not commercially available as recently as a decade ago.

- Material-energy Assessment

The continues dependence of logistical operations on fossil-based fuels is predicted to last well into the twenty-first century. This dependency requires that management understand political dynamics and maintain a search for alternative fuels as substitutes in case of material and energy shortages. Firms must continuously assess their required resources and evaluate potential alternatives. As key resources become scarce and their prices rise or their usage is limited, owing to environmental impact, a transition to alternative may be required. Trucking fleet are currently experimenting with alternative fuel conversions. Experimentation is also occurring with battery-powered vehicles to develop technology necessary for electric vehicles. All three big automakers are planning to develop and sell battery – powered vehicles by the end of the century. Awareness regarding the range of potential alternatives supplemented by an assessment of possible material-energy scenarios is essential for effective strategic planning. Such planning should position an enterprise to implement a transition rather than a panic reaction when change becomes economically feasible or mandated.

- Channel Structure

Logistical strategies are, in part, determined by channel structure. All enterprises, regardless of size, must conduct immediate logistical operations within a defined set of business relationships. For example, throughout industry the reduction in the number of material suppliers is a clear trend aimed at achieving improved product and delivery service. Enterprises regularly evaluate the relative advantage of distributing or buying products direct as contrasted to using the services of wholesalers. In some industries, the trend is away from wholesalers, while in others, wholesalers appear to be gaining in popularity. The growth trend in mail order and telemarketing also has a potential major impact on traditional marketing channel structure for some retail industries. Changes in the composition of demand, structure of supply, number of channel participants, and traditional channel relationships need to be regularly monitored to maintain logistical relevancy.

- Economic-Social Projections

The level of economic activity and the rate of change, as well as prevailing social attitudes and perceptions, are important to logistics. They are also difficult to predict. The slow recovery from economic decline in the early 1990s is a good example of how experts can disagree concerning social-economic trends. The actual trends that materialize directly affect logistical requirements. The illustrations that follow present the interrelationship of such impact. For example, aggregate demand for transportation is directly related to level of gross domestic product (GDP). This transportation demand is also dependent on labor cost and value of the dollar. When labor cost rise or the dollar becomes strong in relation to foreign currencies, imports increase. Interest rates, extremely volatile over the past few decades, dropped during the 1990s to the lowest level since World War II. Changes in interest rates directly influence inventory throughout the marketing channel increases. The desire to reduce inventory cost may, in turn, justify use of premium transportation to maintain service while enjoying an increase in inventory turn velocity.

Social trends, lifestyles, expectations, and attitudes all affect logistical requirements. Today, the potential spill of hazardous materials is a major social issue that influences public safety and jeopardize quality of life. Monitoring public sentiment and leading economic indicators can help an enterprise avoid potentially disabling circumstances and regularly assess risk involved in existing logistical practices.

Service Industry Trends

Over the past several decades, growth in the service sector of the American economy has increasingly made it a greater part of GDP. Of particular interest to logistics are services related to transportation, warehousing, order assembly, and inventory fulfillment, plus a variety of computer-based information systems. These and other related services can be purchased from specialists when reengineering logistics system design. Logistics service providers range from relatively small local and regional firm to nationwide full-service enterprises. The portion of the logistical allocated to the acquisition of essential services from specialists continues to increase. The public warehouse industry in the US is now twice the size of railroad industry. From the viewpoint of logistical system design, such services have the potential to increase flexibility and reduce fixed cost. To be an astute buyer of services, it is essential that logistical manager maintain knowledge of prevailing practices and the rate of technology adoption throughout the service sector. Such a diversity supply structure places an extra burden on logistical managers to ensure that they receive competitive services and prices [2, pp.465-468].

- Regulatory Posture

Perhaps the most viable environmental change science the late 1970s has been in the regulatory structure of such industries as transportation, banking, and communication. Logistical manager has been confronted with a need to evaluate and predict the most likely national, state, and local government regulatory changes they will encounter.

CONCLUSIONS

Finally, the somewhat distant but legendary comments of Peter Drucker when referring to distribution as "the last dark continent" for business to conquer resulted in a flood of activity which in a relatively short time result in the emergence and growth of an important management function. Drucker's comments raised an important issue concerning the cost of distribution to companies and a secondary issue (more important) as to who was responsible for managing distribution activities. The logic of including raw materials, components, manufactured parts and packaging materials within an overall flow of materials expanded the responsibilities of management into a broader logistics concept.

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