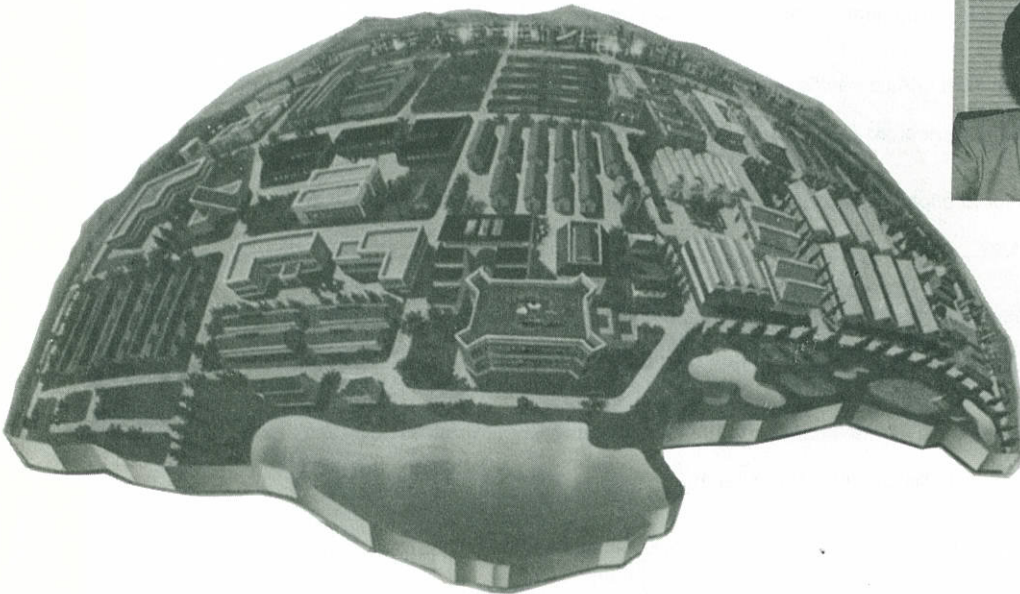


MORE EFFICIENCY IN WORLD DISTRIBUTION.

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The world distribution industry is becoming more efficient, by considering the basic principles of functional integration, cost trade-off and enhanced customer service which are diffusing through industry and commerce.

International logistics now are more efficient service : minimizing out-of-stock occurrences; improved material handling; better W/H layout; simplification of order processing and redesigned packing to permit greater efficiency in warehousing; reducing the customer's receiving facilities; enabling expanded market coverage by reducing freight costs; etc.

For example, the opportunities will become available within the European Community to develop better, more comprehensive logistics services within the single market. The concept of pan-European networks

has the aim of demonstrating an ability to minimise logistics costs, whilst adding value through maintaining or enhancing the quality of service provided to the end customer, thus providing participating enterprises with a much sought after competitive edge.

Six main points are discussed here:-

1) Transport.

In the area of transportation, there has been a huge increase in competitiveness over the last decade, and while the real cost of transportation service has actually decreased, services have generally improved, both in terms of quality and dependability.

1.1) International freight are several and cost options. In many cases, transportation service providers have developed new tailored services,

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including just-in-time, assembly and distribution services in the motor industry, in the aerospace industry, and double stack service in the rail industry. Shipping companies offer mixed sea-air service, different container sizes, scheduled and unscheduled services.

To reduce the lead-time, companies can choose air freight to an extent which appears costly but which, in the context of inventory holding costs, potential lost revenue and market flexibility.

In 1990 and 1991, it would appear that the trend to build larger networks of operations on a national, European or worldwide basis, continues. A number of the domestic deals demonstrate the extent to which certain operators, already strong in their own domestic markets, continue to acquire business to increase their market penetration.

1.2) Integrators service. A door-to-door service can provide shorter and more reliable transit times, swifter and less complex procedure for customs clearance, a worldwide tracking and tracing system. The alternative solution was to use a door-to-door integrated logistics through a company such as DHL or Federal Express. Whilst the per unit transport costs were obviously higher, the total logistics costs were lower (because of the greatly reduced end-to-end lead-time). At the same time variability in the lead-time of supply was dramatically reduced.

Recently a **computerised vehicle routing and scheduling system (CVRS)**, for cars as delivery vans, was used to plan, implement, manage and monitor distribution operations. Many companies have reported savings in vehicle numbers, mileages and management time. These savings become more important in a time of recession, where "trading down" becomes almost as big an issue as increasing customer services.

1.3) Infrastructure improvements. In order to bring the idea of intermodal transport to realisation, a network of roads and goods connections by rail and inland waterways were constructed.

Infrastructure improvements will stimulate the movement towards globalization, e.g., the rapid expansion of satellite communications networks, the expansion of air and ocean shipping capabilities in both the Atlantic and the Pacific, the development and enhancement of new transportation technologies such as the double-stack train, Euro-tunnel-rail, new tunnel through the Alps, Spanish rail-remodelled to new gauge, France high speed train, the increasing co-operation between the 17 national rails.

The broadening of service offered by transportation carriers (*which has been stimulated by deregulation of transportation in the US, France, Canada and other markets*) has extended the reach of global logistics. For example, the most striking aspect of deregulation in trucking markets in the USA was the fall in rates for both FTL and LTL services.

The consequences of deregulation in EC, particularly on road haulage will lead to :-

- * more competition, and lower prices;
- * reduced border delays and therefore greater vehicle and driver productivity (Delay at borders for European road hauliers have been estimated to cost up to 830 million ecu a year (Cecchini, 1988)) ;
- * easier access to markets combined with improved information flows will lead to a reduction in the number of goods vehicles running empty. This not only helps to improve competitiveness, but is environmentally friendly;
- * allow industry to locate stock holding according to more rational supply and demand factors (*since borders will no longer dictate distribution patterns*);

* make European industry more competitive at a global level (*transport costs are a significant proportion of logistics costs*);

* users of transport services selecting regional hauliers, together the functions of domestic and international operations in an integrated way, and;

* dramatic improvements in the efficiency of European logistics.

1.4) Logistics partnerships have developed the concept of third party logistics.

Most companies work with fewer carriers and operate in a much more involved way with these carriers. Contract logistics have been commonplace in Europe and Japan. The advent of large, single source logistics service firms give more flexibility to the logistics.

2) Mechanised cargo-handling.

Cargo handling became mechanised, largely by the use of modern cranes and forklift trucks since the mid-1940s. The introduction of this equipment eliminated much of the hand labour from cargo handling on shore and in the holds of ships. The process was one of gradual evolution with occasional leaps and led to an increasing use of pallets and to the formation of unit loads which significantly reduced hand stowage for packaged cargo in vessels.

A characteristic of any advanced ship simply had to find its counterpart on - shore and this was achieved by a range of facilities such as gantry cranes, straddle carriers, stacking areas and efficient procedures for cargo movement control and the processing of documents.

3) Inventory control.

The advent of globalizations has increased to efficiency of companies' inventory control by :-

3.1) Centralization of inventories. Making use of the well known statistical fact that consolidating

inventory into fewer location can substantially reduce total inventory requirement. Organizations have been steadily closing national warehouses and amalgamating them into **regional distribution centres (RDCs)** serving a much wider geographical area, shortening the replacement for stock in field warehouses, At the same time the penalties of centralizing physical stockholding are reduced, i.e. double handling, higher transport charges and possibly longer total pipelines.

Rank Xerox in its management of its European spares business has demonstrated how great benefits can be derived by centralizing the control of inventory and by using information systems and, in so doing, enabling a much higher service to its engineer to be provided but with only half the total inventory.

Three most important benefits of centralisation of distribution which make logistics more efficient are as follows:-

* Gain financial advantage through cost reduction in the use of land, labour, transport and stock holding.

* Improve customer relations through the provision of speedier and more accurate service.

* Obtain better control.

3.2) Just-in-time concept. (JIT) Now manufacturers and traders adopt the JIT approach in every possible opportunity relating to the logistics of materials and products. JIT concept deals with the finished products. The MRP approach plans for materials and the cooperation of the suppliers to supply the needs or raw materials as early as possible.

Inventory management has been successfully employed by manufactures. By using MRP, the manufacturer can achieve the following criterias:-

- An accurate forecast of the planned production time.

- Availability of the ordered materials to be

delivered and the factories for production.

- Reliability of the delivery of ordered materials.
- Availability of workers with skill and intelligence to produce quality goods without material wastage.
- Availability of reliable equipment for production, including maintenance of these equipments.

3.3) Computer technology. Computers have assisted the analyst, consultant and manager in planning logistics system design and central- inventory levels. The computer's major impact on logistics in the future is likely to be in bringing the technology down to the operating level.

Computers are used to assist despatchers in the daily routing of trucks, to split incoming orders for more efficient picking in warehouses, to keep track of stock in warehouses, and to provide on-line tracking of shipments in a transportation system.

More automation throughout the entire logistics system will likely take place, especially in the area of information flow. For example, retail sales are entered into the computer through a light-pen scanner reading a bar code on the product. A minicomputer at the retail level controls retail inventory and transmits replenishment orders to the W/H. Computers are used to split the order for processing and for controlling and replenishing stock at this level. In addition, computers are used to optimally load the trucks and rout them to the retail stores. They are also used to lay out the warehouses and to keep track of the stock locations for storage and retrieval. Finally, W/H computers are linked to vendor computers to facilitate the accurate transmission and filling of W/H replenishment orders.

Computer control or automation leads to greater accuracy of inventory control and stock movements. Computer aided automation provides the required level of inventory control, throughput, capacity,

safety and distribution efficiency, improving the customer service and reducing distribution costs.

4) W/H Automation can save labour cost and capital and time.

Well planned semi-automatic storage systems can often give the best results that speed up the handling of aisle or block palletization. Aisle palletization has the obvious disadvantages of wasting space; the block method groups pallets into sections, leaving gaps in the middle or of the piles. Floor space is saved. Bar codes are recorded and replacement stocks ordered.

W/H materials handling equipment and complex software packages are available to carry out the calculations. The machines are fast handling. An economic case can often be made for mechanical palletization. On the semi-automatic machine, the operator receives the cartons, cases, parcels or pallets off a conveyor, and slides them into position on a platform. With a press of a button, the machine does all the layering, discharging and replacement of the pallets.

5) Information Technology.

Global logistics information now can enable the achievement of local service needs whilst seeking global cost optimization. Significant development of information technology allows greater flexibility and the release of many supply chain responsibilities to third-party operators without loss of control. Yet the extent of this information technology development varies.

5.1 Information system. Information now can transfer and process real time sales information to central or distributed systems for processing. In this way, companies have access to literally up-to-the-minute information on demand patterns and are able to streamline and tailor customer purchasing strategies so as to be both cost-effective and service- sensitive.

Developments such as *electronic data interchange (EDI)* are fast reducing transaction costs and so make global trading more attractive to an increasing number of companies.

tasks inventory control, W/H stock location and transportation dispatch and control. Now the concepts of artificial intelligence and expert systems (ES) are provided with logistic solutions. (See Figure 1)

Decision support systems are used for such

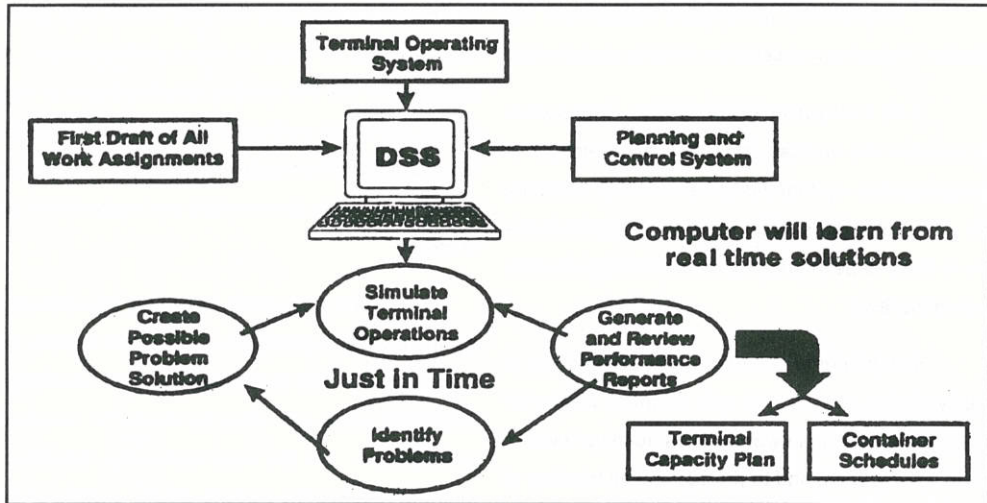


figure 1

DECISION SUPPORT SYSTEM-THE JIT TERMINAL PLANNING PROCESS

A computer simulation program analysis a facility's operations based on simulated real time; in other words, it accurately mimics all aspects of a marine terminal or intermodal yard operation. The simulation model traces ship or train utilisation, storage requirements, truck queues and ship loading or unloading. It shows how a new facility will actually function, or how an existing facility will function given certain quantitative modifications.

5.2) Communication network. International business becomes more efficient with communication links. The last 20 years have seen office technology reduce staff workload and allow an efficient flow of data. External communications allow companies to contact staff and customers efficiently.

The introduction of automation can lead to the more efficient use of time, reduced costs, better service to customers, faster results, greater availability of information and the more efficient storage and retrieval of information.

For example, with the correct software, computers can be used to write reports, plan budgets, send invoice, create job, estimates or produce diagrams.

Telex can send messages to several destinations and communications with other devices. This can include information from suppliers of new product lines, stock removed from circulation due to contamination and additional deliveries of products. Signatures can be transmitted giving authorization.

A fax will be provided for the transfer basis for a communication network that support many different

types of transmission. The distinct use include voice links, fax links, messaging facilities for electronic mail and access to databases and similar services.

Companies are now talking in terms of "*data warehousing*" as a means of consolidating corporate-wide information and "*knowledge engineering*" as the process by which useful competitive advantage can be secured from the company's data.

6) Intermediate component shipping with local added value.

There is an "*intermediate component shipping with local added value*" provide the lower costs and improved flexibility to demand with lower inventory by shipping generic sub-assemblies in intermediate ship packs.

The local operation then provides:-

- * Localization and finishing.
- * Local language packing.
- * Central inventory holding for the theatre of operations.
- * Deferral of the despatch to final markets.
- * Direct customer delivery for all the markets within the theatre without further handling.

And packaging methods for international logistics now, export packers supply export packaging services for shipments. The goods can move through customers more easily. Export packager, who know various countries' requirements, know what materials and methods to use in constructing the most economical crate or container. This gives much more protection for goods. □□