CHAPTER – III

MARKETING CONCERNS – PORT INFRASTRUCTURE AND SERVICES

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01 CONCEPTUAL RATIONALE FOR MARKETING - PORT AND PORT SERVICES

1.1 Prologue

The international market place is huge and vast and has crossed all the borders and the barriers. The whole world is a single market today. The liberalization policy introduced in the early 90s and the principles of GATT/WTO have ensured that all over the world there is a smooth and quick flow of the business. It is obvious that the winners will be those who see global opportunities and have wider perspectives.

The ever increasing competition in the market place, changing consumer preferences and benchmarks, evolving needs and desires, and closer interaction with the world outside has placed a renewed set of consumers in the marketer's hands. Every learning presumably every insight gets questioned, every action has a re-look and every task is redefined. The luxury of using an altered adage, "mistakes can be stepping stones to success" is completely eliminated. [01]

Indian consumer is globalized in thinking and living. Three factors have contributed to this globalization of consumers namely; media, cross country travels and the brands. As the brand moves from market to market, there is tendency to avoid reinventing the wheel and draw on mixes and lessons from the existing market and transpose it into a new market.

In ports, the economies of scale are extensively relative to the size of the market, such that few ports can provide the necessary infrastructure and services required by the industry. As the market size increases, the problem of natural monopoly comes down, which has been experienced recently in telecom infrastructure sector due to the explosive growth in last decade and led to a highly competitive market scenario. On the same pattern, developments of Minor ports in India have opened up a room for competitive environment and the role of marketing practice. Given this pace of port developments, growth expected in economy and international trade, the natural monopolistic situation would become a history in the sector aiming to change the port dynamics from social welfare role to commercial goals

Commercialization refers to reorientation of goals and objectives - from delivering social benefits to achieving social goals. The ports are expected to be more customer oriented and profit driven. Indian ports have become more customer- oriented than one decade ago on the face of the competition from the private ports as well as other Major ports. If numbers of advertisements appearing in the newspapers are the indicators, than the customer orientation comes out very strongly in the port and port based logistics services industry

Lots of strategic business investments have been evinced in recent times in the port sector and the 100% FDI (foreign direct investment) has been allowed in the sector which is an indicative of the bright

future for the Indian ports. The public statements made by the chiefs of some the ports emphasize on the need for marketing, customer concerns and competitive environment in India, few of them are as under:

1. 'It is always not easy to change the berthing policy as there are conflicting and competitive business interests of port users. But these changes will help push up output'. Chairman, Kandla Port Trust [02].

2. 'Calcutta Port Trust plans to get user friendly' [03]. It emphasizes on port operations to be made more user friendly as a customer concern and to increase interface among users and port authority.

3. 'No port can survive unless it is cost conscious and efficient'. On a question raised 'with so many ports competing for available cargo, how does Ennore plans to augment its capacity in the future', CMD Ennore Port replied, 'Ennore Port is planned at a time when Central Govt. wanted to convert Chennai Port into a clean cargo handling port. The future of ports all over the world will depend on how well they market themselves and attract cargo' [04].

Marketing the port infrastructure goods and services, therefore is a concern in the contemporary perspective The "marketing doctrines" equally applies to the marketing of port infrastructure goods and

services as an economic enterprise where the business objectives are aimed at maximization of bottom lines and value creation The marketer is expected to understand the business dynamics, which are covered in this Part and subsequent discussions based on the review of literatures scans.

As regards the marketing analysis, the usual four P's of marketing mix namely; place, product, price and promotion have been elucidated and studied aiming to maximize the customer value and market optimization. The study carried out explains the business dynamics, operation dynamics of the port and port related services and relative marketing perspective.

1.2 Changing Roles of Ports

The role and function of ports is rapidly changing These changes are due to

- Economies of scale in ship size and speed, as well as specialization of shipping and ship types.
- Economies of physical change in the form of cargo, which influence new methods of cargo handling, processing and warehousing
- Economies of specialization in cargo forms or types - bulk, unitized, and containerized carriage of goods

1.3 Review of Factors Determining Shipper's Choice of Port

In tracing the pattern of international trade developments during recent years and pointing to the future trends, the paramount consideration is the ship owner/shipper and more especially the market It is the market, which decides whether the goods will pass on or not and this is conditional on many factors as follows.

a) General world demand for a particular product. An example is oil, which has slumped in recent years compared with the peak of the mid-1970s. This is due primarily to quadrupling of the price in 1973 and the development of the alternative forms of energy. As a consequence, a surplus of oil tanker tonnage has arisen, resulting in an under-utilization of the tanker berths.

b) The quality of the overall international trade transport service. If the port is subjected to frequent industrial disputes, low port efficiency, particularly, in terms of dock labour, sluggish turn-around of ships, absence of modern technology in the port, and so on, the result is likely to be a declining volume of business through the port.

c) The overall competitiveness of the port This includes all the aspects of port operation and commercial practices, such as, tariffs, clearance of cargo, distribution arrangements, hours of working, cargo-handling equipments, other logistic services, port

development, and so on.

d) The port tariff structure. In so far as the Shipper is concerned, some port authorities are very marketing orientated and offer negotiated discount rates to volume shippers. Hence a ship owner or shipper generating, say 100,000 tonnes, of a particular commodity through particular berth annually may have a 5% discount on the published port tariff.

e) The extent of any political or statutory influence relative to port users. Regulations may exist regarding the routing of particular commodities through a particular port, thereby, giving no choice to the shipper A further example arises whereby an increasing number of ports, usually by government decree, give berth preference and more favourable tariffs to the national flag Like, a Singapore flag vessel about to enter Singapore port will be given priority of berth allocation over ships with other national flags, and likewise lower port tariffs. This practice is commonly known as, 'flag discrimination'.

f) The overall transit cost. A situation could exist with parity on port tariffs at two ports situated at some 100 km apart, but where the overall distance from the port to the shipper's premises favours port A rather than port B. Hence, port A is more likely to obtain the business unless port B is willing and able to reduce the port B tariff to a level which will equate to or better the overall transit

cost compared with port A

g) Climatic conditions. Many ports are affected by adverse climatic conditions For example, during winter months, a port may be closed owing to ice formation Other situations include tidal variations imposing draft restrictions, and fog limiting access to and from the port. With regard to foggy conditions, this has been eliminated by the provision of radars on board.

h) Origin and destination of the cargo. This will influence the overall transit costs.

i) The nature of the commodity and the volume. Specific cargoes are dealt with at specific ports - which require specific cargo-handling equipments, facilities and berths.

j) Mode of transport. It may be road, rail, air or canal. If the goods are essentially rail-borne traffic, obviously a rail-link port is preferred.

k) Bunkering costs and other port charges to the ship owner. This will influence considerably which port a ship owner uses when he is examining the port options to start a new service, or reviewing an existing shipping service and the ports served. A further example arises, where some ports offer discounted bunker tariffs to their national flag, thereby, practicing flag discrimination

l) The range of port facilities available to the shipper and ship owner This includes agents, bunkering, stores, provisions, victual ling, tugs, lighterage, towage, ship repairs, surveyors and survey facilities, dry docking, forwarding agents, cargo-handling equipments, door-to-door delivery, customs, port access both seaward and landward, financial services, arbitration, etc

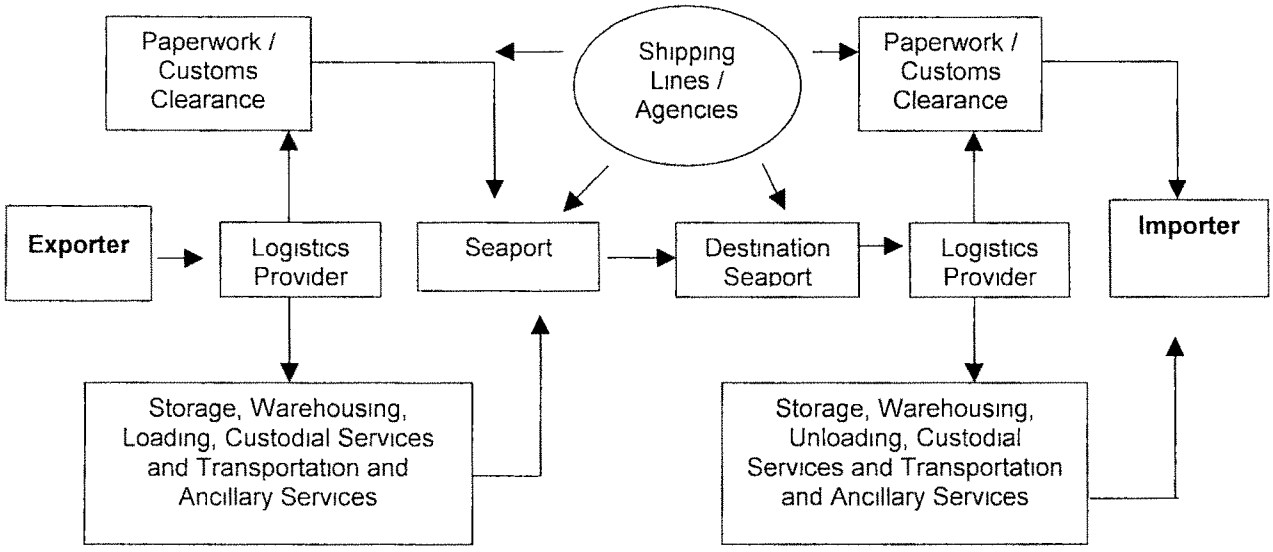
m) Any agreement with liner conferences, trade associations, shippers' councils relative to the users of particular ports.

The significance and importance of the foregoing factors will vary with individual circumstances. The basic considerations tend to be the quality of service, costs, nature of tariffs, the adequacy of port facilities and the overall efficiency of the port together with industrial relation practices

A cargo logistics chain in cargo handling in International Trade and the port and port agencies involved are depicted in following diagram to understand the operational dynamics and a cargo logistics chain

Graph - 8

Cargo Logistics Chain



1.4 Future Trends In International Trade

Against the foregoing background of the factors influencing the shipper's choice of port, it is essential to examine the future trends in international trade and especially how they are likely to affect the port industry. These are

a) The development of containerization and vlccs and ulcc ship sizes Containerization was a revolution that took place in early 1960s followed by the construction of very large size ship tankers for liquid handling affecting the maritime industry all over the world This has drastically changed the design of the ships, face of the ports and the business and commercial practices Containerization will continue to have a major impact on the ports, penetrating existing liner trades and consolidating

further the position in present containerized routes This will call for further investments in berths and associated equipment. These terminals will have highly sophisticated cranes and other container-handling equipment, such as, rubber-tired gantry cranes, straddle carriers, marine loading and unloading systems for liquid handling etc. This will increase the container and tonnage throughput at the turn of the century Further improvements will also foster the development of the combined transport operation involving road, rail, logistics and distribution services to and from the port. More Inland Container Depots (ICDs), warehouses, distriparks and storage and distribution centers will be required away from the port. The advantage is that this will reduce port congestion and, overall, improve the throughput at the container and liquid handling berths

b) Multimodalism: The concept of the combined transport operation is being developed in many trades involving the through rail, road vehicle, or an inland river services The concept of land bridge is an accepted norm in USA and will soon become a way of life elsewhere This system enables the merchandise to travel under one document covering the various transport modes and permits a through rate to be quoted. The major advantage to a port is the unimpeded flow of traffic through the port and ease of documentation and port procedures.

c) Modern cargo-handling equipments, facilities and services: Most industrial seaboard nations have mechanical cargo-handling techniques and their shipping services become modernized. It is important that where there are capital-intensive port transshipment systems, dock labour attains high productivity. The effect will be to place the port in a competitive position and to encourage the development of trade. Countries which do not have modern cargo transshipment systems encourage sluggish turn-around of vessels, increase port charges to the shipper, have longer transit times, and discourage the development of trade compared with countries exporting similar commodities but through a more modern and efficient port and associated shipping services.

d) Computerization: It is developing very slowly in some ports, but by the turn of the century, it will be a major area of technology in many ports throughout the world. Cargo passing through the port and its gates will be thoroughly controlled and monitored by computers. Even the cargo manifests will be issued and dispatched through the computerized environment, together with collation and preparation of consignment lodgement details to customs for custom clearance, including assessments of duties and tax Port must invest in latest equipment, technology and computer systems. 5th generation container quay cranes are now a common fixture in some of the world's greatest ports,

like Singapore and Hong Kong, with computer-aided operations. These cranes are faster, higher and longer. They are designed to handle the latest container vessels with containers stacked 20 across At the terminal itself, the computer-aided expert systems shall be used to expedite operations and to stack containers 7 high (as in Singapore) to optimize the use of terminal space. In 1984, PSA introduced the DATABOX system, which allowed shipping lines access to information on their containers in the PSA database, via terminals connected to PSA computer. In 1989, the DATABOX system was replaced by the PORTNET system, allowing PSA's customers, port users and members of related industries dial-up access to the PSA database PORTNET allows members of shipping community which includes mainly shipping lines, shippers, freight forwarders, hauliers, consignees, agents, to communicate electronically with each other and the port. Through PORTNET, subscribers can communicate directly with Trade Development Board (TDB), Customs, Health, Immigrations and other organisations

e) One-stop shipping center: Ports in future must become one-stop shipping centers, providing modern cargo-handling facilities and a wide range of maritime services. Ships calling at a port must be able to carry out a host of activities like cargo handling, distribution and warehousing, bunkering, acquiring ship

supplies, ship repairs, change crew and so on The quality of these services must be of very high standards and also competitively priced. Prompt, reliable and cost-effective service to the customer should be a port's top priority Singapore's bunker prices are consistently one of the lowest in the world [05] To consolidate Singapore's position as world leader in ship bunkering, Port of Singapore Authority (PSA) is working with bunker operators to use more efficient barges with faster pumping rates, higher maneuverability and highly trained users Special anchorages for bunkering, special bunker jetties and more terminal bunkering facilities will have to be designed and constructed. The ship supplies industry plays an important role in making Singapore a total shipping center. There are many ship suppliers for ships to choose from and the prices are very competitive Ports must upgrade their ship supplies industry, so that good quality goods at competitive prices are available at all time. Ports should offer advanced shipbuilding, ship repair and dry docking services to shipping lines. In Singapore, apart from dry docking and repairs, the local shipyards undertake jobs ranging from the construction of various ships, oil rigs, ferries, tugs, supply boats, to complicated modification, jumboisation and reconstruction projects.

f) Free trade zones and distriparks. In the coming years, major load centers will have to offer efficient cargo handling services

at attractive rates as well as other supporting services One of these is the cargo storage, distribution and processing Goods stored in these Zones can be processed and re-exported with minimal custom formalities Port of Singapore Authority (PSA) provides about 500,000 square meters of covered storage space in the FTZ and about four times that area for open storage.

g) Others: Important thing is that the port must remain effective and efficient in sustaining and developing trade Economic growth of many nations is dependent upon expansion of export lead. This can only succeed in the long term in a highly competitive market, if the international transportation and distribution are efficient. Modern ports attract modern tonnage, which leads to the objective of a country having a low-cost, efficient, sea transport operation. The country and society benefits.

Other activities that will keep port successful in future are:

- Electronic data interchange (EDI) system. This is a computer link of port with various organisations and major shipping lines using port.
- Automated cargo terminal: Transponder readers are featured in the port's gates system, to automate the retrieval of cargo records, and for self-service terminals to capture

and identify the actual identity of truck drivers.

- Cargo freight stations and self service terminals.
- Teleport electronic highway, linking various ports worldwide, to exchange information on cargo loaded electronically
- Telephone enquiry system - a voice-enquiry system for stevedores to dial in to find their work deployment
- Marine systems - to facilitate safe movement of vessels in and out of the port, pilotage, guidance, and giving vital information, ETAs (expected time of arrival), ETDs (expected time of departure), etc. The Vessel Traffic Information System (VTIS) and Computer Integrated Marine Operations (CIMOS), to provide automated assistance to planning staff, enabling better management of anchorages, pilots, launches, berths and tugs. By optimising the utilization of such resources, the effective capacity of the port could be increased Thus enabling the expected growth in demand to be met with a less than proportionate increase in resources

1.5 Recent Developments

Three important developments in the last two decades have radically altered the role of many ports and created new demands on port planners, engineers and operators. These are:

- the large increase in the size of tankers and bulk carriers
- the development of large and fast container / cargo ships
- almost total demise of international passenger liner (other than cruise) traffic.

The movement of goods by sea, in recent years, reflects a similar pattern of change to that displayed on modern roadway systems. In the last century the objective was to link the centers of population with as direct a route as possible to the heart of towns and cities Main arterial roads actually encompassed the high street, and the wharves and jetties serving sea transport were similarly located with the same objective.

02 General aspects – port pattern and cargo characters

2.1 Basic issues and interrelated context of liquid cargo handling in India

The basic issues and their inter-related contexts dealt with are:

- Influences of Indian port policies: privatization, Major Port Trust Act, 1963, etc.
- Socio-economic developments of India cargo growth determining factors, etc.
- Commodity analysis for bulk liquid cargo· commodity nature, values, transport requirements, etc.
- Hinterland transport infrastructure : origin / destination of cargo

- Port performance · trade volumes handled and vessels involved at various ports
- Current and future port capacities overview of existing and planned facilities / capacities
- Cargo forecasting methodology for bulk liquid cargo.
- Generalized – least – cost analysis . Determination / comparison of transport cost elements
- Allocation forecast cargo to ports / port areas.
- Study of required V/s. available port capacities in terms of vessels handled.
- Port policies: considerations to arrive at a Strategic Plan for the ports.
- Evaluation of data sources and analysis of required data input and sources.
- Utilization of the Geographic Information System (GIS) technology

2.2 Commodity structures and composition

The trade nomenclature of cargo covers worldwide trade movements in great detail (cover 4000 commodities) and identifies next to countries of O/D (origin / destination), the cargo volumes and their values. By use of the trade nomenclature, it has been possible to cluster various cargo with similar (cargo and transport) characteristics. The following provides an overview of the main clusters. As per the depth of specific study required, each of the clusters can be subdivided

into more detail

In general, the cargo classification is made into four major clusters, namely, general cargo, major bulk, minor bulk and oil and chemicals. This is based on the SITC (standard international trade classification)

2.3 Factors affecting composition and aggregation of the clusters

General cargo	**Major Bulk**	**Minor Bulk**	**Oil / Liquid Chemical Products / Gas**
Gen Consumption goods	Coal / cock	Animal feed	Crude oil
Animal synthetic	Grain / soya	Fertilizers	White products
Gen Finished products	Iron ore	Soft wood	Middle distillates
Special / high value good	Phosphate	Round wood	Black products
Fresh / edible products	Bauxite / alumina	Hard wood	Lubricating oil
Secondary bulk / general Cargo		Wood chips	Other residues
Wood / paper manufacture		Pulp / cellulose	Tar / bitumen
Heavy / project cargo		Stone / gravel	Natural asphalt
Transport / vehicles		Clay	Anti knock comp
Live animals		Cement / lime	Animal oil
Army / weapons		Sulphur /pyrite	Vegoil
Other / secret		Other non-ferro	Molasses
		Other minerals	Consump Alcohol
		Petroleum cokes	Juices
		Sand	Hydrocarbons
		Salt	Alcohol
		Iron / steel	Organic acids
		Scrap	Nitrogen compound
			Organic / inorganics
			Other organic chemicals
			LPG
			LNG
			Chemical gas
			Ammonia

The general cargo-group harbours hundreds of commodities, the same applies for the last – oil and chemicals group. The bulk groups on the other hand have a more simple structure.

For the purpose of this research work and study, the researcher restricts and confines to the specific cluster area on liquid cargo handling of oil and chemicals group. The other cargo clusters wherever touched upon, aims at to understand the relative and overall contexts in broader perspectives.

The composition and aggregation of the commodity clusters depend on several factors.

- Nature, value and volume of the cargo. The nature is the commodity type and harbours several sub-characteristics, such as the stowage factor of the cargo. Together with the value and volume aspects it is a determinant for other transport factors, such as the packing and the unitisation possibilities

- Unitisation aspects are especially relevant in the general cargo sector where the first groups listed are fully unitisable, the last groups progressively not.

- Just-in-time / required transport speed parameters In order to limit excessive storage and the amount of capital involved, requirements for valuable commodities are often fulfilled at the last moment, making reliability and transport speed extremely important

- Parcel size, the value of one consignment This information is identified on the cargo manifests. In many cases bulk cargo appear to be carried in large quantities, while the actual situation may be different and many consignments may be carried as one In the port of destination the cargo is subsequently split-up into the individual lots.

- Geographic parameters, such as the first place of origin, the last place of destination, including the through / hinterland transports aspects and the location of the producers and consumers of the cargo.

- Other factor may include the statistical / reporting possibilities, the storage and stowage requirements, cargo handling criteria etc.

2.4 Port activities & cargo handling operations – in brief

Introduction

Let us have a look at the chronological phases, which one goes through when entering port. On the one hand this concerns actions from the vessel and its crew, on the other hand actions from brokers / agents, port authorities, stevedores, etc. Most of the actions are co-ordinated by the shipping agent

Prior to docking

After the vessel has loaded in the port of origin, the various cargo

details are forwarded to the agent in the port of discharge by fax. Some 24 hour before arrival, the ship notifies the agent stating its ETA (Estimated Time of Arrival) At that time, the agent takes the necessary steps arranging for the pilot, tugs, boatmen, informing the port authority and the stevedore. In the case of FIO (Free In and Out) terms, the cargo owner is notified and has to arrange for the quay facilities. When cargo is shipped on 'liner terms', these actions are the responsibility of the ship-owner

After arrival

On arrival the agent's representative, immigration authorities and the customers meet the vessel. The cargo is cleared and a discharging permit obtained. At this time a 'notice of readiness' is issued and the unloading procedure may start This notice of readiness is important in connection with L/D (liquidated damage) clauses (demurrage / dispatch times), which are stated in the charter party.

After departure

After the vessel has left, it is upto the agent to clear all outstanding matters and bills left behind These are being forwarded to the ship-owner for which the agent receives a commission. On receival of all port expenses encountered by the vessel, the shipping agent makes the disbursement of the vessel for that port. This is an itemised listing of all expenses made on behalf of the vessel during its stay in port and

includes·

- Port charges / quay dues,
- Tugs, boatment,
- Loading / unloading expenses,
- Bunkers / oil / stores

Modem and efficient ports are necessary and powerful tools for facilitating and fostering trade and development and more so at a time of globalization of trade Nowadays, ports must offer efficient and reliable services to ships and cargo, including communication systems, documentation and customs procedures, to allow the timely flow of goods through the supply and transport chain, which has, in fact, become a production chain. To assist in this flow, some countries have developed distribution or logistics centers in the port area, which are used for the storage, preparation and transformation of cargo. Therefore, ports are no longer simply a place for cargo exchange but are a functional element in the dynamic logistics chains through which commodities and goods flow. An efficient transport system is also a pre-requisite to attract foreign direct investment. Ports can be a crucial element in developing a competitive advantage for a country and therefore governments and port authorities need to adopt suitable port policies to allow the nation to reap this potential benefit

More generally, ports today are called to play an economic role that proves to be far more extended than it used to be previously. After having been at first merely an interface location for cargo between land and sea transport, next a transport, industrial and commercial service

center, the modern port is a dynamic node in the international production/distribution network. Port management appears therefore switching from a rather passive policy of the mere offer of facilities and services to that of active concern and participation in the overall international trade process. These efforts are therefore directed towards promoting trade and transport activities that, in turn, generate new revenue-making and value-adding businesses As a result, ports are more and more turning into integrated transport centers and logistic platforms for international trade. But, as experience already shows, this is easier said than done, and the public sector responsibility in helping this happening or in hampering it must not be overlooked.

The concept of logistics is now widely accepted. In India, the logistics infrastructure is still far from even the minimum at times One must appreciate here that investments and development in infrastructure shall automatically also trigger a growth of superstructure and service providers which in its own way shall contribute towards more employment and a thriving economy. [06]. Logistics is a procedure to optimize all activities to ensure the delivery of cargo through a transport chain from one end to the other. In order to optimize the whole system, the logistic approach is to decide when, where and how actions should be taken. The key elements to develop an advanced logistics strategy will usually include.

- Understanding the cost behavior of the entire logistics systems and

incorporating it into offshore sourcing and manufacturing decision-making,

- Promoting strong relationships with carriers and vendors that include quality certification procedures,
- Designing a flexible transportation system that allows for quick routing and mode selection changes;
- Developing a supportive logistics information system that is effectively integrated with manufacturing and purchasing processes.

Beyond their original need for large operational areas, stemming from the technological evolution mentioned earlier, port will have to face the two main problem areas of space and accesses. Space will have to do in the first place with the new logistical functions Ports have to undertake to keep up with the requirements of international trade. There is a significant number of activities, which can be classified as value added services in the field of logistics. It is therefore important to give an overview of these activities and an insight into the functions and relations. Value added services can roughly be divided into logistics activities strictly speaking, and general value added services The logistics activities themselves can fall into two categories.

- General logistics services: storage, loading/unloading, stripping/stuffing, group-age, consolidation and distribution
- Value added logistics (VAL): repackaging, customizing, assembly, quality control, testing, repair etc. General value added services

will include such services as equipment maintenance, equipment renting and leasing, cleaning facilities, tanking, information/communication, safety, security services, offices.

When grouped together in a common dedicated area, general logistics services and value added logistics activities become what is sometimes called a Distripark. Rotterdam in the Netherlands, Wakefield in the United Kingdom, Verona in Italy, Bremen in Germany are examples of this kind of arrangement. General cargo ports are generally a preferred choice to set up distriparks, since they are already intermodal transport nodes and main traffic gateways.

Accesses are critical to the success of any logistical center. As a matter of fact, accesses are critical for the port itself, with or without a distripark This is indeed a pervasive issue today in many ports worldwide. In many countries, to make things worse, priority in land access to ports was often given prominently to railways, at the expense of road traffic. This was specifically true in former centrally managed economies, like in Eastern and Central Europe So with the pronounced shift towards road transport now taking place in these countries, the limitations in road access to ports quickly became one of the most conspicuous bottlenecks of the transport sector.

A potential way for cities and ports to address together the space constraint, while still offering the global logistical services the market expects, could be to manage space and accesses in a more dynamic way. Most logistics services if they can benefit from being carried out

close enough to the port, do not need to take place physically in the port itself. In fact, it will often be preferable to set up the logistics services area outside the port itself, where it will be easier to find adequate land available at a reasonable cost, the main criteria being easy connections with the different land transport modes. Of course, the connection with the port will remain the critical issue to make the whole system work, but in many instances solving this specific connection problem may well prove to be cheaper, or to make more economic sense for both the port and the city, than to try to expand port land at high cost. The traffic generated on this expansion would require higher capacity accesses anyway and would just concentrate the traffic management problem as the single port/city interface.

So it is surely fair to say that the future of ports will hinge more and more on their capacity to develop their offer of logistics platforms, associated with their regular transit operations. This capacity will depend in turn on the arrangements ports can reach with their home cities in order to provide adequate infrastructure connections between the port area and the inland platform

2.5 Planning traffic flow and cargo movements

It is imperative to understand some of the important aspects on the forecasting of trade and traffic flows for terminals and ports Such a forecast usually results in future cargo flows by type and physical appearance and the corresponding movements of ships by type and size class. It is based on the framework of transport planning models.

For the port concerned, the relevant part of the regional or worldwide network needs to be drawn in such a way that no essential information is lost.

2 5 1 Levels of decision making in transport planning

Three levels of decision-making in transport planning models can be distinguished and applied:

1. The level of locations (trade generation) concerns:
   - Location of industries, number of goods produced
   - Total of imported and exported goods per region.
2. The level of relations (distribution) concerns:
   - The choice of trade partners
   - The assessment of trade relation between regions.
3. The level of operations (modal split, choice of ship size) concerns:
   - The choice of a certain mode, shipping route, size of shipments, logistic chain.

Trade generation, the assessment of incoming and outgoing cargoes per region, concerns long term decision making Trade distribution, the choice of trading partners by importers and exporters is less fixed, but also takes some time while modal split is an operational issue.

Based on these levels of decision-making the classic four-phase transport planning model has been derived which can be applied to the movements of cargo. The four basic phases are

(1) trip generation (in the case of goods one can read 'cargo flows'), (2) distribution of flows and at the operations level (3) modal split and (4) assignment The 'preparatory' phase at the top and the final phase 'evaluation' at the bottom concern the start and final phases of the evaluation process for which the transport planning model is used.

The evaluation may have the concerns for financial or economic evaluation of investments in infrastructure (rail, road, and ports), the performance of a transport service (bus lines, railway lines or shipping lines) or the identification of bottlenecks therein for instance a rail or network.

In the preparatory phase the area of influence is identified and is divided in traffic zones or regions and a corresponding network of infrastructure or transport services is defined Freight flows are divided according to type of commodity and types of vehicles are being defined. Liner services are being defined (bus or railway lines in case of passenger traffic and container/tanker shipping lines in case of sea transport) and the liner services are divided according to type of service and size of vehicles or ships.

In the first phase of traffic generation and attraction, the numbers of trips or volume of cargo flows coming in or going out is assessed on the basis of the characteristics of the regions concerned.

In the second phase, the distribution phase, the outgoing trips or cargo flows are allocated to or distributed over the various destinations

The third phase involves the choice of mode. The various trips are allocated to the different modes of transport .

a) in case of freight over land: truck, train and river barge; and
b) in case of freight over sea: liner shipping, bulk shipping and specialized shipping.

In the last phase, the assignment phase, the various flows by mode are transformed into vehicle movements, which are assigned to the corresponding networks such as:

- Freight movements by truck/tanker to a road network,
- Freight movements by rail to rail network;
- Freight movements by barge transport to a inland waterway network,
- Freight movements in container/tanker over sea to liner shipping services

It should be noted that the last phase is not very relevant for e g. bulk shipping In case of bulk shipping, however, a more relevant issue is the assessment of the size of consignment, which determines the size of the ship This can range from a small bulk carrier of few handred tons dwt (dead weight tonnage) to a large one of more than 400,000 tons dwt, such as the Berge Stahl (name of the vessel).

2.5.2 Cargo flow model · a mathematical relationship

The mathematical relationship and the parameters of the function concerned need to be estimated by, say for instance by a regression analysis. The mathematical relationship often so chosen is linear or non-linear and can be applied for the total or for cargo by sector. It is advisable to apply a non-linear relationship, as during the past, trade increase is stronger than GDP.

The mathematical relationship between incoming and outgoing cargo flows could be the indicators of economic activity such as GDO (Gross Domestic Output) or GDP (Gross Domestic Product) [07]

Development as a function of time

(1) $x_t = X_0 (1+g)^t$

x_t = Cargo volume in year t
x_0 = Cargo volume in year 0
g = Annual growth rate, $g \geq 0$

(2) $x_t = a\, e^{gt}$

a = constant
g = exponential growth rate, $g \geq 0$

A linear relationship

(3) $x = \alpha_0 + \alpha_1 y$

α_0, α_1 coefficients
x = transport flow
y = gross domestic product, as an indicator of economic activity, $y \geq 0$

(4) A multiplicative relationship between production / consumption and explanatory variable

$x = \alpha_0 y^{\alpha 1}$

α_0 = constant factor
α_1 = elasticity
y = GDP, $y \geq 0$

The coefficient α_1 is referred to as elasticity. A convenient property of it is that, if GDP increases with 1%, the total transport flow will increase with α_1 x 1%= α_1%. This relation only applies for small values of the growth rate.

Generally, it is not likely that cargo flows will develop with growth rates bigger than those of GDP for longer periods of time There often good arguments to assume that after some time the growth rate come close to that of total economic activity, i.e. the growth rate of GDP. This can be achieved by applying lower growth rates for period further away in the future. This effect can be achieved by applying a logistic function.

(5) A logistic function

$x = a/(1 + c.e^{-kt})$

a = saturation level of x

t = time

k, c = constants

Various coefficients can be estimated with regression analysis

New factors having lead and still leading to an intensification of trade have come up such as

- the vertical disintegration of production activities

adding extra links to the supply chain;

- the customization and outsourcing of production / service activities;
- a trend towards spatial concentration of production, and
- the rationalization of supply base.

Per type of trade, the impact of these developments is different.

The impact is little for the flows of the major and minor liquid and dry bulk goods and the handling of these goods in ports. For neo-bulk commodities such as iron and steel products, timber products, temperature controlled goods and agro-bulks, there are some interesting developments with respect to supply chain management. In these concepts, processing and value added services are to be located in well-chosen seaports. Ro-ro shipping is also playing and increasing role for these goods

For general cargo flows, however, the impact is great leading to a strong increase in trade, economies of scale in shipping and ports and an overall increase in the importance of quality of service. The container liner shipping network is becoming more fine-meshed, ships on all services are becoming bigger and, for certain

segments, also faster, and the Port entities involved have to adapt themselves continuously to the changing world. Some quantitative justification of the increase in trade intensity can be derived from the worldwide development of trades The factors determining the development of throughput concern the development of:

1 economic activity in general;

2 logistics and technology penetration;

3. trade intensity of various sectors of the economy,

4. shipping systems such as multi-porting and hub and spoke systems; and

5 port competition leading to shifts in port hinterland

The maritime planning needs detailed knowledge of cargo flows between certain regions and the interactions, which exist between such flows This applies to planning with both shipping and ports.

2 5 3 Application of distribution model-origin and destination (O/D)

The outgoing trips or cargo flows are allocated to or distributed over various destinations and can be presented in an Origin Destination table or matrix. This table can take a form as under

General form of the Origin – Destination table [08]

Origins	Destinations						J=M $\sum_{j=1} T_{ij}$
	1	2	. .	J		M	
1	T_{11}	T_{12}	T_1	T_{1j}	T_1	T_{1M}	O_1
2	T_{21}	T_{22}	T_2	T_{2j}	T_2	T_{2M}	O_2
3	T_{31}	T_{32}	T_3	T_{3j}	T_3	T_{3M}	O_3
	$T_{\_1}$	$T_{\_2}$	T	$T_{\_j}$	T	$T_{\_M}$	O
I	T_{i1}	T_{i2}	Ti .	T_{ij}	T_i	T_{iM}	O_1
.	$T_{\_1}$	$T_{\_2}$	T	$T_{\_i}$	T. .	$T_{\_M}$	O
N	T_{n1}	T_{n2}	T_n	T_{2nj}	T_n	T_{nM}	O_N
i=N $\sum_{i=1} T_{ij}$	D_1	D_2	D .	D_j	D.	D_M	i=N, j=M $\sum_{i=1,j=1} T_{ij}$

Assume that there are n regions numbered from 1 to N The rows for instance can represent the cargo flows originating in one of the origin regions numbered from 1 to N The columns can represent the cargo flows with a destination in one of the regions numbered from 1 to M. It should be noted that the set of origin regions and destination regions do not have to coincide.

Thus, a cargo flow from origin region 3 to destination region 2 is given the notation T_{32} In a more general way one gives a cargo flow from origin region i to destination region j the notation T_{ij} All outgoing flows from origin regions i add up to Oj. In a similar way, all incoming flows for destination region j add up to Dj.

In formula for all flows going out of region i ·

$$\sum_{j=1}^{j=N} T_{ij} = Oi$$

and for all flows coming into region j :

$$\sum_{i=1}^{i=N} T_{ij} = D_j$$

The total of O_i and D_j are the result of the generation and attraction phase and the cargo flows T_{ij} are the subject of the distribution phase. The regions i and j do not necessarily have to coincide and may be different. We can assume N origin regions and M destination regions. For instance, the table applies to the flows from producing regions to consuming regions

With respect to the relationship between production / attraction and distribution three possible options exits:

1. both Oi and Dj are given as the result of the production and attraction phase, respectively
2. only Oi is given, or
3. only Dj is given

Specification (1) is called 'doubly constrained' and the other two 'singly constrained'.

Types of distribution models

Distribution models can be distinguished in singly and doubly constrained models and for the latter three types of solutions are used, depending on the way the structure of the OD pattern is established:

a) gravity types of models with a deterrence or cost function,

b) LP (linear programmed) models assuming optimizing behaviour, this can also be considered as a special case of (1); and

c) A basic (explained or unexplained) structure that can be reproduced by the RAS technique

An example of the gravity model is given below:

$T_{ij} = AiBjOiDjf(cij)$,

Where:

T_{ij} = tons of cargo moved from i to j,

O_i, D_j = incoming and outgoing flows for region i and j;

A_i,B_j = balancing factors corresponding with region i and j, these factors indicate the importance of the area of origin i and destination j for a particular flow from i to j;

$f(C_{ij})$ = the deterrence or cost function : a function of the generalized transport costs per ton from region i to j;

C_{ij} = generalized transport costs per ton from region i to j;

The cost or deterrence function makes that the further region i away from region j and as a result, the higher are the transport costs and travel time, the smaller the flow of transport from i to j.

The form of the gravity function is

$f(C_{ij}) = (C_{ij})^{-\beta}$

β = parameter of the deterrence or cost function.

$\beta \geq 0$, $Cij \geq 0$

The larger the value of the coefficient β, the greater the (negative) impact of costs on the volume of traffic flows.

2 5 4 The logit model (demand choice technique) for cost and quality of service trade-off

The trade-off between costs and quality of service aspects can be dealt with using the demand choice technique (Logit model), producing the probability that a user will choose a certain option, rather than the 'all or nothing'

The value that customer j attaches to routing is measured in the 'utility' being a (linear) combination of all aspects or attributes of importance for the selection and is expressed here as

$U_{ij} = \alpha_{oij} D_{ij} + \alpha_{1ij} C_i + \alpha_{2ij} T_i$

D_{ij} = dummy variable indicating whether or not customer has a preference for routing i;

C_i = shipping costs for routing i inclusive of freight rate, handling charges, land transport costs etc

T_i = transit time for routing i

$\alpha_{oij}, \alpha_{1ij}, \alpha_{2ij}$ = coefficients of utility function

Relative position of a service

Compare the probability that a customer chooses routing k=m against the case he chooses routing k=n This can be achieved by subsequently substituting m and n in equation 1, and dividing the results As the denominator is the same for both, the result becomes:

$P_{mj} / P_{nj} = e^{Umj} / e^{Unj} = e^{Umj-Unj}$

The probability of the ratios appears to be a function of the differences of the various attributes. The values for the coefficients of the utility function to be used here are:

α_{0ij} = 0 00;

α_{1ij} = -0.01,

α_{2ij} = -0.50;

The probabilities could be assessed by making mathematical simulations of the passage of the approaches by typical ships under typical hypothetical circumstances. By systematically varying the nautical behaviour of the vessels navigating the approaches of the berths, insight can be gained in the values of the probabilities.

03 Pricing regulations for Port Services

The evolution of pricing over time is influenced by market forces. The payments to the port generally allow for adjustment to account for inflation and may also allow for adjustment for the changing value of the concession. Where the contract involves the transfer of activities from a public monopoly to a private operator, some degree of regulation is required. This can lead to two difficulties. First, if the existing prices do not reflect the market value of the services being provided, then the agreement may preserve this distortion Second, if the market is changing and the quality and types of services required is changing, then the agreement may discourage from introducing these changes.

In most circumstances, the port charges are based on the costs of an inefficient public monopoly. Public port tariffs also tend to have a complex

structure developed from monopolistic pricing practices or arcane cost-based pricing formulas. Another is the use of commercial pricing based on the value to the user, rather than the average cost to the port. Over the short-term, it is important to protect the port users against unreasonable increases in total charges and excessive discrimination. It is desirable to introduce competitive forces to regulate the charges to the user.

Regulations of charges to the users should be limited to those services for which there is no direct competition, e.g., the cargo-handling charge in dedicated terminals or the captive terminals. This will allow to set prices so as to compete for market share in those logistic services offered by other private parties or by the port. The difficulty is to develop an unambiguous definition of competition. This will vary depending on the market. The primary factors to consider are the barriers to entry for potential competitors and the market power of the port users. Regulation should be limited to situations in which there are relatively few service providers who enjoy a distinct cost advantage over potential competitors and where the port users do not have options in terms of different ports, modes, routes, forms of shipment and do not have the market concentration to negotiate effectively. Since the level of options available to the port users (both vessel lines through consortia and conferences and cargo owners through forwarders and non-vessel operating common carriers) are increasing, the requirement for regulation is decreasing. Where pricing regulation is maintained, the most successful procedures have been to use an index that provides an allowance for both inflation and improvements in productivity where the resulting rates are applied as

maximums.

The need for flexibility in pricing is most important where the traffic is changing and the logistic services are evolving Changes in the relative costs of labor and capital, especially in developing countries, will affect not only what is an appropriate price for port services, but how these prices should be differentiated according to the proportion of labor and capital used by different groups of users. Attempts to anticipate these changes in a regulatory process are cumbersome. Where formulas are used, they reduce flexibility, but where negotiation is used, the uncertainty of the income is increased.

The agreements need to allow for competitive pricing of new services, rather than to attempt to bring them under a broad regulatory framework

Public ports have set their tariffs through evolution and relied primarily on comparative pricing. The concept of cost-based pricing was introduced by development agencies to eliminate government subsidies for specific port services This concept was never effective in improving port efficiency or innovation. Instead, public ports have relied on a few innovative ports to develop new services and define the pricing structure and rates for these services While this will continue under a system of private concessions, the evolution is expected to become more rapid

The determination of an appropriate pricing structure depends on the level of risk associated with the concession and the willingness of the parties to the agreement to share this risk.

04 Strategies to invigorate Port Industry

The Indian Port Industry should be able to enhance its global level competitiveness to be successful. Obviously, the first important attribute is developing the global mindset, which goes with it. The world should be the market place, not just India. In any event, global competition has to be faced within the country itself with import barriers and protection coming down Once the 'Think Global' mindset takes hold, other things will follow as a natural corollary.

4 1 Important Areas for right strategies:

There are several important areas wherein the right strategies from industry will lead to enhance cost efficiencies, developing new products and applications, tapping emerging opportunities from within and outside the country. These areas are:

- Process optimization
- Networking
- Marketing
- Supply Chain Management
- Industry Clusters

4 1.1 Process Optimization

Process optimization or process intensification more or less is the various names given, essentially to the same exercise. This single aspect is likely to have a major impact on the sustainability of the industry and to maintain its competitive edge in the global scene.

4 1.2 Effective Networking with Academia

Networking is neglected by Indian port industry, mostly due to poor protection to intellectual property rights and the secretive mindset of the industry

Networking and knowledge sharing can be a tremendous asset to any industry, but unfortunately, its benefits sometimes cannot be quantified accurately and sometimes are in kind and abstract The reach of information to and from industry is very poor, yet with the advent of the Internet, the scene is fast changing The expertise to generate, manage and retrieve information in the Port Industry is limited to the downloading and tinkering with the processes. The benefits of this activity are evident for everyone to see, if one looks at the growth and the progress of the Port Industry.

It is necessary for Port Industry to,

1. Prepare a consolidated list of the problems and difficulties faced by them
2 Identify the pockets of expertise available within the country or outsides, which can solve these problems.
3. Network with these pockets to find a possible generic solutions.

4.1.3 Marketing

This is an area of weakness for the Indian port industry, long used to only 'selling' in a sellers' market. Very few know that

marketing involves from the very concept of the product or service to its potential customers. Marketing is not something to be left only to the marketing manager, but should concern everybody in an enterprise, in fact everyone should think marketing. The functioning of most industries in India is yet to get into a modern seamless borderless functioning, it continues to be heavily compartmentalized with people in one functional area like say, operations not being bothered about marketing and vice versa.

Marketing must involve building a brand through corporate image or specific product / service related brand equity Such branding and brand marketing is a prerequisite for success globally, as a brand signifies not just the product / service but also the entire package that the company offers right from technology to customer service and including even the philosophy and principles of the company Such brand image is required to build customer confidence, loyalty and strong basket of attributes and perception in the customers' minds What Indian companies do by and large now is like an adhoc case by case selling which is not sustainable globally in the long term.

Brand building is a long-term strategy and needs sustained promotion through advertising, participation in exhibitions through internet & websites, direct mail and through direct customer contact

Indian companies lose out on several global opportunities simply because they haven't bothered to create awareness for the rest of the world to know of their capabilities

Fundamentals to marketing are customer service and customer relations, both of which are not given due importance. Being close to the customer, knowing the customer's requirements (even in advance) and problems in relation to the product / service being marketed and being constantly in touch as a part of a family are important for success in marketing.

Knowing what the competition is upto (globally), intelligence information on competitor activity and checkmating through proactive strategies before the competition has been started are aspects that Indian companies got to learn.

4 1 4 Supply Chain Management

Significant cost benefits and improved service can be realised in the area of logistics In India, due to poor infrastructure, proper logistics planning is imperative to avoid headaches, hassles and customer disappointment. Integrating supply chain with one's distribution schedules has become possible with a variety of software and tracking mechanisms that are available This can lead to an effective tool for lowering response time, reducing circle time and improved customer satisfaction. A KPMG study reports that high efficiencies in logistics can enable the industry to reap savings as high as one per cent on sales.

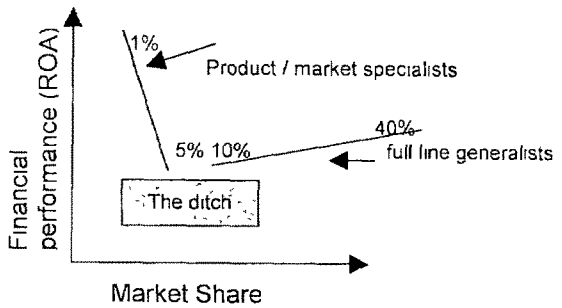
4.1.5 The Rule of Three

In an environment dominated by giants, why do small companies thrive ?

In the book titled "The rule of three : surviving and thriving in competitive markets" [09] states that every industry free of excessive Government intervention eventually will consist of three dominant competitors surrounded by a host of niche specialists. When the markets are largely free of regulatory constraints and entry barriers, it eventually characterizes two kinds of competitors (a) full line generalists: they compete across the range of products / services and markets and are the players driven by volume. For them financial performance improves with gains in market share. (b) product or market specialists : these players are margin driven and their financial performance deteriorates as they increase their share of the market

The Rule of Three

Graph No. 9



Source Ivey Business Journal

The above exhibit asserts that mid sized companies falling in middle position (the ditch) almost always face the worst financial

performance which are usually between 5% and 10% market share. It suggests that the most desirable competitive position is keeping away from the middle. According to Prof. Jagdish Sheth, a market leading company will receive a higher return on assets if it is a "fast follower" rather than a constant innovator, and so such companies should carefully monitor the technological innovations of their competitors. The number three must create a technological atmosphere even though it is likely to be copied by the competitor. The middle one needs to invest "disproportionately" in marketing by focusing on key customers in key segments. The ditch can be an attractive source of bargains for full line generalists looking to rapidly boost market share

The rule of three applies wherever competitive market forces are allowed to determine market structure with only minor regulatory and technological impediments. It would therefore, may not apply in markets where the following factors are significant.

1. Regulation: If regulatory policies hinder market consolidation or continue to allow for the existence of natural monopolies.
2. Exclusive rights. If patterns and trademarks are major factor in a market, it would imply sub-monopolies.
3. Major barriers to trade and foreign ownership of assets. In

this scenario the rule of three is likely to operate at the national level but not at the global level. It may still be seen in the formation of global groups or alliances.

4 Markets with combined ownership with management. If ownership and management are combined, as in the case of professional services, the market process is not allowed to work. Ownership creates emotional attachments and inhibits rational economic decision making.

When these barriers begin to fall, the market start moving towards the rule of three.

('Guru mantra', The Financial Express dtd. Sept. 9, 2004).

Analyzing above, the port infrastructure companies shall be governed by the rule of three in view of the competitive environment having taken shape at national as well as global level and the regulatory forces being scaled down.

05 Best practices

5.1 What it means

If an enterprise is taken as a purely economic entity, then the best practice is one that enables the enterprise to attain the maximum profits and market share. Thus any practice that can cut costs or increases revenue will fit this definition.

But this definition has its inherent limitations. Like individuals, the organization itself is also a social entity and has its own set of needs, aspirations and priorities that may not have a pure economic rationale.

Considering all the relevant aspects, best practice can be framed as.

"Any practice adopted in an Enterprise, which increases the productivity and effectiveness of the available resources resulting in quality and profits without compromising on the health, safety, environment and the customer value"

5.2 The global perspective

The onset of liberalization has signaled a significant break from the past The external environment has changed completely not only because of the increased competition but also because of the introduction of a level playing field

The changed environment poses increased threats and opportunities for infrastructure segment.

The increased and the sustained competition from the global Port entities have exposed the inadequacies and the inefficiencies that have accumulated in the port system as a result of the long protectionist and regulatory policies of the government.

Under these changed circumstances the traditional and age-old practices and mindsets cannot ensure the survival and growth of the Infrastructure companies. These threats have triggered the transformation of Marketing Practices in Port and Port based Infrastructure entities and have forced them to embrace change by looking for and implementing increasingly efficient and effective methods of service marketing with cost reduction for customer value optimization.

06 Port competition in a transition phase (A global phenomena)

In the 18th century the philosopher Jean-Jacques Rousseau contended that man is a non-competitive "noble savage" when in the "state of nature". Competition arose only when population and modern society grew and resources became scarce. To some extent this reasoning is also valid in a seaport context. The times when ports served captive hinterlands and when resources such as land were plentiful have long gone. Scarce land and a logistics-restructured market place are among the many determinants giving rise to intensified port competition, especially in the main economic regions.[10]

Some thoughts thrown open about the impact of the logistics-restructured market place on port competition and on the distribution of benefits and costs related to port operations as follows:

6.1 Reasons to intensify and reshape the competition

Port competition is in a transition phase and developments that has intensified and reshaped the competitive process in the ports industry are as under:

6 1 1 Division of tasks within logistic chain

It cannot be denied that logistics integration is having a tremendous impact on port operations. The market players in transport and logistics are vertically and horizontally integrating activities to reduce costs, to improve efficiency and to deliver value to the customer The strategy of a number of leading shipping lines to offer integrated door-to-door services provides

a good example of this tendency. In some cases shipping lines end up by managing the container / tanker / bulk terminal operation and inland transport and bypassing the freight forwarder by developing direct relationships with the shipper. Many more examples of the increasingly integrated logistics approach of the market players could be given It is important to add that the provision of integrated services does not always need to coincide with the ownership of the related assets. In many cases, the integration is achieved through close partnerships with other players.

What is the effect of increased logistics integration on ports? The integrated approach has created an environment in which the success of a port will depend on the ability to integrate the port effectively into the net works of business relationships that shape the supply chains As such, the success of a seaport more and more is being determined by the ability of the port community to fully benefit from synergies with other transport nodes and other players within the networks of which they are part.

6.1 2 Structural changes in liner shipping and their impact on ports

A second element having a tremendous impact on port competition relates to the ongoing structural changes in liner shipping.

Shipping lines have reshaped their liner service networks in the

last two decades by introducing round-the-world services and pendulum services, especially on the main east-west trade lanes. This development coincided with the emergence of a new breed of hub terminals along the east-west main shipping lanes at places like Freeport (Bahamas), Salalah (Oman) and several stops on the newly discovered Mediterranean shipping lanes (Algeciras, Gioia Tauro, Marsaxlokk, Taranto and Cagliari to name but a few). These sites are being selected to serve continents, not regions and for transshipping at the crossing points of trade lanes.

Transshipment volumes offer bright prospects to substantially increase throughput But, it may be noted that the relay and transshipment business remains a volatile and risky business.

At the same time, alliances and large shipping lines invest in larger ships to raise productivity. It is expected that vessels size of 5500 to 6500 TEU (in the case of container cargo) will become the general rule in the next 10 to 15 years, as these ships offer more flexibility in terms of the number of potential ports of call (and consequently the direct access to specific regional markets) and as they encounter less diseconomies of scale in ports. Economic criteria, primarily related to ports and the access to markets, will eventually bring the scale increases in vessel size to a halt.

- New liner service networks and larger ships force previously

non-competing ports into head-on-head competition.

- Load centers located far way from each other are now to some extent competing In Europe these are signs that ports in the Hamburg-Le Havre range are now competing with UK ports, especially for transshipment traffic. There even exists some evidence of growing competition between the Mediterranean port system and the Hamburg-Le Havre range
- The new requirements related to deep-sea services do not necessarily make the existing large load centers the best locations for setting-up hub operations. That is why the position of the large load centers is to some extent threatened by medium-sized ports and new hub terminals. In northern Europe, successful upstream ports such as Antwerp and Hamburg as well as existing coastal ports will face competition from new terminal initiatives in the near future. Good examples are the Jadeport project in Wilhelmshaven-Germany, the Ceres Terminal in Amsterdam, the Westerscheldt Container Terminal in Flushing and many other terminal projects in the UK. Most of the planned new terminals are expected to act primarily as transshipment hubs.
- The new terminal facilities might give shipping lines and alliances more opportunities to use their bargaining power to

play off one port against another.

6.1 3 Individual Port entities shift to integrated terminal network

A third element having a tremendous impact on port competition relates to growing consolidation in the stevedoring industry.

A number of stevedoring Port entities have evolved toward logistics organisations by vertically integrating activities. Especially German terminal operators HHLA and Eurogate are directly involved in intermodal rail transport. A number of terminal operators have set-up road haulage Port entities (e.g. Hutchison Port Holding controls the transport company Maritime Haulage Limited and Port of Felixstowe Transport Services) or operate own feeder services (e g. United Feeder Services is owned by Eurogate). Finally, many terminal operators have integrated inland terminals in their logistics networks (e.g. ECT in Duisburg, Venlo and Willebroek). These inland terminals in many cases serve as extended gates for deep-sea terminals.

The last couple of years, it is observed that international stevedoring companies are in the process of creating vast terminal networks They understand that the traditional location-based concept of seaports is no longer valid and should be replaced by a more network approach.

Impact of consolidation process on individual ports:

It is obvious that the consolidation process has a large impact on individual ports:

- First, competition is shifting form port authorities to private terminal operators who are trying to establish terminal networks;
- Second, the large terminal operators are becoming more footloose as they loosen their former strong ties with one particular load center;
- Third, the influx of overseas capital in several ports together with the consolidation in the cargo handling business have created circumstances in which some stevedore companies have acquired a very strategic position in a port's future
- And fourth, the key position of such terminal operators catches the attention of governments and 'landlord' port authorities, as they want to secure that not all economic rents of terminal operations are transferred abroad It is clear that the port authorities should not discriminate between service providers.

6 1.4 The distribution of costs and benefits in the restructured environment:

Who gains and who loses from these processes, have just been described as under and in general it can be said that more parties might gain than lose:

- Consumers, importers and exporters win, because the costs of transport are falling;
- The maritime industries as a whole win, because the share

of transport increases;

- Port operators benefit from growing. Port operators are not full beneficiaries as they are forced to making significant investments without any degree of assurance that port traffic will increase and that shipping lines will retain their loyalty

What about port authorities?

What challenges are they facing with respect to the distribution of costs and benefits in the logistic-restructured environment?

It can be observed that the external spill over effects of ports are expanding it from the local port system towards a much larger international economic system. This is illustrated by the development of logistics zones in the vicinity of seaports and along the main corridors towards the hinterland These logistics sites make intense use of seaports. More significantly, it is quite unlikely that they would have developed, were it not for the presence of seaports As such, port benefits are likely to "leak" to users in inland locations. Antwerp and Rotterdam are in fact the central nodes driving the dynamics in a large logistics pole. But at the same time Antwerp and Rotterdam rely heavily on the hinterland nodes to preserve their attractiveness.

It can be argued that the benefits of port operations are becoming less concentrated in the local port system. But unfortunately at the same time, negative externalities remain spatially concentrated in the local system In many port regions

around the world, it is observed that higher costs have been suffered by local economies in terms of land consumption, coastal waste, environmental problems and traffic congestion This situation potentially brings about major socio-economic conflicts related to port development, for example between community groups and the business community

Another major development is the increased risk for ports of a drain of economic rents to powerful players. The ports become increasingly dependent on external co-ordination and control by (foreign) actors who extract a big share of the economic rent (wealth) produced by ports.

If powerful actors in a specific logistics chain exert strong pressure on a port, because of economic rents generated elsewhere in the chain, it might be wise for the port to 'opt out' of this chain. Many of the costs arising out of hub selection are borne by the port community If the costs and benefits of achieving hub status clearly are not distributed equally between shipping lines and ports, the position of the port might not be sustainable.

Rationale

The new competitive environment might create an imbalance in the distribution of the costs and benefits related to port operations. The port authorities have their role to play to achieve a fairer distribution of port effects and this may demand

a strategic scope of landlord port authorities beyond that of a traditional facilitator:

- First of all, port operations should be guided by the user pays principle, at least for those activities for which the costs can be allocated to specific port users. This objective implies amongst other a correct input payback. A good example concerns rental policy: leasing rents should be linked as much as possible to the costs of the local communities not otherwise countervailed by benefits.
- Secondly, the geographical spread of benefits on the one hand and port users' focus on logistics networks on the other are clear invitations to port managers to enhance the ports' networking capabilities. Control of knowledge intensive activities and co-ordination of partnerships with other nodes allow port regions to held leadership of logistical flows and related added value activities. In many cases, some form of (local) public sector retreat in port management may be required to develop the required networking capabilities.
- Thirdly, it would not be wise for port managers to try to maximize port traffic development. Instead, the spatial and overtime sustainability of costs and benefits should be a prime objective in port development.
- And finally, port Authorities should adopt a 'leadership' role with regard the identification and problem solving of all

issues affecting logistics performance and port development. As such, port authorities have an important task to bring together various stakeholders (carriers, shippers, transport operators, labour and government bodies, community groups and the valued customers/users).

Formal and informal partnerships are crucial in view of achieving a better balance between costs and benefits of port operations. In true partnership both sides must win. The perception that one side must lose for another to win is wrong anyway and will only act as a prescription for turmoil.

References

(01) Kenith, Praveen, MD, St. Lukes (India), in Financial Times dated September 9, 2004 in his article titled 'Ad Agencies: Image makers or brand sustainers ?'

(02) Joti, A. K., Chairman, Kandla Port Trust in Business Standard dated June 20, 2002.

(03) As reported by MD, Kolkatta Port, Business Standard daily dated May 27, 2002.

(04) Views expressed by CMD, Ennore Port, The Economic Times dated August 30, 2002.

(05) Asian Development Bank Report on World Ports, 2000.

(06) Menon, P. M. V., President, Asian Council of Logistics Management, at 3rd National Convention held in Kolkatta in January 2003. Reported in The Link, Cargo & Logistics Journal Volume No. VIII–2, February 2003, Page 33

(07) Cargo flow model – based on Training Programme (2001) by Ecorys, research consultants on maritime economics, Netherlands to Podeg team, Gujarat Maritime Board.

(08) O/D Model - based on Training Programme (2001) by Ecorys, research consultants on logistics, Netherlands to Podeg team, Gujarat Maritime Board.

(09) Sheth, Prof. Jagdish, Emory University, USA (2004) in his book "The Rule of Three - Surviving and thriving in competitive markets".

(10) Notteboom, (Dr) Theo, University of Antwerp, Belgium at Conference organized by IAPH, Montreal – 2001 in his paper presentation 'Port competition in Transition phase (Global Phenomena)'