

A Diagnostic Approach for Cost Minimization and Profit Maximization between User Agencies and The Service Providers in Indian Ports

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ABSTRACT

The objective of the paper is how to reduce the cost of port services to the users of the port without affecting its profitability. They range from service quality and value for money to investment returns and economic efficiency. The rationale behind the port costing is that it enables port management to control costs and operations and allocate resources efficiently. In spite of this, one of the major setbacks that Industry has been facing is the cost of doing business which is highest compared with the rest of the world. Cost minimization is the task to reduce costs by consuming resources more efficiently. Ports ultimately want to reduce costs and increase production. The question they must answer is, how to accomplish this task?

1. Introduction

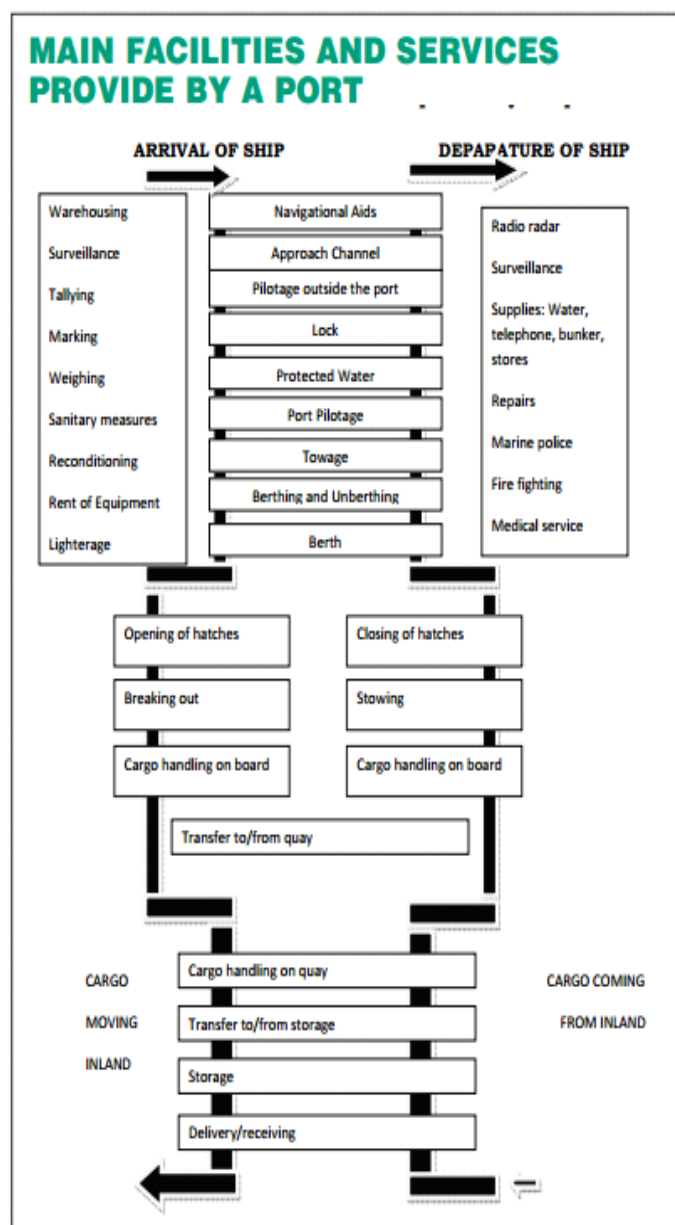
The challenges now being faced by the ports are mainly economy slows down, rising costs, the disappearance of monopoly and stiff competition, despite these bottlenecks, the ports are looking forward to retaining profitability by focusing on cost reductions directly translating to a reduction in user costs and also managing the structural complexity that surrounds a port.

There are many seaport services, but their primary function is to handle cargo between sea and land and/or between ships. The cost allocation of a seaport refers to the cost of labour, equipment and infrastructure and superstructure. The establishment of infrastructure facilities and its maintenance to provide the services creates a flow of cost for the port entity. The use of these facilities and services by the users of the port initiates a flow of benefits for themselves. A strategic pricing policy will enable the port to tap from this flow of benefits to its users to create a flow of revenue for the port. Therefore, a port pricing or user cost is a reflection of the symbiotic relationship between the port and its users. Three important flows, namely, that of costs, benefits and revenue affect the pricing in a port. The cost is borne by a port that provides the services (flow of benefits) to its users, namely, cargo owner and ship operators. The revenue which can be created by tapping the flow of benefits accrues to the port and represents the income from which it can finance its operation.

Seaport as an entity and the services offered are highly complex. In general, the complexity is perceived to be negative - increasing operational costs, overheating systems, a drain on management resources and time. This negative complexity is the result of port entities trying to deliver more to their clients through customized products without value addition. Such customization does not generate revenue to the port.

2. User cost reduction to/ retain or increase profitability

A quick look at the various facilities & services offered by a port to its users (ship owners/operators, shippers, consignees etc.) will help us to understand the possible cost reductions.



Source: UNCTAD, Operation planning in ports, 1985

As facilities and services are concerned, a distinction can be made between those that are specific and general. Specific services and those facilities are clearly identified and charged separately. General services and facilities, on the other hand, the remainder they correspond to the general use of the port. Port dues are generally levied for the use of general services and facilities. Services are further subdivided into those that are given on seaward side (marine services) and landward side and at the connecting point. So port charges are levied to its user to tape the port cost accrued by the port entity. And charges are collected based on three subheadings.

Users tend to look at the competitive advantages of a port to reduce their costs. Competition among ports around the world has increased dramatically due to several factors such as increased competition in liner and tramp shipping, the development of inland transport networks, deregulation of inland transport operators and facilitation of transport procedures. Above all, the unitisation of general cargo which now moves in containers or on pallets and has led to the predominance of intermodal transport, over sea and land transport, and its reduced costs for users. There is stiff competition among intermodal routes and the efforts of ports to establish a competitive advantage that allows them to remain in business.

In the past, the geographical location of the port, the depth of its navigational channel or the security offered by its harbour were sufficient to have a competitive edge. Today, in addition to the above, competitive advantage must be derived by way of providing better services (value added) to cargo and vessels using the port. This can be accomplished through cost leadership through and service differentiation. In the case of cost leadership, a port attempts to become the lowest-cost provider of services or facilities; whereas, in the case of service differentiation, the port seeks to offer services and facilities of superior quality.

3. Cost leadership

A port can achieve cost leadership and service differentiation by addressing the following key factors. There are many micro factors that may not independently contribute to the user cost reduction and increase in profitability.

4. Fast turnaround

For the port, the value-producing activities range from basic cargo-handling and storage activities to cargo documentation and cargo tracking. The value provided to shippers is derived from the transfer of cargo between modes within a given time and in a specified condition. The port may increase this value by reducing the time required to move cargo through the port without loss or damage.

The value provided to ship and transport operators derives from the speedy and careful handling of cargo to and from vessels and vehicles within a predictable lapse of time. The port increases this value by reducing the turnaround time of vessels and vehicles and by increasing their security and that of the cargo. So, lower turnaround time of port will increase berth availability and reduced vessel time at berth for its users (ship owners/operators).

The average Turnaround Time of Indian Major ports has descended to 2.0 days in 2016-17 as compared to 2.6 days in 2011-12, but it was higher even now in some ports like Mumbai Port Trust, Kolkata Dock System, V.O.Chidambaranar Port Trust and Kandla Port Trust, undermining the competitiveness of Indian ports which is a cause of concern. The average Pre-berthing Waiting Time has declined in 2016-17 to 5.77 hours, against 11.13 hours last year. The Average Output per Ship berth-day has gone up to 14,576 tonnes in 2016-17, compared to 13,156 tonnes in the previous year But then a cause of concern is the rise in average turnaround time and average pre-berthing time, and fall in Average Output per Ship Berth day in 2016-17 in some of the ports like Haldia Dock Complex, Kamarajar Port Trust, Chennai Port Trust and Mormugao Port Trust..

Hence, through quick turnaround time a port establishes a competitive edge over its competitors, loss of berth hire is compensated by port dues and other charges accrued by handling more vessels due to the availability of berths. Port users pay less for charges for utilization of the facilities and services.

5. Value addition

Port users are no longer satisfied with the traditional services rendered by Ports. Any process undertaken by the port to add value to the cargo as it passes through it is considered the value added. This will benefit the port as well as its users immensely. A port can focus on providing value-added logistic activities to increase its volume of sales.

Roughly speaking, a maritime logistics chain consists of three large sections: the purely maritime activities, handling of good in the port and hinterland transport services. The formation of chains depends on three important elements: the maritime connections, the goods-handling operations (usually involving large volumes), and the distribution towards the hinterland.

If we come in on the port-related activities, we notice that one of the most important roles of ports lies in the transfer of goods from ship to shore and from ship to ship. Jansson and Shneerson (1982) distinguish the following aspects: In the course of the 1950s, many seaports acquired a further function, in addition to trade and throughput. Because of certain agglomeration effects consisting mainly in economies of scale, location effects and urbanization benefits ports were found to be excellent locations for certain types of industrial activity. Consequently, in addition to their roles in trade and transport chains, they also became significant links in the industrial chain. In more recent research's, one distinguishes even more clearly between the various sub-activities in seaports. Increasingly, these are so-called value-added activities. This evolution is indicative of the increasingly complex nature of seaports.

Year	Avg pre-berthing time (hrs.)	Avg turnaround time (days)	Avg output / ship berth -day (tons)
2011-2012	11.13	2.6	11, 112.0

2012-2013	12.17	2.6	11,800.0
2013-2014	6.91	2.3	12,468.0
2014-2015	5.02	2.1	12,458.0
2015-2016	3.73	2.0	13,156.0
2016-2017	5.77	2.0	14,576.0

Source: Indian Port Association 2011-2017

6. Low and flexible charges

By reducing the complexities associated with service charges, making it simple and implementing a flexible billing system to charge the users only for the services availed and not bind them to bundle charges for services that they are not interested will increase the number of satisfied users (increased volume) and provide a competitive edge to the port (increased marketability translating into volume increase).

7. Integration with other transports

Traditionally, the focus a port has been to increase the throughput of cargo and or passenger in providing service to its users. But in competitive environments ports cannot compete on the basis of operational efficiency and location alone. So they need to provide other integrated transport services to its users. That means ports should be well connected with rail, road and Inland waterways so that shippers and consignees will have multiple options to choose any of the intermodal systems to reach their destination. A port will widen its scope of services while its user will have the option to choose the most cost-effective intermodal transport to move cargo in and out of the port.

8. Access to transport routes

By default, a port would have been located geographically near to the international sea route as well as to the cargo dense area so that it will reduce the transit time from the destination (import) / origin (export) to the seaport. In addition, a port needs to be proactive in decongesting the approach routes (rail or road) from the hinterlands to reduce the lead time to reach the interchange point. This will reduce the user's cost of transportation, adding to the competitive edge of the port. A hub and spoke model will generate a large number of port users giving the new dimension to the port in reducing the port users cost.

9. Economies of scale

A port needs to offer attractive incentives in terms of either cost such as volume discount or services (window berthing, priority in servicing etc.) for its loyal as well as bulk customers to benefit from economies of scale. A proactive approach to meet the needs of long-term and high volume customers such as container lines, automobile carrier lines, etc. will enable the port to have a higher turnaround of vessels and cargo to increase its profitability. In addition, its user will benefit from the reduced unit cost of handling at the port. Business process re-engineering: A port may examine the business processes deployed and optimize the same to improve the productivity of the business processes and have standardized operating procedures. This will remove redundancy in operations and documentation leading to cost savings and reduced processing time and efforts for port users indirectly reducing their costs.

Migrating manual processes to a system driven process flow taking advantage of information technology can reduce processing time, remove redundant paperwork and human interventions in the business process to eliminate subjectivity. Further, implementing a port community system for information sharing amongst business partners will reduce the time of processing and eliminate data processing errors. This, in turn, will increase port efficiency and profitability.

The advancement of information technology provides a wide range of options mainly for the container terminal operators to the automated information system. Electronic devices employed to reduce the manual effort and paper flow, facilitate timely information flow and enhance control and quality of service and decisions made. The use of computer simulation has become a standard approach for evaluating the design of complex cargo handling facilities. It enabled us to investigate the behaviour of two different operating systems, leading to significant savings from the use of electronic devices at terminals.

10. Optimization of resources

Optimizing the resources at the disposal of the port such as yard, equipment, berth etc. will improve the productivity parameters such vessel productivity, crane productivity, truck/vessel/cargo turnaround time, reduce demurrage applicable to vessel/cargo etc. Improvements in productivity and efficiency levels will increase the competitive edge of the port and reduce the cost of operations for the port and its users.

The factors discussed above independently and cumulatively will enable a port to reduce user costs, increase competitiveness and at the same time retain or increase its profitability. These are universal features and port specific factors may be zeroed in depending on the specific port and its infrastructure complexities.

11. Conclusion

The various aspects to solve the problems for cost minimization and profit maximization has been discussed in depth in this study from which the author wants to emphasize that the adoption of the following principles will be fruitful for enhancing operational efficiency. The increase in the terminal competitiveness coinciding with the proper allocation of job commensurate with operational efficiency to handle high-end equipment is vital

The installation of Vehicle Mounted Terminal (VMT) to identify the location of the cargo to be picked up for placing the same in the appropriate earmarked location for speedy discharge minimizing error to attain operational efficiency

The present practice of issuing job orders should be dispensed with and the job orders should be linked with VMT so that it will facilitate the operators to move the cargo faster apart from easier identification of the status of the equipment and the condition of the stacked container

The installation of Optical Character Recognition (OCR), Radio Frequency Identification (RFID) and high accuracy Differential Global Positioning System (DGPS) in the terminals

and location technologies to assess the status of the operation of the control tower where such facilities are not in existence is most essential on need base according to the expectation of the user agencies.

The application of the Internet of Things (IoT) technology integrated with the Terminal Operating System (TOS) will be essential in the future in order to get effective optimization in container flow. The big data platform will enable the terminal operators to identify the problems occurred in the past and

rectify the errors through a centralized system of operation having test check simulation in order to achieve an efficient operational time.

These automation solutions will reduce the gate turnaround time, optimize yard truck movements and minimize container re-handling, which will finally improve terminal competitiveness and eventually reduce the lead to cost minimization and profit maximization.

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