



A STUDY ON CONTAINER CARGO OPERATION AND MOVEMENTS IN PSA TERMINAL PORT

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ABSTRACT

Containerization method means transporting freight by placing it in large containers. Containerization is an important cargo-moving technique developed in the 20th century. Road-and-rail containers, sealed boxes of standard sizes, were used early in the century; but it was not until the 1960s that containerization became a major element in ocean shipping made possible by new ships specifically designed for container carrying. Large and fast, container ships carry containers above deck as well as below; and their cargoes are easily loaded and unloaded, making possible more frequent trips and minimum lost time in port. Port facilities for rapid handling of containers are necessarily complex and expensive and usually justified only if there is large cargo traffic flowing both ways. A container may leave a factory by truck

and be transferred to a railroad car, thence to a ship, and, finally, to a barge; such transfers of an UN-containerized cargo would add substantially to cost.

Key words: Cargo-moving technique, Containerization, Handling of containers

INTRODUCTION:

“Containerization is the use of containers to unitize cargo for transportation, supply and storage”. Container logistics thus incorporates supply, transportation, packaging, storage, and security together with visibility of container and its contents into a distribution system from source to user. Ports, railways, roads, warehouses, shipping & logistics companies, by virtue of being the primary players dealing with containers are also the key contributors to the development of container trade & infrastructure. The advancement in overall trade and benefits due to adoption of containers for transport has brought forward the term “Trading in the „Box“”. Containerization thus, in trade terms, is the driver of various players towards utilizing containers for transporting goods between various places and by various modes of transport. Cargo liners had steadily improved in their speed and



efficiency with the regularity and frequency of services matching the demands of steadily increasing international trade. Further improvements were, however, hampered by the fact that general cargo came in all shapes and sizes. From massive crates of machinery to drums, bales, and cartons. Over a thousand separate consignments per sailing were not unusual and all these had to be best owed by hand. Piece-to-piece cargo is now referred to as break bulk or conventional cargo.

Extraordinary skill was needed to ensure that the different consignments did not damage each other and were carried safely even in heavy weather. The time taken in port was such that there was no scope for any economies of scale because larger ships meant even longer in port. The cost of building faster ships would be lost as the time in port could not be improved. An attempt was made to improve matters by “unitizing” cargo. Which was putting all cargo on to pallets or placing “skids” under heavy crates and cases? This process took place before the ship arrived – a rebate was offered to shippers who delivered their cargo already on pallets or skids. This meant all cargo could be handled by fork-lift trucks and even loaded into the

ship through side ports accessed via ramps on the shore. Unitization raised productivity in the docks from 1.7tonnes per man-hour to 4.5tonnes per man-hour. Then, in the latter half of the 1960s, containers were introduced and this was, and still is, referred to and the “container revolution”; productivity in the docks shot up to 30tonnes per terms of port stays being measured in hours and minutes rather than days and weeks.

RESEARCH GAP

The study on container cargo operation and movements in the PSA terminal port provides a comprehensive overview of the processes and activities involved in the efficient transportation of international cargo. However, there are still some research gaps that need to be addressed.

Firstly, the study only focused on the PSA terminal port, and the findings may not be applicable to other container ports globally. Further studies should be conducted to investigate the similarities and differences in container cargo operations in different ports worldwide.

Secondly, while the study identified the technologies and equipment used in the



PSA terminal port, it did not offer an in-depth analysis of the role of technology in enhancing container cargo operations. Future studies should focus on the integration of technology in the operation of container ports and its impact on efficiency and effectiveness.

Lastly, the study did not examine the environmental impacts of container cargo operations in the PSA terminal port. Future research could explore the environmental sustainability of container ports and ways to minimize their negative environmental impact.

RESEARCH OBJECTIVES

Primary objectives:

To know on container cargo operation and time study of container cargo movements.

To analyze the timely & lead periods involved in movement of container from the point of consumption.

Secondary objectives:

To analyze the qualitative container movements.

To track & keep up with the updated information regarding container & cargo for the customers.

To study the type of container for the requirement cargoes offered.

To evolve efficiency in the movements of same with effective stipulations of newer innovative ideas & structured movements.

LIMITATION OF STUDY:

The results & findings are confined to a limited period.

The opinions of the respondents may be subjective.

Sometimes the observed data will vary based on different conditions.

Some persons will give an approximate value but not exact value.

The data obtained from the respondents will be secured and will not give to others.

RESEARCH METHODOLOGY

The system of collecting data for research projects is known as research methodology. The data may be collected for either theoretical or practical research for example management research may be strategically conceptualized along with operational planning methods and change management.

Research methodology is a way to solve research problem along with the logic behind them. Thus when we talk of the



research methodology we not only take of research method but also context of our research study and explain why we are using a particular method or techniques and why we are not using other so that research result are capable of being evaluated either by the researchers himself or others.

Formulating of research questions along with sampling weather probable of non-probable is followed by measurement that includes surveys and scaling. The last two stages are data analysis and finally writing the research paper, which is organized carefully into graphs and tables so that only important relevant data is shown. Research methodology means the method carried out to study the problem, it shows the type of the sample design used, its size and the procedure used to dew sample.

RESEARCH DESIGN

Research design is the specification of the method and procedure for acquiring the information needed to solve the problem. The research designed followed for this research study is descriptive research design where company fined a solution to an existing problem. The problem of the study is to find out the “problem in container cargo operation in the PSA terminal port”

SAMPLING TECHNIQUE:

Snowball Sampling technique is used for the study.

SAMPLING DESIGN

A simple design is a definite plan for obtaining a simple from a given population. It refers to the technique or the procedure the researcher would adept in selecting items for the sample. Here the researcher using convenience sampling method.

SAMPLE SIZE

Sample size of my survey is 50 customers in various categories of customers the PSA terminal port pvt.ltd

DATA COLLECTION

Primary Data:

1. Information from various departments
2. Practical calculations and observations
3. Use of a questionnaire for getting information

Secondary Data:

1. Books
2. Newspapers
3. Office
4. Newsletter
5. Internet

Primary Data:

Primary data is that which is



collected fresh and happen to be original in character

Secondary Data:

Secondary data is any data, which have been gathered earlier for some other purpose

PERIOD OF STUDY

The study was conducted for four months

LIMITATION OF STUDY:

The results & findings are confined to a limited period.

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DATA ANALYSIS &

INTERPRETATION

Table. 1 showing Know about PSA terminal port

Table with 4 columns: S. NO, PARTICULARS, NO.OF RESPONDENTS, PERCENTAGE. Rows include Web promotion (13, 26%), Social media (8, 16%), Friends (17, 34%), Other company groups (12, 24%), and TOTAL (50, 100%).

From the above table and chart shows 34% of respondents knows via friends

,then 26% of the respondents knows via web promotion, then 24% of respondents knows via others company groups and 16% of respondents knows via social media.

Table. 2 showing Type of shipment

Table with 4 columns: S. NO, PARTICULARS, NO.OF RESPONDENTS, PERCENTAGE. Rows include AIR (4, 8%), SEA (41, 82%), RAILWAY (4, 8%), ROAD (1, 2%), and TOTAL (50, 100%).

INFERENCE:

From above table and chart shows ,82% of respondents prefer sea, then 8% of respondents prefer both rail and air and remain 2% of respondent prefer road. Majority of the respondents prefer sea for moving their shipments.

Table. 3 showing Nature of products the customer mostly deals

Table with 4 columns: S NO, PARTICULARS, NO.OF RESPONDENTS, PERCENTAGE. Rows include DANGEROUS CARGO (5, 10%), PERISHABLE CARGO (12, 24%), BREAKBULK CARGO (17, 34%), GENERAL CARGO (16, 32%), and TOTAL (50, 100%).

INFERENCE:

From the above table and chart, its shows, 10 % of respondents prefer dangerous cargo, 24% of respondents prefer perishable cargo. 34% of respondents prefer Break-bulk cargo. 32% prefers general cargo. Majority of the customers prefer Break-bulk cargo.



Table 4 showing Import & Export Shipments

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include LCL CONTAINER, FCL CONTAINER, REEFER CONTAINER, ALL THE ABOVE, and TOTAL.

INFERENCE:

From the above table and chart, it shows, 24 % of respondents are using LCL Containers, 64% of respondents are using FCL. 10% of respondents are using Reefer containers. 2% of respondents prefer all the above containers

Table. 5 showing Factors Enabling Customers to do business

Table with 4 columns: S NO, PARTICULARS, NO.OF RESPONDENT, PERCENTAGE. Rows include SPEED, ACCURACY, QUALITY, USER FRIENDLY, FINANCIAL ASPECTS, and TOTAL.

INFERENCE:

From the above table and chart it shows that 14% of customers prefer speed and accuracy for enabling business.48% prefer quality for enabling business. 10% prefer quality user friendly for enabling business. 14% prefer financial aspects for enabling business. Majority of customers prefer quality for enabling business

Table. 6 showing Level of Satisfaction in case of tariff rates

Table with 4 columns: S NO, PARTICULARS, NO.OF RESPONDENT, PERCENTAGE. Rows include SATISFIED, HIGHLY SATISFIED, AVERAGE, DISSATISFIED, and TOTAL.

INFERENCE:

From the above table and chart it shows that 36% customers are satisfied with the tariff rates.36% customers are highly satisfied with the tariff rates. 26% customers are average in the tariff rates. 2% customers are dissatisfied with the tariff rates.

Majority of the customers are highly satisfied with the tariff rates.

Table. 7 showing Cargo Handling Services

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include SATISFIED, HIGHLY SATISFIED, AVERAGE, DISSATISFIED, and TOTAL.

INFERENCE:

From the above table and chart its shows that, 38% customers are satisfied with the cargo handling services.32% customers are highly satisfied with the cargo handling services. 30% customers are average with the cargo handling services. None of the customers are dissatisfied with the



cargo handling services.

Majority of the customers are satisfied with the cargo handling services.

Table. 8 showing Issues of Containers while issuing.

S NO	PARTICULARS	NO.OF RESPONDENT	PERCENTAGE
1	DENT OR DAMAGES	16	32%
2	STRAIN MARKS	26	52%
3	SPILLAGE OF CARGOES	8	16%
	TOTAL	50	100%

INFERENCE:

From the above table and chart it shows that, 32% of the customers found dent or damages on the containers in the receiving point, 52% of the customers found strain marks in the containers while receiving. And 16% Of the customers found spillage in the containers. Maximum containers found strain marks while receiving the containers

Table. 9 showing Actions taken for the containers

S NO	PARTICULARS	NO.OF RESPONDENT	PERCENTAGE
1	SEND FOR REPAIR	14	28%
2	INFORM TO EQUIPMENT CONTROLLER	34	68%
3	KEEP SILENTLY	2	4%
	TOTAL	50	100%

INFERENCE:

From the above table and chart it shows that, 28% of the customer's feels that the immediate action taken for the containers which are having issues is

send for repair. 68% feels that of the customers feels that the immediate action taken for the containers which are having issues is inform to equipment controller. And 4% of the customers feel that the immediate action taken for the containers which are having issues is keep silently.

Majority of the customers feels that Inform to equipment controller is the immediate action taken for the containers.

Table. 10 showing Highly Demanded Containers in the Market

S NO	PARTICULARS	NO.OF RESPONDENT	PERCENTAGE
1	GENERAL CONTAINER	21	42%
2	REEFER CONTAINER	12	24%
3	FLAR TRACK CONTAINER	6	12%
4	OPEN TOP CONTAINER	8	16%
5	OTHER SPECIFY	3	6%
	TOTAL	50	100%

INFERENCE: From the above table and chart it shows that, 42% customer's feels that General Containers have high demand in the market. 24% customer's feels that Reefer Containers have high demand in the market. 12% customer's feels that Flat Track Containers have high demand in the market. 16% customer's feels that Open top Containers have high demand in the market. 6% customer's feels that other



type of containers have high demand in the market. Majority of the customers feels that the General Containers have high demand in the market.

Table. 11 showing Using of Container Tracking Equipment

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include YES (66%), NO (20%), ON DEMAND (14%), and TOTAL (100%).

INFERENCE:

From the above table and chart it shows that, 66% customers are using container tracking equipment and 20% customers are not using the container tracking equipment, 14% customers are On Demanding the Container Tracking Equipment. Majority of the customers are using the Container Tracking Equipment.

INFERENCE:

From the above table and chart it shows that 30% customers feels Load port berthing delay in the process of containers flow. 22% customers are feeling shutting out the container. 20% feels delay in the transit. 12% feels Discharging port berthing delay, and 16% feels delay in booking it for resending the container. Maximum customers feel that the delay in the

process flow of container is the Load port berth delay.

Table. 12 showing Stuffing of Cargo in the containers

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include MANUFACTURING (18%), WAREHOUSE (48%), PORT (14%), LCD (OR) CFS (20%), and TOTAL (100%).

INFERENCE:

From the above table and chart it shows that, 18% of the customers prefer manufacturing for stuffing the cargo in the container. 48% of the customers prefer ware house for stuffing the cargo in the container. 14% of the customers prefer port for stuffing the cargo in the container and 20% of the customers prefer ICD or CFS for stuffing the cargo in the container. Majority of the customers prefer ware house for stuffing the cargo in the container.

Table.13 Type of Container Purchase

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include PURCHASE (18%), HIRE (48%), LEASE (14%), REALLOCATE (20%), and TOTAL (100%).

INFERENCE:

From the above table and chart it shows that 18% of the customers purchase the containers. 48% of the



customers hire the containers. 14% of the customers Lease the containers.20% of the customers reallocates the containers. Majority of the customers hire the containers.

Table.14 showing Type of equipment’s used for Stuffing Containers.

S NO	PARTICULARS	NO.OF.RESPONDENT	PERCENTAGE
1	FORKLIFT	17	34%
2	MANUAL HANDLING	22	44%
3	CRANES	9	18%
4	CONVEYER BELTS	1	2%
	TOTAL	50	100%

INFERENCE:

From the above table and chart it shows that 34% of the customers are using forklift for stuffing the container.44% of the customers use manual handling for stuffing the container. 18% of the customers use crane for stuffing the container and 2% of the customers use conveyer belts for stuffing the containers.Majority of the customers are uses manual handling for stuffing the container.

Table.15 showing Container cargo services

S NO	PARTICULARS	NO.OF.RESPONDENT	PERCENTAGE
1	EXCELLENT	12	24%
2	GOOD	35	70%
3	POOR	3	6%
4	VERY POOR	0	0%
	TOTAL	50	100%

INFERENCE:

From the above table and chart it shows that, 24% of the customer’s choices excellent for the current container cargo services.70% of the customer’s choices good for the current container cargo services.6% of the customer’s choices poor for the current container cargo services.None of the customer’s choice very poor for the current container cargo services. Majority of the customers are good with the current container cargo services.

Table.16 showing Level of satisfaction in the free days allowed for Container Warfage

S NO	PARTICULARS	NO.OF.RESPONDENT	PERCENTAGE
1	SATISFIED	23	46%
2	HIGHLY SATISFIED	18	36%
3	AVERAGE	9	18%
4	DISSATISFIED	0	0%
	TOTAL	50	100%

INFERENCE:

From the above table and chart it shows that 46% customers are satisfied with the free days allowed for giving the container out of warfage. 36% customers are highly satisfied with the free days allowed for giving the container out of war age. 18% customers are average with the free days allowed for giving the container out of war age. None of the customers are dissatisfied with the free days allowed for giving the container out of warfage.



Majority of the customers are satisfied with the free days allowed for giving the container out of warefage.

Table.17 showing Cargo Movements

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include TRANSSHIPMENT (48%), SINGLE VOYAGE (36%), ROUND TRIPS (16%), and TOTAL (100%).

INFERENCE:

From the above table and chart it shows that, 48% of the customers are prefer transshipment for their cargo movements. 36% of the customers prefer single voyage for their cargo movements. 16% of the customers prefer round trips for their cargo movements.

Majority of the customers prefer transshipment for their cargo movements.

Table.18 Showing Container preference for lower inventory or storing cost

Table with 4 columns: S NO, PARTICULARS, NO.OF.RESPONDENT, PERCENTAGE. Rows include 20 FEET GP (10%), 40 FEET GP (62%), REEFER CONTAINER (22%), FLAT TRACK CONTAINER (4%), OTHER SPECIFY (2%), and TOTAL (100%).

INFERENCE:

40 feet GP are mostly preferred by the customers for reducing the inventory and storage cost

Table.19 Showing import & export shipments

Table with 5 columns: S NO, PARTICULARS, NO.OF.RESPONDENT (X), RANK (W), WEIGHTED MEAN (WX). Rows include LCL CONTAINER, FCL CONTAINER, REEFER CONTAINER, ALL THE ABOVE, and TOTAL.

RANKING OVERALL

Table with 2 columns: PARTICULARS, RANK. Rows include FCL CONTAINER (1), LCL CONTAINER (2), REEFER CONTAINER (3), and ALL THE ABOVE (4).

Weighted Average = Σ (WX) / ΣX = 75/50 = 1.5

We take the value as = 1.5

INFERENCE:

With the above table we can denote that the 32 respondents from that of 50 prefer for full container load for the shipment they choose

Table.20 Showing Highly Demanded Containers in the Market

Table with 5 columns: S NO, PARTICULARS, NO.OF.RESPONDENT (X), RANK (W), WEIGHTED MEAN (WX). Rows include GENERAL CONTAINER, REEFER CONTAINER, FLATTRACK CONTAINER, OPEN TOP CONTAINER, OTHER SPECIFY, and TOTAL.

RANKING OVERALL



PARTICULARS	RANK
GENERAL CONTAINER	1
REEFER CONTAINER	2
OPEN TOP CONTAINER	3
FLAR TRACK CONTAINER	4
OTHER SPECIFY	5

$$\begin{aligned} \text{Weighted Average} &= \sum (WX) / \sum X \\ &= 108/50 \\ &= 2.16 \end{aligned}$$

We take the value as = 2.2

INFERENCE:

The above calculation show that from that of 50 samples 21 use to say that demand for general types of containers are more than that of other types available in the market

Table.21 Showing Delay of the Containers in the process flow

S NO	PARTICULAR	NO.OF.RESPONDENT (X)	RANK (W)	WEIGHTED MEAN (WX)
1	LOADPORT BERTHING DELAY	15	1	15
2	SHUTTINGPORT BERTHING DELAY	11	2	22
3	IN TRANSIT	10	3	30
4	DISCHARGINGPORT BERTHING DELAY	6	5	30
5	BOOKINGFOR RESENDINGTHE CONTAINER	8	4	32
	TOTAL	50		129

RANKING OVERALL

PARTICULAR	RANK
LOADPORT BERTHING DELAY	1
SHUTTINGPORT BERTHING DELAY	2
IN TRANSIT	3
BOOKINGFORRESENDINGTHE CONTAINER	4
DISCHARGINGPORT BERTHING DELAY	5

$$\begin{aligned} \text{Weighted Average} &= \sum (WX) / \sum X \\ &= 129/50 \\ &= 2.58 \end{aligned}$$

We take the value as = 3

INFERENCE:

From the above calculation we can get to the inference that loading berth delay is the main cause for getting the containers delayed during the shipment process.

CONCLUSION

The introduction of containers resulted in vast improvements in port handling efficiency, thus lowering costs and helping lower freight charges and, in turn, boosting trade flows. Almost every manufactured product humans consume spends some time in a container. Containerization is one example of standardization.

Standardization attempts to solve coordination and matchmaking problems. Shipping products in cargo containers is essential in the flow of materials and goods worldwide. Since global shipping has grown and continues to grow, there is now a need for improved tracking and security of cargo containers. Cargo containers need to be secure so that they are protected from theft. They also need to be secure in order to keep these containers from being used by terrorists. Containers that are not secure could be used to transport weapons of terrorists. The market for container security is still very new but there has been some progress as far as



government mandates and technical standards are concerned.

Container cargo operation study dealt with the types of container required to different types of cargoes and the demand for the customers such as tracking system service level and the service according to the satisfaction level of the customers are studied and tariff level are accordingly revised according to the service demanded by the customers and stuffing of the cargo accordingly and charges for such services are analyzed in the above study.

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