11th TRANS Middle East DOHA2015

5-7 MAy 2015

THE PRODUCTIVITY IN CONTAINER TERMINAL

BY CAPTAIN

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Port Advisor of the ministry of transport in state of Qatar
High seas Master in 1990.
PHD in the strategy from France 1998.
Master in Port management 2011
Bachelor degree of Law 2012.
Port Management , ship Management ,Marine Operation ,Supply chain Management and vessel traffic Management.
Project management ,Port expansions , tendering and contract management .
23 years of experience at sea .
8 years of Experience in the management (field of Marine communication) .
Worked as Consultant of chairman in Alexandria container and cargo handling company (ACCHCO).
Worked as Expert of operation in YANBOU industrial Port (KSA)



Introduction

To optimize the container terminals productivity with in the available resources for the purpose to attract containers and find the best solution to enhance the productivity of container terminal.

❖The development in container terminals to meet the increase in attracting the containerization.

❖The best ways for increasing the productivity.

part ONE

The Productivity of Maritime Container Terminal

The Main Impacts on Productivity

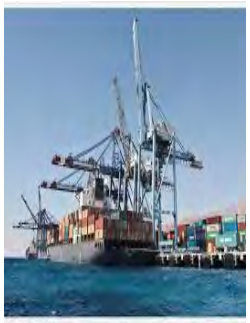
- **A vast number of different berths with specialized berth cranes of different types.**

- **Loading and driving lanes for trucks, with different length and position.**

- **Transshipment zones with several loading tracks under gantry cranes.**

- **Loading/discharging tracks, capable of accommodating an entire train, which differ in length and position on the terminal.**

- **Storage areas, with different shapes, technology and static capacity.**



The layout of a terminal depends on different elements

- **Local availability of space On the inland side as well as on the sea side.**
- **Rail and road regional and local network.**
- **Quantities of maritime and continental cargo flows.**
- **Technical concept of using the superstructure of the terminal.**
- **Number of inland and maritime container terminals in the surroundings.**

Factors influencing the system productivity can be divided into two main groups

External factors

Internal factors

Factors influencing the system productivity

Internal factors

❖**Are most often under the control of the operator and the management of the terminal.**

❖**This group includes terminal configuration and layout, capital resources invested, development strategies and labor productivity.**

Factors influencing the system productivity

External factors

- **Are beyond the control of the operators and the terminal management.**
- **This group contains trade volumes, shipping lines calling the port and the ratio of (import / export) containers or containers in transshipment.**

Terminal Size Benchmark

❖**Benchmarking is a continuous systematic process of evaluating the products, services and work process of organizations .**

❖**Benchmarking is a performance measurement tool used in conjunction with improvement initiatives.**

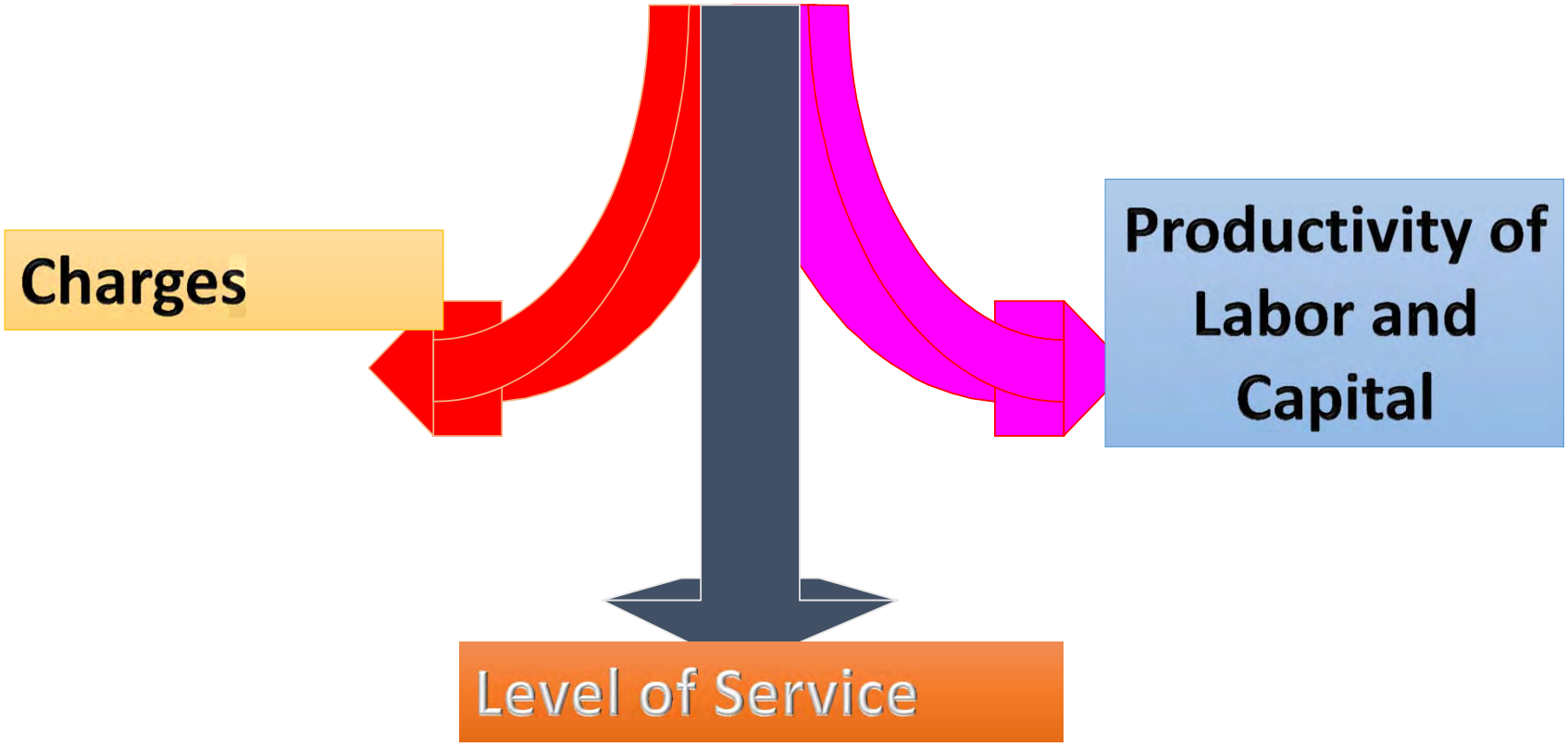
Terminal Size Benchmark

❖**Benchmark standard is generally taken as 20,000 TEU/ hectare/ year.**

❖ **For larger terminals an increase of up to 50% could be considered.**

Terminal Size Benchmark

focused on various aspects of the terminal business to report on one of three areas:-



Terminal Size Benchmark

Commonly used benchmarks on productivity are

- Post Panamax gantry cranes make 35 to 45 lifts /hour.
- Panamax gantry cranes make 20 to 30 lifts/hour.
- Port Mobile makes 18 to 25
- Ship's Gear makes 8 to 15 l

Terminal Size Benchmark

Berth occupancy is the proportion of time that a vessel is occupying a berth it is generally held that occupancy levels of between 60% and 80% per berth is desirable to avoid vessel waiting time delays.

Performance Measurements of Container Terminal Operations

In general seaports have five principal roles:-

- **Handling Cargoes and passengers handling.**
- **Providing services for ships such as bunkering and repair.**
- **Sheltering ships in case of heavy sea and storm conditions.**
- **Founding the bases for industrial development.**
- **Forming terminals to be part of a transport chain.**

Elements of measuring container terminal productivity

- **Ratio of loaded on to unloaded Empty containers are not always included in the port statistic but have to be handled.**
- **Unproductive moves: the handling of all the containers that do not have to be unloaded but have to be moved.**

Elements of container terminal

Element of Terminal	Measure of Productivity	Measure
 Crane	Crane Utilization Crane Productivity	TEUs/year per Crane Moves per Crane-Hour
 Berth	Berth Utilization Service Time	Vessels/year per Berth Vessel Service Time (hrs.)
 Yard	Land Utilization Storage Productivity	TEUs/year per Gross Acre TEUs/Storage Acre
 Gate	Gate Througput Truck Turnaround Time	Containers/hour/lane Truck Time in Terminal
 Gang	Labor Productivity	Number of Moves/man-hour

Elements of container terminal productivity

Berth Operation

The berth operation concerns the schedules of arriving vessels and the allocation of wharf space and quay crane resources to service the vessels.

Elements of container terminal productivity

Ship Operation

❖The ship operation involves the discharging and loading of containers onboard the vessel.

❖This is handled by quay cranes working in synchronization so as to maintain safe separation from each other.

Elements of container terminal productivity

❖The yard operation is perhaps the busiest of all the activities in the terminal.

❖ The operation involves discharging of containers from the vessels, loading of containers onto vessels, shuffling of containers that are out of sequence, or in the yard block, redistribution of containers to other blocks.

Elements of container terminal productivity

Gate operation

- The gate operation deals with external freight forwarders as follow
- Two activities are involved, namely:-
  - **export delivery** where the freight forwarders bring in export containers to the yard or wharf to be loaded onto the vessels.
  - **import receiving** where the freight forwarders receive containers from the yard or wharf to bring into the country.

Performance Measurements of Container Terminal Operations

Classification of Container Port Performance Measures four categories

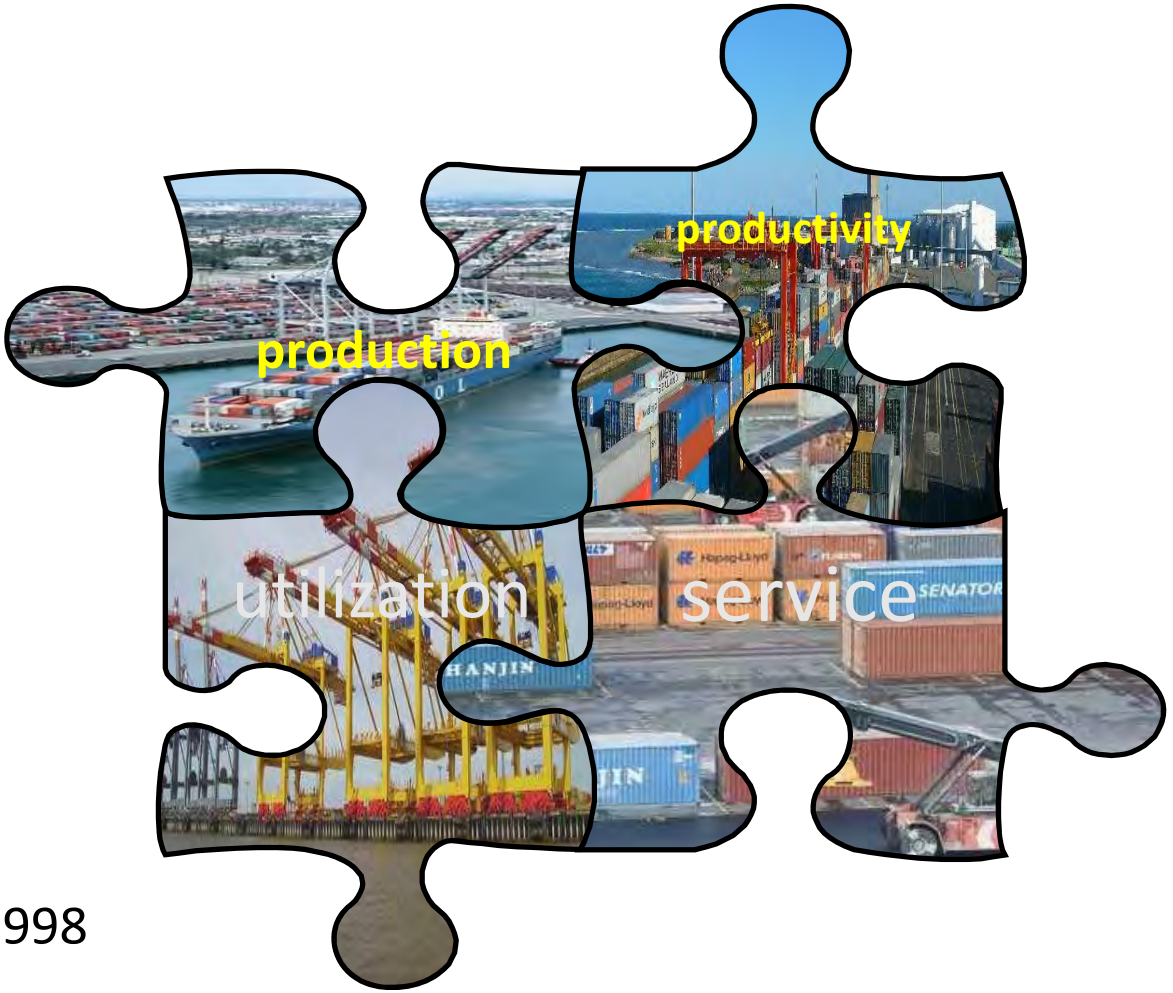
- ❖Ship operations.
- ❖Cargo handling.
- ❖Warehousing.
- ❖Inland transportation.

Performance Measurements of Container Terminal Operations

There are many ways of measuring port efficiency or productivity, although reducible to three broad categories

- **Physical indicators .**
- **Factor productivity indicators .**
- **Economic and financial indicators.**

Performance Measurements of Container Terminal Operations



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Production Measurement

Ship throughput

Measures the entire activity involved in loading and discharging vessels in a given time period (shift, day, month or year).

Production Measurement

Quay transfer throughput

Measure the number of tones or containers moved between the quay and the storage areas.

Production Measurement

Container yard throughput

This is the sum of the movements that take place in the storage areas.

Production Measurement

Receipt /delivery throughput

❖**Measure the activity relating to the delivery of outbound cargo or containers of the port or terminal and collection of inbound cargo.**

❖ **Each of them is expressed as container moves/unit of time .**

❖**The value of this measure is very important when estimating resource needs and the actual costs of handling the cargo.**

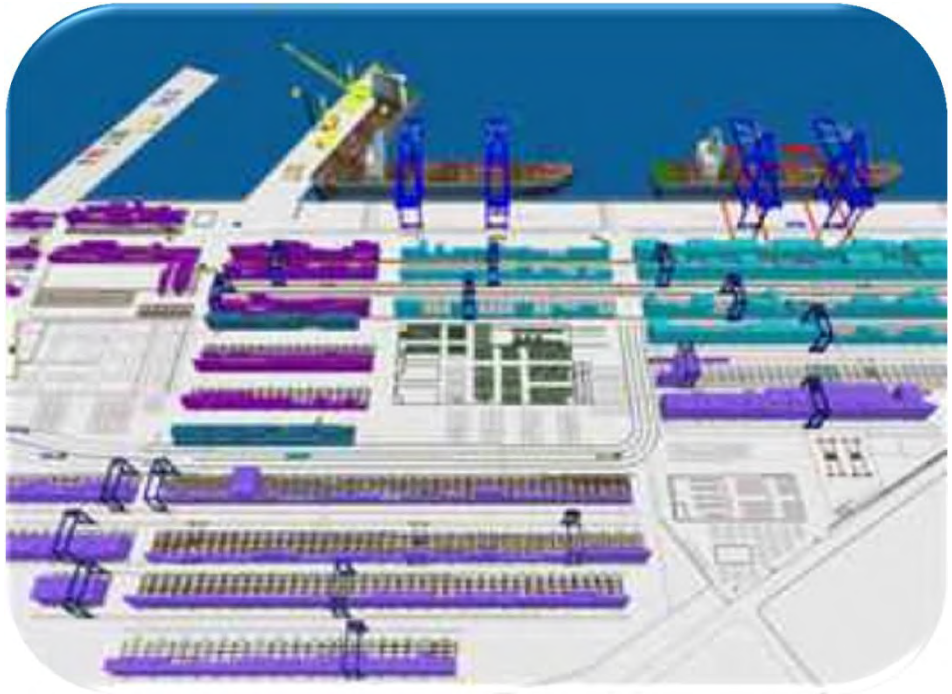
Utilization Measures

Utilization Measures allow management to determine how intensively the production resources are used.

Utilization Measures

Quay utilization

This measure reflects the amount of time that the berth was occupied out of the total time available.



Utilization Measures

Storage utilization

It is calculated by comparing the number of storage slots occupied with the total number of available slots according to the yard's design capacity.

Utilization Measures

Gate utilization

❖**The smooth and rapid processing of incoming and outgoing road vehicles at the gate is a very important factor in efficient terminal operations.**

❖**Gate utilization is a valuable measure for container terminal operators.**

Utilization Measures

Equipment utilization

❖**Because the terminal's investment in cargo-handling equipment is very costly, equipment utilization is an extremely important performance measure.**

❖**The utilization of any item or type of equipment is defined as the proportion of time that it was effectively deployed over a specified period.**

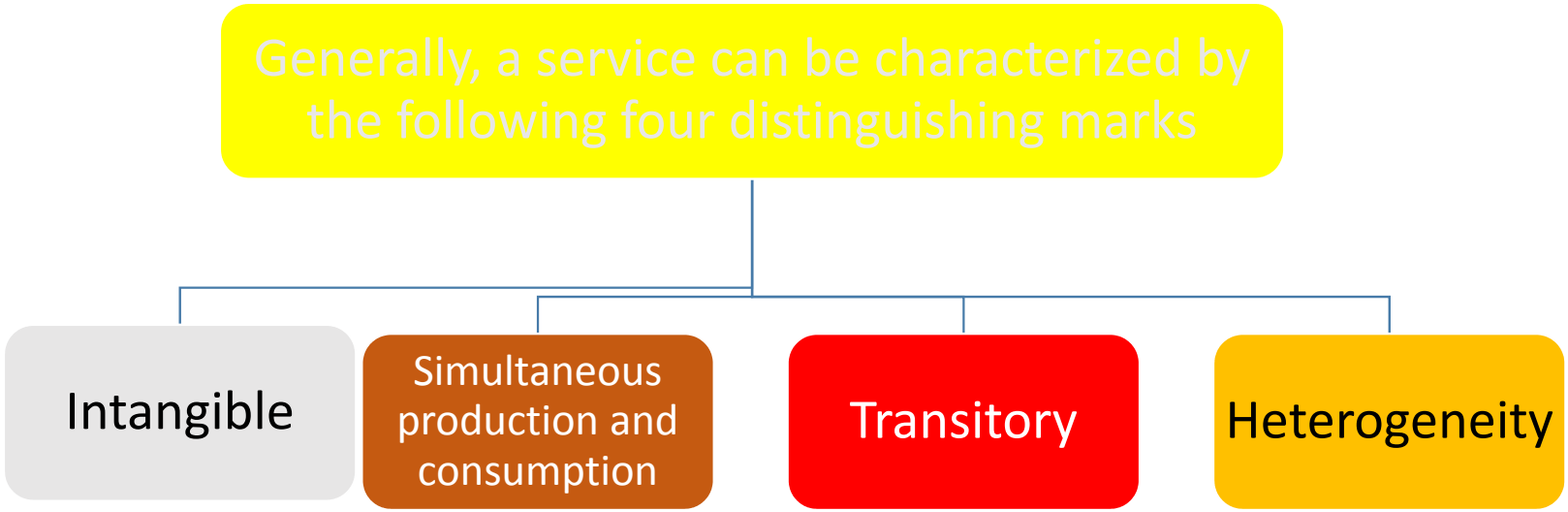
Container Terminal quality Services

Quality elements that are important to terminal customers are:-

Container Terminal quality Services

Theory of Quality of Services

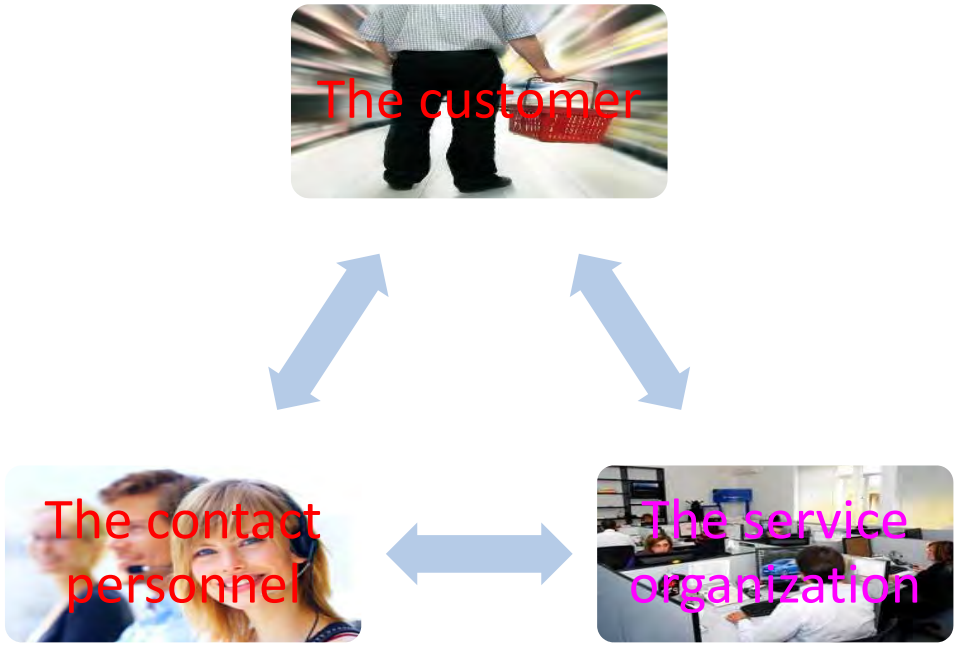
The service is any activity or benefit that one party can offer to another.



Container Terminal quality Services

Service Production Process

In the service process usually the front office of a service organization interacts directly with customers.



Container Terminal quality Services

Quality Analysis

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Container Terminal quality Services

costs of service quality are comprised of:-

- **Inspection costs.**
- **Internal repair costs .**
- **External repair costs .**
- **Lost sales do not induce direct costs.**

Container Terminals and Quality Aspects

The terminal operator on three levels can influence the satisfaction with the waiting time:-