

# Report on port productivity



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In the Hamburg Le Havre range the number of port calls will be limited for the newbuilds due to dimensions of the vessels, max three or two ports will be in the coastal schedule for Europe, can you calculate the call size for your port following info are available.

Port A

- a. Market share in the range 36% with 3 ports and 58% with 2 ports
- b. Vessel size 14, 000 and 18, 000 TEU
- c. Vessel utilization 85%

What will be the call size for your port with 3 ports in the range and a 14, 000 vessel or with 2 ports in the range and a 18, 000 vessel

ANSWER 2

Using Formula:

Note: 2 => discharge & load

To calculate the call size, you also need the TEU ratio. Since this is not given, we assume the TEU ratio is 1.6. This is due to the fact the TEU ratio in Europe now is between 1.5 and 1.65 on average. A TEU ratio of 1.6 means that there are slightly more 40 TEU containers used than 20 TEU. The 0,85 in the formula is the capacity utilization of the vessel. The 0,36 and 0,58 are the market share of the port. We multiply by two in the formula, because containers are loaded and unloaded.

The call size in case of 14000 TEU vessel with 3 port calls and a TEU ratio of 1.6:

$$\text{Call Size} = 14000/1.6 * 0.85 * 0.36 * 2 = 5355$$

The call size in case of 14000 TEU vessel with 2 port calls and a TEU ratio of 1.6:

$$\text{Call Size} = 14000/1.6 * 0.85 * 0.58 * 2 = 8627.5$$

The call size in case of 18000 TEU vessel with 3 port calls and a TEU ratio of 1.6:

$$\text{Call Size} = 18000/1.6 * 0.85 * 0.36 * 2 = 6885$$

The call size in case of 18000 TEU vessel with 2 port calls and a TEU ratio of 1.6:

$$\text{Call Size} = 18000/1.6 * 0.85 * 0.58 * 2 = 11093$$

### QUESTION 3

A carrier plans to upgrade her Asia Europe vessels by upgrading from: 14,000 teu to 18,000 and like to market low emission (Green) by reducing speed on the sea voyage, however the reduced speed leads to 2 extra sailing days. The number of port calls in Europe will go back from 3 to 2 ports.

If a terminal can increase productivity and so reduce effectively on port stay time the difference is made versus competition.

What will be the required crane productivity for the two terminals to handle the 18. 000 TEU vessel with

a crane split of 4, 6 ?

ANSWER 3

For answering question three, we used the capacity utilization given at question 2, which is 85% and we assumed a TEU ratio of 1. 6. As explained at question 2, the TEU ratio in Europe lies between 1. 5 and 1. 65, therefore we take a TEU ratio in between of 1. 6. In the next formula, we multiply by two, because containers are loaded and unloaded.

A 14000 TEU vessel with a TEU ratio of 1. 6 and a capacity utilization of 85%

Handles:  $14000/1.6*0.85*2 = 14875$  containers.

A crane split of 4. 2 with 25 container moves per hour leads to 105 moves per hour in total.

$14875/105 = 141, 6667$  handling hours in case of a 14000 TEU vessel.

Due to the decrease in port calls from 3 to 2, you save 24 hours of port stay and 36 sailing hours. This means 60 hours in total. Due to the slow steaming, you spend two more days at sea, which is 48 hours. The difference is 12 hours in favor of the 18000 TEU vessel. Therefore, the handling time may be the handling time of the 14000 TEU vessel + 12 hours, the hours gained by reducing the number of port calls. This means the total amount of handling hours for the 18000 TEU vessel may be  $141, 6667 + 12$  is 153, 6667.

The amount of containers handled due to the 18000 TEU vessel is again with a TEU ratio of 1.6 and a capacity utilization of 85%:  $18000/1.6 * 0.85 * 2 = 19125$  containers.

19125 divided by the total number of container handlings per hours leads to the maximum amount of handling hours which as calculated is 153,6667. So  $19125/153.6667$  leads to the total necessary amount of container handlings per hour. Which is 124,46. If we divide 124,46 by the crane split of 4,6, we get the required crane productivity of  $124,46/4,6 = 27,06$ , which means the required crane productivity for the two terminals is at least 27 with a crane split of 4,6.

#### QUESTION 4

What is the value economic/commercial value of the increased terminal productivity?

What are the extra costs that the terminal will face to enhance her productivity

#### ANSWER 4

##### DEFINING PORT PRODUCTIVITY

Terminal Productivity especially at container terminal is defined by some factors. Terminal operation is divided by two operations, i. e. waterside operation and landside operation. Waterside operation productivity is determined by some factors such as berth availability and berth productivity. In addition, operation decision influencing berth productivity, namely crane

productivity, crane split and yard performance. On the other hand, Landside operation is determined by factors such as hinterland availability and reliability. Good waterside operation has to be supported with good landside operation, otherwise it would lead to congestion.

There are three main factors determining Container Terminal Productivity, i. e. labor, equipment and land (Esmer, 2008). Therefore efficiency of these resources is important for Container Terminal Operation. Berkovnik (2008) on his reseach build a model of terminal productivity with defining influencing factors and operation elemen.

In order to fulfil increasing trend of international trade, terminal is required to make subtansial investment, improvement in physical capacity and efficiency of operation. Thus improvement lead to enhance terminal productivity (Le-Griffin, 2006). According to this papaer, terminal productivity is determine by five elements, which is crane, berth, yard, gate and gang. However, different port has different way to measure terminal productivity, depend on bussiness process cycle, market, cargo handled and geographical condition.

## ECONOMICS AND COMMERCIAL VALUE OF PORT PRODUCTIVITY

One of the effects of terminal productivity is call size. Improvement of terminal productivity leads to increasing in call size. Assuming the same market share, by improving port productivity would increase call size and decrease ship time at port (port stay) as well. This would be affect marketing power of port. Port with best terminal productivity gives advantage to both shipper and carrier as port customer. Port with very close competition, for <https://assignbuster.com/report-on-port-productivity/>

example port at Hamburg and Le Havre range are supplying nearly identical market. Competition between port within HLH range are strictly strong. Nowadays, customer which is shipping lines are relatively not loyal to port. Port has become key success point for shipper and carrier, therefore, port productivity is one of attractiveness. Having benefit from high terminal performance lead to market power. Furthermore, rising of port marketing power leads to increasing of market share.

In a different perspective, port not only as facilitate to serve international trade between countries. Market used to be determine port capacity, however, recently, port is taking active part to attract market. Port with high productivity and reliable to handle various type of ship, especially large type of vessel. High productivity port would attract market even though, cargo not directed to port region country but could be used as hub and spoke port. It would bring a lot of opportunity to port, foremost port located strategically at international trade route. For example what is Singapore has succeed to achieve nowadays.

#### COST TO IMPROVE TERMINAL PRODUCTIVITY

Improving terminal productivity could be done by several ways. The improvement plan has to consider every element in terminal because each element is related each other. Terminal operation consist with three system that is berth, container yard and delivery zone (Beskovnik, 2008).

Furthermore, each system equipped with components and from here cost of operation occurs, including initial cost (investment), operational cost and maintenance cost.

Direct cost that terminal operator or port have to deal with are cost of investment new facilities or infrastructure to increase capacity of terminal. With new trend that vessel are getting bigger and bigger to fulfill market growth especially for containerized cargo and to achieve economies of scale enforce port to improve her capacity and productivity of cargo handling rate. All terminal facilities has to adjusted with vessel requirement. Thus, further investment of land and equipment are important needs that cannot avoided. Terminal design and layout is substantial aspect to adapt, for example draft, container yard capacity and berth structure. Bigger vessel such as 18. 000 TEU required deeper draft, increased yard capacity and stronger berth structure to sustain more cargo handling.

Moreover, advance technology development is one of necessity. In order to gain efficiency and productivity, applying new technology contribute to improve terminal performance. Furthermore, labor is key point as well. High skill labor needed to undertake sophisticated equipment, therefore, labor competency is prominent factor to be adjusted with advance terminal operation system.

Furthermore, improving in terminal area has to supported by availability and reliability of hinterland. Railroad, truck lane, depot (stripping and stuffing area) and even dry port is integral part that affect port competitiveness. Thus, terminal operator or port it self has to playing active role to develop hinterland. Eventough hinterland is not fully controllable for port, however, port need to build good cooperation with hinterland provider i. e. local government, other state government and private sector. Construct mutually agreement with hinterland providers can improve port competitiveness and



it is possible to gain market share from another port nearby because succeed to have a better link with market.

## **LITERATURE:**

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