Development of Nigerian Ports for Organizational Efficiency and Faster Turnaround Times.

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Abstract

This paper is an attempt to determine the development of terminals for faster turnaround times in an efficient sea port. Organizational efficiency in this study is defined as the result of input divided by output. With regard to port, input may be numerous and difficult to calculate. For example: utilized space, multiple currencies and operational hours. The major determinant of efficiency is berth productivity. There are several factors to be considered in developing a port for faster turnaround times. These factors are: economic factors, technical factors, operational/administrative factors, and other determinants include the transport, the handling and the storage. Recent studies have shown that operational changes have been the most determinant factor responsible for quick turnaround times in terminals reputed for high productivity and efficiency in the world. Warri Port is chosen as a case study to evaluate the impact of private sector engagement in the development of sea ports for faster turnaround times with respect key performance indicators such as Cargo Traffic and Berth Throughout.

Introduction

A turnaround time is a performance indicator of an efficient seaport. A number of performance indicators are commonly used to determine the efficiency of seaport. While efficiency is a function of berth productivity in relation to ship turnaround times there are other frequently used service indicators such as: Truck Turnaround Time: and Equipment Dwell Time and Equipment Availability. But for the purpose of this paper, we shall dwell much on the subject of port development with respect to faster ship turnaround times and efficiency of sea port. Efficiency is defined as the result of input divided by output. With regard to port, input may be numerous and difficult to calculate. For example: utilized space, multiple currencies and operational hours. The major determinant of efficiency is berth productivity. Berth productivity is defined as the number of containers moves per ship per hour on all vessel sizes. While berth productivity is the major determinant of efficiency in developed countries, private sector participation, reduction in corruption and improvements in liner connectivity are the major determinants of port efficiency in developing countries. On the other hand, Ship turnaround time is defined as the total time spent by a ship in a port. The components of ship turnaround time include:

- **Waiting Time**
- **Berthing/Unberthing Time**
- **Berth Time (Service Time**

Waiting time is normally a small proportion of turnaround time. However, berth time is the component which when reduced can substantially reduce ship turnaround time.

The berth time depends on the quantity of cargo a vessel has to load or discharge, the type and characteristics of a vessel, the type of equipment and other resources used at berth.

It has been observed that money is lost every minute ship stays in a port, hence in very highly efficient port; the cost of transportation is lower. There are several factors to be considered in developing a port for faster turnaround times. These factors are:

1. Economic Factors
2. Technical Factors
3. Operational/Administrative Factors

Other determinants include the transport, the handling and the storage. Quick turnaround times of vessels depend on more of economic, technical and operational factors than safety. It is pertinent to note that the reduction in a ship's time in port primarily depends on the performance of the port in fulfilling its functions. In view of the purpose of the subject matter, we shall dwell more on technical, economic and operational factors in determining the development of port for faster turnaround times.

Ship Turnaround Times

Drake Education Association, (UNCTAD, 1982, p. 18) stated that ship turnaround Time is the total time spent by a particular vessel in port. Also, it is defined in another sense as the average time spent in port by all vessels calling in a specific period. Then they are divided into two components namely, the Waiting Time and Ship's Time at Berth. The time in the port is not only an essential factor to clients but also to the port as the most important element to reduce or increase port competitiveness, which should be observed all the time in port operations. Several Authors as well as the UNCTAD have given a strong interest to this issue as they believed that the time at port is the most important factor to develop the port and to achieve profits to all parties concerned in business in the port sector. Drake Educational Associates (UNCTAD, 1982, pp. 18, Unite2) stated that: Ship Turnaround Time gives an excellent indication of the speed of service being provided to ship operators; it is a very important element in determining maritime costs.

Port Efficiency

A key element of port efficiency is to reduce either the time the ship spends in port or reduce costs without seriously effecting the time the ship spends in port. To know whether the level of productivity in a port is acceptable the port has to be able to compare its activities against certain standard benchmarks achieved by its competitors (Lloyd Practical Shipping Guides, Port Management and Operations third edition)

As regards efficiency, one of the most commonly used statistics is the *Berth Occupancy Ratio*. This is the ratio obtained by dividing the time a berth (or group of berths) has been occupied by the time the berth (or group of berths) is available during a considered period of time (week, month or year). However, as a useful comparable statistic it is of limited value. There are many reasons for this but the two main ones are:

1. In many terminals with a long quay wall there is no determined number of berths.
2. The time actually measured varies from port to port. Some ports will use the service time, which is usually the total actual time the vessel is berthed, while other ports may consider only the working time.

Another variation of this statistic is the berth utilization ratio= occupancy time/working time. It would seem better to consider one or all of the following:

For each crane or "cargo-handling gateway" measure the number of boxes moved per crane in both the total ship time on the berth and the *working* ship time on the berth. This gives a gross and net productivity level.

1. The number of people employed on the terminal concerned with cargo handling can also be measured, as can the equipment (e.g. straddle carriers, forklifts, etc.). Therefore, the annual number of boxes per person and per piece of equipment per annum can be measured.
2. The ratio of berth length to the number of cranes is a useful indicator.
3. Dwell time of a container on the terminal is important but not too easy to measure to get a meaningful result. However, the time for a driver arriving at the gate to drop/pick up cargo and return back through the gate is measurable and a useful indicator. Also the length of time per day the gate is in operation can be determined.
4. Further delays lost by strikes should be recorded—say, average days lost per month over the last five years. These are recorded by the various strikes P&I clubs that exist—also in *Lloyd's List*. Time waiting for a berth should also be recorded. (Lloyd Practical Shipping Guides, Port Management and Operations third edition)

OPERATIONAL DETERMINANT FOR FASTER TURNAROUND TIMES

Recent studies have shown that operational changes have been the most determinant factor responsible for quick turnaround times in Yokohama terminal and other terminals reputed for high efficiency in the world. This is due to the synchronized process developed between the vessel and the container yard that eliminates virtually all wasted time between the quay crane and yard equipment operations. These operational determinants include:

Management Efficiency: In developing country like Nigeria, high berth productivity and fast turnaround times are determined by how efficient the port is managed. With a strong management structure in place long waiting time and transit time is eliminated. This is achieved by preparing documentation of papers before the arrival of ship. Efforts are directed toward ensuring that ships do not wait too long in quay side before getting their clearance papers. In addition, efficient management means increased working hour ratio, punctuality ratio and reliability ratio which impacts positively on the quality of service thereby reducing ship's turnaround times. There are different charges ships have to pay when they call at port and the duration of these calls will either increase or decrease the berth time and turnaround times of ship. Efficient management demands that administrative works would have been taken care of before a ship call. This will drastically reduce ship's turnaround times.

Logistic Efficiency: Effective logistic chain will impact positively on berth productivity, turnaround times and berth occupancy ratio. Berth time will reduce with adequate logistics in place as more containers will be loaded/off-loaded within a short period of time. More

so ship turnaround times will reduce as containers are transferred to ICDs. Efficient logistics will reduce Truck's turnaround times. Truck Turnaround time is the time between the vehicle's arrival at the terminal entrance gate and its departure from the terminal exit gate. It measures the terminal's service quality to road transport. We have said earlier that berth time also depends on the type of equipment at the terminal. Ship's turnaround time can be reduced by acquisition of equipment such as cranes. Increased rate of utilization of cranes will shorten ship's turnaround times.

Private Sector Participation viz-a-viz Port Concession: Recent developments in port management have shown that Privatization of terminals has impacted more positively in increasing the efficiency of a terminal and reducing ship's turnaround times. Mainstreaming and optimizing the entire process of cargo handling along the value means increased berth productivity and revenue for the port and government. For example, most terminals in Asia have been privatized, making them the most efficient terminal in the world as they are able to handle volumes of unscheduled tanker calls as efficiently as possible hence reducing turnaround times.

More so, private sector operators will bring their expertise in management of terminals. This will eliminate unnecessary bureaucracies in administration as well as waiting time of ships. The long-term benefit of private sector involvement is increased tanker call which will increase revenue for the port. Moreover, private companies can acquire more quays and build more terminals in the port. This will increase the volumes of ships and cargo vessels calling.

Operational Time: Time is critical for Terminal operation. This is dependent on management efficiency. Terminals should run on shifts so that there will be personnel on duty 24/7.Workers should resume by 8am and dismiss by 5pm while night shift should resume by 5pm and dismiss by 8am.This will quicken ship's turnaround times. Operational time also involves scheduling activities with respect to scope of work and setting a time limit for each activity. This will contribute to faster turnaround times.

Labor Relations: Lack of cooperation between labor unions and port management can hinder the smooth operation. Therefore, in port development, management structure should be put in place to manage labor-related issues that are capable of grounding operations in an efficient seaport. Issues that relate to labor, wages and welfare must be given serious attention especially in occasions whereby the workers are owed or denied the welfare benefits. This should be practiced in order to reduce the ship turnaround times as well as waiting time and berth time.

Multiple Currencies: In developing a terminal, it is necessary to handle all transactions in one currency with high and wider acceptability. This will eliminate multiple currencies in the payment of port charges when a ship calls.More so, single currency will provide a free flow of activities and eliminate ambiguity and confusion that may arise in an attempt to convert from one currency to another at the port. This system will be enforced on shippers to ensure adequate compliance with the regulation. Hence there should be a mechanism in place to enforce strict compliance. This will certainly reduce the waiting time of ships as well as berth time hence making faster turnaround of ships.

Number of Equipment: In developing a for faster turnaround time, there should in place a good number of equipment such as cranes and Forklifts etc. Increased crane utilization is dependent on the number of cranes available at the terminal. The beauty of an efficient sea port is the availability of all kind and grades of logistic equipment such as cranes.However, waiting time and berth time of ship is really affected by the number of cranes available in the port. Different crane types of various tonnages should be available as containers have varying degree of tonnage, shapes and methods of lifting.

More so, adequate maintenance structure should be put in place for proper maintenance of these equipment. This is in view of the fact that there may be a mechanical or hydraulic failure in the course of transferring equipment from the ship to the quay side.

In addition, training facilities and program should be in place for training of manpower (operators) on the use of this equipment. The cumulative effect of the forgoing is reduction in ship turnaround times.

TECHNICAL DETERMINANTS FOR FASTER TURNAROUND TIMES

Port Planning: Port planning is a critical task of management and is undertaken to achieve optimum use of the resources available and those that may be available in the future, particularly infrastructure and capital equipment.

Operational Planning: Operational planning of a port is a critical factor for faster turnaround times of ship. This planning is associated with the allocation of facilities and equipment for daily/short-term activities and includes berth allocation, ship and quay transfer operations. Operational planning is not limited to meeting the daily demands of ship from their arrival in port until departure, they also focus on the resources and allocations required for effective ship operation and cargo handling performance on berth.

With the development of intermodal and logistics system, Port operational planning is now required to consider cargo flow management at both the inland interface as well as at the seaport terminal. A thorough understanding of the planning process ensures the efficient and integrated flow of vehicles and cargo transfer methods.

Operational planning is divided into two main activities namely; Information management and Resource allocation.

Information Management: This refers to the collection and analysis of data and information regarding ship and cargo arrival at the sea terminal. Physical and technical information regarding the ship and cargo is required in addition to the organizational arrangements for their handling.

Resource Allocation: This is concerned with the planning of berth allocation. On common user berths this is normally established on a first-come first-served basis. Resource allocation also has to consider the availability of the port workforce, mechanical handling equipment, transport and support infrastructure. The planning of intermodal operations, including the receipt and delivery of cargo, follows the same procedures but may involve other sets of problems such as congestion or transit delays which are outside the immediate control of the port.

Planning Elements:

Operational planning includes the following elements

- Berth Planning
- Loading and Unloading Planning
- Yard Planning
- Intermodal Operations Planning
- Performance Monitoring

Berth Planning: Berth planning requires knowledge of berth configuration including length, available draught alongside and capacity. It also requires information about each individual ship such as its length service pattern, ETA and Estimated Time of Departure (ETD) Constraints may be imposed by arrival and departure draughts and associated tidal conditions. Information is necessary to plan and allocate the appropriate berth for each expected ship.

Loading and Unloading Planning: Planning the loading and unloading of a ship requires information concerning cargo, ship structure and available port resources, including manpower and cargo handling equipment.

Group data can be generally found in the ship's specification.A ship's data that is of interest to the operational planner are the number of hatches, hold capacities, hatchway dimensions, types and safe working load(SWL) of onboard handling equipment. Technical features of each vessel also need to be known and include ship stability, and for large ship, structural strength limitation. Knowledge of the disposition and quantity of fuel oil and ballast water carried to trim the ship is of importance.

Planning the allocation of port resources is partly determined by the turnaround demand by the ship operator. In planning resources, consideration must be given to the availability of workforce, cargo handling equipment, warehouse and transport needs for each

expected ship. Planning the loading and unloading element needs to identify the amount and type of cargo to be handled and assigns the right combination of operational resources in the most efficient way. Compared to the general-purpose ship operations, the handling of standard size containers at the seaport terminal allows an operator to consider the use of operational research techniques including optimization and queuing theory to achieve efficient use of resources. The identification of each container is critical to the activity and is achieved by providing a unique numerical identifier. To trace the container in the port and on board, the ship's numeric location identification is also used. Further information should include destination port, gross weight; container size and special needs associated with refrigerated commodities, out of gauge cargoes and dangerous goods.

Yard Planning: Yard planning covers the planning of the seaport terminal configuration and layout. It has to take into account, storage and warehousing needs and allow for vehicle movements along defined pathways. Container yard planning should consider location and relocation for containers by status of ship assignment, import, export or transshipment. Planning will take into account, the flexible and constraints of the yard system employed, the straddle carrier operation, gantry system, front end loaders or tractor chassis combinations. A knowledge of container stack height limitations, separation of special containers and the need for entry and exit processing will have an impact on yard planning. Yard planning must also consider container transfer to and from other transport system including road, rail, barge and feeder shipping.

Intermodal System Planning: Intermodal system planning takes place at the inland interface and has similar demands to berth planning. It includes freight configuration, arrival and departure control, loading and unloading, planning for road, rail and barge transport. Much of the planning challenges at this level relate to the choice between direct and indirect routing to the seaport terminal. The need for functional transfer system supported by correct documentation and clearance is important.

Berth Assignment and Port Capacity: One of the frequent problems faced by port managers is the availability of sufficient berths to accommodate every ship calling at the port without causing serious delays or increasing waiting time.

The problem is due to the combination of two major factors.

- The random pattern of ship arriving at the port
- The limited number of berths at the port (port capacity)

The major problem faced in short-term planning is that a ship's arrival pattern and precise arrival times are difficult to estimate. The limited number of available berths compounds the difficulty creating a queuing problem. The maximum berth occupancy ratio depends on the number of berths available and the arrival pattern of a ship. A ratio has been computed statistically by the United Nations Conference for Trade and Development (UNCTAD) for random vessel arrivals.

Number of Berths	Max occupancy ratio
1	30%
2	50%
3	60%
4	66%
5	70%
6	74%
7	77%
8	78%

The relationship between the waiting time of a ship due to non-available berths and the service time when the ship is on the berth including both working and non-working periods is called the waiting time factor. In berth planning, it is important to give priority to regular time/day or week services over irregular berth allocation service requests. The system should be sufficiently flexible to cope with changes to ship's arrival and departure schedules.

METHODS AND ESTIMATES OF PORT CAPACITY

The physical constraints of a port are the number and capacity of berths, sheds, open storage areas and handling system. Each factor has an influence on the performances of others.

- The handling productivity determines the berthing time of the ship and consequently the berth occupancy ratio and the waiting time.
- The capacity of the yard and design of the layout influence the handling productivity.
- Administrative delays such as customs clearance and other bottlenecks determine the dwell time of the cargo hence the transit and storage yard space needed.

Berth Capacity: To estimate the capacity of a berth, an analysis of ratios associated with handling rates are analyzed from which the maximum output is computed.

Tonnes/ship-worked hour = $\dfrac{\textbf{Tonnes}}{\textbf{Gang-hour x average number of gangs/ship}}$

Tonnes/service hour = $\dfrac{\textbf{Tonnes}}{}$

Ship-worked hour x worked hour/service time

Annual Maximum Berth Capacity = Tonnes

Service hour x24hrsx365 days x maximum occupancy ratio x number of berths

Cargo type and packing methods influence a berth's capacity. The table below shows typical gang output levels for various types of cargo-packing. It also illustrates efficiency improvements created by the utilization of cargo.

TYPE OF PACKING	GANG OUTPUT(TONNES/GANG-HOUR)
CASES AND BOXES	12-15
BAGS	20-25
PRE-SLUNG BAGS	40-50
PALLETS	25-40
CONTAINERIZED CARGO:SHORE GANTRY SHIP CRANES	200-250 120-150
RO-RO	300-500
BRY BULK	1000

Storage Capacity:

Storage capacity in a port area is often limited by port-city interface issues, physical features and environmental concerns. Land expansion is expensive and ports attempt to optimize their operations on the basis of existing land facilities.

Storage capacity depends on two main factors; Dwell Time and Cargo type.

1.**Dwell time** is the time in days and hours that cargo occupies space on the yard or in the shed.

2. **Cargo type:** Individual cargo types have their own characteristics in terms of the storage capacity needed. Stowage factor is a measure of the volume occupied by one tons of goods and is given for each commodity in cubic meters per tons, or traditionally cubic feet per ton.

There is cost to storage which is volume related. The relationship between the cargo stowage factor and the floor area required for storage will depend upon stack height. The use of shelving in modern warehouses permits increased use of floor space.

Storage Capacity (cubic meters) =

$$\frac{\text{Tonnes throughput per year X Stowage Factor X Dwell time}}{\text{365 days}}$$

$$\text{Tonnage throughput per year (theoretical)} = \frac{\text{Storage Capacity x 365}}{\text{Storage Factor x Dwell Tim}}$$

Evaluation of Key Performance Indicators (KPIs)

Ship Turnaround Time

Nowadays, the customer is placing more and more emphasis on the quality of service provided than tariff or other elements of costs. This is largely because the level and quality of service provided affects costs and thus profits of the customer directly or indirectly. Therefore, it is essential a port knows and evaluates its quality of service. There are many indicators that can be used to measure the quality of service a port provides for its users (shippers, importers, and ship owners). However, the most commonly used indicator, and the only one that will be considered in this case, is turnaround time: the total time spent by a particular vessel in a port. The ship turnaround time can vary depending on many factors: ships' particulars such as size, and type, and speed of service being provided to ship operators. The larger the vessel, the longer the ship-turn round time tends to be. Similarly, a general cargo vessel with many small consignments and different packaging requires a longer services time and thus longer turnaround time compared to a Ro/Ro vessel with only one type of cargo, mainly vehicles. On the other hand, it is obvious that the faster the service provided to the ship operator, the shorter the ship turnaround time will be. Therefore, it is more logical to present the average turn round time of each type of ship. The table below depicts the average turn round time for each type of ship type based on the statistical data of 2018 in Warri Ports.

Ship Turn Around Times in the Pre-Concession (2000-2006)

Year	No of Vessels	Turnaround Time	
2000	331	5.2	
2001	414	5.03	
2002	386	4.91	
2003	327	5.63	
2004	298	5.92	
2005	361	6.0	
2006	257	6.6	

Average Turnaround Time of Ship in Warri Port in pre-concession
Source; Nigerian Ports Authority

It is instructive to mention that the average Turnaround time in the pre-concession era is about 5.6 days.

Ship Turn Around Times in the Post-Concession (2007-2017)

Year	**No of Vessels**	**Turnaround Time (in days)**
2007	272	6.32
2008	301	4.82
2009	323	10.05
2010	341	7.85
2011	362	6.59
2012	367	6.17
2013	609	5.84
2014	603	4.24
2015	520	4.05
2016	426	3.9
2017	452	5.26
JAN-FEB	72	2.68

Average Turnaround Time of Ship in Warri Port in post concession
Source; Nigerian Ports Authority
It is instructive to mention that the average Turnaround time in the post-concession era is about 5.94.

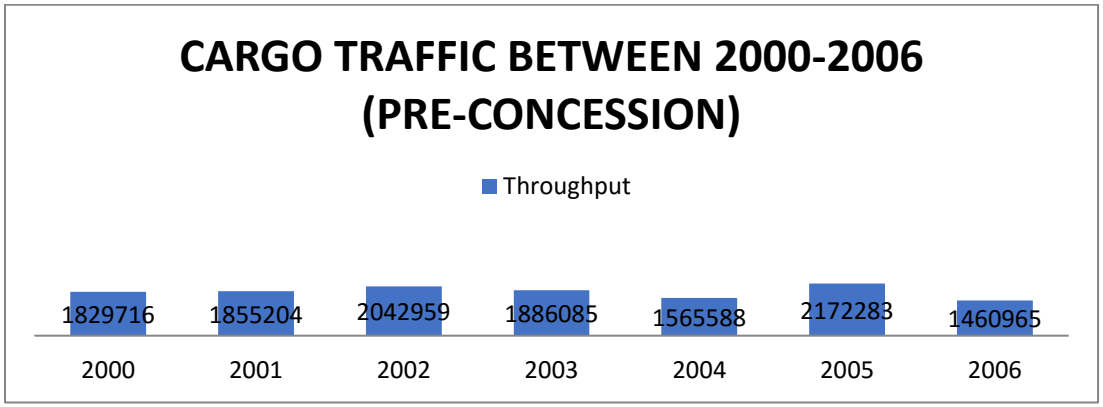
Note: In comparism, Nigerian Ports had less ship traffic and cargo throughput in pre than in post-concession period. There is 50% increase in the Post Concession Period.

Berth Throughput

Generally, there are three essential types of output indicators for ports: berth throughput, ship output, and gang output. The berth throughput measures the total tonnage of cargo handled at a berth in a stated period -usually a year. The Warri ports handled about 12,812,800 tons comprising dry cargo and oil and 2374 vessels in between 2000-2006. The Warri Port also handled 4576 vessels between 2007-2017. The dry cargo traffic comprises break-bulk cargo, containers, bulk cargo, and vehicles**.** The second measure of output is the ship output. It measures the rate at which cargo is handled to and from a vessel at a berth. There are several ways to measure this indicator, but the common ones are tons per ship working hours, tons per ship hours at berth, and tons per ship hours in port. To calculate these indicators, one has to divide the ship's total tonnage by the ship's worked hours, ship's hours at berth, and ship's hours in a port, respectively.

Average Cargo Throughput in Pre-Concession

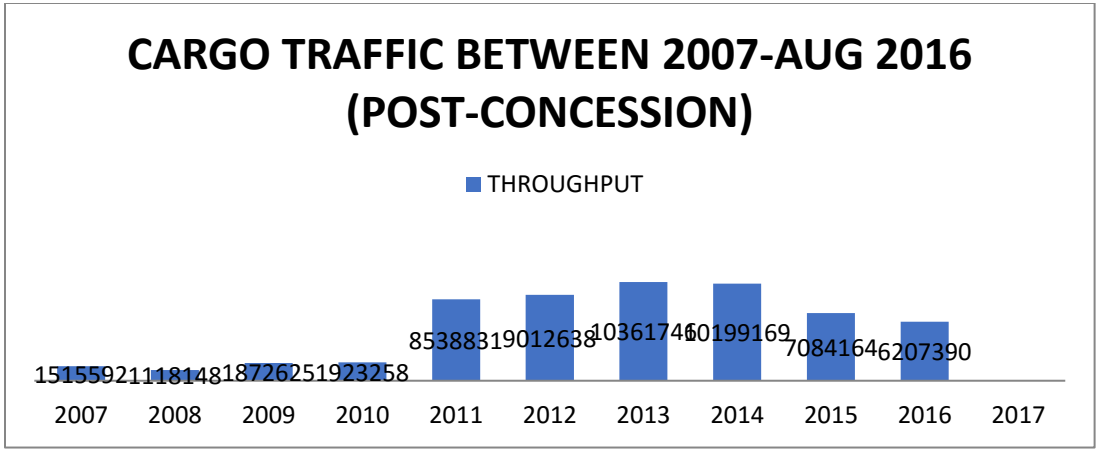
In 2006 the average output per ship hours at worked is 500 t per hour, and the average output per ship hours at berth port is 166 t per hour.



Cargo Traffic between 2000-2006(pre-concession)

Average Cargo Throughput in Post-Concession

In 2017 the average output per ship hours worked is 2125t per hour, and the average output per ship hours at berth port is 708t per hour.



Cargo Traffic between 2007-2016(post-concession)
Source; Nigerian Ports Authority

It is obvious from the foregoing that the ship output and cargo throughput increased immensely in the post concession by more than 500%.

Berth Occupancy Ratio

As the name implies indicators of utilization measure the extent facilities and resources are used. UNCTAD suggests two major indicators of berth utilization; namely, berth occupancy and berth working time. Berth occupancy may be calculated by:

$$\frac{\text{Hours (days) berth is occupied}}{\text{Total Possible hours (days) in a Period}} \times 100$$

CONCLUSION

In conclusion, there are various ways we develop a terminal for efficiency and faster turnaround times of a ship. In summary these include; Private sector involvement, extending the port hours of work; changing the method of working; providing incentives for workers; accelerating custom clearance; limiting the dwell time of cargo in port; purchasing new equipment; building new berths and creating additional storage space.

References

Alderton, P. M. (2011). *Reeds Sea Transport. Operation and Economics.* London: Adlard Coles Nautical.

Angeliki, P. (2006, May). *A New Approach for the Human Factors in the Port Industry: The Case*of Piraeus' Container Terminal. *Maritime Transport III*, p. 929.

CIDA. (1992). *Improvement Port Performance The Eastern Caribbean.Novaport Limited, Halifax, CDN*, p. 2.1.

EIA. (2013, April 2). *Countries Iraq*. Retrieved August 7, 2013, from U.S Energy Information: http://www.eia.gov/countries/country-data.cfm?fips=IZ

Financial Report, I. (2013). *Iraqi Oil and Gas Field Finacial Report.* Iraq: Fifith Edition.

Frankel, E. G. (1987). *Poert Planning and Development.* New York: Jhon Wiley and Sons.

Google. (2013). *Umm Qasr Port*. Retrieved August 22, 2013, from Google Map: https://maps.google.se/

Ma, S. (2012). *Lucture Handouts for Maritime Economics.* Malmo, Sweden: World Maritime University.

Mkango, A. M. (1997). *Potentials, Problems and Constraints for Dar-Es-Salaam Port Competitiveness.* Sweden Malmo: World Maritime University.p78.

Moon, D. (2013). *Port Performance Indicators (PPI). Unpublished Lecture Handouts* . Malmo, Sweden: World Maritime Univercity.

Moon, D. (2013). *Port Logisitics and Planning. Unpublished Lecture Handouts.* Malmo: World Maritime University.

Professor Princewill Owualah, (2016). *Port Management* Port Harcourt,Pp26.

Traffic.Com, M. (2013). *Live Map*. Retrieved August 05, 2013, from Captain Harry: http://www.marinetraffic.com/ais/shipdetails.aspx?MMSI=311041400

Traffic.Com, M. (2013). *Live Map*. Retrieved August 05, 2013, from SIREEN B: http://www.marinetraffic.com/ais/shipdetails.aspx?mmsi=377045000

UNCTAD. (1979). *Systematic Methods for Increasing Berth Throughput and Reducing Ship Turn Round Time.* Basrah Iraq: United nations 1979.

UNCTAD. (1982). *Improvement Port Performance. Management of General Cargo Operations. Train's Workbook. Volume 1: Unite1*. United nations 1982.

UNCTAD. (1995). *Comparative analysis of deregulation, commercialization and privatization ofports.* Geneva: United Nations.

UNCTAD. (TD/B/C.4/131/Supp.1/Rev.1). *Port Performance Indicators.* UNITED NATIONS. UNCTAD TD/B/C.4/175/Rev.1. (1985). *Port Development. A Handbook for Planners in Developing Countries.* New York: UNCTAD.

UNCTAD/Ship/494(6). (1989). *Measuring and evaluating Port Performance and Productivity* Geneva: United Nations Publications.

UNCTAD/SHIPP/494(1), S. B. (1983). *Changing from Daywork Plus Overtime to Two Shift Working.* United Nations: UNCTAD.

UN-JAPU, T. U. (2013, January 30). *New Background Paper on Iraqi Budget*. Retrieved April First, 2013, from Iraq-businessnews: http://www.iraq-businessnews.com/tag/jointanalysis- policy-unit-japu/

Visvikis, I. (2013). *Shipping Management, Unpublished Lecture Handouts.* Malmo: World Maritime University.

Winkelmans, W. (2003). *Port Competitiveness and Port Competition Two of a kind.*