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Value added service strategy for Jakarta International Container Terminal : comparative study of value added services in the ports of Rotterdam, Malmo and Aarhus

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VALUE ADDED SERVICE STRATEGY FOR JAKARTA INTERNATIONAL CONTAINER TERMINAL

A comparison study of value added services in the ports of Rotterdam, Malmö and Aarhus.

By

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Indonesia

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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ABSTRACT

Title of Dissertation: **Value added service strategy for Jakarta International Container Terminal; a comparison study of value added services in the ports of Rotterdam, Malmö and Aarhus.**

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The dissertation is a comparison study of value added service in ports presently, analysing the added value gained through various innovative activities and the possible services applied in Jakarta International Container Terminal (JICT).

A brief look on types of value added services offered in ports are identified. The services in terms of horizontal, vertical and global aspects are analysed in particular. Moreover, the percentage of additional value added contributed from this service is calculated and compared.

Due to the plan of the Indonesian government to build 10 agricultural terminals in Indonesia, there are new opportunities for JICT to extend their existing services in offering value-added services as a distribution centre based on agricultural products. The examples of value added services in comparing ports related to agricultural product are given. Moreover, the impacts of the strategy on terms of employment, value added and distribution of wealth are identified and analysed.
Finally, a summary of findings and recommendations for how JICT could implement the value added service strategy are given

KEYWORDS: Service**,** Value added, Strategy, Comparison, Added Value, JICT.

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LIST OF ABBREVIATIONS

AVS	Added value service
CCM	Cold Chain Management
CFS	Container Freight Station
CTS	Controlled Temperature Storage
CY	Container Yard
DMaS	Distribution Management System
EDI	Electronic Data Interchange
FCL	Full Container Load
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
GTX	Global Tele-Exchange
HPH	Hutchison Port Holdings
HO	Holding Order
ICD	Inland Container Depots
JICT	Jakarta International Container Terminal
LBD	Logistic and business department
LCL	Less than Container Load
LLA	Local Liner Agents
MDT	Monitor of Mobile Data Terminal
NLG	Netherland Gulden
OOCL	Orient Overseas Container Line
PIC	Port Information Center System
POMaS	Port operating Management System
PTI	Port operating Management System
RRM	Remote Reefer Monitoring

SCT	Surabaya Container Terminal
SIBOR	Singapore Interbank offered Rate
TEU	Twenty–foot Equivalent Unit
TIC	Terminal Information Centre
TOMaS	Terminal Operating Management System
UNCTAD	United Nations Conference on Trade and Development
USD	United States of America Dollar
US$	United States of America Dollar
VAL	Value added logistic

Chapter 1
INTRODUCTION

The philosophy saying that *the vessel follows the goods* has been a pattern of the port's role in the global transportation chain. Ports around the world are changing to become third and even fourth generation ports. This is mainly due to information, network, and innovative services beside the traditional service and facility used. These changes are mainly derived from competition between ports and the demands of port users on the basis of an integrated transport chain in terms of production and distribution activities.

Jakarta International Container Terminal (JICT) as the biggest container port in Indonesia is facing a serious competition with other domestic and regional ports. It has existing and potential strength in hinterland connections, distribution centers (distrikpark), transshipment operations, logistic services, information services, knowledge and capital. However, the development of the port does not reflect and support the changing of future industrial needs in using the port services and the competition in the area of Malacca Strait that greatly impacts the market share of the port.

These facts will effect to the services quality provided by the port to its customers. As a result, the traffic level will be reduced and decrease the competitiveness of the port. Therefore, the port should anticipate this increasing changing by improving and

creating new innovative services for cargoes in order to increase its competitive level.

One of the strategies is specific value added creation called added value service (AVS) for reaching customer satisfaction and enhancing the competitiveness of the port. [Verbeke, 1995]. Moreover, Policy Research Corporation NV (1997) argues about the benefits of applying a value-added policy on the strategy planning. Those benefits are as follows:

1). To get information about the evolution development of the value added and its structure; the changes of the value added produced by a port and its composition provides insights on the structure of the port and its efficiency.

2). To compare the value added gained by the port (and its composition) with the value added created in the sector as a whole.

This composition sets the port position itself with respect to its competitors and the sector as a whole, but also relates to a sub-sector of the ports with a similar structure, market coverage or strategy.

3).To have insights into the structure, operations, and relations within a consortium of ports or a link of related companies:

The elements in the structure can be identified where the value added and its components are gained. This information is significant for developing the future structure and/or new relationship with the consortium or chain of ports

4). To examine its importance on a macro-economic level; in negotiations with regional and national authorities, the importance of the port on a macro-economic level can be very important.

The value added service (VAS) concept in many ports has been applied with their specific comparative advantages. The port of Rotterdam has been concentrating on distribution park services to compete and satisfy its users. Port Malmö in Sweden has extended its service on multimodal transportation. Further, the port of Aarhus has

been putting in information services as an important tool to support its operation and services. Those ports are creating an innovative service called *added value service* and gaining the benefit measured as value added for the port. Comparing those ports offering their value added service in terms of distribution centers, logistics and multimodal activities based information service would allow identifying the consequences of the ports improving its position in specific high value added service categories or service niches for overall added creation (see Haezendonck, Coeck, and Verbeke, 1996).

The comparison type used in this dissertation is an academic comparison to get a general strategy on commercial and managerial aspects of the port service. In order to fulfill the "*like with like*" pattern and uniform standard (Ma, 2000), single standard is used and compared in comparing the value added level gained in those port services.

In general, this dissertation aims at searching, comparing, and analyzing the value added services offered in the ports of Rotterdam, Malmö, and Aarhus compared to JICT Indonesia. Through six chapters this dissertation will discuss the detailed objectives:

1. To identify many forms of a value added service in a port.
2. To compare the value added services provided by the port of Rotterdam, the port of Aarhus and the port of Malmö which can be applied in Jakarta International Container Terminal (JICT).
3. To identify possibility to establish a new value added service in JICT.
4. To create a conceptual plan in establishing an added value port services.
5. To make recommendations to the JICT management in providing the new added value services.

In reaching these objectives, chapter two was dedicated to explore the various services called value-added services. This included the calculation of added value of these services in ports.

Concerning the competition among ports regionally in Southeast region and nationally in Indonesia coverage area, JICT should consider the need to expand its traditional services to services outbound the terminal area. The existing added value should be evaluated in order to justify the ability of terminal resources to get more value. Therefore, in chapter three an analysis of the value added gained and the cost breakdown of its existing service will be covered by analyzing both factors, as well as the need for the value added services in the terminal and the cost or incurred on this.

Moreover, a comparison of the ports such as the port of Rotterdam, the port of Malmo and the port of Aarhus have been taken as references in various specific strategies used. The detailed value, costs, and comparison of these values quantitatively will be devoted in chapter four.

Having taken into consideration these experiences, strategies, and values, and the need to provide new services, JICT should investigate which services are possible to be realized in short and long terms.

In addition, the possible added value in offering various activities could be estimated. These analyses are dedicated to chapter five. Furthermore, this chapter discusses the impact of these services on jobs, and distribution of wealth and investment.

Finally, chapter six is dedicated to a summary of findings and recommendations for the JICT management in particular to realize the idea of being a distribution center based on agricultural product.

Chapter 2
WHAT IS A VALUE ADDED SERVICE ?

2.1. DEFINITION OF VALUE ADDED SERVICE

In general value added service (VAS) is the activity or service giving more net value and level of quality of the service. The service or activity, which are based on how to put additional, value or increase the net level of it. Samuelson in 1998 defines the value added as the difference between a firm's sales and its purchases of materials and services from other firms. In detail, Lipsey in 1983 mentioned that this activity aim at adding the net value of a firm's output.

Another source, the dictionary of wisdom system (www.wizdomsystem.com) defines a value added service as a process that adds value to an output and product or service; that is, the activity merits the cost of the resources it consumes in production.

The Policy Research Corporation N.V. interprets value added service (VAS) as the service which contributes to the efficiency of the logistics process and thereby enhances the value of the goods; these services are a sources of value added, consisting of wages, depreciation and profit.

2.2. TYPE OF VALUE ADDED SERVICES IN CONTAINER TERMINALS

Value added services are the third generation port's response to the competing environment among ports and the demand of customers on an integrated transport chain. Consequently, ports and container terminals specially have been turning into integrated transport centers and logistic platforms for international trade. Moreover,

in terms of production characteristics, third generation port provides cargo and information distribution, multiple service package, and high value added services. Furthermore, Prof. Ma (2000) and Prof. Francou (1999) mentioned that third generation ports are characterized by their *infrastructure, superstructure* and *infostructure***.**

Based on that, value added services are not only physically related to transport of goods, but enhance the efficiency of the logistics process as a whole through support of the entire logistics process. The type of value added services in container terminal and ports as general are:

- *Assembling*
- *Value added logistic (VAL) storage*
  - *inventory management*
  - *distribution center*
  - *Warehousing* (Stuffing/unstuffing, crating, palletizing, shrink wrapping, labelling, weighing, repacking)
- *Inspection of cargo and quality control*
- *PDI checking of containers*
- *Information center*, providing real time information on the cargo related matters such cargo movements and cargo inventory.
- *Maintenance and repair*
  - *For containers*
  - *For reefer units*
  - *Cleaning and washing of containers*
  - *Refurbishing of containers*

These services can be classified into three main groups; *horizontal, vertical* and *global* expanding services. The expanding service means an extension of the port activities from the traditional port operations (Beth, 1999, 2000).

2.2.1 Horizontal terms

The value-added activities in horizontal terms are those that operate in advanced processes in order to meet the customer's need on the cargo handling and storing. Usually, in many references those activities are called value-added logistics.

They can be categorized in:

- ❖ Physical activities
- ❖ Logistic activities
- ❖ Electronic documentation activities

The physical activities are those relating to storing activities in warehouses and repair workshops such as:

In warehouses

- Stuffing/Unstuffing containers
- Crating
- Painting, anti-parasite treatment, lubrication, rust proof paint
- Labeling
- Printing
- Weighing
- Packing/repackaging
- Sorting/re-sorting
- Palletizing
- Shrink wrapping
- Coding/bar-coding
- Container checking
- Temperature checking (Controlled Temperature Store)
- Cargo inspection and quality control

In repair workshops

Generally is for maintenance and repair of container

- For dry container
- For reefer container and installation
- Clearing and washing of containers
- Refurbishing of containers

The logistic activities **relating to:**

- Distribution center service
- Buffer stock managing
- Dividing cargo into separate lots
- Assembling

- Mounting of goods for protection on display
- Repairs of damage during transport or storage

Electronic documenting activities **are those relating to:**

- EDI system
- Electronic custom clearance and checking
- Terminal gate System
- Invoicing

2.2.2. Vertical terms

The activities related to transportation (haulage) services from and to a port are:

- Hinterland services
- Sea-based transport services (coastal and shipping)

Hinterland services are those relating to:

- Trucking service
- Train (Block train) service
- Inland consolidation service like ICD (Inland Container Depot), External CFS

Transport chain services are activities relating to:

- Inland waterway service
- Ship booking services

In practice, these kinds of services are aimed at securing market shares of a port through penetrating the hinterland. Furthermore, this service provider port is not longer be bound with its operations to the terminal location. Some parts of operations and services may spread far into the port's hinterland. Dr. Beth informed that the practical decisions taken by a port (the port of Hamburg as an example) to secure their market share by penetrating the hinterland are:

- By playing an active role in intermodal concepts
- By establishing inland positions as collection and distribution points
- By establishing block train system
- By investigating their inland marketing and representative network

2.2.3. Global terms

Global terms are related to information services in the global communications system and trade. Clearly, the service is provided as an e-commerce port information service. This e-commerce service provides an electronic market exchanging information on "*the digital market*" among global shippers (exporters and importers), carriers and other parties as port community societies where the cargoes are transported and handled through the service port provider. As an example, a website GTX (portsnportals.com) is an e-commerce port information system that provides information linking shippers, carriers, ports, customs and other related parties.

Through these three service groups (horizontal, vertical and global), the area coverage of a port that provides these three categorized services consequently is changed. The horizontal services are activities mostly offered in the port area. Then the vertical service patterns use port hinterland as their coverage service. Furthermore, the global pattern service is done on a global scale where the service can be reached by a particular port community, but also by global port community partners through Internet.

2.3. ADDED VALUE CALCULATION

In analyzing the value added services the principle of added value in view of direct impact is used for the various activities offered among ports. Professor Francou (2000) defined two methods to calculate the port impact in added value measurement i.e. direct flow calculation and mass calculation.

Direct flow identifies all actors involved inbound and outbound of a port at the detailed level by field survey and interview. The mass method considers the overall added value of the firms and organizations located inbound the port area. Unlike the direct flow method, the mass calculation assumes all the firms located in the port area are linked to the port and the firms located outbound are not linked to the port activities.

In this dissertation, due to the limit of time and information collected, the added value is calculated directly from the service provider in the area of considered ports by using the *mass calculation*. The information of value collected and calculated is not taken the port authority as an object but it only considers the direct service provider in the terminal such as the stevedoring company and terminal operators, and business and logistic department of Rotterdam, Malmö and Aarhus port.

In addition, the time basis of all data and information collected from these ports are subjected with the same year, in 1999 basis. In the port of Rotterdam, VAS data composed from the study of logistic and business department (LBD) of the port of Rotterdam in 1999 and reports and information from Seabrex Ltd., Ocean Warehousing Ltd. and Lehnkering stevedoring company as the service providers in the port of Rotterdam area. These companies are recommended by LBD as they are handles 30% container traffic in the port (Rotterdam logistic department, 2000) which also offers various activities in terms of VAS in the port of Rotterdam area.

In the port of Malmö, the way of collecting data is similar to in the port of Rotterdam which considered the logistic department of the port which directly offers the VAS to customers.

Meanwhile, for the port of Aarhus, the analysis of VAS focused on Aarhus stevedoring company, which is the operator of Aarhus container terminal in hadling and offering various value added services in the terminal.

In the JICT, the data and information are collected and calculated similar to other terminals which were compared. However, the activities considered in JICT are only from handling services without any value added services.

In computing the value added there are two references taken to analyze VAS in which were compared. Professor Francou (2000) stated the mass calculation formula of added value computing the aggregate value of profit, wages and taxes.

Added Value = profits + wages + taxes

The other reference of measurement from the Policy Research Corporation NV, in 1997 explained the measurement in two methods i.e. additive and subtractive methods.

The additive method computes value added by adding together labor costs, capital cost and profit). Value added = (Labor + profit + depreciation) – capital expenditures.

The subtractive method computes the value added by describing more the profit and costs.

Value added = (Sales – (raw materials+energy)) + (Non operating receipts – expenses) – Capital Expenditure

The unit used for calculating the added value is added value per container and ton handled. The usage of container unit is used for handling, information and documentation, some parts of transportation services, and repair activities. Meanwhile the ton unit is used to determine the value in the activities of distribution, advanced process, transportation, inspection and checking. However, in calculating the value added of JICT, it is an exceptional case as no VAS is offered currently in this port. At the end of the calculating process, the direct value added is based and calculated on container units handled by the terminals.

From the formula described above, the types of costs that can be analyzed are:

- Labor costs
- Material costs
- Rental costs
- Fuel / energy costs
- Investment costs (for equipment , land , building including mechanical and electrical facilities)
- Transportation costs
- Administration costs (overhead costs)
- Information costs

Chapter 3
JAKARTA INTERNATIONAL CONTAINER TERMINAL (JICT) AND ITS ADDED VALUE

Jakarta International Container Terminal (JICT) is the largest container terminal in Indonesia and is one of the country's most important economic gateways. The operations of this port started on 1st April 1999 handling and developing Container Terminal I, II and III of Tanjung Priok port for a period 20 years under a built operation and transfer (BOT) concession (Hutchison-Website, 2000 http://www.hph.com.hk/jct/index.asp).

Currently, the main business of the port is container handling and stacking services. However, no value added services (VAS) are provided to the port's customers. In order to offer the possible value added services in the future, the present value added and costs may be considered as a decision reference in planning the possible VAS.

3.1. REVENUE AND ADDED VALUE OF JICT

In 1999, on the basis of financial report stating that per month average JICT could have 60,291,975,056 Rupiahs or 8,038,930 US$ with the total container handled approximately about 135,273 moves per month. In Table 1, confirms that the main revenue source of the terminal comes only from the handling and stacking charges. On handling services, the value added gained per TEU container handled is about 61 US$ or about 5.94 US$ per ton handled.

However, for the long term, it can be argued that this tariff will not still at the same level, due to the competition from other terminals such as direct regional competitors especially in the Malacca Strait area e.g. Penang Klang, Belawan, and Johor Port as far as feeder services are concerned. It other words, in the future if the port is going to have a leading position in the market, the terminal should find a solution in value added services.

For analyzing reasons, the profit value consisted of four items (royalty, public value, management value, and mother company value). Table 1 shows the biggest amount of value added per container gained by JICT 's mother company (Hutchinson group) about 50% followed by Government royalty (15%), Tax (15%), labor (9%), and public (5%) as the notable elements contributing added value per container moved. It means that actually with the existing activities JICT has made more impact for its mother company than to Indonesia side. If the 50% of value to Hutchison group are assumed no changes, then it can be predicted that JICT will be able to return its investment payment of about 247 million USD (as their winning bid in 1999) for 60 months or 6 years. However, due to the competition circumstances in the port business, this value will hardly be achieved if JICT does not extend their service pattern in order to attract cargo coming to the port.

On the royalty value, it can be stated this number to Pelindo II is a permanent quantity that JICT has to allocate as regulated on their agreement for 20 years. *For the tax* it can be assumed that as long as the government regulation on tax is not changed this level is going to be the same.

The labor value (about 5600 USD with 1250 people working) can be predicted as the value that is increasing in the future due to the labor cost level in Indonesia, which indicated a rising trend of about 10% until 1999 (Department of Labor-Force, 2000). It means that in the future, this factor should be considered in order to have a productive result in operation.

Like the tax, the public value relies on the government regulation. It can be assumed that this element will have the same percentage in the future.

As a conclusion, it can be stated that JICT should increase their added value by expanding the service pattern. Furthermore, the administration value can be considered as an important element. Therefore it should be taken into consideration in the future.

Table 1. Revenue and Value Added of JICT per month in 1999

No.	TOTAL REVENUE	(Rp)	(USD)	In Percentage
	Handling services	**60,291,975,056**	**8,038,930**	
	PRODUCTION COSTS			
1	Material cost	896,385,697	119,518	2.04%
2	Maintenance cost	3,935,820,414	524,776	8.94%
3	Insurance	162,026,640	21,604	0.37%
4	Rental cost	16,354,151,624	2,180,554	37.15%
5	Office cost	90,314,804	12,042	0.21%
		21,438,699,179	**2,858,493**	
	Total			
	Profit deducted to costs	***38,853,275,877***	**5,180,437**	
	CONTRIBUTING VALUE			
1	Public cost	2,992,323,143	398,976	6.80%
2	Management cost	997,999,997	133,067	2.27%
3	Cost out of handling	1,005,204,408	134,027	2.28%
4	Labor cost	5,501,214,386	733,495	12.50%
5	Royalty (to *Pelindo II*/Govt)	9,027,082,333	1,203,611	20.51%
6	Depreciation	3,053,552,219	407,140	6.94%
	Total	**22,577,376,486**	**3,010,317**	
	Avg. Container handled/month	***135,273***		
	Added Value	***61,430,652,363***	**8,190,754**	
	Added Value/container	***454,124***	***61***	
	Added Value/man	***48,870,845***	***5600***	
1	* Labor	40,667	5	8.96%
2	* Royalty (Govt)	66,732	9	14.69%
3	* Public	22,121	3	4.87%
4	* Management	7,378	1	1.62%
5	* Depreciation	22,573	3	4.97%
6	* Tax	68,119	9	15%
7	*JICT Group	226,534	30	50%

Source: JICT Financial Report, 1999

3.2. THE NEED OF VALUE ADDED SERVICES

As far as the value added services are concerned in the future, there are some elements from the existing operation costs which can be assumed as the future significant costs for offering value added services. These costs are labor, administration, energy, material, rental, transportation and information costs.

From Figure 1 below, it can be noted that in offering their handling operation, the port consumed a large part for rental costs (37%), administration cost (28%) as the significant costs in this terminal. The biggest production cost spent on the operation is *the rental cost*, which is about 37.15 % of the total costs. For the *labor cost*, it is calculated about 12%, which consisted of 8% for the non-management level, and 4% for the management level. This percentage is relatively low if compared to the ports of Rotterdam, Malmö and Aarhus.

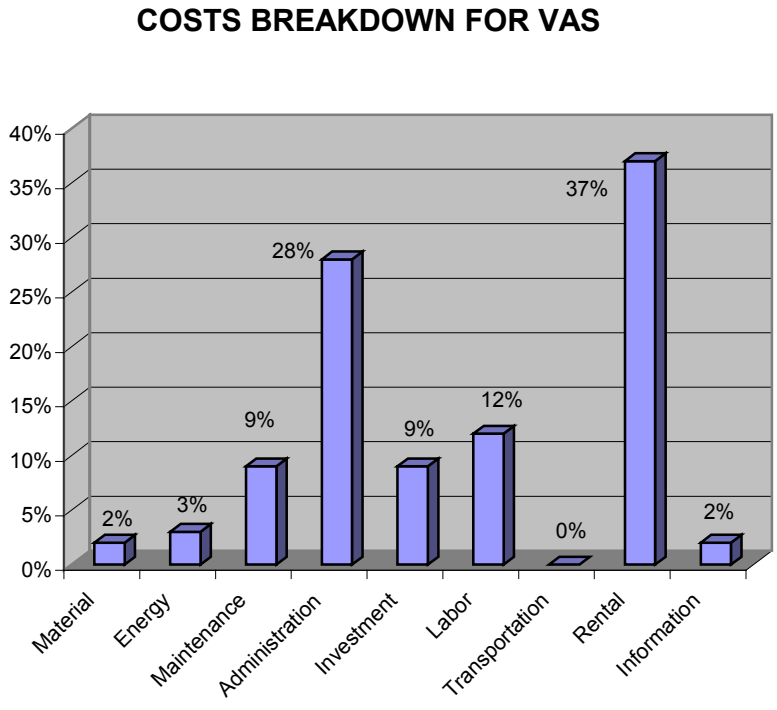

Figure 1. Costs Breakdown of JICT
Source: JICT Annual Report, 2000

This low level was caused by the low labor cost average in Indonesia. Moreover, it is an indication that about 65% of the labor costs are for management personnel, and 35% for non-management level.

The zero percentage on *transportation cost* is indicated clearly as there are no transportation costs separately allocated for the operation.

The administration cost about the 28% came from the office cost (0.21%), public cost (6.8%) and royalty costs to *Pelindo II* (20.51%). The biggest part for this can be stated as a permanent responsibility of the terminal during 20 years. Moreover, it can be argued as a risk that JICT should pay whatever the situation, either in loss or in pay off situations.

Material cost (2%), and *energy cost* (3%) are cost items, which are relatively low, compared to other elements. However, it does not mean that in giving the VAS in the future the cost for material and energy will still be same. The need of material and energy for the next service is fully dependent on what kind of VAS will be offered.

The information and communication costs (they can be categorized as management cost) about 2% can be stated as low level due to the fact that the information/communication cost actually is not expensive in Jakarta. This is because of a good infostructure system in Jakarta which creates an economical cost in operation.

Generally, from the information of current added value and costs, it can be stated that JICT has its critical points on administration factors such as royalty, tax, and public items. This is due to the position of JICT against Pelindo II which is not a fully free private entity. The management control for all container terminals in Jakarta is shared with Indonesia Port Corporation II *(Pelindo II)*. As explained in Figure 2, for Container I and II, JICT's shareholders are Hutchison Port Holdings (51%),

Indonesia Port Corporation II (*PT Pelabuhan II*, 47%) and *Pelabuhan II*'s employee cooperative, *Koperasi Pegawai Maritim ("Kopegmar")* about 2%. At container terminal III, the share of Hutchison is about 47% and the other 53% is owned by Port Corporation II.

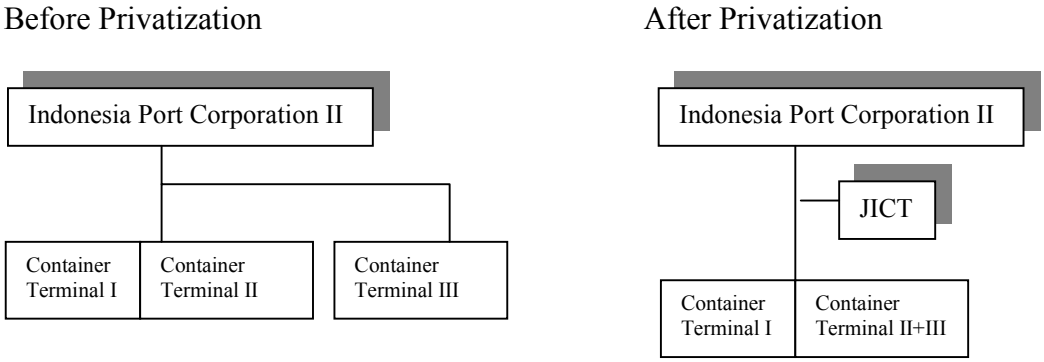

Figure 2. Organization Hierarchy of JICT
Source: JICT Annual Report, 1999

Under the shelter of the *Pelindo II*, for the short-term, JICT may get the benefit from the tariff regulation adjusted by Pelindo II, as a government agency. However, for the long term, this strategy will not work as the competition and the customers' needs and demands will drive the port to be focused on market oriented and innovations in giving services to the customers in the perspective of the transport chain. Therefore, JICT should not depend on this condition but should create new service patterns from the traditional handling operations.

Chapter 4
COMPARISON OF PORTS

4.1. PORT OF ROTTERDAM

The port of Rotterdam is a value-added service port in Europe. It has been offering facilities and services for transportation chain needs in Europe as *distribution center* providing integrated distribution services since 1986 in the form of multi users and dedicated terminals. The port has decided to concentrate their core competencies on transshipment services. Moreover, in commodity matters, since 1996 the port has noticed that there are two types of traffic on which the port has been concentrating. These are chemical based products and agriculture based products that have given a significant value added both to the port and the national GDP.

4.1.1. TYPE OF VAS OFFERED

As far as distribution and hinterland services are concerned Lehnkering B.V can be discussed as an example of a company that has offered various services on these two typical services. Lehnkering B.V is one of the terminal operators (a stevedoring company) in the Maasvlakte area (Mudde, 2000) that has been providing services in addition to the cargo handling such as:

- Logistic services (transportation)
- Warehousing and physical distribution
- Inspection / survey , Sampling and weight determination
- Chartering and ship's agency
- Dangerous goods management
- Forwarding Tank Cargo
- Fiscal representation

4.1.2. THE ADDED VALUE OF VAS

From the information given by the logistic Department of the port Lehnkering and Seabrex BV, it could be estimated that the total added value per ton handled in the port of Rotterdam is about 23.85 US$ per ton. It comes from 293,333 containers handled by Lehnkering that gave about 73,735,485 US$ in that terminal. It is further predicted that about 42% of added value from VAS in 1998 until 1999 beside container handling services gave about 58%. Therefore, the total added value per ton from VAS is about 11.45 US$.

In detail, the added value gained per ton of containers handled from value added services provided is explained in Figure 3. In offering the VAS, transportation and distribution services become the core competence of the port in terms of VAS. It is reflected from the percentage of transportation (30%-35%) and distribution (15%-21%) services, which are the significant added values to the port. The services of storage, cargo control, draught surveys, documentation and information are the secondary services complementing the function of distribution center.

The percentage of *transportation services* sectors also indicates the hinterland penetration of the port throughout the chain of goods before transferred to port. It gives the port ability to control and manage the consolidation of cargo and container to and from the port through their CFS and container depots.

Externally, the infrastructure that is being used is really to support the service offered by the port, especially the block train service that has been applied to transport the goods instead of road service. Furthermore, in giving and servicing the customers (in terms of shipping lines and shippers) as a distribution center, the port has had the benefits in the transportation value added.

On the *distribution services side (including the storage service)*, it is indicated that, the port or terminal operators for various cargo commodities have got significant

value added per ton handled. It means also the service offered has attracted the customers to let the port or terminal operator for some advanced activities such as packages, labeling, coding, sorting/re-sorting, weighting, and assembling for the cargoes and to distribute them to destination. In this case the port is involved in the door to door service for their customers.

In *software packaged services* given by the port such as information, documentation, draught surveys, and cargo control, it shows that the port has an active position to the customers' needs relating to the distribution and transportation services. It can be said that these activities contribute to port a moderate percentage of value added.

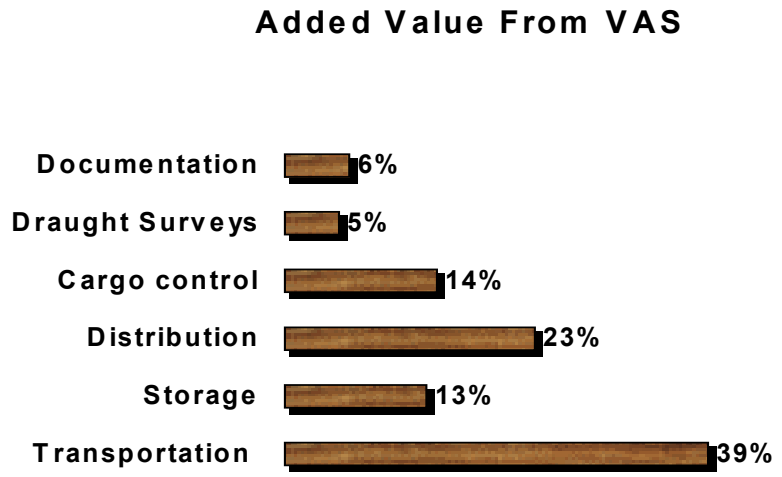

Figure 3. Added Value from VAS (in percentage).
Source; Lehnkering BV, 2000, Logistic Business Dept., 2000

The portions of information as a kind of separated service can not be calculated directly, as information is not independently offered. This element is involved in many service forms. Generally, it is reported that the information service in the port has had a portion of about 12% for added value. These are divided in many parts of services. The biggest part is in transportation service where information has 4% from a total of 39% of the transportation service. This service is tracking services for

cargoes and containers, which are executed electronically through internet and satellite services linking with the same system operated by customers in Rotterdam or outside or by passing on the service provider's website on internet.

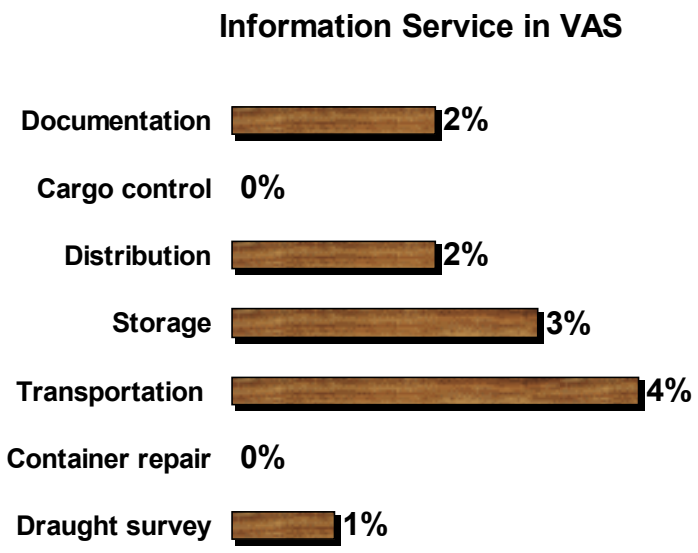

Figure 4. Information value in Port of Rotterdam.
Source: Logistics Business Dept, 2000.

The same mode of operation is also used for distribution and draught survey services, which are performed in the port's warehouse or at certain distribution centers outside the port. The checking results are then sent to the customs office through the EDI line. Similar to the documentation service, the port gives their customers information services in transportation and distribution services. In these services, the information is used for booking, invoicing and tracking services. However, for services for cargo control and container repair, it is understandable that technical information service is not needed. It is found that in the port of Rotterdam (the port authority) is as a coordinator and facilitator in this service. The port coordinated the information system through a port community system to which all parties can get access to other players in the area of the port through the port community system gate (a website). Consequently, this port community system makes all the systems used in the port

area relatively inexpensive. Furthermore, it also ensures the security of the information due to the information management via the port community system.

4.1.3. COSTS BREAKDOWN FOR VAS

From Figure 5, it can be argued in offering their VAS the port operationally used up important portions for rental costs (21%), labor costs (15%) and investment costs (15%). And as a distribution center, then consequently, the service providers have consumed much on rental costs for space or land. Therefore, the goods handled spending time in the warehouse area for value added activities before being distributed and because of this process, and logically the material cost (8%) and energy cost (12%) contribute a moderate percentage in the VAS activities as activities need those elements.

Moreover, the space utilized for advanced processed contributes the *investment costs* with about 15% as the fixed assets lie in the product process. The investment cost moreover is contributed from equipment purchasing for advanced activities in warehouses and the investment for transportation equipment.
Therefore, it can be stated that the VAS given by the port is fully dependent on investment decisions in terms of purchasing new equipment.

The relatively high percentage on *transportation cost* is due to an operational cost for railway and trucking services to and from the port of Rotterdam and destinations.

The *labor cost* is relatively high due to high labor costs (including overtime) in the Netherlands with about NLG 120 with additional social security and tax paid as one package of the worker's salaries.

The administration costs about the 2% came up as payment for the documentation process, storage, draught survey and custom clearance.

Material costs (8%) and *energy costs* (12%) are costs items, which are needed in the advanced process of the goods to a particular stage (semi to finished product).

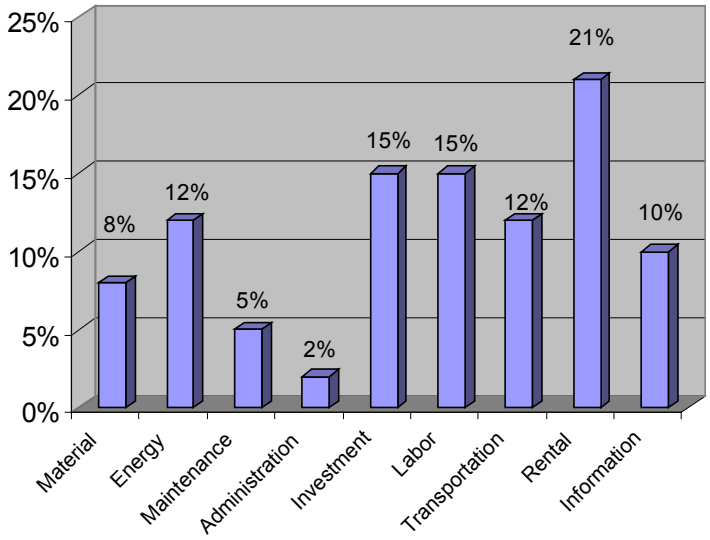

Figure 5. Costs breakdown for VAS in Rotterdam Port.
Source; Lehnkering BV, 2000.

It means that in giving the VAS provided in the port of Rotterdam, the costs for material, and energy are the crucial factors in their operations. This is due to the fact that the port is dealing with some parts of production processes that need material and energy.

The information and communication costs about 10% are meaningful due to the fact that in concentrating on service-based orientation, the information system is totally needed to facilitate the service. This relative high percentage shows that the information/communication cost actually is not expensive in the port of Rotterdam. This is because of a good infostructure system in Netherlands and the port community system that facilitates and coordinates the flow of information, and as a result creates an economical cost in operation.

4.2. PORT OF MALMÖ

According to business volume (Port of Malmö Website, 2000, http://www.mst.se/english/homepage/ehindex.html), the Port of Malmö is the fourth largest port in Sweden, after Gothenburg, Stockholm and Helsingborg.

Table 2. Value added services offered in Port of Malmö.

Logistics	Forwarding Agency
Warehousing	Container expedition
Distribution	Customs agent
Trucking	Ship booking
Railway service	

Source: Compiled from Financial Report Port of Malmo (1999) report and Port of Malmö Website, http://www.mst.se/english/eindex.html

In terms of value added service (table 2), the port has found it as a diversification field to extend the business in the port industry. Through a field survey to the port, discussions with the managers, and searching from the Port's websites, it was found that the port is offering mainly two classified services. These are *forwarding* and *container repair* services.

4.2.1. Added Value of VAS

The traditional port operations have been expanded into comprehensive forwarding services such as logistics and agency services. These make the port of Malmö unique in offering VAS compared to the ports of Rotterdam and Aarhus. Through these services, the management was able to get 5,4 million SEK in 1999 that is about 30 % of the port's revenue (see appendix D). There was a 13% increase in revenues compared to 1998 when the port got 17 % from the revenues from these services.

From the two main services offered, the forwarding services are the primary services, which give 73% added value from VAS, as explained in Figure 6. Moreover, the figure indicates that this forwarding service has three significant services; transportation, storage and distribution as typical logistic operation which takes 50%, 12% and 11% added value of VAS. A part about 3% value from the storage

services, was gained for renting space outside the port for distribution purposes. Agency services give a moderate percentage for the port of about 26% (PTI 4%, Cargo control 3% and Documentation 19%). This percentage is not as high as logistics and agency services due to the function of this service to facilitate both services. Unlike forwarding service, the container service is a complement service to forwarding activities, providing 1% of added value.

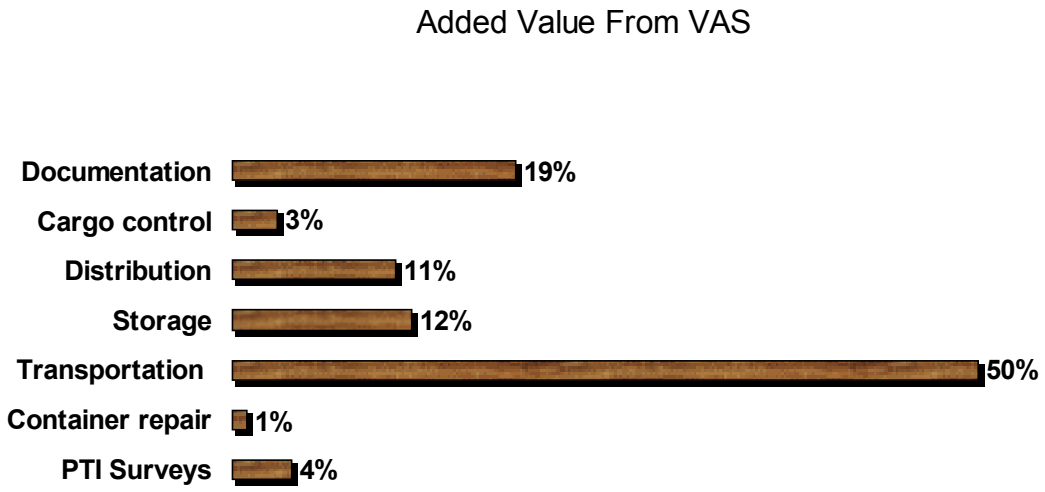

Figure 6. Added value from VAS in Malmö Port.
Source; Logistic Department Port of Malmö, 2000.

The portions of information as a kind of service can not be calculated directly. This element is involved in many service forms. Generally, it is reported that the information service in the port has had a portion about 9% for added value. Those are divided in many parts of services. The biggest part is in documentation service where the information has 4% from the total 19% documentation service. This comes from the factor that all clearing documentation is done electronically linked with the same system operated by the customs authority in Malmö. The same mode of operation is also used for PTI Survey that is performed in the port's warehouse. The checking results then sent to the customs office through the EDI line. Similar to the

documentation service, the port gives their customers information services in transportation and distribution services.

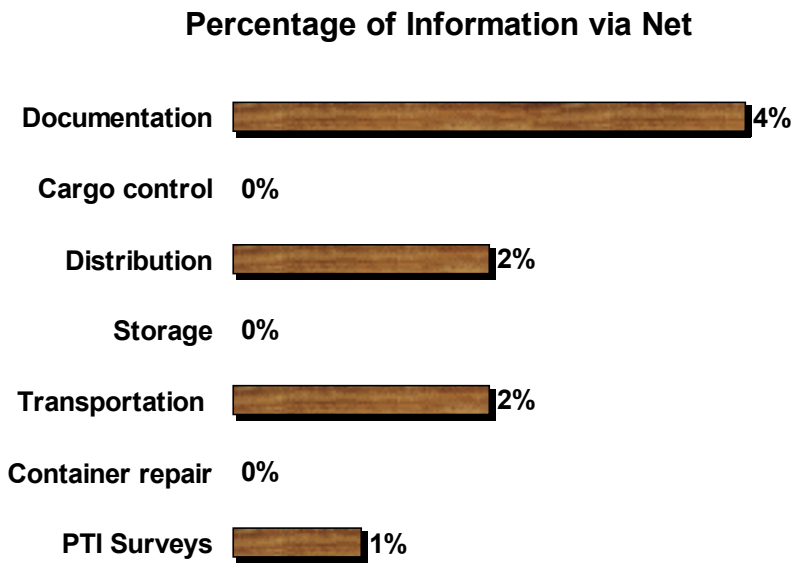

Figure 7. Information value in Malmö Port.
Source; Logistic Department of Malmö Port, 2000.

In these services, the information is used for booking, invoicing and tracking services. While for services for cargo control, storage, and container repair, it is understandable that technical information service is not needed.

4.2.2. Cost breakdown for VAS

In offering their VAS, the costs spent at a big portion for transportation 43%, labor cost 28% and administration cost 15%, especially for documentation purposes followed by maintenance cost 10% (Figure 8). In matters of *rental cost* for space, it can be stated that the port pays the rental fee for land to the city of Malmo (as an owner of the land) as a main expense for this item. Relating to VAS, it seems that the port does not include the payment of land for warehouse mainly as a unit cost

calculated in these services (VAS). The relatively high percentage on *transportation cost* is due to payment for shipment or transferring the cargo and container by truck, rail or ship to the port of Malmö and destinations. The *labor costs* is relatively high due to high labor costs (including overtime) in Sweden about SEK 120 with additional social security and tax paid as one package of the worker's salaries. *The administration cost* about the 10% came up as payment for documentation process, storage, and PTI surveys and custom clearance. *Material costs* (1%), *energy costs* (3%) and *investment costs* (1%) are cost items, which are relatively low, compared to other elements. It means that in giving the VAS provided in Malmö port, the costs for material, energy and investment are not a crucial factor due to the fact that the port is not releasing massive products, which need material and energy. Additionally, the VAS given by the port is not fully depending on investment decisions in terms of purchasing new equipment. It can be reflected from the low investment cost for operations (about 1%).

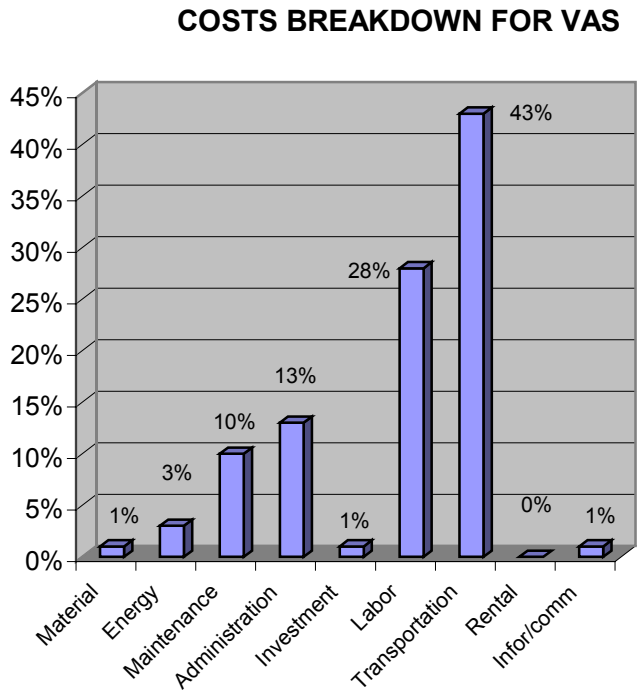

Figure 8. Costs breakdown of VAS in Port of Malmö.
Source: Annual Port Report, 2000

The information and communication costs about 1% are at a low level due to the fact that in offering information services, the port has cooperated with the Swedish Customs office in documentation. Consequently, the value gained was shared with the customs office. This low percentage shows further that the information/communication cost actually is not expensive in the port of Malmö. It is because a good infostructure system in Sweden, which creates an economical cost in operation.

4.3. PORT OF AARHUS AND ITS VALUE ADDED SERVICES

The port of Aarhus, one of largest harbor in Denmark, has decided to focus on *feeder services* as their core competence. In terms of container traffic, the port's website (http://www.aarhushavn.dk/index_uk.htm) reported that in 1999 the port handled about 450,000 containers and 80 percent of those containers are reefers with the perishable goods, especially poultry products exported from the hinterland area around Denmark.

4.3.1. Type of VAS

In the aspect of value added service, the port is providing three kinds of services as their competitive advantage; *information system, container services, and cargo controlling*. For the information system of the port of Aarhus, the areas of services are:

- Electronic Data Interchange (PIC-EDI)
- Terminal Operating Management System (TOMaS)
- Port operating Management System (POMaS)

For the container services, the port is providing:

- PTI (Pre Terminal Inspection) checking of containers
- Maintenance and repair of containers
- Maintenance and repair of reefer units
- Maintenance and repair of reefer installations

- Cleaning and washing of containers
- Refurbishing of containers

4.3.2. Added Value of VAS

From the various services offered, it can be stated that the port of Aarhus has been benefited from concentrating on perishable goods as the object of VAS. It is informed (Van Nielsen, 2000) that from various VAS offered they could create 20% of its total value added. In 1999, the stevedoring company handled about 450,000 containers or 4,871,250 tons could create added value about 25.34 US$/ton from which 5.07 US$/ton is resulted from VAS.

In Aarhus, these profitable services can be grouped into PTI surveys (23%), cargo control (22%) and storage (17%) and transportation (12%) as core services for perishable goods handled (figure 9). It can be estimated that those activities are really the customers' necessity as the services of the PTI survey and cargo control are required as a vetenerary related service to the customers in maintaining the quality of the cargo before being exported.

Moreover, on the storage service and CFS service in the terminal, the stevedoring company provides the service of packaging, repackaging, weighting, and special treatment for the anti-ripening of the vegetables and fruit especially for perishable goods For the container service, the port is additionally able to get notable percentage of value added about 18%. And the container they are focusing on is the reefer containers for perishable goods as exportation and importation commodities. And relating to this, documentation service could make a moderate percentage about 8% which is derived from the main and value added services. This comes from the reasons that in controlling the cargoes mostly for perishable goods in reefer container, the stevedoring company offering services for adjusting and maintaining the temperature level of the reefers. It is

managed and supervised directly through IT system linking to the port information system. The same mode of operation also for PTI Survey that is performed in the port's warehouse and the checking results then sent to customs office through EDI line.

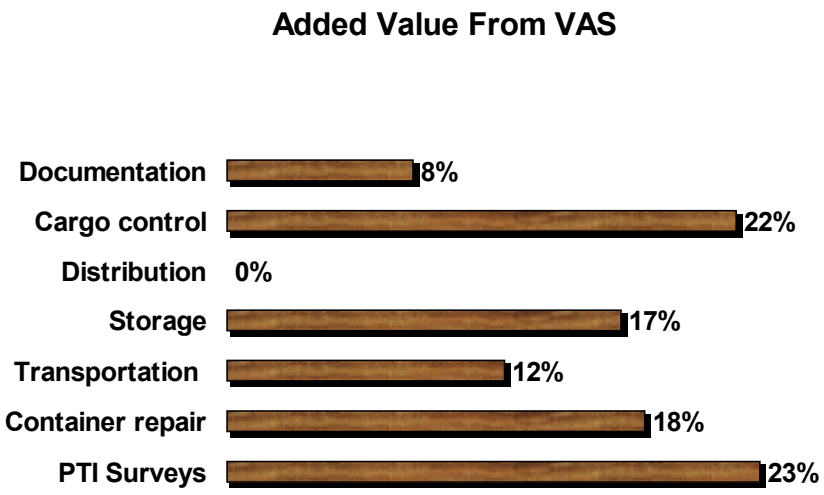

Figure 9. Aarhus's added value from VAS.
Source; Aarhus Stevedoring Company, 2000.

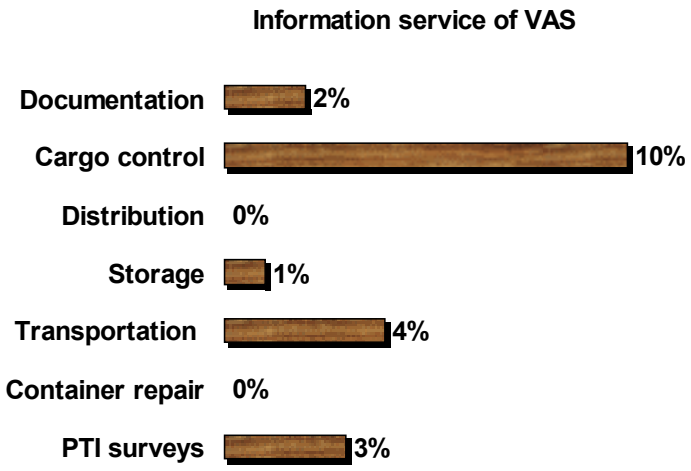

Figure 10. Information part in VAS.
Source: Aarhus Stevedoring Company, 2000.

Similar to the documentation service, the port gives their customers information services in transportation and distribution services. In these services, the information is used for booking, invoicing and tracking services. In the storage services, especially for the CFS service (container freight station), the stevedoring company gained about 1 percent of total value related the information services (Figure 10) they give regarding cargo and container tracking services that can be accessed by customers and sent to customers' agents or transportation service providers to transport the goods further. Compared to other services, it can be stated that this service may be categorized as a complement services employing the information system.

4.3.3. Cost breakdown

In offering the VAS as explained in Figure 11, the port spent an extensive segment for labor (25%), investment (20%) and rental costs (17%), especially for space around the port area followed by information costs (8%).

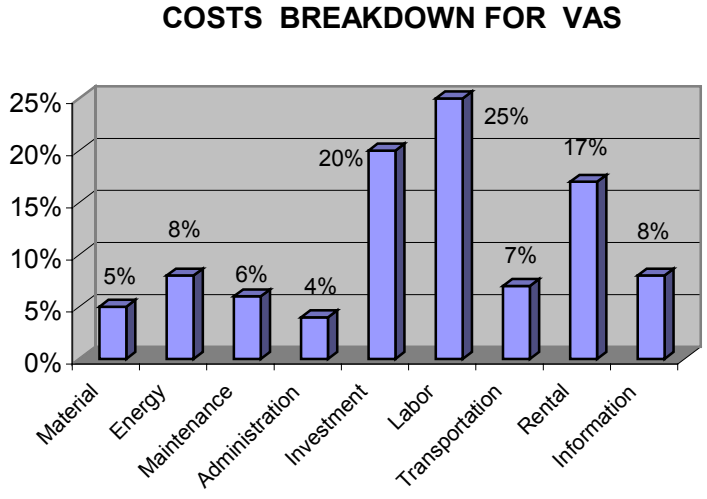

Figure 11. Cost breakdown for VAS of Aarhus Port
Source; Annual Port Account (2000), Aarhus Stevedoring Company (2000).

In terms of investment costs, the VAS given by the port partly depends on investment decisions in terms of purchasing new equipment, especially for the IT related equipment, either for handling operations and cargo controlling operations for reefer containers

In matters of *rental cost* for space, it can be stated that this stevedoring company pays the rental fee for land to the port authority (as an owner of the land) as a basic of leased area. Regarding to VAS, it seems that the port included the utilization of land for warehouses mainly as a unit cost calculated in these services (VAS) as some spaces were rented under the management of the stevedoring company.

The 7 % on *transportation cost* are due to a payment of slots shared for transferring the cargo and containers by block train to or from the port of Aarhus and destinations.
The *labor cost* is relatively high due to high labor costs (including overtime) in Aarhus about DKK 130 with additional social security and tax paid as one package of the worker's salaries.

The administration cost about 4% came up as payment for the documentation process, storage, and PTI surveys and customs clearance. This low percentage resulted from the cooperation of the port and customs authority to facilitate the trade through the port.
Material cost (5%), and *energy cost* (8%) are cost items, which are relatively low, compared to other elements. It means that in giving the VAS provided in Aarhus port, the costs for material and energy are not a crucial factor. Moreover, material and energy is relatively not a considerable operation cost in giving services mainly for reefer containers.
The information and communication costs about 8% are at a moderate level due to the fact that in concentrating on service-based information which makes the information cost is operated at an economical level.

4.4. COMPARED FACTORS AMONG PORTS

4.4.1. Value Added Gained among Comparing Ports

Table 3 shows that all ports have specific profit centers on which they are focusing on as the core service competencies of their ports.

VAS being offered by Lehnkering stevedoring company in the port of Rotterdam, make he terminal get the biggest added value from VAS per ton (11.45 USD) compared to others terminals. It means that in concentrating on a distribution center strategy, the terminal inclusively and the port on large scale has benefited from advanced and various services given to its users, shippers and shipowners. Moreover, it can be stated that the terminal and port have created more activities outside the port traditional areas.

However, Aarhus terminal got the biggest added value per TEU handled (82.29 USD) in providing VAS eventhough the terminal has the lowest percentage of VAS over the total added value gained. It means that, Aarhus terminal is more concentrated on container services rather than physical activities in the CFS or warehousing areas. In addition, those services are mainly offered inside the terminal site.

The port of Malmö could get a significant value added compared to other ports. Even though, the port gained the lowest value added in general (2,096,471 US$) or about 50 times less than the port of Aarhus, the port could benefit considerably from its VAS offered. The added value of VAS gave the port about 4.52 US$/ton or 49.77 US$ per container handled which about 11% slightly less than the port of Aarhus. In addition, it can be stated that the port has utilized their VAS profitably not only inbound the port area, but it extended outbound the port.

Table 3. Added value comparison among ports.

Port/Items	Value added (USD)	TEU handled	Tonnage handled	AV/ton	%VAS	VAS/ton	VAS/TEU
JICT	98,289,048	1,623,276	16,557,415	5.94	0	0	0
Malmö	2,096,471	12,636	139,000	15.08	30%	4.52	49.77
Aarhus	123,430,837	450,000	4,871,250	25.34	20%	5.07	82.29
Rotterdam	73,735,485	293,333	3,091,733	23.85	48%	11.45	75.41

Source: Compiled from JICT (2000), Malmö (2000), Lehkenring BV (2000), Aarhus website, www.aarhushvn.dk (2000), Van Nielsen (2000)

In this matter, JICT has gained no value on these VAS services as no value-added services were offered. Although JICT may handle the biggest container quantity compared other ports.

4.4.2. Value added of VAS among ports

In the container repair service it can be noted that the port of Aarhus has got more benefits in this service than other ports. The strategy to concentrate on reefer containers handling and services has resulted a profitable percentage in value on the service of reefer container, if compared to the port of Malmö that also offers the container repair services for all types of container. The Port of Rotterdam has no value on this business. Moreover, the service of this repair supports and gives the port of Aarhus expertise and knowledge in handling and treating the reefer containers.

In the information service, more or less all the ports have gained a similar value in percentage relating to all their service businesses. The stevedoring company in the port of Aarhus has benefited from the sale and the service of the used for handling, repair and survey the container included commodities in it.

The Port of Malmö got value from the services of ships, trucks, rail booking, handling of goods in warehouses and electronic clearing and checking.

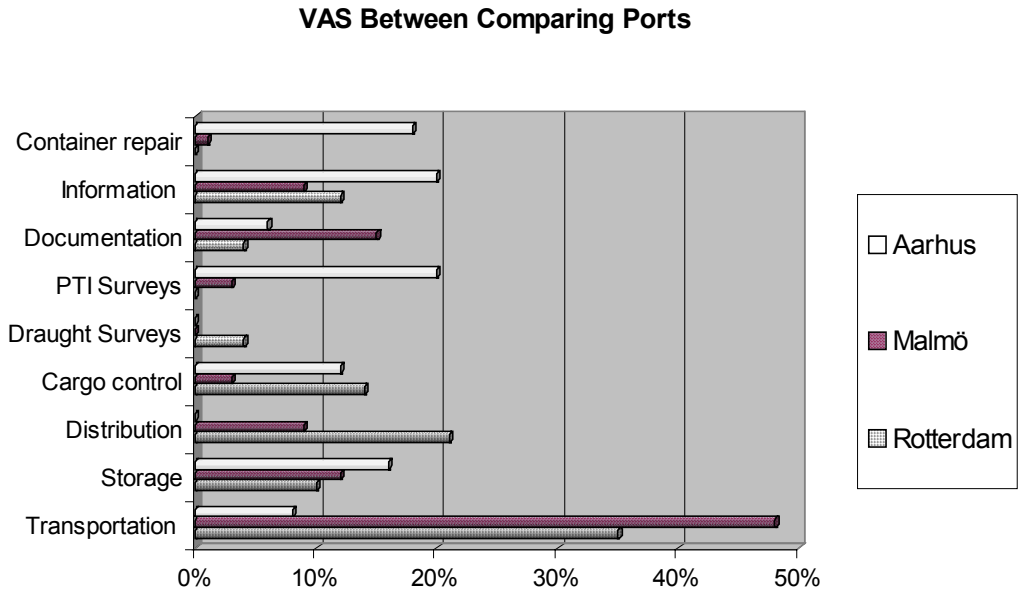

Figure 12. VAS Comparison among Ports

The service providers in the port of Rotterdam have used the informal service for customs clearance and truck or container tracking in the transport chain. The port of Malmö is the most benefited port, which got the *documentation* fee per ton, handled it compared with the other two. This is due to the customs clearing service offered by the port compared to the other ports that can not provide it.

The port of Aarhus in the *PTI Survey* has taken much advantage of providing this service and followed by the port of Malmö. Even this service gives the biggest value for the port of Aarhus, however, generally it can be noted that the port of Rotterdam got no value on it. For the Port of Aarhus this value resulted from the inspection service of perishable goods especially exported pork.

In the Draught Survey service, the Port of Rotterdam is the only port that gets as much value on it. This service reflects that the port of Rotterdam handles a lot of chemical commodities transferred by special containers. This is a typical service that can be offered for the chemical commodities.

In the Cargo control, the Figure 12 shows that the Port of Rotterdam is the most benefited port as it gains more value in percentage than the port of Malmö and Aarhus. It means that the port has a big part involved in storing products, in the warehouse. It relates much to the distribution service that the port of Rotterdam offered. It can be noted that the distribution service has given a big percentage to the port of Rotterdam compared to the port of Malmö, while the port of Aarhus has no value gained on it, due to any service given for it. For the Port of Malmö, the distribution service is also a significant service for them as a part of the door to door service the port gains the distribution activities as their profit source. However, from the *storage service*, it shows that in percentage the Port of Malmö is the most benefited port compared to the other two. This is due to the direct control management of storing services. For the ports of Malmö and Aarhus, the storage for inside and outside the port (while the port of Aarhus only provides the inside the port) is under full control of Management of stevedoring Company. But for the Port of Rotterdam, the storage value is shared with other subsidiary companies correlated with the service providers.

On the transportation service, it can be noted that all ports have gained significantly with this service. The Port of Aarhus got this value from the rail service offered to the customers. The ports of Malmö and Rotterdam have more variations modes of transport than the port of Aarhus such as trucking, ship booking (Port of Malmö) and inland transport (Port of Rotterdam). Generally, Malmö and Rotterdam have this transportation as their biggest profit center for VAS. All ports and service providers in the port of Rotterdam have a considerable control in transportation services. They do cooperated

with the other haulage service companies. But in practical terms, they shared slots and frequencies of services with their partners.

4.4.3. Cost Comparison between Comparing Ports

In this comparison from Figure 13, it can be confirmed that all ports indicated the particular cost centers as a result of their typical services competence.

On information and communication, the port of Rotterdam has used a bigger portion of costs on this, due to more controlling and tracking services on cargo. The budgeting on this argues that all ports have spent in some percentages to offer their value-added services.

On the rental cost, the port of Rotterdam have spent the biggest amount on this item, due to the space rental fee that the service providers use for storing and distributing the goods more in the Port of Rotterdam than other ports.

On the transportation cost, it can be stated that the port of Malmö has spent the biggest cost in percentage compared to the other ports. This is due to fact the port role as customer agent of customer that arranges the customer's needs. The port does not invest neither involve in a share business with other companies in giving these services.

The service providers in the ports of Rotterdam and Aarhus spend less percentage compared to Malmö due to facility or slot sharing they have had with rail or truck service companies.

On the labor cost side, it can be stated that labor costs in JICT is the lowest level among ports. Moreover, the ports of Malmö and Aarhus are relatively higher than the port of Rotterdam. It is because the labor costs cover not only the wages, but also the social

security and pension guarantee and labor union fee for the workers in those two ports are higher than in Rotterdam. The high labor cost in those three ports resulted from labor regulations and the strong labor union bargaining position in Europe.

On investment side, it is reported that the Port of Aarhus has spent bigger costs compared to the ports of Malmö and Rotterdam. This is due to computer system and container repair facilities. Moreover, it was found that the port of Malmö had used less percentage relativity compared to the others. It means that the port did not invest much on equipment and facilities in their services.

On the Administration side, JICT has spent these items in comparison to the others, due to the fact that the customs activities are more concerned with items related to their service. This is the opposite in Rotterdam Port, which has the lowest administration cost among the ports. It can be stated that the container procedures in Rotterdam port are the simplest one compared to others.

On the maintenance side, all ports have similar percentage on maintenance activities. Even it is shown that the port of Malmö has spent slightly larger amounts than the others.

On the energy and material sides, the biggest percentage is shown in the port of Rotterdam followed by the Port of Aarhus. This consequently shows that the process of VAS in the warehouses in the port of Rotterdam is more complex than other ports. That is also the same between the ports of Malmö and Aarhus.

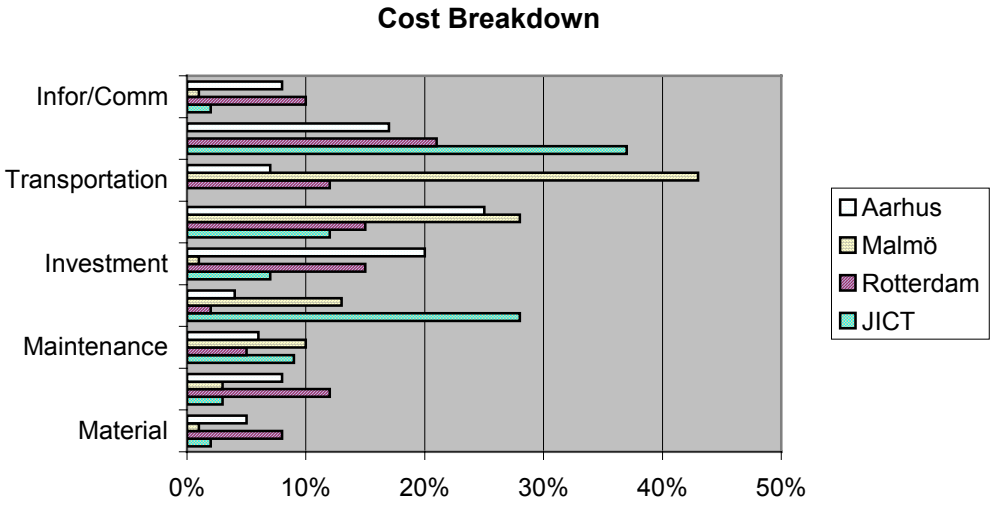

Figure 13. Comparison of Costs breakdown among ports

In conclusion, in respect of expanding the service pattern regarding horizontal, vertical and global terms, the service providers in the ports of Rotterdam, Malmö and Aarhus have their competence service on which they indicate a specific percentage on value added and operation costs.

The port of Rotterdam has decided to be a distribution center in Europe with chemical and agricultural based products as their competency traffics. Moreover, they provided various value added services in terms of horizontal, vertical and global forms. In these various services, the port got the biggest value on *transportation services* followed by distribution, storage, cargo control and information services. In doing their strategy, the port had to allocate the operation cost on *rental cost* followed by labor, investment, transportation, energy, info/communication and material costs.

The port of Malmö has determined to concentrate on a logistic service center for paper products in the Baltic and Scandinavian regions. Services they provide can be

categorized in horizontal and vertical forms. In this competence service the port has benefited from the biggest value from *transportation service* followed by documentation, storage, information, distribution, PTI surveys and container repairs. In doing their strategy, the port had to allocate the operation costs much on *transportation cost* followed by labor, administration, maintenance, energy, material, investment and information/communication costs.

The port of Aarhus has concentrated their service on reefer containers through the information service due to the large percentage of perishable goods handled in the port. For this objective, the various services they provide can be categorized generally in horizontal terms. With this competence service, the port has benefited from information services given the biggest added value followed by PTI surveys, reefer container repair, storage, cargo control, and transportation. In doing their strategy, the port had to allocate the operation costs on labor costs followed by investment, rental, information/communication, transportation, maintenance, energy, and administration costs.

JICT is a specific case as it needs to develop new services instead of existing handling services. Although, the terminal could handle containers more compared to other ports, the value gained per ton handled resulted a low level.

In addition, JICT has a comparative advantage in terms of labor costs and material costs. The labor costs in JICT are the lowest compared to other ports.

Chapter 5
ANALYSIS OF POSSIBLE VALUE ADDED SERVICES IN JICT

In offering the value-added services, JITC can probably get profit by setting its core competencies in the port circumstances. This starting point has to be considered, as JITC will never be able to be competitive in all the different traffic categories and services vis-à-vis rivals. Then a question arises on which traffic and services categorizing the set of core competencies should be focused on. After that, the next step is to determine the detailed services in term of horizontal, vertical and global patterns and impacts of these services in terms of value added, labor, investment, and the possibility to establish these services.

5.1. TRAFFIC TREND

The traffic commodity report in 1995 (see appendix B) both for export and import traffic informing a substantial market share of the terminal in **agricultural products**. These agricultural products in the period 1995 to 1998, when Pelindo II managed the terminal, showed a considerable growth.

However, in 1997 some commodities decreased due to economic crisis which started in September 1997 until 2000. Moreover, this crisis resulted in a decrease in almost all commodities handled in 1998. Nevertheless, there were some commodities that kept growing despite of the economic crisis. Those commodities were foodstuff and crude oil on import side and frozen fruits, tapioca powder, coffee and sawn timber on the export side.

In 1999, when JICT started, the agricultural products were the most significant commodity handled. On the import side, the agricultural products handled were cotton, frozen fruit, frozen meat and rubber which made up about 12% of the total commodity. On the export side, agricultural products were profitable commodities handled by the terminal compared to manufactured products and chemical products. Agricultural products consisted of perishable goods and agribusiness products dominated the export traffic which about 52%. From those trends, it can be stated that agricultural products are less affected by the economic crisis. Even for the export part, it showed increasing trends. Externally, the trend of the increasing trade of JITC's agricultural market can be supported by a similar trend in the national agricultural product growth that was reported about 10%-15% per year since 1998 (Dillon, 1999). This sector has contributed about 6,7% of GDP in 1999 (Indonesia Central Statistic Bureau, 2000) and with the growth of 10%-15%; therefore agricultural products are predicted to be Indonesia's second primary commodity after oil and gas in terms of GDP in 2005 [Saragih, 1999].

Furthermore, as its contribution to the total containers moved trough JITC, agricultural products have given some substantial value added to the JITC compared to other groups of commodities. In the future, it can be predicted that the JITC market share on the agricultural commodities will increase due to the factors below:

- 10–15% agricultural trade growth in the future. It will raise the seaborne trade partially on this commodity.
- The increasing of direct call of transshipment ships to Jakarta, which is estimated about 5% of total containers handled since 1999 (JITC, 2000).
- The position of Tanjung Priok Port on the agricultural seaborne trade can be estimated in the range of 50%-65% of Indonesia's agricultural trade. This level is estimated from many reports made by United State Department of Agriculture (about 65% in 1997 – 1998), Indonesia Statistic Bureau (about 50% in 1999) and BPEN (about 55% in 1998).

- The planning of the government and Indonesian Farmer Association to set up 10 agricultural commodity based terminals in Indonesia (Department of Agriculture, March 21, 2000)

5.2. VALUE ADDED SERVICES BASED ON AGRICULTURAL PRODUCT

In order to service the customers on the agricultural based products, JICT should understand and give another opportunity on which this field could be more attractive and efficient by giving services which can simplify the chain on the cost and benefit effectiveness. Through information collected from TNT's study in 1998, National Export Development Agency's report *(BPEN*) in 2000, and an OOCL-Indonesia market study in 1999, the process of agri chain can be mapped generally as explained in appendix F. From those sources can be summarized that the agribusiness industry in Indonesia is not utilizing its resources in technology, commerce, research and best practices to its best advantage. There are three main problems that need to be solved in this chain, i.e. lack of *time management, quality, and information.*

Time management is a typical problem in the logistics issue of this trade especially for Indonesian exporters. It is informed that a lot of deliveries were not made on time, due to lack of facilities, information, documentation and inspections. On the other hand, the importers consequently may miss sales opportunities on extra costs, lose sales and damage their market relationships. Costs increase for importers and exporters when timing problems are not resolved. The quality of the product exported or imported was found inconsistent through failures to exercise control between the farmers and the buyers and not knowing where and how inconsistencies are occurring. The key areas, in these problems created are as follows:

- Poor or absent of Cold Chain Management (CCM)
- Packing and stowing inefficiencies
- The use of incorrect packing materials
- The selection of poor quality products.

Inconsistent quality leads to increases in the prices per unit through the costs of increased claims and insurance premiums. It wastes management time on non-sales-producing activity, puts unnecessary strains on the exporter's relationship with importers, and adds to perception that Indonesians are unreliable suppliers.

On the information issue, Indonesia Exporter Association argumented in 1999 that the main problem of information flows is the non-disclosure of information. It is reported additionally that this problem is mainly caused by distant and wanting to maximize returns. Furthermore, a TNT study relating to citrus trade between Indonesia- Australia mentioned about the information blockage among practitioners. Consequently this flow will increase cost and indirectly degrade the quality of products due to the insufficient information of quality procedures and requirements for export. Regarding these problems, in order to have an efficient process, a simple flow of chain is recommended as a service structure of JICT to create new VAS (see appendix F). In this new structure, JICT could provide services on warehousing activities, distribution (consolidation), packing facility, temperature controlled stores, processing activities, inspection and quarantine services, block train, road transport, e-commerce facility, electronic documentation, and container repair in one service system as an agricultural distribution center. This service system may simplify the process of business from 5 stages (dry/cool warehouse), packinghouse, stowing agent pool, export agent pool, and inspections/customs) to only one consolidated stages of export and import flow. Moreover, for the exporters and importers, through this service, they will get the benefit in monitoring all the stages in order to reduce damages and losses.

5.3. CORE COMPETENCIES VIS-A-VIS RIVALS

The core competencies of JICT will be determined if the service will offers in the future shows a sustainable competitive advantage compared to their competitors. The factors that can determine the core competencies of JICT are *inimitability, durability, transparency, transferability and replicability* (Grant and Montgomery, 1995). In the container terminal business, JICT is competing with several ports as direct and

indirect competitors. The direct competitor of JICT as far as the agricultural product concerned in Surabaya Container Terminal (SCT). At present the indirect competing terminals are Panjang Terminal Container in Lampung (South Sumatra) and Belawan Container Terminal in North Sumatra. If JICT is compared with SCT, it can be analyzed that both terminals have their own inimitable character by nature. JICT has its geographical location advantage in western Indonesia. Meanwhile, SCT is covering the eastern part of Indonesia. This specific advantage makes both terminal are handling different commodities, one more in another. OOCL representative in Indonesia (2000) reported that in agricultural products, SCT is handling more fishing and forest commodities than JICT. However on other hand, JICT is taking more market shares in fruits, crops and raw based products. However, due to the frequency of space availability, JICT is the place that is more preferable to be called by ships due to the location relatively close to international traffic. This is the reason why JICT had more traffic on the export side than on import side.

On this location matter, JICT is naturally more strategic than other indirect competitors. Panjang Container Terminal has the similar advantage like JICT, however due to the facilities, technology, productivity and skills; JICT has the higher position in competencies. The same reasons are considered if JICT is compared with Belawan. If the various value added services in JICT will be realizing, there are three strong competitive factors compared to its competitors especially SCT i.e. strong financial capability, worldwide networking in HPH groups, and high skills and capabilities. The first one, on the financial ability, it can be said that JICT may have a good financial back- up due to the strength of HPH as an international port operator which is financed under Whampoa Inc (a finance based on institution in Hongkong).
Second, HPH is operating 17 container terminals in Asia, Europe, and South American, makes the JICT has worldwide networking that would benefit to JICT on marketing and information. On the marketing activities, due to networking, HPH has increased the direct call percentage from 1% to 8.5% in one year. Meanwhile, on the information issue, the HPH with the cooperation with oracle has launched GTX

information system based on e-commerce port community information system. Thirdly, the networking and the experience in the container terminal business result in them a good capability and high skills and knowledge in running the terminal productively.

Those factors for JICT will develop their core competence based on complexity ports to imitate. Consequently, with their core competence, JICT may build a good reputation as a distribution center for agricultural product on which they can gain a higher degree of durability. Moreover, the future specific advantages combined with the location will create higher mobility of resources and capabilities needed for the competitors to transfer these competencies to them. Furthermore, those things reflect the difficulties that the competing ports to duplicate JICT core advantage.

5.4. THE TYPE OF VAS CAN BE OFFERED

5.4.1. HORIZONTAL SERVICES TERMS

On this kind of services, it is recommended to apply the distrikpark concept of Rotterdam Port. The concept of park being operated could be an example of a port's response to the growing demands on shippers and the transport industry in large to maximize their benefits for *just in time delivery and storing* at lower cost. Based on this concept and the inherent traffic trend, JICT could provide an advanced logistic park with comprehensive facilities for distribution operators at a single location; a location close to the cargo terminals and multimodal transport facilities for feedering and transshipment, employing the latest in information and communication technology. It also provides space for warehousing and forwarding facilities including the storage and transshipment of cargo, stuffing and stripping of containers.

Moreover this concept could be applied in 10 planned agricultural centers which have been planned by the government. In these centers, JICT may provide various

services in order to minimize the transportation cost of agricultural product as explained in appendix F.

In these horizontal service terms, JICT could provide:

5.4.1.1. Consolidation and Distribution Services for Agricultural Trade

JICT has an opportunity to set up a warehousing networking center for containerized agricultural products on 10 agricultural commodity based terminals. For this, JICT has to provide storing facility equipped with controlled temperature stores due to the climate in Indonesia and the general temperature requirements for particular products. In this facility, the distribution activities are included as a part of the service packages. The function of distributing activities should not only be located in the port area it might also be placed outside. In these warehouses, for the documentation processes, it is possible to centralize the inspection (in terms of quarantine and other procedures) and customs checking

For the consolidation service, like the example of Port of Rotterdam where the applied inland consolidation depot provided to consolidate and further distribution of containers. This idea of ICD could be applied to be part of JICT distribution centers in many agricultural centers spread over Sumatra, Java, Kalimantan and Sulawesi islands where on these areas the ICD could be placed (see appendix H). As these services are able to be the polling centers of agri-product, the consolidation and distribution services could be an indirect solution of imbalance traffic of agricultural based containers especially for reefer containers which are reported that lot of empty containers especially reefer containers needed to be filled. In this matter, JICT might assist shipping lines in Indonesia to consolidate the traffic in those areas.

5.4.1.2. Packing and Processing Services

It is reported that the agribusiness industry in Indonesia uses high number of packinghouses for various types of products (*BPEN*, 2000).

Especially for export commodities (see appendix G) as reported in a study of the Indonesia Poultry Chain Management in 1998 stating that packing activities takes about 10%-15% of total transportation cost from farmers to the port of loading in Tanjung Priok. Like in the case of the poultry chain from Kabanjahe to Tanjung Priok, the packing activities contribute 14.7% of total transport cost before shipment (appendix I). Consequently, these multiple packing activities could decrease the competitiveness of the product

Therefore, there will be many benefits for the industry if packinghouses can be consolidated in reducing packing costs at a reasonable level. This is the opportunity of JICT to offer a consolidated packing infrastructure to the industry. Moreover, there are reasons that center-packing facility can make more benefits for the supply chain;

- ❖ Larger products harvest volumes will reduce lead times and encourage faster order filling;
- ❖ Market demands can be satisfied more precisely with grading to customer specifications;
- ❖ A better utilization of capital equipment will improve cost efficiencies, allowing for intensive equipment in capital equipment to monitor quality controls;
- ❖ Cheaper freight rates will be obtained through economics of scale.
- ❖ Logistics co-ordination and planning will be improved and product availability and quality will be rationalized;
- ❖ International product specifications can be introduced to reduce variations in quality between farmers, packers and regions.

Relating to this center packing facility, the services that possible be given are:

* Weighing
* Washing
* Labeling
* Bar coding
* Palleting
* Pre-terminal inspection
* Shrink Wrapping
* Packaging/re-packaging
* Crating
* Additional processing activities

5.4.1.3. Information service

This operational information service may be applied through EDI (Electronic Data Interchange) and Terminal Information Center (TIC).

In the practice of Aarhus Port and Malmö, those ports have operated a reliable and *user friendly* information system combined with electronic documentation service to support the operations of the port.
It can be stated that the service applied currently has raised the productivity of handling cargo, gate system, equipment operation and maintenance, storing, inspection and administration processes. Consequently, as Van Nielsen (2000) commented that the service saved money (communication cost) and 60% of operating time during three years period both for the stevedoring company in handling the cargoes or containers and the customers. As a result the information system named Port Information Center System (PIC) has been applied as profit center for the port in offering the customers through software services for various activities.

By taking those experiences and strategies, JICT should facilitate electronic service for document transfer by:

- Encouraging the use of electronic documents
- Creating an alternative method for those without the financial capability to install electronic commerce or access to internet by establishing a facility or agency close to the ports (in port hinterland area) that will transmit documents by electronic commerce
- Interlink all distribution points (under JICT) by EDI systems which is applicable to be connected with the similar facility customs inspections, shipping line, shippers, carriers, freight forwarders, banks, navigation office, and quarantine office.

The link structure of Rotterdam Port (as explained in appendix J) is should be adopted to connect all users and partners of terminal services.

Therefore, the information service which has been the core competencies of JICT, should involve a lot of efforts in managing and reducing the forms of procedures of containers handled. It is recommended that this service should consist of three main systems:

- Electronic Data Interchange (PIC-EDI)
  - Booking (Advanced container details)
  - Container status system
  - Documentation relating customs checking
- Terminal Operating Management System (TOMaS)
  - Yard space and deploying optimizing
  - Gate monitoring system
  - Ship, yard, and equipment planning and control
  - Cargo and reefer controlling
- Distribution Management System (DMaS)

As far as the parties and function are concerned, this system may be noted as an integrated system based on a networking line. Throughout these three sub-systems the parties with an interest in container handling, transport and services are on-line. These parties are:

- Local liner agents (LLA)
- Shipping lines
- Haulage companies
- Service providers
- Tally Company
- Railway Company
- Custom office
- Port Authorities

From these parties, it may be commented that the information service has been a tool linking and managing the activities of service in terms of horizontal, vertical, and global scale of the port. As the flow of information is not only bound on the port area, but it already covers the external areas of the port. All aspects of functions in managing a

terminal are also covered. Technically, the system can interface with ship and yard planning, equipment maintenance modules, warehouse and CFS operations, customs, and haulage planning.

5.4.1.4. Container Services

These services are intended to support the availability and the operation performance of the container especially for reefer containers. Like in the Aarhus and Malmö, the possible services that can be given are:

Booking and repairing

- Container booking and tracing
- Container maintenance and repair services such as: Floor replacement, rail insertions, cornerpost, and roof holes, side panels.
- Container cleaning services such as water cleaning, chemical cleaning, vacuum cleaning, sweeping.

Real time monitoring service

In reefer containers, the JICT should provide a universal and up to date monitoring system along the supply chain to identify the problems causing damaged procedures. It is recommended that the system should be able in monitoring reefer temperature via the internet in real time (by satellite) for the duration of the trip so that the cold chain can be monitored while reefer power is on or breakdowns. Therefore, the importer's supply chain can be detected and problem areas identified to assist in locating the source of the problem. The system that is under control of the JICT information system has to be accessed in consolidation and distribution places.

In these services, JICT may invite other container service companies to offer the services together. In order to give sophisticated services on this matter, JICT should utilize better technology integrated with an information system applied in the terminal

especially for temperature controlling of reefer. The service of RRM (remote reefer monitoring) in Port of Aarhus can be applied in JICT.

RRM is a system based on the transmission of signals from the reefer container's built in microcomputer to a central control print on the bridge or elsewhere, where the data can be achieved, analyzed, and stored. Moreover, it is recommended that the service of controlling, booking and tracing should be able to be accessed easily by customers in the real time basis with the proper security system. The main features and the benefits of this system are explained in appendix K.

5.4.2. VERTICAL SERVICE TERMS

In 1999 it was reported that JICT mostly handled about 87.8% of the container trade in FCL and only 2% are under LCL condition. Moreover, this condition has been a trend of the terminal since 1995 (as explained in appendix L). Furthermore, this figure indicates that value-added activities are not being operated and completed in the terminal area but outside the terminal and in the hinterland as well. Therefore, it is reasonable for the terminal to extend their service patterns outside from the existing port area. In this sense, that JICT has to achieve a large share in intermodal transport and consolidation processes.

In the port of Rotterdam, this type of service called hinterland services covers transportation services around central and Eastern Europe. As an example, Seabrex stevedoring company in Maasvlakte has provided transportation services on road transport, inland waterway, and rail service for distributing vegetables and fruits to and from the port of Rotterdam. Moreover, in the port of Malmö, to support its logistic and forwarding strategy, the port has provided shipbooking for its users to transport papers and plastic products to Eastern Europe and Southeast Asia.

From these experiences and strategies in Rotterdam and Malmö, JICT could establish a transportation service for its hinterland on Java and other islands as its foreland such as Sulawesi, Sumatera, Kalimantan, Maluku and Irian Jaya. The objective of these services generally is to give the customer efficient transportation flow related to the agricultural product base to final destinations. The detailed services that possible to be offered are:

5.4.2.1. Block train service

In covering the hinterland, JICT has another opportunity to extend its rail transportation service. It is a reliable and more practical solution rather than the planning of dedicated toll highway infrastructure for containers to and from the terminal, which is more expensive than the existing rail service. The rail service or in the block train might be an alternative of the crowded of road transport around Tanjung Priok which has been overloaded. Moreover, the block train, like in the case of the ports of Malmö and Rotterdam, can reach certain consolidating places even trough the center of Jakarta. Currently, the service of train to dry Port Gede Bage in Bandung may not be enough and satisfying for transporting containers out of the terminal. However, this service might be an initiator to develop new service area coverage to where the hinterland or agricultural centers are located. Due to specific traffic focus, the block train to be offered should be equipped with proper reefer installation and monitoring system for temperature changes during the transport.

5.4.2.2. Road (Refrigerated) Transport Service

JICT is possible to provide trucking service in supporting the various value-added services afforded. It is reported that this service is needed especially for refrigerated transport, which is insufficient to handle the supply chain to Indonesia. The service should be involved in a three-road transportation system used; rural transport, urban transport and overland transport. Moreover, it is recommended that this service in 10 planned agricultural centers in seven Indonesia main islands. Through this service, it

would maintain the constant quality of agricultural product during transportation. On the matter of transportation service, JICT does not have to invest in all the transportation lines. They can cooperate with other institutions and companies to offer these services. The object is to attract cargoes coming to the terminal through the services offered. This joining action would let JICT to realize the expanding service pattern. For the block main service, the National Train Company might be invited to join this new service to open new service areas related to consolidation and satellite distribution centers. A similar method could be applied with haulage service companies. However, JICT has to convince those companies with feasible future traffic to share this with them. Moreover, JICT has to share the risks with other partners to offer those services. This is the same strategy that has been made by the management in Rotterdam, Aarhus and Malmö.

5.4.3. GLOBAL SERVICES TERMS

In the information system, it is recommended that JITC should offer an e-commerce based port community system which makes JICT an information facilitator to customers in linking their needs with others parties. The difference between this service and the information service in horizontal terms is in the trading process. This e-based service provides an artificial trading market in agricultural products. Clearly, via this tool customers may benefit indirectly by having free market access in the digital form. This is one solution to penetrate the market by improving the information flows along the supply chain of agricultural products. From two references of TNT and *BPEN*, it can be analyzed that the open information and communication system can be a key solution to this existing hindrance of the supply chain. The reasons are:

- The farmer's state (Indonesia or other countries) may receive market information and feedback on their performance in the market.
- Export agents will take advantage in gaining accurate information on product availability, especially when they have to liaise with growers, pack-house, quarantine house, shipping companies and importers.

- This affects immediate and forward sales of a stowing agent in planning the arrival of products and handling efficiently way due to clear advance instructions provided through this open system.
- For the shipping lines, the export agent through the system to transport the goods will inform them the time. This real time information is a great support for planning the space of the ship for a shipment. Further, for some destinations like Australia, New Zealand and Taiwan, the overbooking compensation charged (about 5-10% of tariff) will be diminished.
- The lack of information regarding standards and procedures regulation will be overcome. It is reported that the lack of quality standards and procedures knowledge of Indonesia exporters is the main problem of automatic holding order (HO) emerged in the trading activity. It is caused by the misunderstanding of detailed trading description regarding to production processing standard, importer data, batch/lot code, total weight, label requirement and inspection requirements.
- Related to the cargo control, the information system through portal net system makes it possible for the transportation of goods in containers to be tracked and controlled in terms of real position, temperature level, security and distribution information.

In port of Rotterdam, the Seabrex Company has used an e-based information service called Integrated E-business solution for global fruit and cold chain businesses. Through this service Seabrex global distributors and customers have instantaneous access to information about their own orders and products.

For JICT, it is recommended to join the GTX networking service of Hutchison (HPH), the JITC's mother company, that has been leading this issue on *Portportalson.com* (a HPH subsidiary joined with Oracle, Inc). This GTX facility is offering real time information with the response directly from the other side. Through this existing facility, JITC will get the benefit from the possible increase in market shares. This comes from

the active interactions of all port community parties that allow them with an online exchange to transact and share information over the Internet. GTX moreover links buyers and sellers of transport capacity in a marketplace that is borderless and timeless. In order to apply it on agricultural products and the circumstance of Indonesia, like in the case of Aarhus Port, the peak technology mobile terminals and transmitters are recommended in verifying tracking goods during transportation and distribution activities. Furthermore, like in the application of Integrated E-business solution of Seabrex, the system should have three modules related to logistic, coldstore, and merchandise.

5.5. THE IMPACTS OF VALUE ADDED SERVICES

The future VAS is not only benefiting JICT inclusively, but it may give significant contributions to its hinterland and foreland. The chart in appendix N shows the interest of business and social objective of the terminal as a private entity which may build a better reputation of the terminal in its circumstances and create a longer durability of the JICT competitive advantages vis-à-vis rivals. There are three considerable impacts; *employment, value added and distribution of wealth* that JICT may contribute to its circumstances either the hinterland or foreland as general. In addition, investment and possibilities to set up this distribution center will be discussed on this part.

5.5.1. Value Added

From the information collected and given by the studies of citrus and poultry chain in 1998, it is estimated that in offering various value-added services, JICT could create additional added value about 32.81 US$/ton. Moreover, it is predicted that in giving VAS based on agricultural product, activities in *transportation*, *information* and *distribution* services will give a high level of value added to JICT. Transportation and distribution services would create new revenues about 93.6 US$/ton. Moreover, information service is estimated to contribute about 10% of transportation and

distribution services given. This percentage is taken as the minimum level of information value gained in the ports of Rotterdam, Malmö and Aarhus. Furthermore, Warbiz Indonesia in 2000 confirmed about 10% value gained from information services given as a product. Therefore, on the transportation, distribution and information services, the revenue that could be gained is about 102.96 US$/ton.

In order to get the added value of these services, the revenue should be deducted with the costs spent for offering those services (a table of cost in appendix N). Those expenses (in total about 75.06 US$ per ton) are estimated and based on the existing operational cost and the studies made by OOCL Indonesia. Then, it can be estimated that the services of transportation, distribution and information could create about 27.90 US$ per ton.

On other service activities, the value that would be contributed to JICT is lower than transportation, distribution and information services. Cargo control and surveys is estimated to contribute about 3.28 US$ per ton (10% of the total added value of VAS), documentation 1.31 US$ per ton (4%), and container service 0.32 US$ per ton (1%).

If these values are added to the existing value of handling service (5.49 US$ per ton), then the total value for 10 agri-terminals could be estimated about 38.75 US$ per ton (see appendix O). The total value is estimated in three scenarios; optimistic target (with 100% total throughput), normal target (60%), and pessimistic target (40%). The normal target is calculated from the existing agricultural commodities handled by JICT (about 6.5 million tons especially for export traffic). By looking those scenarios, it is predicted that the total value created in 10 agri-terminals (each terminal has 1 million tons capacity) is about 387.5 million US$ (for optimistic), 232.5 million US$ (normal) and 155 million US$ (pessimistic).

The transportation service is predicted as the highest part of value if JICT has a large share in the transportation industry in line with the distribution center service. Like in the case of poultry chain from Jakarta to Kabanjahe, which shows the percentage of transportation about 80% of the total value chain per tonnage poultry commodity handled. Furthermore, the study of citrus from Indonesia to Australia, transportation takes value about 70%-80% of the total value chain.

In information sector, in the future, it potentially becomes a significant tool in business practice especially in the agricultural sector. A survey from an e-commerce association in Indonesia (Warbiz, 2000) predicted that on the agricultural products there is about 44.500 potential subscribers waiting to use an electronic trading floor for export and import contracts. Additionally, this study calculated the prediction of total transaction value about 3.5 billion USD on which information could get about 10% of it or 0.35 billion USD in 2002.

The value added that would be gained by JICT would follow relatively with the pattern of value added gained by other compared ports (see appendix Q).

In the case of Rotterdam, the port has been concentrating on the strategy of distribution center getting the biggest part of value added from transportation (35%) and distribution (21%). In the transportation service, the same case happens in Malmö which has been giving forwarding service and receiving highest value added from transportation service (48%).

5.5.2. Employment

Various activities in VAS are possible to create both direct and indirect. As in the case of the port of Rotterdam in terms of direct and indirect emplyment, 50% of the employment was created in port industries, 30% in transportation services, and 20% in

distribution services. In JICT, new direct vacancies could be created inbound and outbound location of the terminal in the hinterland and foreland-consolidating centers along the agri-product chain. It is the reason that on distribution and transportation service, a high level of employment could be created compared to storage services along the agricultural chain.

However, it is assumed that other service activities would contribute at a low level of employment due to their specific and specialized person needed on those activities. H.S. Dillon (in Bisnis Indonesia, 2000) reported that agricultural sector in 1999 (especially for export trade) could create about 4.6 million employment in whole agricultural chain. It means that the increase in commodities exported makes it possible possibly to create new employment.

From Table 4, it can be argued that value added services on this commodity could increase the quantity of agricultural exportation due to the improvement of quality, information, and time management. The increase per tonnage exported will create 0.37 employment in this sector. Therefore, as an example, if the agri-distribution center set up is able to increase 1% of the export volume in the future through VAS, it would create about: = 0.124 x 10^6 x 0.37 = 45,880 employment.

Table 4. Estimated employment ratio for one ton of agricultural commodities exported in 1999.

Containerized form (M ton)	General cargo and Bulk form (M ton)	Total (M ton)	Labor created (M people)	Ratio of Labor/ton
4.8	7.6	12.4	4.6	0.37

Source: Compiled from Central Statistic Bureau (2000), H.M. Dillon (2000), and Port of Tanjung Priok (2000).

5.5.3. DISTRIBUTION OF WEALTH

The third contribution is wealth distribution of added value that is not only for the JICT but it is further expanding to external areas of the terminal. It is logic as many companies created are getting profits, giving tax and wages. As a result it makes further impact to others sectors in the perspective of macro economic.

Currently, the presence of JICT and other terminals are some of the factors generating the urbanization phenomenon in Jakarta. As a result of this many remote areas are empty as people are moving to Jakarta, and consequently social problems will emerge. One of the many reasons is because the *imbalance of added value distribution.* However, by applying the strategies of distribution and consolidation that present situation is possible to be changed.

Consolidating, warehousing, packing, transporting, processing, documenting and information centralizing activities will generate new value added in the many agri-centers in Indonesia especially in seven major islands in Indonesia, in a district and provincial areas. The value is not only in the forms of these direct activities, however, it may create indirect and induced value resulting from various activities derived from agri-chain activities. Moreover, the specific commodities produced substantially influence the value possibly gained through various services. West Timor, as an example that will gain more value on the poultry product due to the large quantity in that area compared to other areas especially beef meat to be exported.

Similar to the impact of value added mentioned, the impact of wealth distribution will be gained from the distribution and information services at a high value level followed by storing services. Furthermore, it will create more value added value that could be augmented on the Indonesia GDP.

5.5.4. INVESTMENT

The Department of Agriculture announced a plan to built 10 agricultural center terminals in ten of agricultural places in Java, Sumatra, Kalimantan, Sulawesi, Bali, West Timor and Irian Jaya. The government has planned to budget about 470 billion rupiahs or 59 million US dollars per unit of terminals (Department of Agriculture, 2000). This level of investment was calculated on the basis of Rotterdam Port (Indonesia Chamber of Commerce/*KADIN*, 1999), which reported that one of the agricultural terminals in Rotterdam spent about 85 million US dollar in 1999. This point was converted in the roughly prediction stating that the reasonable level in Indonesia is about 70% of this point due to cheaper price of land and lower project costs in Indonesia compared to the Netherlands. The objects of cost benchmarking were agri terminals in Rotterdam for fruit and juice, horticulture, frozen meat and fish in the Maasvlakte area.

Information collected from *KADIN* regarding to agricultural terminals mentioned the planned total area (70 Hectares) and the capacity to handle agricultural commodity about 1 million tonnes. However, *KADIN* and Department of Agriculture have not formulated the detailed investment calculation and items. An investment table in appendix R summarizes the estimation value of 8 items of infra supra and infostructures needed for the predicted investment.

5.5.4.1. Land

It is assumed that the average land price in Indonesia in 1999 is about 2.5 US$/$m^2$ or 22,000 rupiahs (*KBN*, 2000). Therefore, if one terminal needs 70 Ha, it can be calculated that the land cost needed is about 1.76 M US$.

5.5.4.2. Packing Facility

Seabrex Company informed that packing facility in their services spent about 10 million US$ in 1998. It is assumed that due to the differentiation in price in 2000 about 20% the value would be 12 million US$. However, if the 70% factor of investment is considered

then predicted investment for this facility is about 8.4 million US$ or about 14% of the total investment.

5.5.4.3. Quality Control Facility

The investment value of this facility varies due to the type of product and quality level and regulation required. As a simplification value, the investment needed for this item is about 5.8 million US$ that is about 70% of 8,4 million US$ invested by Seabrex in 1998.

5.5.4.4. Controlled Temperature Storage (CTS)

For this item, Seabrex informed the CTS facility spent about 18 million US$ in 1998. It is assumed that due to the differentiation in price in 2000 was about 20%, then the value would be 21,6 million US$. Moreover, if 70% of the investment factor is considered, the investment for CTS is about 15.28 million US$ or about 37% of the total investment.

5.5.4.5. Container Yard

The project is not intended to build a new quay area in these 10 terminals. However, the container yard facility would be laid out as an extension of the existing berth (general cargo or multi-purpose berth) in certain ports. As mentioned before that the planned terminal has a maximum capacity of handling about 1 million tonnes. It is assumed that if 5 tonnes of products were containerized in one of the 20 ft container, the maximum container capacity of the terminal would be about 2000,000 TEU per annum. This level of output by Drewry in 1998 could be categorized in small terminal (200,000-210,000 TEU). Through a survey made by Drewry in 1998, predicted that the terminal needs about 5.3 hectares land, and the unit-paving rate is about 4,638,000 per ha. It means that the investment for a container yard is about 5.3 x 4638,000 = 3.38 million US$. Moreover, if the price differentiation factor, 20% used on this number, then the investment for that item might be 4.1 million US4 or about 7% of the total investment.

5.5.4.6. Transportation and Lifting Equipment

Based on the maximum throughput as a small terminal about 200,000 TEU per annum, the transportation and lifting equipment can be predicted as explained in appendix R. It is calculated that the total investment needed is about 11,76 million US$ or about 20% of the total investment

5.5.4.7. Dry Stores

Information given by Ocean Warehousing Ltd, a stevedoring company in Rotterdam, mentioned the investment in dry stores facilities for 4 million tonnes, the company spent about 17 million US$. Therefore, with the capacity of 1 million ton and 70% of the investment factor, it is predicted that the investment needed is about 2,9 million US$ or about 5% of the total investment.

5.5.4.8. Information system

Data and press release given by Seabrex Ltd. and Magic Software Inc in 1999 informed that the information system included the Integrated E-business solution was about 2 million US$. If the differentiation price factor 20% is taken into consideration the investment in this item would be about 2,4 million US$ or about 4% of the total investment.

From these calculations, it is predicted that the transportation service will need a considerable investments followed by distribution services (packing facilities) compared to other service activities.

From the tables in appendix P, it can be estimated that JICT will need 7 years as the longest period to pay the investment cost about 590 million US$ (for 10 ten agri-terminals with 59 million USD each). Moreover, this period is based on the pessimistic

target of throughput about 4 million tons in total. However, for the optimistic target, JICT is predicted will need 2 years to pay back the investment cost.

In addition, the interest rate, about 18% is taken as a maximum reference rate of Bank Indonesia for a business project (BPEN, 2000). In other countries, furthermore BPEN informed that this level is probably lower than 10% (for example SIBOR interest in July 2000, about 6%)

5.5.5. POSSIBILITY

If the level of agricultural trade keeps growing at the same level (10%-15%) and same percentage of JICT market share on this commodity, it is predicted that distribution and transportation are services that have a high level of possibilities to be realized. The high possibility on the distribution services (including storing and warehousing) is due to a high of opportunity and needs in term of facilities and services in agri-chain. For example in citrus and poultry trades, the studies on those commodities in 1998 pointed out the insufficient of inland transport and distribution facilities especially packing facilities as the main causes of the low competitiveness of Indonesia agricultural products compared to Australia, Singapore, and Taiwan. Moreover, these studies and a report of OOCL Indonesia (2000) informed a large need of cold storage facilities. It also mentioned that there is only about 16%-20% of Indonesia shippers and import agents that have reliable cold storage facilities. Furthermore, Indonesia department of agricultural announced the need of 10 agriculture terminals in Indonesia. It is a plan to boost Indonesia agricultural trade, which has not been influenced by economy crisis since 1997. The plan is opened for national and multinational investors in offering efficient and reliable distribution center and transportation facilities for agricultural product. Therefore, on this plan, JICT has a high possibility to be a distribution center of agricultural product as JICT has a reputable network and experience in container business especially for handling the existing agricultural traffic through JICT. In

addition, in term of networking, JICT has a wide networking both in national scale (through Pelindo II) and in international scale (under Hutchison Port Holdings).

On the transportation service, JICT has more opportunity in offering refrigerated units for inland transport in its hinterland and forelands. This service is possible to be provided in a block train service that has been operating in Gede-Bage route to Bandung. Morover, the refrigerated block-train unit is more needed to support the facilities of cold storage. For the coastal shipping service, it is predicted that JICT will have difficulties to offer this service to its customers. It is due to a large of ship investments and many existing operators providing this service which is inclusively protected by the government.

On the information services, the possibility is not as high as transportation and distribution. The reasons are due to many main competitors such as EDI Indonesia Ltd. which has 30% market share of EDI service in Indonesia and Agrindo.com; an agri based information portal service for e-business which has 20% market share on agribusiness. However, due to the big opportunity of value on information system on this sector, it may justify that the business on this service is possible to be exist and profitable. In addition, JICT may have easily get the assistance and support from its mother company, Hutchison (HPH) Hongkong, to be on line with GTX.com

On the other services for container repair, documents, PTI surveys, and cargo control, it is predicted that the possibilities to set up are relatively low. This is due to the existing government entities in charge on these services. In addition, for container repair, many container manufacturers in Jakarta and Surabaya are offering the service of reparation.

Chapter 6
CONCLUSION AND RECOMMENDATIONS

6.1. CONCLUSION

Value added service (VAS) is one strategy that Jakarta International Container Terminal (JICT) could apply to satisfy its customers' needs in the perspective of transportation chain and to exist in the global competition with other container terminals in Indonesia.

At present, the handling service as the core service of JICT creates 5.94 US$ per ton handled. It is the lowest level of value added per ton compared to other ports. The low level is due to no value added services offered to contribute to the value level. However, terminal operators in Aarhus, Malmö, and Rotterdam get higher added value than JICT as they provide VAS additionally to their handling services. Rotterdam gets about 48% of its total added value coming from VAS, while Malmö and Aarhus get about 30% and 20%. Respectively therefore, through the VAS strategy, the terminal may create supplementary added value from services given to users and companies connected to JICT activities located in its hinterland and foreland.

In order to have a sustainable objective in offering VAS, JICT should focus on their competitive advantages in terms of market (traffic) share, knowledge and networking.

By analyzing all commodities handled over the years in 1995 to 1999, it can be stated that the core traffic competence of JICT is on the agricultural-based commodity. This commodity has made up 12% of the total import traffic and 52% of the total export traffic. Moreover, the national growth of the agricultural trade was predicted about 10%-15% in 1998. Furthermore, in the container industry, JICT has a business networking with over 17 container terminals under its mother company, The Hutchison Whampoa group in Hongkong. Through its expertise and financial support from HPH, JICT is able to operate the terminal efficiently and productively. Therefore, by considering those reasons, it is possible for JICT to create a new efficient trade process for its customers as an agricultural distribution center in Indonesia.

In this distribution center JICT could provide various value-added activities in terms of horizontal, vertical and global forms. In the horizontal terms, possible activities that can be offered are distribution, packaging, information and container related services. In addition services such as dry and cold storaging, advanced processing, controlled temperature storaging, quarantine inspection, quality cargo control, and electronic documentation are included in this group. The possible activities in the vertical terms are consolidation and hinterland services. The consolidation service could be realized as inland container depots (ICD), while block train and road (refrigerated) transport is recommended hinterland services. In the global form, it is practicable that JICT could offer a service of an e-commerce based port community system.

Regarding the plan of the Department of Agriculture to build 10 agriculture terminals in 7 areas in Indonesia, JICT has the opportunity to involve in this project by giving comprehensive services as an agri-based distribution center. Moreover, by being involved at these agriculture terminals, it is predicted that JICT could get more value added (about 32.81 US$ per ton) from transportation, distribution, information services

(e-commerce and electronic documentation), cargo and survey, documentation and container services.

Furthermore, the involvement of JICT in these terminals in many areas will subsequently give positive impacts on employment in particular and a significant wealth distribution over regions in general.

6.2. RECOMMENDATIONS

6.2.1. Partnership

The reasonable strategy in realizing value added services for JICT as a distribution center in 10 agricultural terminals is *partnership*. Through partnership JICT could reach the comprehensive objective of the proposed strategy in collecting, processing, handling, and transporting agricultural commodities. In addition, it would reduce investment risks relatively, as it will be shared with partners. It is recommended that the partnership form should be based on the same pattern of value added services offered in horizontal, vertical, and global terms.

In horizontal terms, JICT should contact and build cooperation with national shipper associations and reliable service providers in the agribusiness. Government institutions regarding to quarantine and inspection should be involved in activities regarding regulations and requirements. For EDI services, it is recommended that JICT should have joint operation with EDI Indonesia Ltd, which is a main operator of EDI services in the country.

In the vertical form, in order to give users the efficient and integrated transportation chain, JICT deals in a joint operation with the national Train Company, trucking companies, and container service providers.

In the global form especially the e-commerce port community system, it is recommend that JICT could directly be linked with the GTX system monitored from the HPH office.

6.2.2. Legal status

The existing status of JICT is authorized as an operator of the container terminal. Consequently, it means that JICT should have another legal permission to set up new business activities of value added services. Moreover, to involve and develop these new activities in 10 agricultural terminals in seven provincial regions in Indonesia, JICT would also consider the certain regulations made by those municipalities.

As JICT is a joint venture agreement among Grossbeak Ltd (a subsidiary company of Hutchison) and Indonesia Port Corporation II, it can be argued that JICT would not have difficulties in getting permission from local governments in the Port Corporation II coverage areas. This is due to the position of Indonesia Port Corporation II as a government agency. However, as the areas of 10 agricultural terminals are not only on the duty coverage of Port Corporation II, consequently, they should consider having a joint operation together with other port authorities in these areas. Therefore, in those areas, Port Corporations I, III, and IV, are the institutions that should be targeted to establish cooperation in offering the value added services on agricultural products.

In addition, this future corporation should be supported and agreed by governors in these provincial regions. Furthermore, it can be argued that those local governments would positively respond to the project of establishing agricultural activities in those regions. The reason is due to the possibility of creating employment in those areas regarding the various value added activities. As a result, new value added augmentation would contribute to their GRDP in stead of Jakarta where JICT is located.

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APPENDIX A. THE OPERATIONAL PERFORMANCE INDICATORS OF JICT

Facilities	***Total***	***Berth Depth***	***Level***
Total Areas (hectares)	45	6 Berths (m)	-12
Ship berths	7	1 Berth (m)	-14
Total berth length (m)	1683	***Yard Performances***	
Quay Cranes	12	Container Yard Density (%)	35.53
Mobile harbor cranes	4	Container Dwell time (days)	3.24
RTG	44	***Quay Side Performances***	
Business Volume		Avg. QC rate (mph)	22.84
Throughput (moves)	1,073,996	Avg. Vessel Opr rate (mph)	35.86
Throughput (TEUs)	1,483,442	Berth Occupancy (%)	42.11
* Feedering (%)	99.7	Avg.vessel waiting time (hrs)	0.38
* Transshipment (%)	0.3	% waiting over 2 Hours	6.81
Number of vessel calls	1,445	***Open Storage Performances***	
Number of RoRo calls	22	Holding capacity (TEUs)	240
Container gates moves	914,499	Throughput/month (TEUs)	1440
Open Storage		Dwelling time (days)	3
Length (m)	100	working days/month	30
Width (m)	50	YOR	60%
Area(m^2)	5000	Broken Stowage	10%
Effective area (m^2)	2000	Stacking Factor	2.5

Source: JICT Annual Report, 1999

APPENDIX B. JICT TRAFFIC (COMMODITY) HANDLED

Import commodity (In 1000 tons)

No.	Commodity	*UTPK* Period				JITC Period
		1995	1996	1997	1998	1999
1	Chemical	606	848	764	305	128
2	Paper	605	1029	926	370	156
3	Polypropylene	520	884	796	318	134
4	Polyester	364	619	557	223	78
5	Textile	337	573	516	206	87
6	Spare part (automotive)	296	503	453	181	76
7	Carbon black	197	335	301	121	51
8	Heavy equipment	193	328	295	118	50
9	Cotton	160	352	810	567	204
10	Spare part (electronics)	157	345	794	556	200
11	Plastics	105	231	531	372	134
12	Aluminum	98	216	496	347	125
13	Frozen Fruit	96	125	150	127	181
14	Ceramic	95	209	481	336	121
15	Rubber	64	141	324	227	109
16	Frozen meat	60	78	101	71	96
17	Footwear/Accessories	53	66	87	77	36
18	Battery	46	55	63	55	31
19	Tire	39	43	47	40	23
20	Foodstuff	39	47	56	67	57
21	Crude oil	36	47	56	62	22
22	Others	2691	3498	3988	3509	2527
	Total	**6857**	**10571**	**12592**	**8257**	**4623**

Export Commodity (In 1000 tons)

No.	Commodity	*UTPK* Period				JICT Period
		1995	1996	1997	1998	1999
1	Fishery products	530	760	1400	1100	1040
2	Frozen fruit	470	573	684	750	645
3	Frozen fish	400	448	627	558	502
4	Textile	277	332	499	374	168
5	Polyester	275	633	1139	774	372
6	Paper	244	366	476	285	103
7	Chemical	180	414	745	507	243
8	Tapioca Powder	177	230	272	323	339
9	Cocoa	160	170	150	225	270
10	Glassware	142	170	150	225	180
11	Coffee	112	146	172	204	189

12	Chopstick	99	104	109	84	48
13	Garment	89	196	235	164	66
14	Spare part (automotive)	88	123	209	126	45
15	Tea	74	57	50	52	80
16	Ceramic	70	98	167	100	36
17	Tire	68	95	162	97	35
18	Aluminum	60	84	143	86	31
19	Plastic	60	102	173	104	56
20	Sawn Timber	44	57	67	80	85
21	Heavy Equipment	42	59	100	60	22
22	Punice stone	40	56	95	57	27
23	Accessories	33	46	79	47	23
24	Spare part (electronic)	25	35	60	36	15
25	Furniture	17	26	30	36	37
26	Others	1554	2331	3030	1818	873
	Total	**5330**	**7710**	**11022**	**8273**	**5529**

Source: Compiled from Tanjung Priok Container Terminal Report , 1996-1999 and JICT Annual Report, 1999

APPENDIX C. CONTAINER AND AGRI-PRODUCT COMMODITY HANDLED IN PORT OF ROTTERDAM

Year	Number of Containers (x 1000)	TEU's (x1000)	Weight of cargo X 1000 ton
1995	3,136	4,787	38,870
1996	3,180	4,936	41,018
1997	3,605	5,530	46,336
1998	3,841	6,004	47,519

Commodity Items	Quantity in millions tons
Agricultural raw materials	12.8
Cereals	3.3
Cereal products	1.7
Drink	2.1
Frozen meat and fish	1.8
Frozen fruit and fruit juice	1.2
Fresh fruit and vegetables	1.1
Dairy products	1.1
Coffee, tea, spices	0.9
Tobacco, tobacco products	0.5
Preserved vegetables	0.4
Sugar, sugar products	0.4
Cocoa beans, cocoa products	0.3
Miscellaneous	0.4
Total	**24.8**

Source: Statistics Netherlands, 1999 and Port of Rotterdam Website, 2000, Http://www.port.rotterdam.nl/port/GB/food_aanaf.html

APPENDIX D. 1999 REVENUE REPORT FOR VAS IN MALMÖ PORT

No.	Income Sources	In (1000 SEK)	Percentage
1	On board and crane work	1,660	*4%*
2	Inspection	525	*1%*
3	Terminal work	6,495	*15%*
4	Gear shifting/Wagons operation	400	*1%*
5	Storage services	4,270	*10%*
6	Storage services (outside)	465	*1%*
7	Renting of space premises	305	*1%*
8	Rental of Storage room	4,060	*9%*
9	Rental fee of the company	60	*0%*
10	Transportation services	19,055	*44%*
11	Documentation services	2,886	*7%*
12	Debit customs/toll	3,000	*7%*
13	Container repair	300	*1%*
	TOTAL INCOME	**43,481**	100.00%

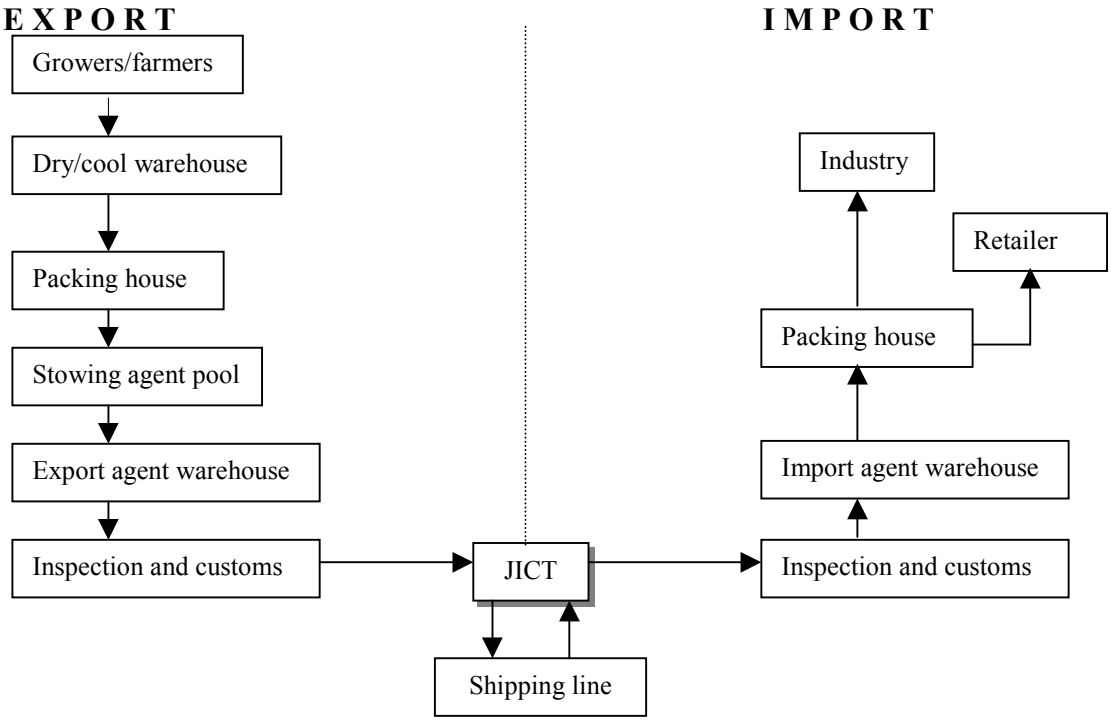
Source: Compiled from Logistic department Hamn AB, 2000, and 1999 Annual report Port of Malmö.

APPENDIX E. COSTS REPORT FOR VAS IN PORT OF MALMÖ

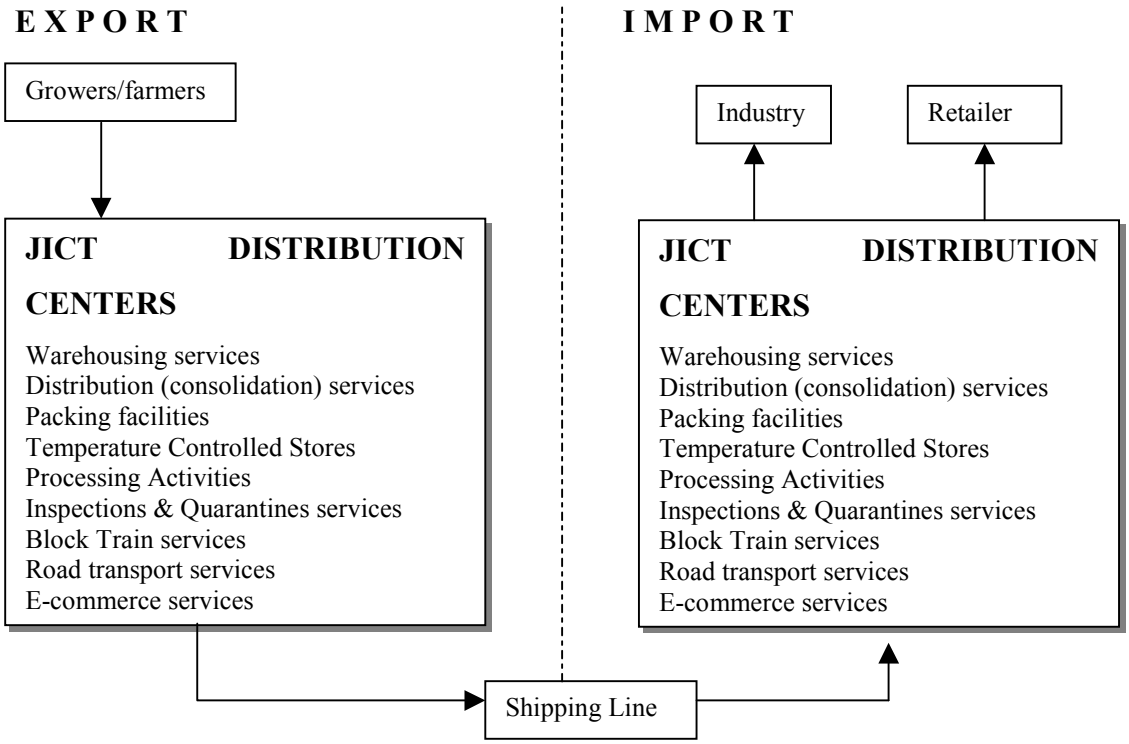
No.	COSTS	In (1000 SEK)	Percentage
	Maintenance costs		
1	Port area maintenance	1,100	
2	Maintainance for machinery	2,500	
3	Inventories maintenance	15	
4	Sanitary and cleaning costs for storage	165	
5	Water and drainage for building	10	
6	Cleaning and sanitary for building	275	
	Sub Total 1	***4,065***	*10.69%*
	Communication costs		
1	Telfon/telex costs	100	
2	Newspapers	10	
3	Sub Total 2	***110***	*0.29%*
	Material costs		
1	Operating Material costs	175	
2	Office materials	55	
3	Sub Total 3	***230***	*0.60%*
	Labor costs		
1	Labor costs for maintenance	475	
2	Labor cost for terminal workers	4,749	
3	Labor costs for administration	1,751	
4	Labor costs for supervisors	412	
5	On duty costs	60	
6	Social fee for workers	2,167	
1	Purchase of hand tools	80	
2	Others rents and purchases of services	100	
	Sub Total 5	***180***	*0.47%*
	Energy costs		
1	Fuel	40	
2	Lighting facilities	375	
3	Heat and electricity for building	725	
	Sub Total 6	***1,140***	*3.00%*
	Transports costs (for all modes)	***16,345***	*42.98%*
	Documentation costs		
1	Clearing costs	1,850	
2	Custom permit costs	3,000	
	Sub Total 7	***4,850***	*12.75%*
	Financial costs		
1	Insurance costs	200	
2	Depreciation of inventory	123	
3	Deductable representation	50	
	Non-Deductable representation	25	
	Sub Total 8	***398***	*1.05%*
	TOTAL	37,923	
	RESULT	5,558	

APPENDIX F. EXISTING AND PROPOSED AGRI-CHAIN THROUGH JICT

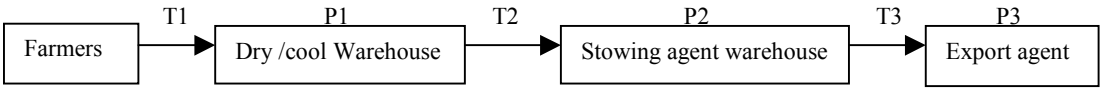
EXISTING AGRI-CHAIN THROUGH JICT



NEW PROSPECTIVE AGRI-CHAIN THROUGH JICT



APPENDIX G. THE FLOW OF PACKING ACTIVITIES



T1: Overland transport from a remote location

T2: Transport in urban areas

T3: Coastal shipping

P1: Wrapping and covering

P2: Processing and packing

P3: Re-packing

Source:.Andy Hale (1998)

APPENDIX H. PROPOSED ICD SERVICE LOCATION

Area	ICD	Commodity	Export destinantion
Jakarta	3	Fish, banana, frozen meat, cucumber	Japan, Singapore, Hongkong, Taiwan
Semarang	2	Mushroom, tea, cocoa, banana, ginger	Korea, Japan, Singapore, India
Surabaya	2	Mangoes, coffe, vegetables, fish	USA, Singapore, Japan
Bandung	2	Tea, rubber, vegetables, flowers, tobacco	USA, Hongkong, Eropa
Lampung	1	banana, coffee, coconut, bean	Japan, Singapore, Brunei
Palembang	1	Duku, nut, durian, mangoes	Singapore, Japan, Hongkong
Padang	1	Duku, banana, vegetables	Singapore, Taiwan, Japan
Medan	1	vegetables, banana, tea, papaya	Singapore, Taiwan, Japan
Ujungpandang	1	vegetables, citrus, cocoa	Singapore, Far East, Hongkong
Menado	1	Cocoa, coconut,	Japan, Hongong, Singapore
Balikpapan	1	Citrus, fish	Brunei, Singapore, Taiwan
Samarinda	1	Oranges, fish, bullfrog	Korea, Malaysia, Singapore
Bali	1	salak, bananas, fish, shrimps, cucumber	Taiwan, Singapore
Kupang	1	Cow meat, fish, tapioka powder	Singapore
Jayapura	1	Birds, shrimps, fish	Japan, Singapore, Taiwan
Total	**20**		

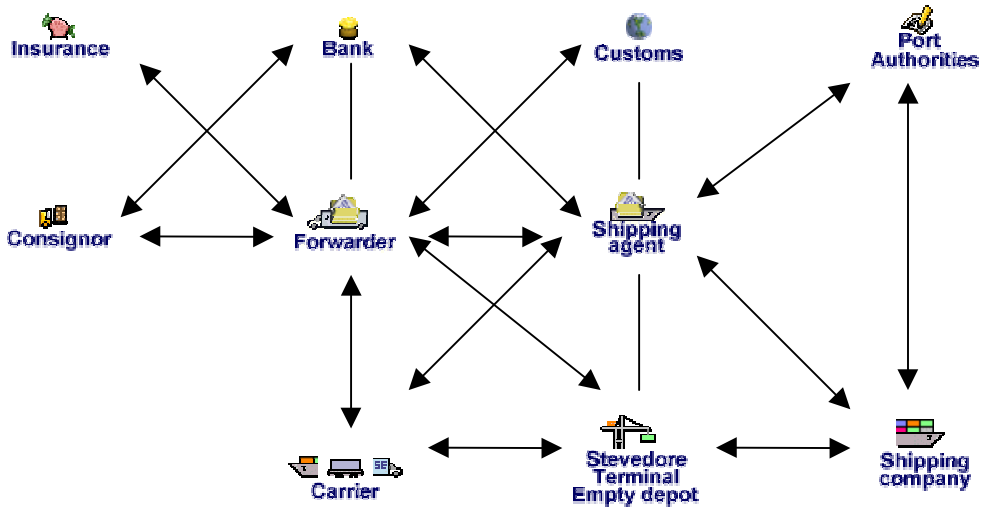
Source: Compiled from Warta Ekonomi (2000), Indonesia Department of Agriculture (2000)

APPENDIX I. TRANSPORTATION COST PER METRIC TON OF POULTRY COMMODITY FROM KABANJAHE TO JAKARTA

No.	Items	Cost per metric ton ($US)
1	Farmers site to Kabanjahe	3.5
2	Kabanjahe Warehouse (activties for wrapping and covering)	0.5
3	Kabanjahe to Medan (common truck)	6.8
4	Processing and packing in Medan Stowing agent	4.2
5	Refrigerated truck Medan to Belawan	25.1
6	20' reefer container on coastal vessel	23.4
7	Refrigerated truck Priok to Jakarta export agent/warehouse	20.5
8	Re-packing for export	12.5
9	Refrigerated truck Jakarta warehouse to Tanjung Priok port	20.5
	Total costs before shipment	**117**
	Percentage of packing activities	14.7%
	Percentage of refrigerated trucks	56.5%
	Percentage of Coastal shipping	20.0%
	Percentage of farmer transportation	8.8%

Source: Compiled from Andy Hale (1998), www.maritimindo com (2000).

APPENDIX J. FLOW OF INFORMATION SERVICE IN PORT OF ROTTERDAM



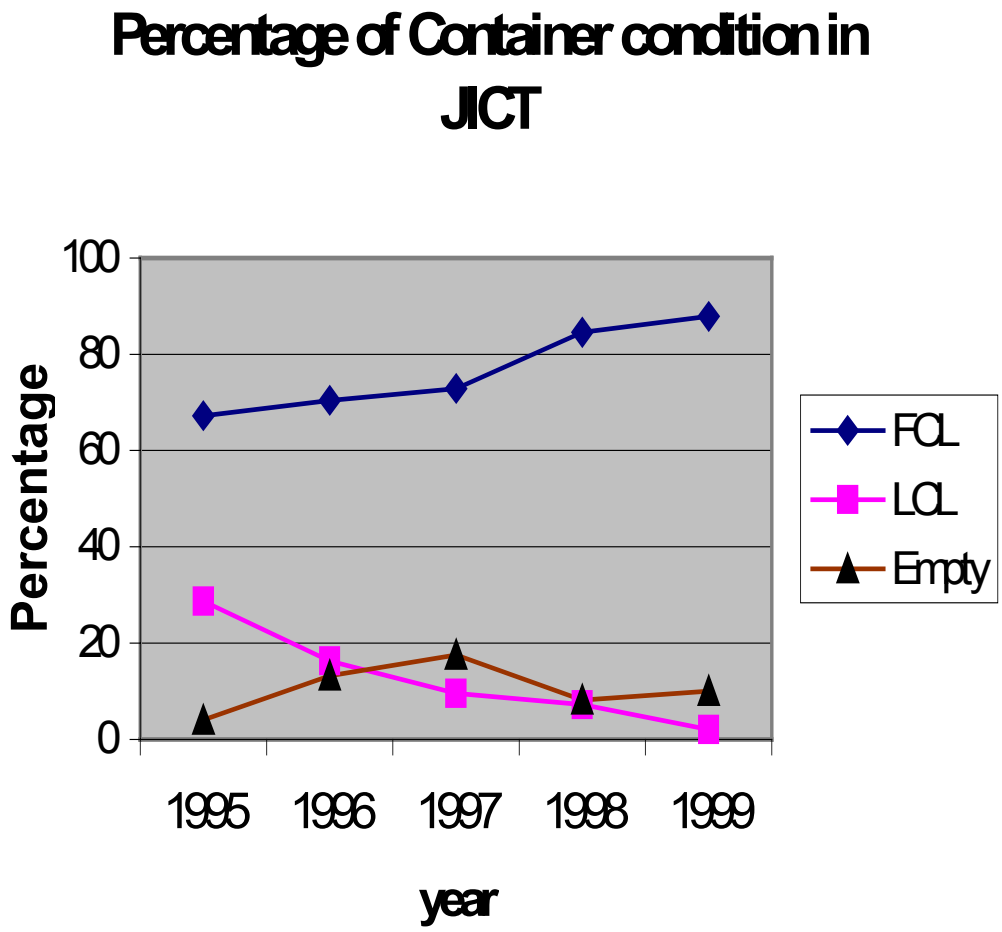
Source: Port of Rotterdam website, www.portofrotterdam.com

APPENDIX K. REMOTE REEFER MONITORING BENEFITS.

Capability	Benefit
* Monitors containers	Saves labor time and reduces product quality problems by enabling crew to detect and deal with malfunction more quckly
* Remote setpoint, change and defrost initiation	Reduces shipboard time spent in erecting safold and ladders
* Diagnostics features	Cuts labor time spent on trouble-shooting and pre-tipping
* Data Storage and checking	Sounds system alarm in event of discrepancy
* Load management	Can save on electricity costs by controlling power consumption
* Electronics	Automatically prints logging reports

Source: Compiled from Lloyd's Ship Manager (1986), Van Nilsjen (2000).

APPENDIX L.



Source: Customer service department of JICT, 2000

APPENDIX M. VALUE ADDED SERVICES A LA CARTE.

Activities	Value Added	Labor	Investment	Possibilities	Distribution of wealth
Distribution	***	***	**	***	***
Transportation	***	***	***	***	***
Container repair	*	*	*	*	*
Documentation	*	*	*	*	*
PTI Surveys	*	*	*	*	*
Draught Surveys	*	*	*	*	*
Cargo control	*	*	*	*	*
Storage	**	**	*	**	**
Information	***	*	*	**	**

Explanation:

*** : **high level**

** : **middle level**

* : **low level**

APPENDIX N
TOTAL ESTIMATED ADDED VALUE OF VAS

Table Of Revenues

No.	*Type of VAS*	*Revenue (USD)*
1	Transportation + Distribution services (80% of total cost before shipment) = 80% x 117 USD =	93.6
2	Information service (10% of main service revenue) = 10% x 93.6 =	9.36
	Sub Total Total 1 (USD)	**102.96**

Source: Compiled from JICT (2000), Lehkenring BV (2000), Study of poultry and citrus chain (1998), and Warbiz (2000)

Table of Cost

No	*Items*	*Percentage (%)*	*USD/ton*
1	Labor	9.12	9.38
2	Maintenance	6.52	6.71
3	Insurance	0.27	0.28
4	Material and energy	1.48	1.52
5	Rental for equipment and facilities	27.11	27.91
6	Office	0.15	0.15
7	Public	4.96	5.10
8	Management	1.65	1.69
9	Royalty and fees	14.97	15.41
10	Depreciation	5.06	5.20
11	Information	1.66	1.71
	Total	**72.95**	**75.06**

Source : Compiled from JICT (2000) and Studies of citrus and poultry chain (1998), and Van Nielsen (2000)

Table of Total Added Value

No.	*Added Value sources*	*Percentage (%)*	*Added value/ton*
1	(distribution + transportation + info)	85	27.90
2	Cargo control + Survey (10% of total value added of VAS)	10	3.28
3	Documentation (4% of total value added of VAS)	4	1.31
4	Container Service (1% of total value added of VAS)	1	0.32
	Total added value / ton		**32.81**

Appendix O. Estimated Value of 10 Agri-Terminals

Target Estimation	*Percentage*	*Throughtput*	*Value (M USD/ton)*
Optimistic target	100%	10 million tons	387.5
Normal target	60%	6 million tons	232.5
Pesimistic targe	40%	4 million tons	155.0

APPENDIX P. CRUDE INVESTMENT APPRAISAL

OPTIMISTIC (100% throughput target)

Year	Invest.Cost (M USD)	Total value (M USD)	Cashflow (M USD)	Discount rate (18%)	Discount cash flow (M USD)
0	590	0	-590	1	-590.00
1		387.5	387.5	0.85	328.39
2		387.5	378.5	0.72	271.83

Crude appraisal

- Payback period 2 years
- Average return 387.5 M USD
- NPV 10.22 M USD
- IRR 19.5%

NORMAL (60% throughput target)

Year	Invest.Cost (M USD)	Total value (M USD)	Cash flow (M USD)	Discount rate (18%)	Discount cash flow (M USD)
0	590	0	-590	1	-590.00
1		232.5	232.5	0.85	197.03
2		232.5	232.5	0.72	166.98
3		232.5	232.5	0.61	141.51
4		232.5	232.5	0.52	119.92

Crude appraisal

- Payback period 4 years
- Average return 232.5 M USD
- NPV 35.44 M USD
- IRR 21.10%

PESIMISTIC (40% throughput target)

Year	Invest.Cost (M USD)	Total value (M USD)	Cash flow (M USD)	Discount rate (18%)	Discount cash flow (M USD)
0	590	0	-590	1	-590
1		155	155	0.85	131.36
2		155	155	0.72	111.32
3		155	155	0.61	94.34
4		155	155	0.52	79.95
5		155	155	0.44	67.75
6		155	155	0.37	57.42
7		155	155	0.31	48.66

Crude appraisal

- Payback period 7 years
- Average return 155 M USD
- NPV 0.78 M USD
- IRR 18.05%

APPENDIX Q. VALUE ADDED SERVICES AMONG COMPARED PORTS

Port	Function	Activities	Percentage
Rotterdam	**Distribution center**	Transportation	35%
		Storage	10%
		Distribution	21%
		Cargo control	14%
		Draught Surveys	4%
		PTI Surveys	0%
		Documentation	4%
		Information	12%
		Container repair	0%
Malmö	**Forwarding agency**	Transportation	48%
		Storage	12%
		Distribution	9%
		Cargo control	3%
		Draught Surveys	0%
		PTI Surveys	3%
		Documentation	15%
		Information	9%
		Container repair	1%
Aarhus	**Cold chain service**	Transportation	8%
		Storage	16%
		Distribution	0%
		Cargo control	12%
		Draught Surveys	0%
		PTI Surveys	20%
		Documentation	6%
		Information	20%
		Container repair	18%

Source: Compiled from JICT (2000), Malmö (2000), Lehkenring BV (2000), Aarhus website, www.aarhushvn.dk (2000), Van Nielsen (2000)

APPENDIX R. THE ESTIMATION OF INVESTMENT COSTS FOR ONE TERMINAL (1 USD = 8500 RUPIAHS)

No.	Items	Quantity (M USD)	Percentage
1	Land	1.76	3%
2	Packing Facilities	8.23	14%
3	Quality control facilities	5.88	10%
4	Controlled temperature storage	21.74	37%
5	Transportation and lifting equipment	11.75	20%
6	Dry Stores	2.94	5%
7	Container Yard	4.11	7%
8	Information system	2.35	4%

Source: Compiled from KADIN 1999, Drewry Shipping Consultant 1998, Seabrex Ltd 1999,