

**Selection of Private Participation Model in Seaport Terminal Operation
Case : Port of Tanjung Priok Jakarta Indonesia**

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Abstract

Pressure towards privatization about seaport infrastructure management in Indonesia had increased in last years. It was triggered by some factors to overcome with changing of maritime business environmental. In this situation, need of privatization program in seaport business couldn't be avoided, so this research tries to develop selection system of privatization form to manage seaport's terminal at port of Tanjung Priok as a part of PT (Persero) Pelabuhan Indonesia II, Jakarta, Indonesia.

This research was done with questionnaire survey which are distributed to respondents. The later are stakeholders and decision makers related to PT (Persero) Pelabuhan Indonesia II.

The proposed research consists of Analytic Hierarchy Process with four criteria's, they are: financial, service, market condition and local situation, and three alternative solutions, they are: management contract, leasing and build operate transfer. The result showed that the build operate transfer alternative is the most suitable model of privatization to manage seaport's terminal at port of Tanjung Priok.

Mean while, according to a specific criterium, that is readiness for privatization, the most suitable alternative is leasing. So there is a conflict between AHP result and non AHP result. The solution is a compromised step, through Delphi forum. And decision makers consider that both alternatives are the most suitable solutions. Curently, the final decision is in process.

Keywords:

AHP, specific criterium, decision maker, compromised step, privatization

1. Introduction

Most of activities in Indonesian Ports is managed by government, and executed by PT.Pelindo, especially under control of Port Business Division. There are some ports who have cooperation with private sectors in managing port activities, such as: Port of Tanjung Priok and Port of Tanjung Perak. However, business performances of these ports are still relatively low compared to other ports. This is due to limited resources used to respond customer needs. In this case, types of service are more and more varied, complex and dynamic; such that it needs important financial resources and more professional management for increasing port service quality.

Related to above condition, and based on experiences in some countries who have applied port privatization program, especially in South American countries, there are some positive aspects emerging from privatization program, i.e.: operational performance improvement, technology transfer, investment mobilisation, market network development, etc.

Private sector participation in port operation management is varied from a simple outsourcing system to full divestiture. Selection of these kinds of private sector participation depends on traffic volume, port function, competition level, economic growth, regulation and local condition.

According to A. Baird (2000), port management activities consist of three elements: port regulator, port land owner and port operator. The port element which is the most possible to be divested or to be full privatized is port operator (Public-private Model). In fact port operator main activities have important role in physical handling of passengers from sea to land and vice versa or is more known as stevedoring activity. This model is utilized by most of ports in the world.

Based on the problems envisaged in Indonesian port management and based on the world wide competition situation, and in the frame of service quality improvement, so it needs privatization strategy of port terminal management. It is expected to have more positive advantages than negative ones.

That's why this research tries develop model concerning selection of private sector participation in managing port terminal, especially in Port of Tanjung Priok, Jakarta, Indonesia. Decision process in selecting privatization model is a complex process, where there are many actors, stakeholders and factors to be considered. Multi criteria Decision Making is used to solve this problem. In this research, the decision model is focused on Analytic Hierarchy Process (AHP).

2. Privatization Models and AHP

2.1. Privatization Definition and Classification

In general, privatization is defined as selling of state-owned asset to private sector. Meanwhile, according to UNCTAD (1998), it is defined that:

“Privatization is the transfer of ownership assets from the public to the private sector or the application of private capital to fund investment in the port facilities, equipment and system.”

Regardless critics and controversies on privatization program implementation, empirically there are some studies showing success and benefit of privatization program implemented in many countries.

Bosse, S. (2001) stated that benefits of privatization policy implementation are:

- Increasing efficiency of port service management
- Empowering private sectors to invest their fund in developing and operating infrastructures and facilities of port service.
- Attracting new markets, investment, and technology application by private sectors who had better performance in managing port services.
- Improving customer service quality with a competitive price.

A. Baird (1999) offered a framework of private sector participation in managing port based on function and authorization sharing between port regulator, landlord and port operator to facilitate policy making in port privatization, as shown in tabel 1.

Tabel 1. Model of Private Sector Participation in Managing Port (Baird,1999)

Port Model	Port Regulator	Port Landowner	Port Operator
I. PUBLIC	<i>public</i>	<i>public</i>	<i>Public</i>
II. PUBLIC-private	<i>public</i>	<i>public</i>	<i>Private</i>
III. PRIVATE-public	<i>public</i>	<i>private</i>	<i>private</i>
IV. PRIVATE	<i>private</i>	<i>private</i>	<i>private</i>

Among these four models, **Model II or PUBLIC-private** is the most popular and most implemented in the world. In fact, this model has some advantages and does not change asset ownership. In this model, private sector is responsible in cargo-handling provision and loading-unloading equipments.

On the other hand, according to UNCTAD (1998), basically privatization style in port management includes: *outsourcing, restructuring, partial divestiture dan full divestiture.*

Tabel 2. Private sector participation
(ADB, 2000)

PRIVATIZATION MODEL	TARGET OF PRIVATIZATION PROGRAM							
	Operational Efficiency	Market Growth	Attract Investor	Operating Cost Red.	Reduce Deficit	Efficiency of organization	Depolitization Labor	Ownership Of Public
OUTSOURCING								
Sub Contract Labor & Service	+++	+	+	++		++	++	
Mangement Contract	++	++		++		+	+	
Equipment Leasing	++		++	+ Reduction			+	
RESTRUCTURING								
Capital Leasing	++	++	++	++	++	++	++	
Wholly-owned Subsidiaries	+			++		+	++	
PARTIAL DIVESTITURE								
Concession	++	+++	+++	+++	++	++	+++	+
Joint Venture	++	++	++	++			++	+
FULL DIVESTITURE								
Port Privatization	+++	++	+++	+++	+++			

Note:

- +++ : Direct & significant impact
- ++ : Direct impact
- + : Indirect impact

As shown in tabel 2, all models of private sector participation have its own impact in their implementation, so selection of port management privatization selection is influenced many factors, such as target of privatization program.

2.2. Seaport Business Eviromental

In last decade, there are significant changes in port operation process, due to technology and market demand changes. To be survival, each port operator tries to modify or renovate its management system and facilities in order to be able to compete with other operators. One of efforts is to attract investor or private sector to participate in operating port business process. This is done by reforming regulation related to fund, technology and some procedures to capture market coming from network of the private sectors. However, this effort is not easy to implement, because of complex characteristics of port operation activites. Each port business process, (for example: goods transfer from sea to land) involves many actors and stakeholders and takes place in a very limited spatial area. In fact port services are influenced by three factors: port infrastructure, seaport services and coordination (Trujillo L dan Nombela G, 2000).

Private sector penetration level in operating port is varied and depends on many aspects, such as:

- port operating system
- legal aspects
- stakeholders related to port business activities

Core activities of port service basically concern loading-unloading and terminal business processes; and these activities are key point of all port performances. Meanwhile, terminal is a port facility package consisting of berth, warehouse and yard where loading-unloading activities, inventory, goods acceptance are token place continuously under one responsibility.

2.3. Analytical Hierarchy Process

This research utilized three basic principles of AHP (Saaty, T.L, 1980) i.e:

- (a) *decomposition*
- (b) *comparative judgement and synthesis of priority*
- (c) *logical consistency*

(1) Hierarchy Decomposition

Stakeholders respond to terminal privatization program is varied and it depends on their business interests. These responds reflect willings, constraints, and impacts that may be emerged from the privatization program. The reponds are then considered as basic of criteria and sub criteria formulation. The hierarchy is shown in figure 1.

(2) Weighting and Priority Identification

Results of questionnaire survey are translated into pair wise comparison matrix and then it is followed by weighting process. Steps to calculate relative weights among criteria and sub criteria and among solution alternatives are as follow:

- a. Construction of pairwise comparison matrix
- b. Calculate geometric mean in each row:

$$w_i = (a_{i1} \cdot a_{i2} \cdot a_{i3} \cdot \dots \cdot a_{in})^{1/n}$$
- c. Summation of all geometric mean from step (b):

$$w_t = w_1 + w_2 + \dots + w_n$$
- d. Normalization : $w_{i \text{ relatif}} = w_i / w_t$

Priority indentification is formulated based on relative weighting among hierarchy components.

(3) Consistency Ratio

To ensure model consistency, the following equations are utilized::

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad \text{and} \quad \lambda_{\max} = \frac{1}{w_i} \sum_{j=1}^n a_{ij} \cdot w_j$$

where:

CI	=	Consistency Index	a_{ij}	=	Comparison value between A_i and A_j
λ_{\max}	=	Maximum Eigenvalue	w_i	=	Weight of A_i
n	=	Matrix orde	w_j	=	Weight of A_j

and:

$$CR = \frac{CI}{RI}$$

where :

RI = random index
I = index consistency
CR = consistency ratio

3. The Proposed Model

The proposed model consists of four level hierarchy (figure 1):

Level I: Goal : Selecting the most suitable privatization model in terminal operation at Port of Tanjung Priok Jakarta Indonesia

Level II: Key factors influencing target achievement. There are four factors (tabel 5):

- financial
- service
- market condition
- local situation

Levels III: At this level, there are 20 sub factors (tabel 6).

Level IV: This level corresponds to privatization alternatives, i.e:

- management contract
- leasing
- build operate transfer

GOAL : **Selecting private sector participation model in operating port terminal Tanjung Priok**

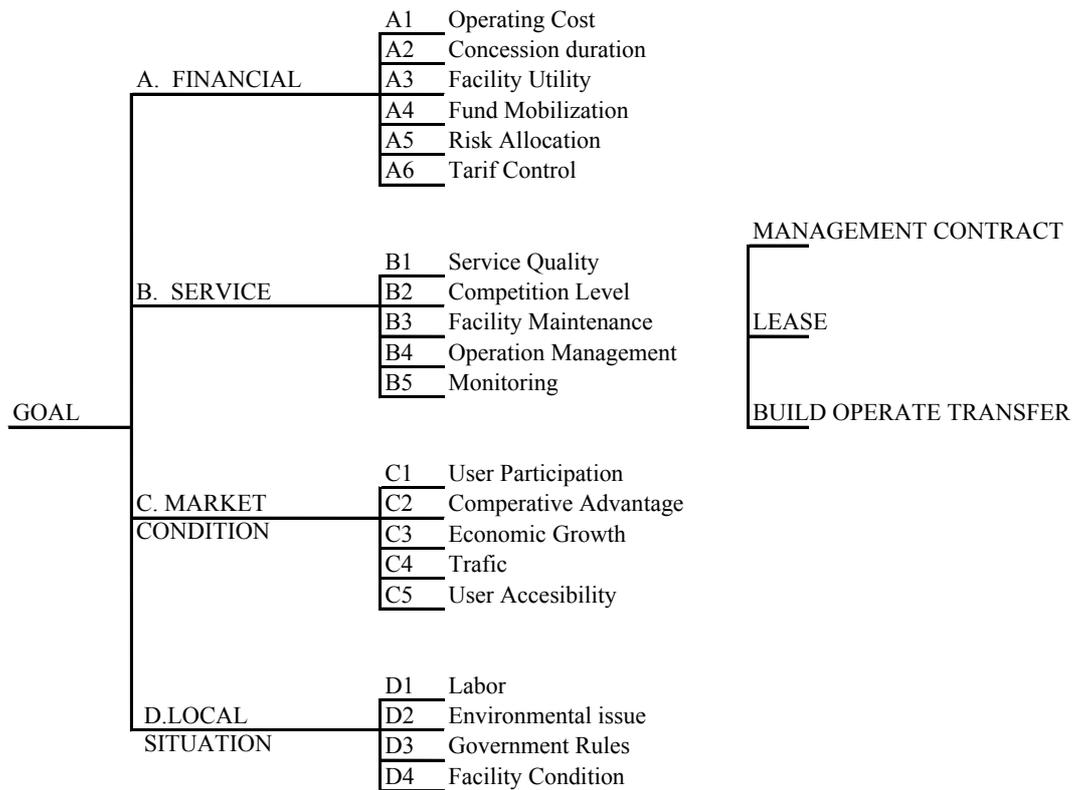


Fig 1. Hierarchy structure of Private Sector Participation Model in Operating Port Terminal - Tanjung Priok

4. Model Analysis

4.1. Analysis Process

Process of analysis in selecting private sector participation model is shown in figure 2.

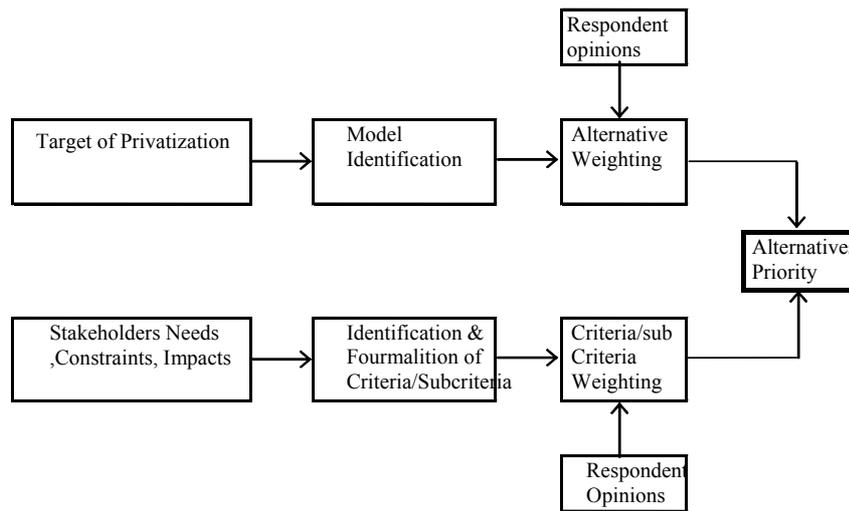


Fig 2. Proses of Analysis in Selecting Privatization Model

Criteria and sub criteria are determined based on stakeholder’s expectation and needs and based on impacts privatization program implementation. Respondents consist of experts coming from major stakeholders (PT Pelindo 2, Maersk, JICT). Weights of criteria and sub criteria are calculated using AHP model. Solution alternatives are defined based on needs envisaged by the port company who will implement privatization program. In this case, set of alternatives is also determined based on experiences of other port companies in other countries who have implemented privatization program.

4.2. Priority of Criteria

Result of this research shows that market condition has the most important weight (45,75%), and followed by service criteria (31,17%). Due to significant contribution of market condition and service criteria in selecting privatization of port terminal operation, the both criteria and its sub criteria have special intention of decision makers related to privatization program.

Tabel 3. Priority of each criteria

Criteria	<i>Resp : Mixed</i>		<i>Resp : Pelindo2</i>		<i>Resp : Maersk</i>		<i>Resp : JICT</i>	
	Relative Weight	CR	Relative Weight	CR	Relative Weight	CR	Relative Weight	CR
A Financial	8.64%	0.005	7.84%	0.017	9.93%	0.024	8.82%	0.025
B Service	31.17%		27.00%		34.95%		34.87%	
C Market condition	45.75%		51.49%		39.06%		42.49%	
D Local situation	14.44%		13.67%		16.06%		13.83%	

As shown in tabel 4, more than 70% of global weight corresponds to 8 sub criteria: Competitive Advantage, Competition level, Accesibility to user, Facility maintenance, Economic growth, User participation, Traffic and Labor. On the other hand, ± 30% of global weight corresponds to other 12 sub criteria.

Tabel 4. Priority Weight of sub criteria

Sub Criteria	Resp : Mixed		Resp : Pelindo2		Resp : Maersk		Resp : JICT	
	Relative Weight	CR						
A1 Operational Cost	12.20%	0.028	9.48%	0.036	17.06%	0.036	12.72%	0.057
A2 Concession duration	8.36%		7.11%		10.74%		8.17%	
A3 Facility Utility	17.39%		17.95%		15.37%		17.98%	
A4 Fund Mobilization	33.80%		33.63%		29.89%		36.06%	
A5 Risk allocation	17.25%		16.58%		18.26%		17.13%	
A6 Tarif control	10.99%		15.25%		8.67%		7.92%	
B1 Service quality	9.26%	0.032	12.63%	0.048	5.59%	0.050	8.70%	0.057
B2 Competition level	36.78%		36.90%		35.89%		35.73%	
B3 Facility maintenance	29.98%		29.03%		31.05%		28.82%	
B4 Operation Management	12.11%		9.44%		15.90%		14.36%	
B5 Monitoring	11.87%		11.99%		11.58%		12.39%	
C1 User Participation	14.67%	0.012	11.35%	0.052	13.78%	0.040	21.40%	0.060
C2 Competitive Advantage	32.28%		36.71%		24.77%		29.93%	
C3 Economic growth	18.38%		17.48%		23.92%		14.10%	
C4 Traffic	13.97%		14.87%		21.07%		8.07%	
C5 User Accesibility	20.69%		19.59%		16.47%		26.50%	
D1 Labor	32.70%	0.016	26.52%	0.039	40.29%	0.040	34.78%	0.013
D2 Environmental policy	20.31%		27.02%		16.04%		14.94%	
D3 Government Intervention	29.82%		26.40%		33.51%		30.26%	
D4 Facility condition	17.17%		20.06%		10.16%		20.01%	

4.3. Overall Rating

Based on overall evaluation of alternatives, it is found two best selected alternatives: “*build operate transfer*” (BOT) having weight of 0,316 and “*management contract*” having weight of 0,130. So the alternative with highest priority is model “Build Operate Transfer” (BOT) (see tabel 5).

Table 5. Alternative Priority Weights

Criteria	Sub Criteria	Local Weight	Global Weight	Mgt Contract		Leasing		BOT	
				Score	Weighted Score	Weighted Score	Score	Weighted Score	
FINANCIAL									
8.64%	Operational Cost	12.20%	1.05%	0.122	0.001	0.321	0.003	0.557	0.006
	Concession Duration	8.36%	0.72%	0.230	0.002	0.450	0.003	0.320	0.002
	Facility Utility	17.39%	1.50%	0.132	0.002	0.275	0.004	0.592	0.009
	Fund Mobilization	33.80%	2.92%	0.124	0.004	0.313	0.009	0.564	0.016
	Risk Allocation	17.25%	1.49%	0.134	0.002	0.281	0.004	0.584	0.009
	Tarif Control	10.99%	0.95%	0.136	0.001	0.277	0.003	0.587	0.006
SERVICE									
31.17%	Service Quality	9.26%	2.89%	0.134	0.004	0.273	0.008	0.593	0.017
	Competition Level	36.78%	11.47%	0.121	0.014	0.325	0.037	0.554	0.064
	Facility Maintenance	29.98%	9.35%	0.131	0.012	0.332	0.031	0.537	0.050
	Operation Management	12.11%	3.78%	0.159	0.006	0.288	0.011	0.553	0.021
	Monitoring	11.87%	3.70%	0.113	0.004	0.334	0.012	0.553	0.020
MARKET CONDITION									
45.75%	User Participation	14.67%	6.71%	0.117	0.008	0.406	0.027	0.477	0.032
	Competitive Advantage	32.28%	14.77%	0.144	0.021	0.295	0.044	0.561	0.083
	Economic growth	18.38%	8.41%	0.125	0.011	0.313	0.026	0.562	0.047
	Traffic	13.97%	6.39%	0.117	0.007	0.331	0.021	0.552	0.035
	User Accesibility	20.69%	9.47%	0.120	0.011	0.322	0.030	0.558	0.053
LOCAL SITUATION									
14.44%	Labor	32.70%	4.72%	0.124	0.006	0.332	0.016	0.544	0.026
	Enviromental Policy	20.31%	2.93%	0.159	0.005	0.242	0.007	0.599	0.018
	Government Intervention	29.82%	4.31%	0.141	0.006	0.271	0.012	0.588	0.025
	Facility Condition	17.17%	2.48%	0.134	0.003	0.284	0.007	0.582	0.014
TOTAL SCORE					0.130	0.316	0.553		

5. Conclusion

The result of evaluation based on AHP has shown that the most suitable alternative is “*build operate transfer*” (BOT) having score 0,553. The second most suitable alternative is “*leasing*” having score 0,316 and the third priority is “*management contract*” having score 0,130. So it is recommended to select Build Operate Transfer (BOT) as alternative to involve private sector in operating port terminal at Port Tanjung Priok.

However, the proposed research needs to be evaluated by other point of view, such as readiness of local authority to join with private sector. Besides, it needs to do a feasibility study with a more detail and technical aspects.

Mean while, according to a specific criterium (readiness for privatization), the most suitable alternative is leasing. So there is a conflict between AHP result and non AHP result. The solution is a compromised step, through Delphi forum. And decision makers consider that both alternatives are the most suitable solutions. Currently, the final decision is in process.

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