Institutional Analysis for Multimodal Transport to Support Logistic System in Port of Tanjung Priok: Methodological Framework

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***Abstract*- In Indonesia, The absence of an institution that has the authority to coordinate and strengthen national commitment to the implementation of logistics policy is a constraint in the institutional system of national logistics in Indonesia. This paper conducted a review of the methodology of institutional framework to support cheap, fast and safe multimodal transport logistics system in port of tanjung priok, in an effort to objectify the institutional coordination concept of multimodal transport that can properly support the attainment of the vision in the development of the national logistics system. The method used in the form of qualitative descriptive to explore aspects of transport such as patterns of institutional coordination, range of powers and the institutional level. Meanwhile, multi-methods is used to select the proper transport institutional patterns according to the stakeholders associated with multimodal logistics activities in Indonesia.**

Keywords: Logistics System, Multimodal Transport, Methodological Framework.

1. Introduction

Logistics system plays strategically related synchronization and harmonization of economic progress in the various sectors and regions in creating inclusive economic growth, in addition to acting as an important aspect of national sovereignty and economic security. Indonesia has a geographical nature as an island nation with abundant natural resources, should be able to make Indonesia a role as a country can supply the world with a wealth of natural resources and processed industrial products, as well as a huge market potential with its population in the global supply chain.

In recent decades, the national logistics system shows inadequate performance. According to the Logistics Performance latest Index (LPI) issued by [26],Indonesia's logistics performance is low compared with the member countries of ASEAN, Indonesia's position is only ranked 63 of 160 countries surveyed, far behind Singapore (5), Malaysia (32), Thailand (45) (LPI 2016, the World Bank). The application of the logistics system in Indonesia still has many obstacles, such as: (a) inadequate infrastructure quantitatively and qualitatively; (B) the number of charge / illegal fees and transaction costs that lead to high economic cost; (C) the import-export process takes a lot, especially because of the slow port services; (D) logistics services less reliable, as well as supporting network of national logistics providers; (E) weak stock management and fluctuations in the price of basic commodities; (F) is the occurrence of a significant price difference in border areas, remote areas and outer islands [19].

Indonesia faces global competition and tight between the regional logistics networks and supply chains, no longer between products and companies. The dynamics of development led to the new challenges in national and international logistics system planning, particularly in terms of policy and institutional system. Conflicts of authority on the logistics activities which have tended to be partial and sectoral that are always faced with the inadequacy of inter-agency coordination system, has become a major cause of failure in developing harmony and aligning the vision of National Logistics System itself. This paper draws on an analysis of the literature on institutional models of multimodal transportation in the context of the national logistics systems, in an effort to objectify the institutional collaborative concept of multimodal transport that can properly support the attainment of the vision in the development of the national logistics system. The paper is divided into big two sections. Section one reviews the current institutional conditions related to the logistics and multimodal transportation system in Indonesia,

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localized in Port of Tanjung Priok as case study. Section two presents the methodological framework which aims to observe the factors that can lead to logistical efficiency and sustainability.

2. Existing Logistical Problem In Port Of Tanjung Priok

Dwelling time about 3.9 days (although it has dropped significantly compared to Minister RR period). This is still caused by forwarding process of goods that takes a long time from the consignee (user / sender) and consignor (freight forwarder service) which is undisciplined, as a result goods piled up and causing container queue. Delays resulting additional costs for consignee and consignor.

Waiting times for boats, trucks and trains in terminals are too long. The terminal has facilities for intermodal transport, such as cranes to load the container directly to the freight train that stops at the port railway station. However, because capacities such as crane handling speeds cause the container to wait too long, to be loaded in other modes of transport. At each terminal, the arrival of uneven container vessels spread over a day, at certain hours the terminal arrives more vessels and in other hours the terminal is less busy. For example, 40% of ships arrive at rush hour every day.

2.1. Multimodal Transportation at Tanjung Priok Port

The government seeks to develop port capacity and development of interconnection with hinterland One of which is by developing a railway network for freight transport as the development of multimodal transport network which will Reduce cost, time and road load. But the use of trains so far has not been optimal. The use of the train (to Cikarang Dry Port) which had been operated earlier this year is still not effective, this is because the truck mode is still competing with the train mode.

Besides, there is still interest that motivated by economic motivation, resulting in the end of container shipments through the train is still quiet. In the end, the use of the train is being reviewed by the new maritime minister (Luhut Panjaitan) and is being sought for its development strategy.

Related efforts to reduce cost, a product cost can be suppressed if at the time of the delivery process is supported by the system of multimodal transport and logistics that have been good. While this has not been applied properly in Indonesia, so our products are less competitive with countries that already have a good system.

The use of trains makes it more efficient, because for a certain distance in the process of moving the container, but the condition that occurred in the Port of Tanjung Priok is the number of trucks that do not work, despite having invested so much, and many items carried by truck, but still many trucks that do not work consequently cause losses.

Formerly implemented, Short Sea Shipping Program, which is a program to reduce the congestion of land transportation and reduce the cost of logistic production, in the implementation has not run optimally and then stalled. This is because the party who owns the goods is a party who has a truck as well. So this party has power, so there was a monopoly.

Reff[18] Multimodal transport regulations have been provided Concerning Multimodal Transport), but none of the operators are willing and able to implement multimodality in one document. Basically, the government is trying to improve the integration of infrastructure network according to private and public demand, one of them through port train but quality and services from private parties (Multimodal Transport Agency) it is most importantly enhanced so that existing facilities and infrastructure can be used and maximized. The IT system for multimodal transport licenses has been provided by the government through Indonesia National Single Window (INSW), but its use by logistic actors is still minimal.

2.2. Urgency of Coordination in Solving Congestion at Tanjung Priok Port

Congestion of transport networks occurs when there are actors in the chain not performing their proper role in a timely manner. However, the problem is that the actors are not coordinating effectively. Lack of good coordination between partners of logistics actors, should be full attention. Better coordination has also been driven by the role of port authorities and related ministries who see that port connections with hinterland have become an important issue. The development of port capacity has been done with Tanjung Priok Newport in Kalibaru which is a deep-sea port for large vessels anchored and continuously carried out several phases according to the latest port master plan of Tanjung Priok. This document will soon be

legalized but pending the approval of the city government.

3. Research Related To Multimodal Institutional freight transport

Research related to the field of transportation logistics of institutional collaboration is still quite rare. Thus, review of available shows that few studies have been done on a multimodal transportation system in the context of developing countries, especially Indonesia. Relevant studies specifically in the context of Indonesia has never been done in the level of detail. None of certain of the above research work is focused on problem identification and development dimension of multimodal freight transport from the institutional side. This study tries to contribute to fill this gap. Patterns following institutional and governance policies multimodal transport logistics are not yet a comprehensive discussion of the material in the academic literature. To that end, novelty in this research is to address the institutional model in the context of multimodal transport logistics system in Indonesia.

The study, there is more scrutinized at each aspect of multimodal transportation [10],[27], [13],[24],[22]; [1], and the institutional logistics [11] ; [8]; [7]; [16]; [15]; [2], [14] although it has combined these two major aspects, namely multimodal intermodal transportation and logistic institutions but within a framework of port regionalization [17] more specific, not in the form of institutional arrangement itself.. To that end, the proposed research proposal has to have an element of institutional kebaharuan for raising the issue in the context of multimodal transport logistics system in Indonesia. This research fills this gap by exploring models of institutional collaboration multimodal transportation of freight.

Based on the development of institutional knowledge in transportation, research is done by elaborating First, the concept of the port as a Hub and Spoke and relevance to the Hinterland area, and secondly, the institutional approach. So that idea will be approached through the concept of linkage between port as a hub, spokes and the importance of the port hinterland and take a port development model of the spatial focus toward a focus on institutions. Here encompasses institutional forms / institutional structure, function / authority / regulations, procedures / mechanisms and other aspects.

Another contribution of this dissertation is going to identify, prioritize and classify processes in the institutional aspect of multimodal transportation. However, the study did not aim to develop a normative theory but more towards presenting a more multidimensional view, offers a focus on the relatively sparsely studied in multimodal transport theory, by studying the institutional aspects encountered in a particular context. Transport logistics can not be fully understood without a larger analysis of the key issues arising from in-depth analysis of the institutional characteristics of spatial and transport and logistics. Institutional determinants associated with variable models with particularity in the Indonesian context.

4. Theories Used In Analyzing Multimodal Freight Logistics System

The two theories on which the logistical coordination problem is based relate to the institution in the seaport-hinterland logistics system, Transaction Cost Economics and Principal Agent Theory that try to understand the coordination, especially the trust factor as a condition for sharing better information on supply chain mechanisms and transport shifts at ports, especially in the context of the harbour - hinterland transportation chain. In addition, both theories will provide answers to questions about the role of coordination, especially what the trust factor is involved in the transport chains associated with ports and hinterland. This particular theoretical attention is particularly given to the issue of 'sharing information as a result of trust between business people that causes transactions to run efficiently and transparently. The reason for focusing on hinterland transport is because of the important extension of the entire container transport chain, which involves a large part of the total transportation cost.

With the combined use of these two theories will provide insight to understand the coordination factor especially the better trust factor, mainly sharing information that is interconnected between business to business or government to business, which became the basis of analysis and a strong frame of mind.The concept of TCE-PAT theory can be combined as an alternative theory that can be used to conceptualize supply chain relationships in institutional coordination of multimodal logistic transport, among others to analyze the role of transaction costs, trust, specificity of assets /

property rights, monitoring, sanctions, and engagement / Bounding). The application of TCE theory in this dissertation is about transaction costs that are generally considered as a coordination mediator in the multimodal transport supply chain but are rarely included in empirical studies explicitly. PAT theory is adopted to support the incentive alignment dimension of supply chain collaboration. Proper alignment of incentives for supply chain partners can build mutual trust and develop a commitment between the two parties. [23] .The main focus of both theories is about building trust and cooperation to improve operational efficiency. From the relevant theories with the logistic coordination. Transaction Cost Economics (TCE) and principal agency theory (PAT) have similarity which is look efficiency as a key issue. However, TCE and PAT are more likely to see efficiency as an incentive problem. TCE and PAT have similarities or differences but are complementary. Both of these efficient approaches are biased combined without causing overlapping problems as may occur if the efficiency approach is combined with the power approach.

TCE has a tendency to deal with relationship problems; while PAT plays a role in how to understand more deeply about contracts in relationships that occur. TCE-PAT is able to offer a relevant and realistic range of paradigms and research concepts to be built.

Table 1 –TCE- PAT Theory

Theoretical Views	TCE	PAT
Focus	Minimize transaction costs	Maintaining a long-term relationship
Conceptual Platform	Protect economic assets	Strengths and relationships
Assumption	Rationality bound & opportunistic behaviors, individuals acting opportunistically require reduction of uncertainty, risk neutrality	Rationality bound, asymmetric information, conflict of purpose
Mechanism	Contractual / legal hierarchy	Relationships (trust, commitment, information (communication, information sharing)
Benefits	More larger partner controls, of course, remember the relational specifications first	Identify the costs and benefits of Actors integration
Applications	The role of transaction costs, trust, asset specificity, performance	Volunteerism, trust and risk-sharing commitments
Reference	[3]; [25], [9]	[6] , [12]

5. Institutional Content Scope

This study will discuss the institutional dimension in multimodal transport system related logistics systems in ports. Institutional dimension that will be examined include, among others, the involvement of organizations / actors, regulatory requirements, mechanisms and procedures operational, functions and authority, and activity such as coordination, collaboration and cooperation. Discussion on the institutional aspects of the institutional limited in the scope of the multimodal transportation system is based on the concept of multimodal benchmark used as a reference. More specifically this research will focus on the discussion of institutional aspects to support the institutional embodiment of multimodal lead to the institutional development of the single trait carriers as well as single document. The scope of the broader institutional support will be given the substance of the discussion of institutional aspects cannot be separated from the institutional aspects at a higher level or wider.

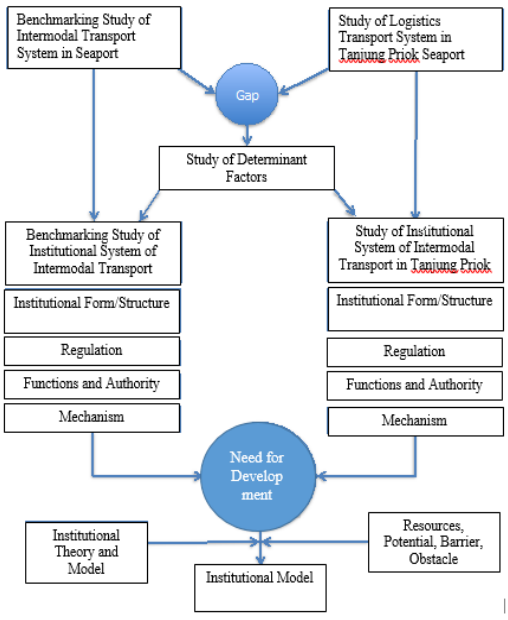


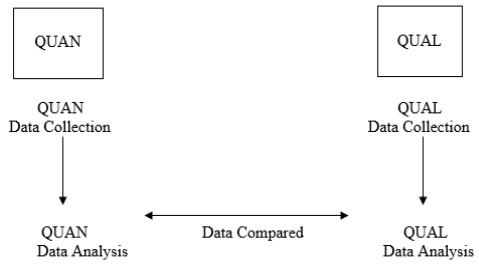
Figure 1 –Outline of the Scope of Research

The substance of other studies that will be discussed in addition to the institutional aspects and transportation system is related substance system multimodal logistics in the port. Some aspects of logistics systems in ports to be discussed among other mechanisms of distribution and transportation of goods from upstream to downstream and Chain transport linkages that support it. Analysis of the

flow of goods, money flow and flow information are also discussed on the logistics aspect. The study will also examine related resources, potentials and constraints on the development of good institutional level; ports as well as national level.

6. Methodological Framework

To achieve the purpose of research, data collection and analysis will be conducted using a mixture (mixed method), which uses a combination of quantitative and qualitative methods. The use of mixed methods in this research is because of the need to make a generalization of the findings. The strategy will be used to combine the two methods are triangulation concurrent strategy, quantitative and qualitative data collect concurrently (at a time), and then compare the two databases to find out if there is convergence, differences or some combination. This strategy generally applies quantitative and qualitative methods separately to cover/balance the weaknesses of the methods by forces other method (or conversely, the power of the methods add strength to other methods). [4] .



(See Figure 2 below).

Figure 2 – Concurrent Strategy
Source: Creswell (2009)

Mixing in this strategy occurred when the researchers came to the stage interpretation and discussion. Mixing is done by merging two research data into one (like transformation of one data type into another data type, so they can be easily compared) or by integrating or results of two such data side by side in the discussion. This strategy, in addition to the already popular among researchers, this strategy can produce substantive discoveries and completely validated. [4] .

Approach to qualitative content analysis is used to represent issues and state the institutional model of multimodal transportation in Indonesia. Qualitative Content Analysis (Qualitative Content Analysis) aimed at sorting out the data obtained from multiple sources of information to clarify the information, both the interviews and secondary data.[4]. The objects on qualitative content analysis shall be any type of the communication which are recorded, transcripts (interview/discourse), observation, video tapes, and written documents [21].

The above analysis techniques chosen because it can answer the research questions. Qualitative content analysis and stakeholder analysis is used in describing the problem and formulate a model of institutional logistics of multimodal transportation in the research process, various multimodal transportation models that exist in various countries will be adapted to the context of this studies to try to understand the existing problems and formulate further institutional recommendations.

Techniques and methods of further analysis of the qualitative and quantitative instruments used are techniques and methods needed to support each activity research conducted, mainly related to the goals to be achieved. Techniques and analytical methods are used according to the research objectives can be seen in the following table 2 below

Table 2 – Techniques and Analytical Methods

Goal	Analysis Needs	Method
Mapping of the structure of a multimodal transportation problems	•Review of performance standards multimodal transportation • Analysis of the performance and performance gap logistics transportation system	• Field survey •Descriptive Analysis • literature study • Methods gap analysis • Q-sort analysis
Mapping of specific roles and contributions of the institutional aspects in the structure of the multimodal transport issues	•Identification of the involvement of actors / institutions in the multimodal transportation system • Analysis of : l institution performance of transportation logistic system 2. influence of the institutional embodiment and gap of the transportation system in the area of research	Descriptive Analysis Method • Methods of study of literature • mapping the structure of the institutional multimodal freight problems • Methods of multi-modal institutional gap analysis • Q-sort analysis
Portraying opportunities of applying single operator and a single document as a key factor in the institutional	Analysis of the application of resource-based opportunities, potential and institutional constraints	•Field surveys and analysis related to perception, potential development opportunities-constraints

development of multimodal transport		• Statistical Analysis of primary survey • Analysis of the feasibility of developing an institutional model
Identifying factors determining the success of the institutional development of multimodal transport	Analysis of the factors determining the success of institutional development	Analysis of success factors
Establishment of an institutional model multimodal transportation	Analysis of institutional development	Analysis of the institutional construction

6.1. Data Reliability and Validity

To ensure the reliability and validity of qualitative data is can be done with various ways. For this study, there are three ways to be done items, namely: (1) triangulation, by checking the suitability of Data Obtained from questionnaires (quantitative) and interviews (qualitative); (2) checks by the respondents items, namely by asking respondents to confirm and check the description made by the researcher; (3) using a detailed description to give the reader an idea of the feel of the atmosphere when the interview was conducted; (4) ray clarification that may arise from the data collected. [4] .

The validity of the instrument very important to see how far the measurement by the instrument can measure what attributes should be measured. In the context of the multi method analysis, the interpretation of measurements, in particular construct validity and content so it can be investigated more accurately. In addition, this multi-models can also measure the validity of the respondents, which if found to be a pattern of respondents inconsistency. One of the strengths of this study is access to interviews with the competent authority for the case study approach based primarily on interviews and questionnaires that will be carried out, a chance to catch the deep knowledge that would not be possible through different research designs.

7. Research Approach. Why Institutional Arrangement Analysis?

A literature review of the institutional challenges for transport multimodal and logistics reveals that there is a diversion of multimodal transport development model from the spatial focus to the focus on institutions. Development of logistics infrastructure, logistics integration strategy, and institutional processes and cooperation in solving the problem of collective action is related in multimodal concept for the relevant infrastructure in capturing or controlling the main corridor and the load centers movement of goods. Multimodal transportation concept relies on effective multimodal transport infrastructure and the operations which underlie the level of integration are needed to capture. Multimodal transport cannot be understood without a larger analysis of the key issues arising from in-depth analysis of spatial and institutional characteristics of multimodal transportation and logistics. To build the institutional system of multimodal transport logistics should be based on the concept of cooperation, institutional design concept, and the concept of multimodal transport. The concept of cooperation is used to find the relationship and the type of cooperation that has been formed.

The concept of stakeholder coordination is used to see the role of government in encouraging the establishment of institutional multimodal transportation logistics, and the concept of collective action is used to see the possible collaboration opportunities between actors who have been involved in transforming the multimodal transport logistics. The state of institutional model is built upon the institutional concept and design, also the concept of multimodal transport logistics. The concept is used to see how the division of roles between actors, strategies and policies that can build a lasting and sustainable multimodal transport. The concepts are also used to conceive the existing institutional multimodal transportation in several countries as a best practice and lessons for the institutional development of multimodal transportation in Indonesia

This study discusses the institutional focus for Port of Tanjung Priok multimodal transport and logistics, multimodal transportation development model. Multimodal Transport cannot be fully understood without a larger analysis of the key issues arising from in-depth analysis of the spatial characteristics and institutional multimodal transport and logistics. Traditional spatial analysis on the transportation of goods has been expanded to include institutional relationships that govern the complexity of transport connections. Recent research has shown how spatial development in a high degree is a matter of institutional [5] .This development Recognizes that the perpetrators of modern transport operates in an environment of transport and logistics are more complex and

sophisticated, relevant in the regime of planning of multi-scale transport. The concept of coordination will be used as the basis for the relationship and the type of coordination that has been established in the institutional development and use for anyone to see the actors who will be Involved in institutional development [20] .Similarly, the concept of coordination between the actors is used to see how far the port authorities and operator role so far in the logistics system and the concept of this partnership will be used to see the opportunities / possibilities of actors' coordination who had been engaged to form multimodal transportation for logistics.

Departing from the concept of coordination, this kind of study will explore what kind of dynamics and a range of roles each actors, then strategies and policies that have been and should be done by the government and the factors that can sustain the success and sustainability of the realization of institutional multimodal transportation for logistics in Indonesia. Then as a comparison, various institutional models that exist in various countries will be studied as a best practice institutional multimodal transportation to see the weaknesses and strengths both models institutions, strategies, policies and actors involved, which then can be input and recommendation in accordance with the institutional context that exist in Indonesia.

8. Conclusions

The literature identifies that the inadequacy of stakeholder coordination are have a significant impacts on the poor logistics coordination in multimodal transport system in Tanjung Priok Port. Logistics in Indonesia is complicated due to its characteristics: multi-sector and across the region. The arrangement and enhancement of logistics system in Indonesia that is dispersed across several ministries require strong commitment and coordination. In the case of the multi-sector characteristics in the logistics coordination system, its implementation may be effected through the establishment of a national logistics institution that have a deal with: Moreover, the institution also has a deal in monitoring the implementation of national logistics system, identify obstacles and problems, evaluate and recommend solutions to all related parties, as well as overseeing the implementation of these recommendations. Congestion of transport networks occurs when there are actors in the chain not performing their proper role in a timely manner. However, the problem is that the actors do not coordinate effectively. Lack of good coordination between partners of logistics actors, should be full attention.

Better coordination has been encouraged also by the role of port authorities and related ministries who see that port connections with hinterland have become an important issue. A literature review of the institutional challenges for transport multimodal and logistics reveals that there is a diversion of multimodal transport development model from the spatial focus to the focus on institutions.

The research approach used in this study is a case study, which focused on the context of the development of multimodal transport for logistics in Indonesia. This study discusses the institutional focus for Indonesia multimodal transport and logistics, multimodal transportation development model. The concept of coordination will be used as the basis for the relationship and the type of coordination that has been established in the institutional development and use for anyone to see the actors who will be Involved in institutional development. Departing from the concept of coordination, this study will explore what kind of dynamics and a range of roles each actors, then strategies and policies that have been and should be done by the government and the factors that can sustain the success and sustainability of the realization of institutional multimodal transportation.

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