

THE INFLUENCE LOADING, DISCHARGING CARGO AND SHIP DOCUMENTS ON THE AGENCY PERFORMANCE

Mudiyanto¹, Khuzaini²

¹ Doctoral of Student Management, STIESIA Surabaya and lecture at Hang Tuah University, Surabaya, Indonesia

² Doctoral of Management, STIESIA Surabaya, Indonesia

*Corresponding Author: Mudiyanto@hangtuah.ac.id

Abstract: Indonesia is 2/3 of its territory consisting of Oceans, so sea transportation plays an important role in the national economy. Port management provides port services as the ship travels through the shipping channel to the dock at the port. The purpose of this research is to find out about the success of agency performance which is supported by the loading and discharging process and processing of ship documents. This research methodology is quantitative using multiple linear regression with a total sample of 52 respondents. The results of data processing obtained multiple R values of 0.861. The multiple correlation coefficient indicates that the loading and discharging process variables and ship document management have a very strong relationship to the agency performance variables. The results of this study are the loading and discharging processes and processing of ship documents have a significant effect on agency performance. Management of ship documents has a greater / dominant influence on agency performance.

Keywords: agency, ship document, loading and discharging

1. Introduction

Ships are of transportation, especially at sea, which plays an important role in the distribution of goods and people. As stated in (UNCTAD, 2014) that sea transportation plays an important role in the supply chain, especially in Indonesia and internationally in general, which has a share of 80 percent of the volume and 70 percent of the value of goods traded. In 2016, the volume of cross-sea trade reached 10,287 million tons (UNCTAD, 2014). The port plays an important role in various complex activities, especially work activities at the port. The existence of global trade will increase the delivery of goods widely, so that one of the most important parts of globalization is the distribution of goods and sea transportation (Rodrigue et al., 2013). The distribution of goods is the role of shipping coordination and logistics service providers in international trade (Wood, 2002). Ports are the entry and exit points for various flows which include the flow of goods, service flows, ship flows, passenger flows, ship crew flows, foreign exchange flows, flow of animals, flow of plants and so on. Port management provides port services, namely when the ship goes through the traffic scame that is pilot to the port pool, then anchors at the port pool, then the ship shifts to alongside, after the ship moored at the dock then carries out loading and discharging activities from the ship's hold alongside (Sasono, 2012: 13). Ship agency performance shows

a very good category in terms of agency services (Suparwan *et al.*, 2018). There are types of commercial ship business activities, namely the main business of shipping; agency business (Kosasih and Soewedono, 2009).

The agency business carried out by shipping companies is to act as an agent for other / foreign companies or *principals* (Kosasih and Soewedono, 2009). Supporting the loading and discharging activities of goods at the port the role of agents has an important role. As stated in (*Peraturan Menteri Perhubungan No : PM 11 TAHUN 2016*) regarding the Operation and Operation of Ship Agencies. Article 2 explains that ship agency activities are services carried out to represent national sea transportation companies and / or foreign sea transportation companies while in Indonesia.

The loading and discharging activity is the activity of discharging imported goods and / or inter-island / inter-insular goods from the ship by using a crane and ship sling to the nearest land on the edge of the ship / dock, then from the dock with a lorry, forklift, loaded and arranged into the nearest warehouse and vice versa during loading activities (Sasono, 2012: 131). The loading and discharging process at the port is one of the factors that can affect port performance. The length of time or not the loading and discharging process of cargo at the port can have an impact on the length of a ship's turn round time so that it can increase the ship's operational costs (Rum Raekhan *et al.*, 2017).

Based on the background description above, it is very important to understand the agency performance of shipping companies which is influenced by the loading and discharging process and processing of ship documents and there is still a lack of research examining the agency performance of shipping companies, so the problem formulations in this study are (1) does the loading and discharging process has an influence on the shipping company's security performance. (2) does the handling of ship documents affect the agency performance of shipping companies in Surabaya. The purpose of this research is to analyze and test the loading and discharging process and management of ship documents on the agency performance of shipping companies.

2. Literature Review

Ports

Port is a place consisting of land and/or waters with certain boundaries as a place for government activities and business activities that are used as a place for ships to alongside, board and / or unload goods, in the form of terminals and berths equipped with facilities. safety and security of shipping and port support activities as well as a place for intra and inter mode transfer of transportation (Shipping Law No. 17 of 2008).

Ports are the entry and exit points for various flows seen from an economic aspect, including the flow of cargo / commodities; inter-insular export and import, passenger flow, whether passengers from or outside the country or passengers from or to between islands; flow of ships, both ships with red and white flags and ships with foreign flags; money flows from various foreign currencies as well as national currencies; flow of documents, namely documents accompanying and protecting export-import goods / commodities; meanwhile, non-economic flows are viruses / bacteria that are carried in the flow of cargo and people passing through ports (Sasono, 2012: 1).

Port managers provide services needed by various companies operating in the port area including: the availability of waters and port pools to ensure smooth ship traffic and the berth of ships, where dredging is carried out periodically in the waters and ponds of the port to prevent silting of waters, cleaning and removing shipwrecks; guidance and delay services to

ensure the safety of ships in carrying out movements in the port area; provision of warehouses and stockpile of goods so that exporters-importers and inter-insulators can store their goods while waiting for the ship to export destination or while waiting for the completion of Fiat documents out of customs for imported goods; provision of docks for mooring for ships as well as loading and discharging services by procuring laborers who are members of TKBM, as well as mechanical equipment such as forklifts, top loaders, land cranes, sea cranes, ship slings, as well as providing various facilities for passenger boarding and disembarkation; the provision of clean water / drinking water, especially for ship logistics and the general public who live at the port, the provision of electricity so that loading and discharging at the pier and warehouse line 1 can be carried out 24 hours, procurement of fire engines to fight fire in case of a fire either at land and on the ship; provision of land and buildings to support the smooth operation of sea transportation and the needs of the hinterland industry at the port; port information system as well as mechanical equipment such as forklifts, top loaders, land cranes, sea cranes, ship slings, as well as providing various facilities for passenger boarding and disembarkation; the provision of clean water / drinking water, especially for ship logistics and the general public who live at the port, the provision of electricity so that loading and discharging at the pier and warehouse line 1 can be carried out 24 hours, procurement of fire engines to fight fire in case of a fire either at land and on the ship; provision of land and buildings to support the smooth operation of sea transportation and the needs of the hinterland industry at the port; port information system especially for ship logistics and the general public who live at the port, providing 24 hours of electricity for loading and discharging at the pier and warehouse line 1, procurement of fire engines to fight fire in the event of a fire accident both on land and on board; provision of land and buildings to support the smooth operation of sea transportation and the needs of the hinterland industry at the port; port information system especially for ship logistics and the general public who live at the port, providing electricity so that loading and discharging at the pier and warehouse line 1 can be carried out 24 hours, procurement of fire engines to fight fire in the event of a fire accident both on land and on board; provision of land and buildings to support the smooth operation of sea transportation and the needs of the hinterland industry at the port; port information system (Sasono, 2012: 5)

Shipping Company Agencies

General agent is a shipping company appointed by another shipping company in Indonesia or a foreign shipping company abroad to take care of everything related to the principal ship's interests. The agent's job starts with the appointment of a shipping company as an agent (owner / operator) of foreign ships, which is confirmed in an agency agreement (Kosasih and Soewedo, 2009: 203). If in a public port there is no loading and discharging company, the loading and discharging activities of goods from and to a foreign general agent vessel or a national ship agency can be carried out by the loading and discharging company at the nearest public port based on the appointment of a national sea transportation company that acts as an agency (Decree of the Minister of Transportation No: KM 14 of 2002).

Agency function (Kosasih and Soewedo, 2009: 204) is to compile an agency operational program based on company policy, both for liner service and tramp services; monitor the implementation of agency handling or services, both in the nature of cargo physical activities and ship arrival and departure schedule activities; administering agency activities, both those related to physical operations and financial matters; provide data and evaluation of the development of agency activities as input in determining policies as appropriate; strive for agency activities in such a way that it can provide simultaneously to the main activities of the company.

The agent provides operational services to principal vessels, namely port information (port facilities, port formality, custom of the port); ship needs, such as bunkers, water, provision, repair, maintenance, crewing, ship documents and certificates and so on; completion of documents, B / L, manifest, hatch list, stowage plan, crew list, documents for loading / discharging, ship handling, immigration, customs, port health, port administrators; request for advance payment for port expenses, cargo expenses, shipping needs; provide information to the principal (Kosasih and Soewedo, 2009: 205).

The agent's job starts with the appointment of a shipping company as an agent by the owner / operator of foreign ships that is confirmed in an agency agreement. Before the ship arrives, the principal notifies the ship's arrival and the amount of cargo that needs to be handled. The agency unit at the head office as general agent will appoint branches as the port agent for ship and cargo services for the principal ship (Kosasih and Soewedo, 2009: 204). Agency administrative procedures, namely the principal notifying the arrival of the ship accompanied by notification of data regarding ship data, the cargo that needs to be searched for, the cargo to be unloaded, the need for the ship, the time at the port is used to calculate the disbursement fee, after receiving the down payment for disbursement, then the shipping company that acts as general agent will send the money to the port agent (Kosasih and Soewedo, 2009: 207).

The transportation performance criterion is a service level factor, meaning that the capacity is expressed as the number of passengers or goods that can be moved within a certain time unit, in this case the capacity is a function of the capacity or size of the place or means of transportation and speed and influences the amount of movement required. Accessibility states the ease with which people use a particular means of transportation and can be a function of distance or time. The second criterion is the service quality factor, consisting of safety, reliability, flexibility, comfort, speed and impact (Nasution MN, 2015).

Loading and Discharging

The activities of loading and discharging goods from and to ships include *stevedoring*, *cargodoring*, and *receiving / delivery* at ports. (Decree of the Minister of Transportation No: KM 14 of 2002). *Stevedoring* is the work of discharging goods from / ship to dock / barge / truck or loading goods from the dock / barge / truck or loading goods from the dock / barge / truck onto the ship until they are arranged in the hold of the ship by using a ship crane or land crane; *cargodoring* is the work of releasing goods from the ropes / nets at the dock and transporting them from the dock to the warehouse / field of stockpiling of goods, then arranging them in the warehouse / field of stockpiling or vice versa; *receiving / delivery* is the work of moving goods from the stockpile / piling place in the warehouse / stacking field and handing them over until they are arranged on a vehicle at the warehouse door / stacking field or vice versa (Decree of the Minister of Transportation No: KM 14 of 2002).

The types of loading and discharging activities from or to a ship are as follows: *stevedoring*, which is the process of lowering cargo from the deck of the ship to the edge of the port using loading and discharging tools, on the other hand, export goods are loaded from the edge of

the pier onto the ship; *cargodoring* activity, which is the process of bringing ship cargo already at the edge of the port to the port storage warehouse for storage / stockpiling; *deliverydoring* activity, is the process of sending ship-loaded goods already in the port storage warehouse to outside the port environment for storage; *receivedoring* activity, is the process of transporting goods back at the factory or company or industry to be sent back to the port storage warehouse (Sasono, 2012: 13).

The activity of loading and discharging ships using *manifest* documents, *stowage / bay plans and hatch lists*, the activities are checking and matching the condition of the goods and the number of goods, brands, crates, wrappers and for containers, check the seal, container number and position of the cel container in the ship's hold, if there is damage, a damage list is made (*damage cargo list*) and if the cargo is more or less an over and short cargo list is made; check the integrity of the *lashing and dunnage* contained in the goods; check loads requiring serious handling; using appropriate loading and discharging tools; before discharging, it is necessary to know the condition of discharging, whether it has entered the warehouse / field or immediately left; check the completeness of the work team; when discharging the ship crane capacity must be considered (Kosasih and Soewedo, 2009: 233).

The activity of loading a ship is checking the completeness of the loading documents to be loaded onto the ship; inspect the loadable space / hold; check load condition; use a loading tool in accordance with the type of cargo to avoid damage to the goods to be loaded; pay attention to the capacity of the ship's crane; check the completeness of work safety; pre-load the last unloaded and for stowage in the hold for light loads over heavy loads and separate dangerous, leaky loads; use strong lashing and dunnage so that during the voyage there is no damage due to weak lasing; After the loading activity is complete, the final stage is the completion of the tally sheet document, labor time sheet, short/overlanded cargo list, damage cargo list, statement of fact, warehouse receipt, mate's receipt (Kosasih and Soewedo, 2009: 234-235)

Ship Documents

The documents that need to be prepared when the ship departs from the port are the sailing declaration from the quarantine; *port clearance out*, *quarantine clearance*, *immigration clearance*, *custom clearance*, *light dues*, *PPKB out from port authority*. Meanwhile, ship cargo documents are *bill of lading*, *cargo manifest*, *certificate of origin* (Suyono, 2007). The document grouping in export-import is financial documents, this document is used to withdraw funds from an advising bank or other party after fulfilling the specified terms and conditions; shipping document, including *commercial invoice*, *inspection certificate*, *insurance policy*; official documents include *export declaration* *packing list*, *certificate of origine*, *certificate of quality*, *manufacture's quality certificate*, *certificate of analysis*, *weight certificate*, and others (Sasono, 2012: 79).

Commercial documents include a trade invoice (*commercial invoice*), inspection certificate and insurance policy. The document inspection certificate contains the condition of the goods made by an independent surveyor, goods inspector, or an official body authorized by the government or international trade (Sasono, 2012: 81). Clearance is the handling of various kinds of documents required by the ship for the safety of the ship, the goods transported, the crew and passengers (Lasse, 2014).

Performance Management

Performance is the level of success achieved by employees in carrying out a work activity with reference to the tasks they must do (Rahadi, 2010).

Performance management is a continuous process of identifying, measuring, and developing individual and team performance and aligning their performance with organizational goals (Dessler, 2015).

3. Method

Research methods

This research method is quantitative with the data used is primary, meaning that it is obtained through direct answers of respondents to the questionnaire. Data collection methods are observation, questionnaires and literature. The research location is 5 shipping company agents in Surabaya. The sampling method used in this research is the proportional cluster random sampling method with a total of 52 respondents.

The analysis used is the Multiple Linear Regression model because there are two independent variables with one dependent variable which in this case is to measure the magnitude of the influence of the loading and discharging process and management of ship documents on agency performance.

The equations are as follows:

$$Y = a + b_1X_1 + b_2X_2 + e$$

Information :

Y = Agency Performance

a = Intercept coefficient (cut point in curve about Y axis)

b = The coefficient of the dependent variable X1-X2

X₁ = Variable Loading and Discharging of Cargo

X₂ = Variable Ship Documents

e = Variable error

Research Model

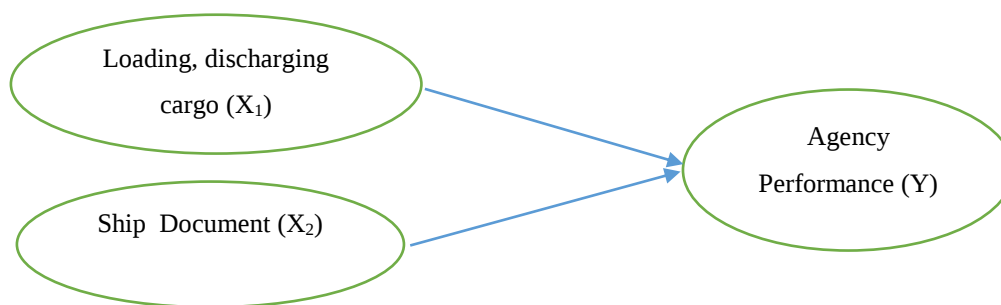


Figure 1. Research Model

4. Result and Discussion

Results of Respondents' Responses to indicators of modernization of loading and discharging equipment must be provided/prepared from 52 respondents 37 people or (71.2%) respondents answered agree; Respondents' responses to indicators must exist procurement of supporting facilities such as warehouses, piling fields of the 52 respondents totaling 30 people or (57.7%) respondents answered agree; Respondents' responses to the active indicators of TKBM carrying out their duties must be in accordance with the procedures of 52 respondents totaling 27 people or (51.9%) respondents answered agree; Respondents' responses to

indicators of supervision of TKBM in the implementation of their work from 52 respondents totaling 38 people or (73.1%) respondents answered agree; Respondents' responses to the indicators for the smoothness of the Delivery Order management reached the hands of the recipient of the goods from the 52 respondents totaling 33 people or (63.5%) respondents answered agree.

Respondents' responses to indicators documents must clearly explain the condition of the goods 52 respondents totaling 31 people or (59.6%) respondents answered agree; Respondents' responses to indicators a warrant issued by the company or its agent addressed to the ship's captain or officer to load goods from 52 respondents a number of 29 people or (55.8%) respondents answered agree; Respondents' responses to indicators lists of cargo loaded by ships at ports of cargo and will be unloaded from 52 respondents 30 people or (57.7%) respondents answered agree; Respondents' responses to agency service indicators must have the principle of safe, fast service from 52 respondents a number of 37 people or (71.2%) respondents answered agree.

Respondents' responses to indicators of public trust in agency services are the timeliness of the loading / discharging process of 29 respondents or (55.8%) respondents answered agree; Respondents' responses to the indicator of agency service principles must be able to provide services and affordable costs from 52 respondents totaling 34 people or (65.4%) respondents answered agree; Respondents' responses to indicators by paying attention to the main principles of handling cost efficiency content can be achieved from 52 respondents totaling 31 people or (59.6%) respondents answered agree. The results of data processing obtained by the SPSS version 20 computer program show the results of the reliability test in table 1 are as follows:

Table 1. Reliability Test Results

Variable	CHAPTER 1 ALPHA VALUE	CHAPTER 2 CUT OFF	Ket
Loading and discharging cargo (X ₁)	CHAPTER 3 0.889	CHAPTER 4 0.6000	Reliable
Ship documents (X ₂)	CHAPTER 5 0.880	CHAPTER 6 0.6000	Reliable
Agency Performance (Y)	CHAPTER 7 0.830	CHAPTER 8 0.6000	Reliable

Source: SPSS

Based on table 1, the alpha value shows all variables 0.6 so that the loading and discharging process variables and the ship document management variables are declared reliable. To determine the effect of loading and discharging process variables and ship documents on agency performance, multiple linear analysis is used. The results of data processing are as follows in table 2

Table 2 Simultaneous Testing of Processed Data

Variable	Regression Coefficient (B)	T count	Sig. T
Constant		2,597	
Loading and discharging cargo (X ₁)	0.427	3,960	0,000
Ship documents (X ₂)	0.432	4,875	0,000
R Square	0.742		
Multiple R	0.861		
Sig. F	0,000		
F Count	70,521		

Source: SPSS

The purpose of using multiple linear regression equations is to estimate or estimate the variation in the value of a dependent variable caused by the variation in the value of an independent variable. In this study, the function of the multiple linear regression equation is to estimate the value of agency performance if there is a change in loading and discharging variables and ship documents. The results of data processing obtained multiple R values of 0.861. The multiple correlation coefficient indicates that the loading and discharging process variables and the handling of ship documents have a very strong relationship to the agency performance variables.

The regression equation in this study is obtained:

$$Y = 2.597 + 0.427 X_1 + 0.432 X_2$$

Based on the regression equation, interpretations of each coefficient value are as follows:

a. Constant (a) = 2.597

The constant value (a) = 2.597, meaning that if there is no loading and discharging process and managing ship documents, the value of the agency performance variable = 2.597

b. Regression coefficient $b_1 = 0.427$

This means that if there is an increase in the value of the loading and discharging process variable, the value of the agency performance variable will increase by 0.427, assuming the value of the other independent variables does not change or remains.

c. The regression coefficient $b_2 = 0.432$

This means that if there is an increase in the value of the ship document variable, the agency performance variable value will increase by 0.432, assuming the value of the other independent variables does not change or remains. To determine the effect of loading and discharging processes and partially managing ship documents on agency performance, partial testing can be carried out as shown in table 3.

Table 3. Partial Testing with t Test

Variable	T count	Sig	Beta
Loading and discharging cargo (X_1)	3,960	0.000	0.416
Ship documents (X_2)	4,875	0.000	0.512

Source: SPSS

Based on table 3, it can be seen that ship documents are more dominant and have a significant effect on agency performance. So that the results of the regression analysis can be used to conclude the level of influence of each independent variable on the dependent variable, the regression coefficient needs to be tested for correctness, either simultaneously (together) using the F test or partially (individually) by using the test t.

The F test is used to test simultaneously whether there is an effect of the loading and discharging process variables and ship document management variables on agency performance. The calculated F value (sig.) In Table 2, the value of 0.000 is smaller than the significance level of 0.05, so it can be concluded that the estimated linear regression model is suitable to be used to explain the effect of loading and discharging processes and ship document management on agency performance.

The *prob* value. t count of the loading and discharging process variable is 0,000 which is smaller than 0.05, so the loading and discharging process has a significant effect on agency performance. The influence of the variable of ship document management on agency performance *prob* value. t count 0,000 is smaller than 0.05, so it is said that the variable of ship document management has a significant effect on the agency performance variable at 5% alpha. From the results of the t test analysis (partial), the ship document variable has a significant effect, this can be seen in the results of the questionnaire regarding the role of

smooth flow of ship documents. The implementation of the smooth flow of ship dockers must be further improved in order to improve agency performance. The results of this study are consistent with the research (Ferretti and Schiavone, 2016) that the performance of port business processes is supported by the cooperation of port service partners; quality of transport planning for ship operators and cargo owners (Verdouw et al., 2016); improve cargo transportation management (Wu et al., 2017); optimization of ships, utilization of assets and performance (Zaman et al., 2017); improve multimodal transport management (Xu et al., 2016).

5. Conclusions

The conclusion of this study is the loading and discharging process and handling of ship documents has a significant effect on agency performance. The main finding in this study is that the handling of ship documents has a greater/dominant influence on agency performance. The point is that in managing documents, there is an easy way to handle the *Delevery Order* up to the recipient of the goods, the document must clearly explain the condition of the goods, orders issued by the company or its agents to the captain or ship's officers to load goods, list of cargo loaded by ships at ports of cargo and will be dischraging.

The implication of this research is that it focuses on providing complete ship documents. Ship documents in the sense of increasing the quality of service speed of ship document management. The limitation of this study is that it only focuses on two indicators that affect the agency performance of shipping companies, so it is suggested that future research is necessary to add the *port clearance* factor after it is known the optimal performance of the shipping company agency.

Acknowledgements

By giving thanks for the presence of Allah SWT for all his graces and gifts, so that the author can complete this research with the title the influence loading, discharging cargo and ship documents on the agency performance. On this occasion the author would like to express respect and gratitude to the parties who are willing to take the time to provide input in this research. In the preparation of this research, the writer realizes that it is still lacking in technical and material aspects of its preparation, for that the author is always willing and open to accept suggestions and criticism which of course are constructive in completing this research. In conclusion, the authors hope that this research can be useful for all parties.

References

- DA, L. 2014. *Manajemen Kepelabuhanan*. Raja Grafindo Persada. Jakarta.
- Dessler, G. 2015. *Manajemen Sumber Daya Manusia*. 14th ed. Salemba Empat. Jakarta.
- Suparwan, C. K., D. P. Sari, dan B. Badarusman. 2018. Kinerja Keagenan dan Clearance Kapal Livestock Perusahaan Pelayaran Indonesia. *Jurnal Manajemen Bisnis Transportasi dan Logistik* 4(2): 233-236.
- Ferretti, M. and F. Schiavone. 2016. Internet of Things and Business Processes Redesign in Seaports: the Case of Hamburg. *Business Process Management Journal* 22(2): 271–284.
- Keputusan Menteri Perhubungan No : KM 14 Tahun 2002 tentang *Penyelenggaraan dan*

Pengusahaan Bongkar Muat Barang dari dan ke Kapal.

Kosasih, E. dan H. Soewedo. 2009. *Manajemen Perusahaan Pelayaran* (kedua). PT Raja Grafindo Persada. Jakarta.

Nasution, M. N. 2015. *Manajemen Transportasi*. 4th ed. Ghalia Indonesia. Surabaya.

Peraturan Menteri Perhubungan No : PM 11 TAHUN 2016 tentang *Penyelenggaraan dan Pengusahaan Keagenan Kapal*.

Rahadi, D. R. 2010. *Manajemen Sumber Daya Manusia*. Tunggal Mandiri Publishing. Malang.

Rodrigue, J. P. dan T. Notteboom. 2013. The Containerization of Commodities. *The Geography of Transport System* 3.

Suyono, R. P. 2007. *Shipping: Pengangkutan Intermodal Ekspor Impor melalui Laut*. Penerbit PPM. Jakarta.

Rum Raekhan, M., L. Djakfar, and A. Pujiraharjo. 2017. Evaluasi Kinerja Bongkar Muat di Pelabuhan Umum Gresik. *Jurnal Transportasi* 17(2): 133–144.

Sasono, H. B. 2012. *Manajemen Pelabuhan dan Realisasi Ekspor Impor*. Penerbit Andi. Yogyakarta.

UNCTAD. 2014. Developments in International Seaborne Trade. *United Nations Conference on Trade and Development*.

Undang undang Pelayaran No 17 Tahun 2008 tentang *Pelayaran*.

Verdouw, C. N., J. Wolfert, A. J. M. Beulens, and A. Rialland. 2016. Virtualization of food supply chains with the internet of things. *Journal of Food Engineering* 176: 128–136.

Wood, D. 2002. *International Logistics*. 2nd ed. AMACOM Books.

Wu, P. J., M. C. Chen, and C. K. Tsau. 2017. The Datadriven Analytics for Investigating Cargo Loss in Logistics Systems. *International Journal of Physical Distribution & Logistics Management* 47(1): 68–83.

Xu, K., H. Zhen, Y. Li, and L. Yue. 2016. Big Data Acquisition and Analysis Platform for Intermodal Transport. *International Journal of Database Theory and Application* 9(12): 67–78.

Zaman, I., K. Pazouki, R. Norman, S. Younessi, and S. Coleman. 2017. Challenges and Opportunities of Big Data Analytics for Upcoming Regulations and Future Transformation of the Shipping Industry. *Procedia Engineering* 194: 537–544.