ANALYSIS ON BILLING SYSTEM IMPLEMENTATION QUALITY IN ENDEAVOR TO INCREASE CUSTOMER SATISFACTION IN IMPORT ACTIVITY: STUDY OF SURABAYA CONTAINER TERMINAL

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ABSTRACT
This study aims to determine and explain the simultaneous and partial effects of service quality components consisting of reliability, responsiveness, assurance to customer satisfaction in PT. Terminal Petikemas Surabaya, and to know and explain which between the three service quality variables that have a dominant effect on customer satisfaction. The type of research used is explanatory research with population or census method with quantitative approach. Samples taken were 35 Billing Service users registered in PT. Terminal Petikemas Surabaya. Data collection method used is questionnaire. The result of multiple linear regression analysis shows that the three independent variables reliability, responsiveness, assurance have significant influence on the dependent variable that is customer satisfaction.

KEY WORDS
Service quality, customer, satisfaction, billing, service.

Commerce is a crucial aspect of a country's economic activity. International commerce is a transaction between nations as an economic subject with another, whether it is goods or services. International Commerce is usually conducted in the form of export-import. The export-import transaction is one of an important aspect of economic activity in Indonesia. Export-import is one of government method in obtaining foreign exchange in order to fulfill the country's need.

Indonesia possesses wider maritime territory compared to its land, therefore sea transport node is the mainstay in export-import. Aforementioned sea transport should be supported by adequate ports.

In supporting trading activities, a port not only acts as a harbor but also to switch transportation mode. Such as from sea to land transport, vice versa. Ship cargo would be unloaded and transported using trucks or trains to its destination. This activity is usually conducted in container terminal (*terminal petikemas*).

The container terminal is one of port-related business which focuses on services as main capital in order to face similar rival businesses. Service business capable of satisfying consumers is a compulsory aspect of running Service Company, maintaining long-term good relationship with consumers, as well as competing with similar businesses. Kotler (2009:170) stated that a service quality should start from consumer needs and end at consumer perception. Service quality is divided into five dimension which involves reliability, responsiveness, assurance, empathy, and tangibles. A company's method for increasing service quality user could be conducted by developing technology-based service. Fast technology development requires service companies to follow up in order to improve their services.

Fast technology development, especially electronics, is an inevitable aspect. Simplicity, speed, and effectivity offered by technology development require changes in various aspects of service businesses. Marketers ought to recognize the everchanging business landscape which is vastly different compared to several years ago. Technology is a primary factor which changes community thought process and lifestyle. The community found practicality and ease in advanced technology services.

Electronic-based service development influenced harbor service in Indonesia. One of such case occurs in PT. Terminal Petikemas Surabaya (PT. TPS) which is a company focusing on loading-unloading service. PT. PTS partners with more than 30 shipping companies. These companies transport containers to more than 25 countries worldwide. In the last five years, PT. TPS dominates container loading-unloading management in Tanjung Perak. PT.TPS dominates more than 50% of the market and it will continue to improve in the future.

One of the methods developed by PT. TPS, in order to improve their service, is by developing an electronic based payment application called Billing System. Billing System application development is one of PT.TPS support on the government program in an endeavor to decrease dwelling time, which in the end would smoothen imported goods unloading, therefore reducing ship accumulation and entry queue in the harbor.

Dwelling time is a set of time which is counted from whence a container is unloaded from a ship until it leaves terminal through the main gate (World Bank, 2011). Each country set their respective dwelling time. Indonesia is one of the countries with high dwelling time. Speed uping goods release is not only influenced by unloading process itself in the field but also documentation and payment procedure. Billing System was developed in order to speed up documentation process and record of release order (SPPB or *surat perintah pengeluaran barang*) and DO (delivery order) as well as speed up payment process. Billing System is part of payment service option provided by PT. TPS in endeavor to increase service quality.

LITERATURE REVIEW

International Commerce. According to Waluya (200:3), international commerce could be defined as commercial activity from a country of origin to country of destination. It is conducted by Multinational Corporation by performing goods and service transport, capital transport, labor transport, technology (factory) transport, and commercial brand transport.

Port. Auwjong (2005:16) stated that "A port is a region of calm sea water. This region enables a ship to load or unload cargo at a dock (kade)". Triatmojo (2009:3) stated that "A port is a gateway to enter a region or country. It acts as a connecting bridge between regions, islands, and even nations, continent, and nationality".

Maritime activity is divided into two: commercial and non-commercial. Commercial Maritime is shipping business between islands or countries. Non-commercial maritime is the patrol, naval survey, etc. Port functions as ship terminal after a voyage. Ship performs a various activity in a dock, the activities are described as follows: passenger embark-disembark, load-unloading goods (container), ship repair, supply procurement, etc.

According to Triajmojo (2009:1) ports were originally shores where ships docks in order to perform load-unload cargo, passenger embark-disembark, and other activities. Those activities could be conducted in ports with calm water. Therefore in the past, ports were usually by river shores, bay, or natural beaches protected from waves.

Due to country or region's social and economic development, its community need increase as well. Therefore adequate facilities are required in order to fulfill those need. Ships were originally simple and small. Nevertheless, with technology advancement, the ships were build bigger. Ports didn't need to remain in naturally protected regions such as river shores, but it could be built by sea shore to provide space for big ships.

Container Management. Container management occurred in container yard is conducted in the following procedure:

- A forklift truck, reach stacker, and side loader are utilized to stack containers up to six levels;
- Straddle carrier is utilized to stack containers up to two or three levels;
- Rubber tyre gantry (RGT) or transtainer is container crane in the form of a rubber wheeled portal, capable of stacking containers up to four or six levels.

Container Terminal Facility. Big ports in Indonesia are generally equipped with specialized terminal focuses in container transport. A number of facilities in container terminal is described as follows:

- Dock. Container docks generally built in the form of wharfs (docks parallel to the shoreline). This was built as docks receive heavy loads, whether it is containers or loading equipment.
- Apron. Container terminal apron is wider compared to another terminal which is normally 20m to 50 m in size. This particular apron is bigger as it is container loading equipment.
- Container Yard. Container yard is a set of land used to collect, store, and stack containers. Modern or big container terminal divides container yard into several divisions: export container, import container, refrigerated container, and empty container.
- Container Freight Station (CFS). Container Freight Station is a warehouse provided for Less Container Load/LCL. CFS in the loading dock, goods from several senders is loaded into one container.
- Observation Tower. The observation tower is utilized to perform observation in every nook and cranny, manage, and directing every activity in a terminal. This activity includes equipment operation and managing container storing and placement.
- Maintenance Workshop. Loading activity in container terminal is supported by a variety of equipment, therefore regular maintenance and reparation on loading equipment and empty containers are required. This activity is conducted in maintenance workshop.
- Other Facility. Container terminal requires several generic facilities such as entry gate, fuel supply, fresh water supply, electricity for the refrigerated container, etc.

Information System. System' is a term generally used in the education system, accounting system, banking system, etc. The system could be defined as a group or a set of elements, components, or variables. These elements are organized, interact and dependent on each other, and integrated (Sutabri 2005:3).

According to Darmawan (2013:1), data is a set of fact or manners that could be used as an input in generating information. Data could be in the form of discussion material, decision making, calculation, and measurement. Longkutoy (1978:3) stated that "Data is the plural form of datum. It means fact, which is used and correlated to facts, symbols, images, words, numbers, letters, or symbols representing an idea, objects, condition, situation, etc."

According to Darmawan (2013:3), information is a result of data processing. Nevertheless, not every obtained data could be processed into information. Processed data incapable of giving meaningful benefit could not be defined as information.

Billing System. The billing system is a part of payment service option provided by PT.TPS for service user in an endeavor to improve service. PT.TPS is the first and sole container company which uses electronic based payment system. The billing system is one of payment option aside from conventional payment at cashiers. Billing system was developed to enable online based import transaction. Billing System was developed in order to speed up documentation process and record of release order (SPPP or surat perintah pengeluaran barang) and DO (delivery order) as well as payment procedure.

Dwelling Time. Dwelling time, in general, is a vehicle waiting time such as public bus or train. These vehicles spend time in bus stop/train station. Normally this time is used for passenger embark/disembark, waiting for sterile traffic, parallel line merging, or schedule management. Dwelling time is a set of time counted from whence a container is unloaded from a ship until it leaves terminal through the main gate (World Bank, 2011).

Service Quality. According to Zeithmal, Parasuraman, dan Berry (1990:19), service quality is "the gap between consumer desire and perception". Kotler (2009:170) stated that service quality must start at consumer need and end at consumer perception. Consumer perception of service quality is a thorough assessment of a service quality.

According to Photis M. Panayides and Dong- Wook Song (2006) defined port service performance as price (cost advantage), quality, reliability, customization, and responsiveness. Tongzon (2004) defined a variety of port service variable which is: port or terminal efficiency level, cargo maintaining fee, reliability, port selection preference, and

maritime route depth. In other Tongzon's study (2002), there is a few other variable defining port competition level which are efficiency, ship docking frequency, infrastructure availability, location, docking fee, responsiveness, and reputation on damaged goods.

Dwelling time quality service could be observed from clearance and post clearance stages solution as described by PT Pelabuhan Indonesia II (Persero):

- Pre-Notification on clearance. Early notification which allows PIB document submission in Custom before the ship docks, where existing PIB submitted after Data Heap from terminal (seat container unloaded).
- Trucking and freight forwarder in post clearance. Trucking and freight forwarder support on e-service and TBRCS usage. Importer or freight forwarder must collect container or IPC to be delivered to an importer.

Customer Satisfaction. According to Kotler (2009), customer satisfaction is a person's satisfaction level after comparing performance and expectation. Customer satisfaction is determined by their respective perception and expectation.

A system's success could be determined by service provided. Especially service type which is integrated with information system. User satisfaction towards information system is how a user perceives information system in reality, but not against system quality in technical aspect (Guimares et al, 2003). User satisfaction exhibits how a user is satisfied and place belief in the provided information system in an endeavor to fulfill their needs (Ives, et al., 1983).

METHODS OF RESEARCH

Research method utilized is explanatory research with population method or census and quantitative approach. The research was conducted in PT. Jakarta International Container Terminal (PT.PT.TPS) Jl. The researcher conducted this research in PT.PT.TPS after considering easiness in collecting data as the company is the biggest and busiest container port. PT.PT.TPS dominates 60% of DKI Jakarta and Indonesian market. Population taken in this research is service user utilizing loading-unloading service, conducting import activity, and registered as billing system user in PT.TPS. In order to accurately draw research variable, researchers took every population as the sample. Sample obtaining technique is called saturated sampling. Based on aforementioned criteria, samples taken (n) from PT.PT.TPS service and billing system user are 35 people.

The data source used in this research is primary and secondary data. Data collection technique utilized was a questionnaire. The research instrument used was questionnaire aid. In order to examine data validity, the researcher conducted validity test and reliability test. Data analysis conducted involved descriptive analysis, multiple linear regression analysis, and partial regression analysis.

RESULTS AND DISCUSSION

Reliability Variable Frequency Distribution (X1). Based on obtained data, reliability variable obtained grand mean of 4.40. The respondents, in general, agreed with proposed statements in the questionnaire. First item stating Custom Officer providing clear image in offline/online SPPB document arrangement obtained 4.20 in average. Second Item stating Custom finished offline/online SPPB on time obtained 4.34 in average. Third item stating fee accuracy on container release on e-billing application obtained 4.54 in average. Fourth item stating container number information accuracy on e-billing application obtained average 4.51.

Responsiveness Variable Distribution (X2). Based on obtained data, responsiveness variable obtained grand mean at 4.16. The respondents, in general, agreed with statements provided in research questionnaire. First item stating Custom Officer providing information on required document clearly and easy to understand gained average value 4.20. Second item stating Custom Officer providing aid in overcoming problems in arranging offline/online SPPB obtained average value at 4.09. Third item stating tutorial providing easiness in e-billing application usage obtained average value at 4.17. Fourth item stating existing service in case

of error system occurring obtained average value at 4.17.

Assurance Variable Frequency Distribution (X3). Based on obtained data, responsiveness variable obtained grand mean at 4.36. The respondents, in general, agreed with statements provided in research questionnaire. First item stating Custom officer providing detailed list of fees and its functions obtained average value at 4.29. Second item stating Custom officers provides clear answer on customer inquiry obtained average value at 4.29. Third item stating e-billing is equipped with advanced security obtained average value at 4.51. Fourth item stating existing payment slip in each transaction using e-billing obtained average value 4.26.

Customer Satisfaction Variable Frequency Distribution (Y). Based on obtained data, responsiveness variable obtained grand mean at 4.37. The respondents, in general, agreed with statements provided in research questionnaire.First item stating offline/online SPPB registry procedure in e-billing application is easy and in accordance with expectation obtained average value 4.46. Second Item stating good offline/online SPPB and e-billing service and in accordance with expectation obtained average value 4.29. Third item stating offline/online SPPB payment procedure and e-billing application is easy to use and in accordance with expectation obtained average value 4.37.

Table 1 – Normality Test Result

-	Unstandardized Residual
N	35
Normal Parametersa, b Mean	.0000000
Std. Deviation	1.01792938
Most Extreme DifferencesAbsolute	.084
Positive	.084
Negative	-.074
Kolmogorov-Smirnov Z	.500
Asymp. Sig (2-tailed)	.964

Source: Processed primary data (2017).

Based on calculation result, sig. the value obtained was 0.964 (as exhibited in Table 1) or larger than 0.05; therefore, H_0 conditions were accepted as normality assumption is fulfilled.

Table 2 – Multicollinearity Test Result

Dependent Variable	Collinearity Statistics	
	Tolerance	VIF
X_1	0.712	1.405
X_2	0.750	1.333
X_3	0.635	1.574

Source: Processed primary data (2017).

Based on examination result, total tolerance value > 0.1, therefore, it could be concluded that there is no multicollinearity between independent variables.

Table 3 – Regression Formula

Dependent Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.585	1.925		0.304	0.763
X_1	0.261	0.109	0.327	2.393	0.023
X_2	0.221	0.104	0.283	2.128	0.041
X_3	0.244	0.102	0.347	2.401	0.023

Source: Processed primary data (2017).

Regression formula obtained based on Table 3 is as follows:

$$Y = 0,585 + 0,261\, X_1 + 0,221\, X_2 + 0,244\, X_3$$

The formula above could be interpteted as follows:
1. Customer Satisfaction would increase each addition of X_1 (Reliability). Therefore should reliability improves, it would increase customer satisfaction by 0,261 with assumption other variables are constant.
2. Customer Satisfaction would increase each addition of X_2 (Responsiveness), Therefore should Responsiveness improves, it would increase customer satisfaction by 0,221 with assumption other variables are constant.
3. Customer Satisfaction would increase each addition of X_3 (Assurance), Jadi apabila Therefore should Assurance improves, it would increase customer satisfaction by 0,244 with assumption other variables are constant.

Based on interpretation above, Reliability, Responsiveness, and Assurance affect positively to Customer Satisfaction. In other words, should Reliability, Responsiveness, and Assurance improves, it would increase Customer Satisfaction.

Table 4 – Coefficient of Correlation and Determination

R	R Square	Adjusted R Square
0.767	0.588	0.548

Source: Processed primary data (2017).

The coefficient of Determination is utilized to determine influence or contribution of independent variables towards dependent variables. Table 4.11 analysis obtained *adjusted* R^2 (Coefficient of Determination) at 0.48. It indicates 54.8% Customer Satisfaction variable is influenced by dependent variables which are Reliability (X_1), Responsiveness (X_2), and Assurance (X_3)). On the other hand, 45.2% Customer Satisfaction variable is influenced by other variables not studied in this research.

The coefficient of Correlation exhibits a relationship between independent variables (Reliability, Responsiveness, and Assurance) towards Customer Satisfaction variable. R-value (coefficient of correlation) is 0.767. This correlation value exhibits that relationship between independent variable (Reliability (X_1), Responsiveness (X_2), and Assurance (X_3)) with Customer Satisfaction is included in Strong category as it is between 0.6-0.8.

Hypothesis Examination:

Table 5 – F-Test/Simultaneous

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	50.313	3	16.771	14.757	0.000
Residual	35.230	31	1.136		
Total	85.543	34			

Source: Processed primary data (2017).

Based on Table 5. F count value is 14,757. On the other hand F table (α = 0.05 ; db regression = 3 : db residual = 31) is 2,911. As F count > F table which is 14,757 > 2,911 or Sig. F value (0,000) < α = 0.05 therefore regression analysis model is significant. This indicates H_0 is rejected and H_1 accepted. It could be concluded that dependent variable (customer satisfaction) could be significantly influenced by independent variables (Reliability (X_1), Responsiveness (X_2), and Assurance (X_3).

Based on Table 3, the following result was obtained:
1. T-test between X_1 (Reliability) with Y (Customer satisfaction) exhibits t count = 2.393. On the other hand, t table (α = 0.05 ; db residual = 31) is 2,040. As t count > t table at 2,393 > 2,040 or sig. t (0,023) < α = 0.05 therefore X_1 (Reliability) towards Customer Satisfaction is significant. This indicates H_0 was rejected. Therefore it could be concluded that Customer Satisfaction could be influenced significantly by Reliability. By improving Reliability, customer satisfaction will significantly increase.

2. T-test between X_2 (Responsiveness) dengan Y (Customer Satisfaction) exhibits t count = 2,128. On the other hand t table (α = 0.05 ; db residual =31) is at 2,040. As t count > t tabel yaitu 2,128 > 2,040 or sig. t (0,041) < α = 0.05 therefore X_2 (Responsiveness) influence towards costumer satisfaction is significant at alpha 5%. This indicates H_0 was rejected. It could be concluded that Customer Satisfaction could be significantly influenced by Responsiveness. By increasing responsiveness, customer satisfaction will significantly increase.

3. T-test between X_3 (Assurance) and Y (Customer Satisfaction) exhibits t count = 2,401. On the other hand t table (α = 0.05 ; db residual = 31) is at 2,040. As t count > t tabel at2,401 > 2,040 or sig. t (0,023) < α = 0.05 therefore X_3 (Assurance) influence towards customer satisfaction is significant at alpha 5. This indicates H_0 was rejected. It could be concluded that Customer Satisfaction could be significantly influenced by Assurance. By improving Assurance, Customer Satisfaction would significantly increase.

Table 6 – Dominance Test Result

Ranking	Variable	*Beta* Coefficient	Influence
2	X_1	0.327	Significant
3	X_2	0.283	Significant
1	X_3	0.347	Significant

Source: Processed primary data (2017).

Based on Table 6, Assurance variable possesses the highest coefficient of regression. It indicates that Y variable is more influenced by Assurance variable. Coefficient possessed by Assurance variable is positive. This indicates parallel relation. Therefore it could be concluded that better Assurance variable would increase Customer Satisfaction (Y).

DISCUSSION OF RESULTS

Three variables of Reliability (X1), Responsiveness (X2), and Assurance (X3) possess significant influence towards Customer Satisfaction (Y) which is determined from service provided. Service user satisfaction towards dwelling time and billing system implementation determined from PT.TPS services were 54.8%. It is influenced simultaneously by the three variables. On the other hand, 45.2% service user satisfaction was influenced by other factors. Despite reliability, responsiveness, and assurance simultaneously provide positive influence to service user, each variable possess different influence value. The difference in value is described below based on hypothesis test conducted:

Reliability. Reliability involves capability in providing services immediately, accurately, and satisfactory. Hypothesis test exhibits coefficient of reliability for 0.261 with t count 2.393 and significant in influencing satisfaction. It indicates PT.TPS possess good reliability during dwelling time and in billing system utilization in endeavor to aid service user. PT.TPS service reliability influences the high satisfaction level of a service user. Service user's need were satisfied with existing punctual, accurate, and satisfying service. Punctuality in documentation procedure conducted by customs officers, fee and information accuracy in billing system enables service user to release goods. This research result is in line with Andy's research (2013) which stated reliability independent variable possess significant influence to patient satisfaction in RSUD Nganjuk (Nganjuk Public Hospital).

Responsiveness. Responsiveness is related to willingness in providing aid to customers and punctual services. Hypothesis test exhibits a coefficient of responsiveness at 0.221 with t count at 2.182 and significantly influence service user satisfaction. It indicates PT.TPS possess good responsiveness during dwelling time and in billing system utilization in endeavor to aid service user. The customer feels satisfied due to aid provided by customs officers in documentation procedure and existing tutorials in billing system. These factors influence high customer satisfaction.

Assurance. Assurance is related to knowledge, skills, manners, and trust. Coefficient of

regression exhibits assurance coefficient value at 0.244 with t count value at 2.401 and significantly influence customer satisfaction. It indicates PT.TPS possess good assurance during dwelling time and in billing system utilization in endeavor to aid service user. Assurance is a set of emotion when service user considers service provided is in accordanece with procedure and reality. In the end, it creates service user confidence. Detailed explanation on fees, transaction slip, advanced security system in billing system applied by PT.TPS causes assurance variable to be the most dominant factor in creating customer satisfaction. This research result is in line with Tamara's research (2011) stating that assurance is the most dominant factor influencing service user satisfaction in Pelindo IV Port in Makassar.

CONCLUSION AND SUGGESTIONS

Based on discussion above, there are several conclusion which is described as follows:

Simultaneous influence of each independent variables towards customer satisfaction needs through F-test examination. Based on multiple linear regression analysis, independent variable caused significant influence simultaneously towards customer satisfaction. It could be concluded that hypothesis examination stating existing simultaneous influence from independent variable towards costumer satisfaction variable is accepted.

In order to determine influence individually (partial) of independent variables Reliability (X_1), Responsiveness (X_2), and Assurance (X_3) to customer satisfaction was conducted utilizing t-test examination. Based on this examination, there are three variables possessing significant influence towards customer satisfaction which are Reliability, Responsiveness, and Assurance.

Based on t-test result, Assurance variable posses the highest t-count variable. Therefore Assurance variable possesses the strongest influence compared to other variables. Assurance variable possesses dominant influence to customer satisfaction.

Based on conclusion above, the researcher proposed the following suggestion:

It is expected from the company to improve responsiveness as among the three variables, responsiveness possess the lowest value. The company could improve service quality conventionally or through billing system, and additional information required by service user in SPPB arrangement and billing system utilization. The company should maintain service assurance as Assurance variable possess dominant influence to customer satisfaction.

With existing documentation and electronic based payment system (billing system) could become a benchmark to other similar ports to adopt and develop this system in endeavor to speed up and simplify dwelling time.

Independent variable is a crucial factor which influences customer satisfaction, therefore it is expected that this research result could be utilized as reference for future researcher in developing this research. Future researchers could consider other variables outside variables used in this research.

Considering the rarity of billing system utilization in port-related businesses, future researcher could conduct analysis on application benefit or conduct research on this application in other ports as benchmark.

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