

ANALYSING THE IMPACT OF PRODUCT QUALITY IMPROVEMENT AND PROCESS EFFICIENCY AND EFFECTIVENESS TOWARDS ON-TIME DELIVERY OF TUNA FISH AT PT. PELNI

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Abstract. This research was made by referring to users who use freight forwarding services in PT PELNI. This study aims to analyze the impact of improving the quality of products and processes that are effectively and efficiently carried out by PT PELNI to optimize the punctual delivery of goods. In this study, there are nine indicators namely endurance, reliability, aesthetics, satisfaction, development, productivity, reliability, positive responsiveness, and certainty. The approach used in this research was quantitative. This was done by distributing questionnaires to 50 users of freight services in PT PELNI to collect the data. In this study, researchers conducted validity tests, reliability tests, multiple linear regression tests, and hypotheses test. The results show that all hypotheses have positive and significant effects.

Keywords: packaging, punctuality, freight forwarding services

1. Introduction

Indonesia has a lot of marine products. One of them is the potential of marine fish, which could make Indonesia become one of the largest sea fish producers in the world by looking at the vast target market. The geographic location of Indonesia, which is located in the equator, is very potential to be the one of the biggest world's fish producers that exports tuna fish, one of the potential marine fish. That is the mainstay of Indonesia, which the population of tuna fish is spread in many Indonesian sea waters, especially in Eastern Indonesian sea including the Makassar Sea, Banda Sea, Maluku Sea, Sulawesi Sea, Arafuru Sea and Papua Sea. Because Tuna fish populations are scattered across Indonesian sea waters; improving and maintaining the quality of tuna fish, as well as customer satisfaction levels, require good process handling and best packaging technology as well as best quality, effective and efficient process, and minimum delivery time / on-time delivery.

One thing that needs to be considered in order to maintain tuna properly is when tuna is at the port. At the port, Tuna must be handled more seriously, especially because tuna is an export commodity. To maintain the quality of tuna, further processing is necessary for both the frozen and other tuna. The handling of packaging technology properly is required as well, so that tuna has its own added value after the processing. Added value is the value that occurs because a commodity undergoes a packaging process that is processing, handling, and freezing as well as frozen storage in a production process so that it can increase its utilization, selling price, and function (Hartanto, 2016).

The quality of tuna is very influential on customer satisfaction where the quality is related to good packaging through proper handling process. However, at this time at PT PELNI there was still a problem of being lack of packaging facilities and also the inaccurate delivery time due to loading and unloading process at the Port which still uses the traditional system so that it results in delays in shipping goods. Therefore, the researchers raised this problem in order to observe a continuity between packaging meeting the standards and proper handling process on tuna fish

2. Literature Review

2.1. Product Quality Improvement

The definition of product quality has appeared to be problematic ever since the scientific management of quality became a field of expertise in the early 20th century (Giroux, 2006). Available definitions of product quality in the literature have been repeatedly reviewed over time, consistently exhibiting a variety of definitional perspectives or approaches (Garvin, 1984; Reeves and Bednar, 1994; Giroux, 2006). From a manufacturing perspective, for instance, product quality has been defined as conformance to specifications (e.g., Crosby, 1979), while the user-based approach has defined product quality as the suitability between the characteristics of a product and the customer's needs (e.g., Buzzell and Gale, 1987). Each of the different definitional perspectives on product quality focuses on a different aspect of this multifaceted concept. Garvin (1984, 1987) (Trentin, Perin, & Forza, 2012)

- Durability, which is related to how long the product can continue to be used.
- Reliability (reliability) is less likely to experience damage or failure to use.
- Aesthetics (aesthetics), which is the attractiveness of the product to the five senses. (Pahruraji, 2019)

2.2. Effectiveness and Efficiency

Drucker [22] has practically stated the variation between effectiveness and efficiency. He refers to "doing things right" as efficiency. In his definition of this term, a measure of efficiency appraises the organization's ability to achieve the output (s) considering the minimum inputs level. Likewise, Achabal [2] pointed out that efficiency principally links to costs in minimum level and refers to allocating resources across optional uses. In addition, Chan [23] defines efficiency in the literature of management as the utilization of resources (Labor, Machine, Capacity, and Energy). "Doing the right things" and choosing the activities in proper way are defined as effectiveness [22, 27]. Also, effectiveness measures the firm's ability to gain prearranged objectives and goals [28]. In simple description, an organization is considered effective where it attains its goals [29]. (Roghanian, Rasli, & Gheysari, 2012)

- Satisfaction is a measurement to show the level at which an organization can meet the needs of the community.
- Development is a measurement of an organization's ability to increase its capacity in facing community demands.
- Productivity means the number of services produced (Rachman, 2012)

2.3 On-time

On-time is the availability of information for decision makers when needed before the information loses the ability to influence a decision (Suwardjono, 2011: 170). (Rachman, 2012)

- Reliability

According to Fathoni (2009) indicators of reliability include:

- a) Information about shipping costs
- b) Clear information on the delivery process
- c) Timeliness must be as promised

- Responsiveness

According to Fathoni (2009), indicators of (Responsiveness) are

- a) veracity in explaining the procedures for shipping new items / packages
- b) readiness of customer service in providing services to consumers who experience problems in shipping goods
- c) complaints by consumers are responded properly.
- Certainty

According to Fathoni (2009), certainty indicators (Assurance) include:

- a) Safe shipping guarantee
- b) Guarantee of an accurate recording system
- c) Guaranteed on-time delivery and reception (Machado, Scavarda, & Vaccaro, 2014)

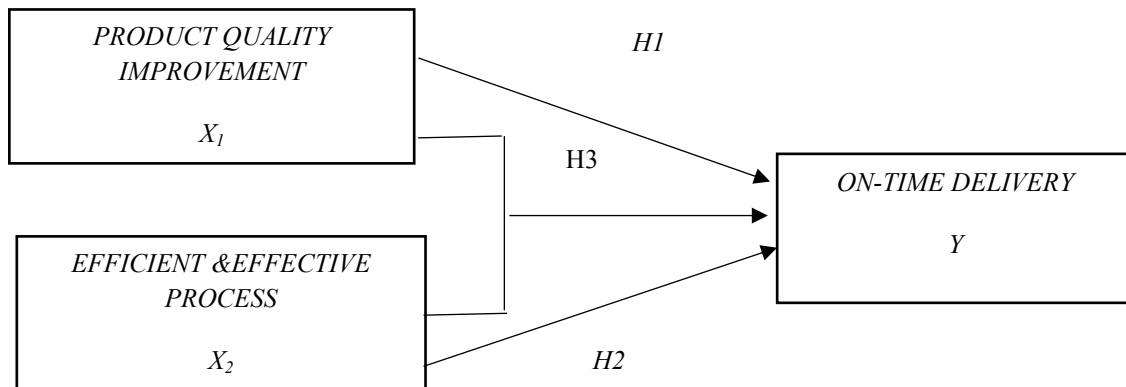


Figure 2. Hypotheses

H1 = Significant influence is expected between product quality improvement on the shipping speed

H2 = There is presumably a Significant impact between efficiency and process efficiency on the timeliness of delivery

H3 = There is presumably a significant effect between increasing product quality and increasing production efficiency on on-time delivery

3. Method

In this study, the method was quantitative. "Quantitative research methods can be interpreted as a research method based on positivistic philosophy because it is based on the philosophy of positivism; This method is a scientific method because it meets the scientific rules that are concrete / empirical, objective, measurable, rational, and systematic ". Sugiyono (2009: 7). This types of research was conducted by researchers using Non-Experimental research. The design used for this study was Expost Fasco research which aims to study the causal relation between the independent variables and the dependent variable. Causal research is carried out to prove the causal relation between variables in this study is to improve product quality (X₁) and effectiveness and efficiency (X₂), the dependent variable in this study is timeliness (Y). The sampling method used was non-probability sampling by using primary data obtained through the distribution of questionnaires to companies that used transportation services PT. PELNI transportation services, shipping routes from Sorong to Jakarta. Researchers used SPSS 26 software to process and analyze research data, such as: validity and reliability tests. The regression model used in this study was multiple linear regression to test: t test, f test, and coefficient of determination. (Wibowo, Setyo Ferry Sarih, Iin pusfita Sarih Kresnamurti, 2014)

4. Discussion and Result

4.1 Test Validity and Reliability

Validity test was carried out using SPSS version 26 for Windows. Validity test was calculated by comparing the r count value with the rtable value at the error level of 5% for the degree of freedom (df) = n-2, provided the test results of the questionnaire statement are declared valid if r count > rtable (Ghozali, 2013: 53 in research Prastiwi & Jumino, 2018). According to (Prof.Dr.Sugiyono, 2017) in his research, the reliability calculation used was by using the Cronbach alpha method. The reliability test was carried out concerning Cronbach's alpha, which had a reliability level of 0.6.

Table 2. Results Test Validity and Reliability

No	Variabel	Item	Counted	Cronbach alpha	r _{tabel}	Cronbach alpha standard	Explanation
1	Improvement of Product Quality (X ₁)	X _{1.1}	0.398	0.684	0.2353	0.60	Valid
		X _{1.2}	0.766		0.2353	0.60	Valid
		X _{1.3}	0.616		0.2353	0.60	Valid
		X _{1.4}	0.557		0.2353	0.60	Valid
		X _{1.5}	0.616		0.2353	0.60	Valid
		X _{1.6}	0.755		0.2353	0.60	Valid
					0.2353		
2	Efficiency and Effectiveness of Process (X ₂)	X _{2.1}	0.408	0.683	0.2353	0.60	Valid
		X _{2.2}	0.768		0.2353	0.60	Valid
		X _{2.3}	0.609		0.2353	0.60	Valid
		X _{2.4}	0.558		0.2353		
		X _{2.5}	0.609		0.2353		
		X _{2.6}	0.758		0.2353	0.60	Valid
	On-Time Delivery (Y)	X _{3.1}	0.446	0.679	0.2353	0.60	Valid
		X _{3.2}	0.762		0.2353	0.60	Valid
		X _{3.3}	0.618		0.2353	0.60	Valid
		X _{3.4}	0.549		0.2353	0.60	Valid
		X _{3.5}	0.618		0.2353	0.60	Valid
		X _{3.6}	0.705		0.2353	0.60	Valid

Source: Processed based on the results of questionnaire data, 2020

The researcher distributed questionnaires to 50 respondents, df = 50-2 or df = 48 with alpha (5% = 0.05) then the validity rtable was 0.2353. Based on the rtable, the criteria in this study, the instrument is declared valid if r count > 0.2353 and the instrument is invalid if r count < 0.2353. The reliability test results in table 2, then each variable produces an alpha value that exceeded the Cronbach alpha value of 0,60. So it can be concluded that indicators and questionnaires can be trusted or consistent.

4.2. Analysis of Multiple Linear Regression Equations

According to (Pardede and Manurung, 2018), it is known that in multiple regression, the dependent variable is influenced by two independent variables so that the functional relation between the dependent variable (Y) is the on-time delivery, with the independent variable namely: Improvement of product quality (X1) and Effectiveness and Efficiency of process (X2).

Table 3. Equation of Multiple Linear Regression and Test t Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
1		B	Std. Error	Beta		
	(Constant)	.274	.148		1396.	.169
	IMPROVEMENT OF PRODUCT QUALITY (X1)	.994	.143	1.003	6.936	.000
	EFFECTIVENESS AND EFFICIENCY OF PROCESS (X2)	-.004	.143	-.004	-.004	.975

a. Dependent Variable: ON-TIME DELIVERY

Source: Processed based on the results of questionnaire data, 2020

Based on data analysis using SPSS 26, the regression equation results were obtained as follows:

$$Y = 0.274 + 0.994X_1 - 0.004X_2$$

The multiple linear regression equation implied that each increase in the application score of the X1 variable (Improvement Product Quality) of 0.994 would be followed by an increase in Y (Punctuality of Delivery) of 6.618. Every 1 score increase for variable X2 (Process Effectiveness and Efficiency) of -.004 would be followed by an increase in Y (Punctuality of Delivery) of 0.994.

Results Test F (Simultaneous)

This test was carried out by comparing the significance of $F_{count} > F_{table}$

According to (Pardede and Manurung, 2018), the formulated model is appropriate, by looking at the value of $F_{table} = F_{(5\%;k;n-k-1)} = F_{(5\%;2;50-2-1)} = F_{(5\%;2;47)} = 3.2$

Table 4. Test F (Simultaneous) ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	417.488	2	208.744	10525.927	.000 ^b
	Residual	.932	47	.020		
	Total	418.420	49			

a. Dependent Variable: ON-TIME DELIVERY

b. Predictors: (Constant), EFFECTIVENESS AND EFFICIENCY OF PROCESS (x2), IMPROVEMENT OF PRODUCT QUALITY (x1)

Source: Processed based on the results of questionnaire data, 2020

Based on the results of the test table above, it can be seen that the F_{count} value of 10525,927 with the F_{table} value is 3.2. It was concluded that of $F_{\text{count}} > F_{\text{table}}$ and thus H_0 is rejected and H_3 is accepted.

Coefficient of Determination

According to (Pardede and Manurung, 2018) the coefficient of determination (Goodness of Fit) is denoted by R^2 . The coefficient of determination (R^2) measures how far the model's ability to explain variations in the dependent variable.

Table 5. Coefficient of Determination

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999 ^a	.998	.998	.141

a. Predictors: (Constant), EFFECTIVENESS AND EFFICIENCY OF PROCESS (X2), IMPROVEMENT OF PRODUCT QUALITY (X1)

Source: Processed based on the results of questionnaire data, 2020

Based on the table above, it can be seen that the coefficient of determination found in the Adjusted R Square had value of 0.998, which means that the independent influence (X) on the dependent variable (Y) was 99.8% while the remaining 0.2% was caused by other variables not identified into the model.

5. Conclusion

Based on the analysis of the results of the research in the previous chapter, it can be concluded that the improvement of quality emphasizing on product packaging standards carried out appropriately has a positive and significant effect on the timeliness of shipping items which was stated quantitatively. This study has very effective results while the effectiveness and efficiency of the process, especially in the process of handling goods, did not show the results of a positive influence for on-time delivery

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