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Article

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Article



Customer Perception on Last-Mile Delivery Services Using Kansei Engineering and Conjoint Analysis: A Case Study of Indonesian Logistics Providers

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Abstract: *Background*: This article identifies the preferences of the customer of logistics services in Indonesia using the Kansei engineering and conjoint analysis methods. The Conjoint Analysis aims to establish utility scores that represent factors in logistics services. *Methods*: In this study, 100 respondents from several cities in East Java, Indonesia, are selected to fill out the formal questionnaire. At the same time, 30 respondents are chosen to determine the attributes and level attributes. The analysis to determine attributes, level attributes, and formal questionnaires are assisted by SPSS 25. Sixteen stimuli are generated in this study to be used for a formal questionnaire. In this study, Kansei is used to provide a different perspective to describe the customer service, Including six attributes: delivery services, delivery speed, courier attitude, order information, condition of goods, and warehouse locations. *Results*: The results show that customers' most preferred attributes are based on the condition of undamaged objects, and the attitude of the courier is vital for users in this study. *Conclusions*: The most considered instruments by the customer, such as delivery services, delivery speed, courier attributes of the courier is object.

Keywords: Kansei engineering; conjoint analysis; logistics service; customer preference

1. Introduction

During the development of the e-commerce era, the logistics business is one of the determining factors for its success. The logistics business is classified as one of the executants whose plans are to implement, control, and store business products: goods, services, and all kinds of related information from the point of supply to the point of demand can meet customer demands [1]. Logistics service quality is an important element in trading marketing to create customer satisfaction. Among the most logistics services, third-party logistics (3PL) is the unit that frequently interacts with the customer [2]. Third-party logistics penetrates the business of various basic logistics activities, such as last-mile delivery of goods to the customer [3]. Last-mile delivery refers to the final set of activities in a delivery cycle, activities and deliveries from the warehouses to the house, and the final drop [4].

The objective key of a qualified last-mile delivery service is to have loyal customers and fulfill their customer satisfaction [5]. Hence, logistics service providers need to show their consideration for the quality provided. However, one problem is that there are many customer complaints regarding the efficient logistics services derived from after purchase evaluation. For example, customers complain about the inaccurate number of products, the delay and extension of delivery time, damages in packaging, and unfriendly couriers [1]. Based on these, the last-mile services should be able to improve the services in terms of customer satisfaction, which can be measured through Kansei engineering and Conjoint Analysis.

Kansei engineering is a method for converting affective words into a product or service design, such as changing responses, emotional feelings, and mental impressions



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). into authentic product images [6]. Meanwhile, Conjoint analysis can be carried outs to formulate valid findings to analyze the proper Kansei method on customer perceptions. Conjoint analysis is a priority process to balance trade-offs among limited alternatives [7]. Many studies confirm that compared to other methods such as evaluating single product attributes of importance by rating scale, the rank ordering of product attributes, and multidimensional measurement, the results obtained by the conjoint method are more detailed, reliable, and easier to understand [8]. Regarding the effectiveness of Kansei engineering methods and conjoint analysis, various studies have developed products based on customer perception in the company [9,10], conjoint analysis [11–14], or two of combination [15–17].

Previous studies have not carried out much research on last-mile services, especially Kansei engineering and conjoint analysis methods. According to Sudibyo [18], the preferences of logistics service users are still limited. At the same time, customer preferences are critical as an essential attraction to attract customer interest and as a reference for companies to improve their services. Based on that, this research decided to acquire the part of the emotional design of the Kansei engineering method, to analyze the important attributes that affect the quality of logistics services. This study preferred attributes and levels from a complete profile Conjoint analysis, then provided input to logistics service providers on what customers most preferred attributes and levels. However, no research has formulated how effective Kansei engineering methods with conjoint analysis are in designing logistics company strategies. This research focuses on uncovering how important Kansei engineering and conjoint analysis are in formulating the strategy of logistics companies. The main goal that will be achieved in this research is to foster the perception that Kansei engineering and conjoint analysis are the most suitable methods for formulating logistics company strategy.

The structure of this article is written in four sections. Section One (introduction) discusses this study's background and identifies the gap between previous studies and the research statement. Section Two discusses the related studies that contribute to the research development. Then, Section Three discusses the research methodology and presents the managerial implications, followed by Section Four, which contains the conclusion and limitations.

2. Literature Review

2.1. Last-Mile Delivery

Last-mile delivery is one of the main steps in the business process. It is the last step in the logistics process [19]. The logistics company forms the delivery process, so the customer does not come to pick up the goods or deliver them directly [10]. Instead, customers can receive goods ordered through HDS from the warehouse or a third-party logistics provider to a specific home or location [20]. As a result, the demand for home delivery services (HDS) increases, and it can provide great additional value both for customers and businesses. In addition, the service is worldwide spreading in response to the rapid growth of e-commerce and the changing customer need for delivery services [21].

2.2. Customer Preference

Customer preference is a choice of something customers prefer [22]. Preferences are formed by customer perceptions of a product [23]. According to Swastha [24], customer preferences include homogeneous, diffuse, and group preferences. Simamora [25] states that the data obtained in measuring customer preference levels are subjective. This is in accordance with respondent answers based on their experience in using a specific type of product. Marketers need an early detection system against some threats to their products.

2.3. Kansei Engineering

Kansei is a Japanese term that means sensitivity, impression, and emotion [26]. Kansei engineering is a tool for the systematic development of new and innovative solutions but

it can also be used to improve existing products and concepts. Kansei engineering (KE) ensures that a product or service meets the desired emotional response [27]. Through research tools, service quality assessment can be carried out by investigating the gap between perceived quality and customer expectations. One of the emerging service sectors is logistics. Recent research on KE in logistics services has been conducted by exploring the quantitative relationship between feelings (based on Kansei's terms) and design elements in-home delivery services [28].

However, the application of KE in service design is less common nowadays, as it is more challenging to present intangible service elements to stimulate customers that are asked to express their affective perceptions [26]. Typically, KE begins with a survey of several invited respondents regarding basic level concepts that can be further assembled into sub-concepts to guide the configuration or design of product features [17]. Referring to Nagamachi [29], the KE procedure consists of three main phases:

- 1. Establishing the goal product and target segment;
- 2. Building a Kansei word hierarchical structure;
- 3. Conducting experiments to explore suitable product features to obtain potential alternatives.

2.4. Research Method

The research method is the most important principle step researchers take to support their research. The research method is made to find, develop, and check the validity and reliability of research findings to be validated as science. This study uses quantitative research with a descriptive approach design. A quantitative approach is a research method that measures all variable relationships in a concrete, observable, measurable manner and analyzes the cause and effect of the relationship [30]. Quantitative research uses numbers in the formulation process, starting from data collection and data interpretation to the appearance of the data that has been analyzed [31]. This allows researchers to produce an optimal interpretation of data processing results regarding Kansei engineering and Conjoint analysis for last-mile delivery services. On the other hand, the research with a descriptive approach benefits researchers in conveying information to users. The reason is that descriptive analysis is beneficial and effective for delivering complete information, starting from interpreting numbers and data to the perception of cause and effect relationships from data interpretation regarding Kansei engineering and Conjoint analysis for last-mile delivery services.

This study uses several stages consisting of five main steps. The first step is the preliminary stage. Some observations related to the topic studied were made before conducting research in this study. This helps in formulating the earliest stage in the research. Next, researchers obtain the solutions to the topic research problems using methods used to complete case studies. In this case, the researcher uses a literature review from journals, publications, and books relevant to the quality of logistics services in general and methods of measuring service quality for research validation. Finally, this research was formed based on the formulation of the problems faced in accordance with the background.

This research is formulated in the data collection process as part of the preliminary stage. Kansei word identification is formed by distributing questionnaires to e-commerce users who already have experience using the logistics service. The process of spreading the sample uses the complete profile method with purposive sampling. The respondent criteria are specific to individuals who have made purchases on e-commerce via logistic providers. The respondents of this study are from the province of Eastern Java, Indonesia. Through the calculation of Walpole et al. [32], with the standard of error of 5% (SE = 5%), the ideal respondents in this study used 100 respondents. The standard error is the standard deviation of accuracy in measuring the mean or average value. The accuracy desired by a researcher can identify the size used by sample statistics to estimate population parameters. The standard error of the mean of the sample means distribution will equal the population

mean if we can select all possible sample sizes from the population. Storage error is divided into two parts: sampling and non-sampling errors [33].

This method determines the customer's feelings and impressions of the logistics services. First, service users fill out the questionnaire that has been given. In response, Kansei words will be perceived from words that respondents frequently write. In consideration, these words are deemed to be able to represent the feelings of respondents. Kansei words can be found from various sources, such as experienced users, previous research, television, magazines, and the results of the first questionnaire. These results are then processed in the second questionnaire, which determines the level of carefully processed attributes.

Eversheim [34] stated that conjoint analysis (CA) assesses customer acceptance of the product and its functions. In the analysis, it is assumed that the total benefit of a product is the sum of the benefits of each product component individually [34]. CA is a workable method for measuring preferences or attitudes toward a product, service, or other multiattribute concepts [35]. Conjoint analysis has the least assumptions about model estimation. Unlike other multivariate analyses, conjoint processes do not require assumption tests such as normality, heteroskedasticity, and others [36].

The real strength of CA is in its ability to predict preferences for product profiles that respondents are not assessed. This is called a simulation case [37]. One of the two main objectives of CA is to identify the positive and negative aspects of existing product characteristics from the user's point of view. The other objective is to eliminate the negative aspects, thereby increasing product satisfaction. This process is related to the design of CA in Malhotra [38], as follows:

$$U(X) = \alpha_0 + \sum_{i=1}^m \alpha_{ij} X_{ij} + \varepsilon$$

As the data are collected, the researcher formulates the data processing. This study uses the choice-based conjoint method for attributes no higher than six [39]. Regression analysis is used to complete the model from conjoint analysis, also known as the regression analysis method with dummy variables. As a further focus of the research, the regression categories with dummy variables are as follows; (1) two categories are coded 1 for level one and 0 for the other level, (2) three categories can be seen in Table 1 and (3) for more than three levels, coding is carried out in the same way so that each factor has k - 1 dummy variables.

Table 1. Coding of dummy variables.

Category	Code	Code
Category 1	1	0
Category 2	0	1
Category 3	0	0

Next, the part-worth coefficient is calculated according to the first and second attribute part-worth equations. Conjoint analysis, in principle, aims to estimate the respondent's opinion pattern, which is called the part-worth estimation, then compare it with the respondent's actual opinion. Furthermore, the validity test uses the SPSS25 software in this study. In reliability testing, an instrument is valid if the R squared value is 0.70 or above [40]. R count, in general, can be used to compare with r tables so that from the comparison of r counts and r table, it can be seen whether a question or instrument is valid or not [41]. The value of the r count is beneficial for research in statistics, especially those related to testing the validity of an inquiry or instrument. Level validity of a question/instrument is needed to be used as a reference and a basis for whether or not a question/instrument is appropriate to use. R table is a table of numbers generally used to test the validity of data

obtained from instrument research [42]. This can be concluded that the function of the R table is to the validity of a research instrument.

The last two steps are the stage of problem analysis or discussion and conclusion drawing. The researcher interprets the results and conclusions of the research accompanied by data on the research. Data analysis is formed from the most to the least preferred attributes. At this stage, regression analysis of dummy variables is used with the formula according to Supranto [43] as follows:

$$Y_h = \beta_0 + \beta_1 D_{1h} + \beta_2 D_{2h} + \ldots + \beta_{k-m} D_{k-m,i} + \varepsilon_h$$

The conclusion drawing stage discusses managerial implications that can help management advice regarding actions that logistics service providers must take to compete and increase the satisfaction of logistics service users.

3. Results and Discussions

3.1. Recapitulation of Kansei Word Results

The accumulation data of Kansei words, obtained with a propagating questionnaire in 30 respondents, use logistic services such as X, Y, and Z for at least one user. After the answers are collected, there are with the software named Nvivo. Then, some Kansei words are obtained, as shown in Table 2.

Table 2. Recapitulation of attributes based.

Word	Length	Count	Weighted Percentage (%)
Delivery	10	16	5.78
Courier	5	14	5.05
Information	9	13	4.69
Condition	7	12	4.33
Located	6	12	4.33
Reservation	7	11	3.97
Cost	6	10	3.61
Cheap	5	9	3.25
Package	5	9	3.25
Precise	6	8	2.89
Merit	4	7	2.53
Home	5	7	2.53
Appopiate	6	7	2.53
Good	4	5	1.81
Service	7	4	1.44
Get Serve	9	4	1.44
Neat	4	4	1.44
Cod	3	3	1.08
Accepted	8	3	1.08
Schedule	6	3	1.08
Sent	5	3	1.08
Easy	5	3	1.08
Broken	5	3	1.08

Word	Length	Count	Weighted Percentage (%)
Х	7	3	1.08
System	6	3	1.08
Respectful	5	3	1.08
Exact	5	3	1.08
Time	5	3	1.08
Y	8	2	0.72
Come	6	2	0.72
Use	9	2	0.72
Trusted	9	2	0.72
Eficiency	7	2	0.72
Warehouse	6	2	0.72
Price	5	2	0.72
Arrival	10	2	0.72
Broken	9	2	0.72
Tracking	5	2	0.72
Serve	8	2	0.72
Satisfy	9	2	0.72
Packaging	9	2	0.72
Perceptive	7	2	0.72

Table 2. Cont.

Based on Table 2, the attributes that obtained the highest-rated results are delivery, 5.78%; courier, 5.05%; information, 4.69%; and location, 4.33%. After analyzing with Nvivo, the Kansei word is found, then the attribute levels are searched using a questionnaire. Weight percentage is the percentage of weight assigned to a data point to give it the lighter or heavier percentage value in a group. It is usually used to calculate weighted averages and give groups less or more importance. Weight percentage is also used in statistical sampling [44].

3.2. Summary of Yield Attribute Level

The Kansei word collection was obtained using a propagating questionnaire to 30 respondents for the customers who have used logistics services such as X, Y dan Z. Respondents' answers were collected and analyzed using SPSS software. The level of significance used is 5% with a degree of freedom of 28 (df = n-2); an instrument is valid if $r_{count} > r_{table}$ [30]. As a result, the following results are obtained (Table 3):

Table 3. Results of attribute-level validity test.

No	Item	Item Indicators	R-Count	R-Table	Description
1	K1	How far is the closes warehouse from your house?	0.605	0.374	Valid
2	K2	How far is the farthest warehouse to your house?	0.503	0.374	Valid
3	К3	What do you think about a fast delivery service?	0.444	0.374	Valid

No	Item	Item Indicators	R-Count	R-Table	Description
4	K4	What do you think about a slow delivery service?	0.503	0.374	Valid
5	K5	What is a good courier service according to your opinion?	0.469	0.374	Valid
6	K6	What is a not good courier service according to your opinion?	0.546	0.374	Valid
7	K7	In your opinion, what is considered as bad condition from an order?	0.427	0.374	Valid
8	K8	In your opinion, what is considered a good condition from an order?	0.527	0.374	Valid

Table 3. Cont.

Based on the results of the attribute-level validity test (Table 3), all respondents' answers are declared valid because each item of the problem has a value if $r_{count} > r_{table}$.

3.3. Attributes and Research Levels

The basis of research using conjoint analysis is the design of stimuli. This design is an attribute and level used as a consideration that will affect the effectiveness and accuracy of stimuli. The attributes and levels or levels of each attribute are shown in Table 4.

Table 4. Autoutes and levels	Table 4.	Attributes	and	levels
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Attribute	Levels	Levels
	1	Х
Logistic provider	2	Y
	3	Z
Delivery	1	Fast
Denvery —	2	Slow
Courier —	1	Polite
	2	Impolite
Order information —	1	Accurate
	2	Inaccurate
Condition of goods –	1	Damaged
	2	Undamaged
Location	1	Far
Location —	2	Near

3.4. Stimuli Plan

The formation of stimuli using a complete profile allows respondents to evaluate many attributes in unison. The stimuli are the combinations of attribute levels. This plan produces many stimuli; $3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ is 96 stimuli. However, suppose the stimuli results are too much. In that case, they will impact the validity, and the respondents will be confused in filling the questionnaire so that the reduction will be that of the stimuli. With the help of SPSS25 software, 16 stimuli were produced, as shown in Table 5.

No	Logistic Provider	Delivery	Courier	Oerder Information	Item Condition	Location
1	Y	Slow	Impolite	Inaccurate	Damaged	Near
2	Х	Fast	Polite	Accurate	Undamaged	Near
3	Х	Fast	Impolite	Inaccurate	Damaged	Near
4	Х	Fast	Impolite	Inaccurate	Undamaged	Far
5	Y	Fast	Polite	Inaccurate	Undamaged	Far
6	Х	Slow	Polite	Inaccurate	Damaged	Near
7	Z	Fast	Polite	Inaccurate	Damaged	Near
8	Y	Fast	Impolite	Accurate	Undamaged	Near
9	Z	Slow	Impolite	Inaccurate	Undamaged	Far
10	Z	Fast	Polite	Accurate	Undamaged	Near
11	Х	Slow	Polite	Inaccurate	Undamaged	Far
12	Х	Slow	Impolite	Accurate	Damaged	Far
13	Z	Fast	Impolite	Accurate	Damaged	Far
14	Y	Slow	Polite	Accurate	Damaged	Far
15	Х	Slow	Impolite	Accurate	Undamaged	Near
16	Х	Fast	Polite	Accurate	Damaged	Far

Table 5. Attributes and levels.

3.5. Respondent Profile

In this study, the sample was taken using purposive sampling techniques. The questionnaires were distributed through an online survey based on Google Form media with 100 respondents around the East Java province of Indonesia. Most respondents are female, with 60% percentages and 40% male respondents. As for the highest age, it is between 17–22 years with a percentage of 44%. Most of the respondents' highest level of education is high school, with a percentage of 53%, for the most types of work are students with a percentage of 53%.

In describing the characteristics of the sample obtained, researchers used descriptive statistics. Descriptive statistics can help researchers to detect the sample characteristics that can influence conclusions [45]. All questions (variable indicators) answered are equal to 100 responses. Most question indicators are responded with a score on the Likert scale of 3 (neutral). Meanwhile, the lowest answer is obtained. Most of the question indicators are on the Likert scale 1 (not important).

3.6. Conjoint Analysis Evaluation

In this study, the obtained answers from 100 respondents will be processed using conjoint analysis methods and SPSS25 software.

3.6.1. Dummy Variable Encoding

According to Hardy [46], research using conjoint analysis methods needs to determine the reference level of each attribute before the presumption of regression parameters. The level used as the reference level is coded 0. Dummy variable encoding is set as follows:

Y: average rating of 100 respondents

```
X1, X2: (1, 0) X
(0, 1) Y
(0, 0) Z
X3: (1) fast
(0) slow
```

- X4: (1) polite
- (0) impolite
- X5: (1) Accurate
 - (0) inaccurate
- X6: (1) damaged
 - (0) undamaged
- X7: (1) far
 - (0) near

Preference assessment was based on 100 respondents in East Java, Indonesia, then an average was found from the questionnaires of each respondent on each stimulus.

3.6.2. Dummy Variable Regression Results

Respondent assessment of stimuli has been carried out, where Y is the average of 100 respondents to each stimulus. Based on regression analysis, dummy variables can be formed in regression equations as follows:

$$Y = 2.948 + 0.005X_1 - 1.098E - 16X_2 + 0.243X_3 + 0.438X_4 + 0.330X_5 - 0.595X_6 - 0.130X_7$$

Based on the result obtained R^2 of 0.861, it can be concluded that the dummy variable regression model is able to predict because existing attributes can explain 86.1% of the total diversity of respondent utilities. The regression equation results cannot be interpreted because the estimation of dummy parameters in conjoining analysis is only used to estimate the part-worth coefficient.

3.6.3. Part-Worth Coefficient of Relative Importance Value

Based on the result obtained, part-worth coefficient values on the output of SPSS 25 software can be calculated manually. Some examples of part-worth calculations for delivery service attributes and manually courier attributes are shown below.

1. Calculations for two levels on the courier attribute.

$$\alpha_{11}-\alpha_{12}=\beta_1$$

 $\alpha_{11} + \alpha_{12} = 0$

$$\alpha_{11} - \alpha_{12} = 0.438 \tag{1}$$

 $\alpha_{11} + \alpha_{12} = 0 \tag{2}$

$$-2 \alpha_{12} = 0.438$$

$$\alpha_{12} = -0.219 \tag{3}$$

Substitution Equation (3) for Equation (2)

$$\alpha_{11} + \alpha_{12} = 0$$

 $\alpha_{11} - 0.219 = 0$
 $\alpha_{11} = 0.219$

Coefficient part-worth for courier attribute as follows:

Polite courier
$$(\alpha_{11}) = 0.219$$

2.

10 of 16 Impolite courier (α_{12}) = -0.219 Calculations for three levels of the delivery service attribute $\alpha_{31} - \alpha_{33} = \beta_3$ $\alpha_{32} - \alpha_{33} = \beta_4$ $\alpha_{31} + \alpha_{32} + \alpha_{33} = 0$ $\alpha_{31} - \alpha_{33} = 0.005$ (4)(5) $\alpha_{31} + \alpha_{32} + \alpha_{33} = 0$ (6) Making new equation from Equation (4) $\alpha_{31} = 0.005 + \alpha_{33}$ (7)Substitution Equation (7) to Equation (6) $\alpha_{31} + \alpha_{32} + \alpha_{33} = 0$ $0.005 + 2\alpha_{33} + \alpha_{31} = 0$ $2\alpha_{33} + \alpha_{31} = -0.005$ (8)Elimination of Equation (5) and Equation (8) $\alpha_{32} - \alpha_{33} = -0.000000000001098$ $\alpha_{32} + 2\alpha_{33} = -0.005$ $-3 \alpha_{33} = 0.004999999999999902$ $\alpha_{33} = -0.001666666666663007$ (9) $\alpha_{33} = -0.002$ Substitution Equation (9) to Equation (4) $\alpha_{31} - (-0.00166666666663007) = 0.005$ $\alpha_{31} = 0.0033333333326013$ $\alpha_{31} = 0.003$ Substitution Equation (9) to Equation (5) $\alpha_{32} - (-0.001666666666663007) = -0.0000000000001098$ $\alpha_{32} = -0.001666666666673987$ $\alpha_{32} = -0.002$ Coefficient part-worth for courier attribute as follows: • \rightarrow X (α_{31}) = 0.003

$$\bullet \to \Upsilon(\alpha_{32}) = -0.002$$

$$\bullet \to \mathcal{Z}\left(\alpha_{33}\right) = -0.002$$

The results of part-worth coefficient values and relative importance values are shown below.

In Table 6, the part-worth coefficient on each attribute can be seen. The most preferred attribute is that the item's condition is not damaged. A relative interest value is a value that indicates the level of the relative importance of an attribute compared to other attributes. The conjoint result is the total satisfaction of respondents from various attributes contained in the concept. Here, the relative importance value can be seen in Table 7.

Table 6. Part-worth coefficient result.

Attribute	Levels	Coefficient Part-Worth
	Х	0.003
Logistic provider	Y	-0.002
-	Z	-0.002
delivery	Fast	0.121
denvery –	Slow	-0.121
Courier	Polite	0.219
counci	Impolite	-0.219
Order information	Accurate	0.165
	Inacurrate	-0.165
Condition of goods	damaged	-0.298
Condition of goods -	undamaged	0.298
Location	Far	-0.065
	Near	0.065

Table 7. Relative importance value.

Attribute	Relative Importance Value (%)
Logistics provider	0.29
Delivery	13.90
Courier	25.16
Order information	18.95
Condition of goods	34.23
Location	7.47

The relative importance value of each attribute can also be defined as the difference between both maximum and the minimum usability value divided by the number of all relative importance of the attribute.

Based on Tables 6 and 7, it can be concluded that the logistics attributes of providers, delivery, couriers, order information, goods conditions, and locations are considered by respondents to determine their preference for logistic services. For instance, respondents prefer X delivery services due to undamaged goods conditions, polite couriers, accurate order information, fast delivery, and close locations.

3.7. Validity Result and Discussion of Conjoint Analysis

Validity testing for conjoining analysis can be seen from Pearson's correlation value to measure the validity of the utility or part-worth that has been obtained. The results of

conjoining analysis are expected not to differ much from the actual opinions of respondents by looking at the high value of correlation between the results of the estimate (estimation of dummy regression parameters) with actual results or preferences from respondents. To find out if the results are valid, the hypotheses used in this study are:

 H_0 : There is no strong correlation between the estimation variable and the actual.

 H_1 : There is a strong correlation between the estimation variable and the actual.

Based on the output of SPSS 25 software, the Pearson correlation results are 0.928 or 92.8%, which means there is a high correlation between the estimation variable and the actual variable. Then, the signification value based on the test is very small, at 0.000, so H_0 can ve rejected, which means there is a strong correlation between the estimation variable and the actual.

Therefore, it is clear that the customer paid more attention to the first factor; the condition of goods in logistics delivery. This is in accordance with some previous studies stating that variables in the quality of delivery services (condition of goods and timeliness) and courier service significantly affect customer satisfaction. [1]. Restuputri et al. [47] stated that the quality of delivery services and courier services is very significant. If the logistics service provider improves the quality of courier service, customer satisfaction will also increase. It can be concluded that, significantly, the logistics attributes of the provider, delivery, courier, order information, condition of goods, and location are considered by respondents to determine their preference for logistic services. Respondents prefer X delivery service with undamaged goods conditions, polite couriers, accurate order information, fast delivery, and close locations.

The most important aspect of a logistics service provider relationship with a customer is that the service provider does not have a deep insight into customer preferences. There is often a difference between what the customer wants and what the service provider offers [5]. This research attempts to develop instruments to measure customer perceived quality of service in the life of the logistics sector. The instruments obtained are six dimensions: delivery services, delivery speed, courier attitude, order information, condition of goods, and warehouse location. From a management perspective, this study provides information on aspects of service quality that are important for service providers in the logistics industry. Service providers can use this information to strengthen their relationships with current and future policyholders by implementing different strategies to improve the quality of service in the sector. The statement also agrees with research by Siddiqui and Sharma [48]. Therefore, service providers are encouraged to focus more on the critical aspects to achieving quality service and set acceptable limits on the less important aspects.

It can also be seen from the results of this study that customers attach great importance to the condition of the goods that arrive, regardless of which logistics provider sends them. This is in line with the research results conducted by Restuputri, Masudin, and Sari [49], which found that one of the most important factors of logistics services is the suitability of goods ordered by customers. This factor includes the condition of the goods, packaging, timely delivery, and accurate order information. Moreover, Masudin et al. [27] also found that the last-mile delivery brand (carrier) is no more important than whether the item is shipped in a good condition. Another case study in humanitarian logistics also occurs this phenomenon, where delivering goods in a good condition is far more important than the last-mile delivery brand. Both well-known and unknown last-mile delivery have not received customer attention [50].

Affective perception assessment occurs in the human brain before cognitive assessment, and individuals evaluate an object even without cognitive stimulation, this phenomenon indicates that customer perceptions of service elements can be an important consideration when designing and delivering services [10]. In addition, Hartono and Chuan [51] showed that the Kansei technique is a potentially good approach to provide a competitive advantage of its ability to read and translate customer influences and emotions. One of the two main objectives of conjoint analysis is to determine the positive and negative aspects of the existing service characteristics from a customer perspective and to eliminate the negative aspects, thereby increasing the level of satisfaction with the service. Conjoint analysis is also appropriate to formulate the strategy of service companies, especially logistics companies, to measure the form of service expected by consumers by service providers [7].

3.8. Managerial Implications

This section discusses the managerial implications that are expected to make a theoretical contribution to a company's management practices [52]. Finally, the study proposes Kansei engineering and conjoint analysis to determine customer preferences for defined logistics services. This stage aims to contribute to knowing customer preferences for logistics services positively. Some suggestions given by researchers are shown below.

- 1. The condition of the goods is the first attribute that respondents liked the most, so the researcher suggested that management can convey SOPs to couriers to recognize what products are delivered and the condition of the products delivered, because the goods should be in a good condition before being delivered. At the same time, when the delivery process incurs unwanted issues, the delivery service should carry out the replacement procedure. According to Sum and Teo [53], a professional workforce is very important in logistics services to meet customer needs and satisfaction.
- 2. The technology for tracking should be improved so that customers can know their orders' position in real-time. To aid this, RFID technology can be optimized quickly and easily [54]. In an organization, employee performance can be supported by the ease and usefulness of using information technology [55].
- 3. It is important for logistics service providers to deliver orders in a short period, especially on products that require immediate acceptance as soon as possible [10]. Logistics service providers should send goods according to their operational time for orders to be delivered on the same day and delivered the next day [6]. Warehousing management and technology systems can also be improved because, in the industrial era 4.0, it is very effective in the order processing [56].

4. Conclusions

This study discusses how logistics services are performed in Indonesia. Six attributes of the study were formulated based on the questionnaire results. A total of 100 respondents from various regions of Indonesia participated in this study to answer 16 questions given in the questionnaire. Finally, the data are collected and further analyzed with detailed discussions. Many previous studies have presented descriptions of logistics services. These descriptions range from order security issues and order location information to how couriers handle them.

This study's findings indicate the most considered instruments by the customer, such as delivery services, delivery speed, courier attitude, order information, condition of goods, and warehouse location. In addition, this study shows that there is a significant correlation between the estimated and actual variables. Furthermore, this study shows that logistics services attach great importance to the safety of goods, courier professionalism, and delivery speed. The research results would provide important information to stakeholders involved in the distribution networks, such as last-mile delivery providers and the government. The important variables that appear in this study should be given more attention because they can improve company performance. In addition, the development of digital technology and the occurrence of the COVID-19 pandemic brought new challenges to the last-mile delivery business process. Thus, the results of this research theoretically would provide new insight into Kansei engineering and conjoint analysis from the perspective of last-mile delivery, especially in developing countries. Therefore, for further studies, information technology such as RFID, EDI, and blockchain, which would help shorten the delivery process, could be investigated in the COVID-19 pandemic context.

This research has limitations which are the scope of the study. This research only refers to user preferences for logistics services that have used logistics services x, y, and

z. Nevertheless, it is expected that the proposed suggestions can help improve logistics performance in Indonesia, as summarized in managerial training. Future studies can use respondents and different perspectives or variables to improve their performance in logistics services. It is also possible to choose different methods to analyze the logistics services.

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