



Prioritizing the Improvement of Expedition Service Quality in Indonesia Using an Integrated Logistics Service Quality (LSQ) and Three-Dimensional Model

Hery Suliantoro^{1*}, Ferra Kurnia Dewi²

^{1,2}Department of Industrial Engineering, Faculty of Engineering, Diponegoro University, Semarang, Indonesia

ABSTRACT: This study investigates expedition service quality in Indonesia in response to rapid e-commerce growth and increasing logistics demand. Despite industry expansion, persistent service issues such as delivery delays, lost goods, and poor customer service remain prevalent. This research aims to identify priority attributes for service quality improvement by integrating Logistics Service Quality (LSQ) with a three-dimensional model consisting of the Kano model, Importance–Performance Analysis (IPA), and Goal Difficulty (GD). Data were collected from 372 customers and 11 logistics company representatives. The results indicate that customer service ethics, pick-up service, and compensation for damaged goods are the most critical attributes requiring improvement. This study contributes by proposing a practical prioritization framework that incorporates both customer perception and managerial feasibility. The findings provide actionable insights for logistics companies to enhance service performance and customer satisfaction.

KEYWORDS: Logistics Service Quality; Kano Model; Importance–Performance Analysis; Goal Difficulty; Expedition Services

1. INTRODUCTION

After the COVID-19 pandemic, Indonesia's economy has been growing with a growth of 5.31%, up from 3.7% in 2021 (Statistics Indonesia, 2023). According to CNCB Indonesia, the logistics sector has been the best industry for the past 2 years, driven by increased domestic consumption and the growth of online businesses (Putra, 2023). Bank Indonesia (BI) reported an 18.8% increase in e-commerce transaction value, reaching IDR 476.3 trillion in 2022, with transaction volume reaching 3.49 billion times (Rizaty, 2023). Indonesia's increasing lifestyle has fuelled the rapid growth of e-commerce, with the number of users projected to reach 196.47 million by the end of 2023 (Mustajab, 2023). This growth opens opportunities for logistics and expedition companies to contribute to the delivery process (Nuraeni, 2016). Expedition services are indispensable in providing public transportation services and additional services.

Expedition service companies are expected to provide services that are on time, intact, and fulfil promises to all parties, with the aim of creating fast, accessible, and measurable services. There are still many complaints from customers regarding the quality of expedition company services. According to data in 2022, complaints related to expedition services in 2021 included various problems. Lost goods are the main complaint with a percentage of 41%, followed by the inability of the courier to pick up the goods (18%), the goods are not delivered (18%), the shipping price does not match (12%), and the goods are damaged, and the delivery estimate does not match (6%) (Rizaty, 2022).

In 2023, similar problems continue to emerge as the main complaints related to expedition services as shown in Figure 1.1, with lost goods reaching 32%. Other issues include delivery estimate discrepancies (20%), packages not reaching their destination (16%), poor service and refunds (12%), and claims for lost goods and damaged packages (4%) (Indonesian Consumers Foundation, 2023). In addition, research involving a survey on social media Twitter, resulted in a record of 150 accounts reporting complaints related to poor expedition services throughout 2023. The problems that arose were delivery not according to the estimate given by the company (78%), bad courier behaviour, inaccurate tracking, goods not reaching their destination (18.7%), damaged goods, no compensation, inappropriate prices, and poor customer service (26%).

The research conducted by K. C. Hu et al (2022) used a modified Logistics Service Quality (LSQ) scale to evaluate consumer views and logistics service quality. The goal is to provide businesses with a more accurate understanding of the prioritization of service quality aspects according to customer views. The selection of the LSQ scale as a research dimension allows managers to identify the relationship between service quality attributes and customer satisfaction. Customers' feelings of dissatisfaction with service quality encourage companies to understand the attributes that affect customer satisfaction and dissatisfaction. The use of the Kano model provides an overall view that service quality does not always have a linear relationship with customer satisfaction. Although not all attributes are

considered equally important by customers, indicating that service quality is multi-dimensional rather than one-dimensional (Matzler et al., 1996; Sohn et al., 2017). The Kano model categorizes service quality attributes based on customer satisfaction and dissatisfaction, with five category classifications: One-Dimensional (O), Attractive (A), Must-be (M), Indifferent (I), and Reverse (R) (Kano et al., 1984). Although the Kano model has been widely used to identify categories of service quality attributes, it has no function to prioritize these attributes (K. C. Hu et al., 2022; Löfgren & Witell, 2008).

To resolve the shortcomings of the Kano model in prioritizing service quality attributes, this study applies Importance-Performance Analysis (IPA) developed by (Martilla & James, 1977). By analysing how important attributes are and how well customers perceive their performance, IPA can determine the priority level of attributes that require improvement. This method helps formulate strategies by exploring competitive conditions, confirming improvement opportunities, and showing strategies in a four-quadrant matrix (Hu and Lee, 2012). The four-quadrant matrix provides an overview of areas where improvement efforts can deliver excessive, satisfactory, deficient, or relatively unimportant results (K. C. Hu et al., 2022; Blešić et al., 2014; Hu dan Lee, 2012; Hu dan Lee, 2017).

Even though the Kano and IPA models provide a customer perspective on service quality, limited resources and capabilities make it difficult for managers to improve all service attributes at once. This research introduces Goal Difficulty (GD) as a third dimension to help companies achieve service improvement goals. GD assesses the degree of difficulty in achieving goals, allowing managers to decide which attributes are feasible and complex to improve. The Three-Dimensional Model Kano-IPA-GD, developed by K. C. Hu et al (2022), was used to analyse the company's strategy for prioritizing the service quality attributes of freight forwarding services, considering the available resources and capabilities.

2. LITERATURE REVIEW

2.1 Expedition Services

Expedition services are the activities of delivering products to customers efficiently and accurately by land, sea, or air. Essential in the supply chain, the main function of freight forwarding services involves managing logistics to ensure goods reach their destination quickly, safely, and efficiently. Users of expedition services include shipping merchandise, personal packages, or business cargo, including document handling and customs services for international shipments. In the e-commerce era, expedition services play a key role in supporting the delivery of goods from sellers to buyers online (Islami & Oktaviani, 2022). To improve delivery effectiveness, companies can choose the best expedition services from outside. The global phenomenon of

offshoring and global supply chains has encouraged the industry to rely on logistics outsourcing to improve overall logistics performance (Kim et al., 2020).

2.2 Stages of Goods Delivery

In the process of shipping goods, each expedition service involves several stages that can vary but generally involve the following steps (Muljana, 2023):

1. Package Delivery to Drop point/Pick-up
Customers hand over the goods to be shipped to the nearest Branch Office or Agent of the expedition service or utilize the pickup facility.
2. Package Received by Drop-point Party
The delivered goods will be input into the expedition service system at the Drop point and will get a receipt number for package tracking.
3. Delivery to Transit Center
Packages are sent to the Transit Centre. This stage involves sorting the goods based on the delivery system and the destination area.
4. Delivery to Destination City
Shipped to destination city and temporarily placed at destination city sorting warehouse.
5. Delivery from Shorting Warehouse to Drop-point
Sorting is done based on the destination area and sent to the branch office or agent closest to the destination address.
6. Delivery by Courier
Courier will deliver to the destination address according to each region.
7. Package Sent
The courier delivers the package according to its order or delivery list. After that, confirm the delivery of the package, and the delivery stage is considered complete.

2.3 Logistics Service Quality (LSQ)

Logistics Service Quality (LSQ) is a concept that aims to improve efficiency and ensure customer satisfaction in logistics services. LSQ includes two main approaches, namely the physical aspect and the user aspect. In the context of the physical aspect, LSQ is often categorized as Physical Distribution Service Quality (PDSQ), and it involves a few attributes that affect logistics service quality. The main attributes in LSQ according to Mentzer et al. (1999) include Personal Contact Quality (PQ), Order Release Quantities (ORQ), Information Quality (IQ), Ordering Procedures (OP), Order Accuracy (OA), Order Condition (OC), Order Quality (OQ), Order Discrepancy Handling (ODH), Timeliness (T). These factors are considered important aspects that are of primary concern to customers for logistics service quality (K. C. Hu et al., 2022). LSQ is seen as a development of the SERVQUAL (Service Quality) concept and is expected to present a more effective method of measuring customer satisfaction with logistics services (Pramudita et al., 2022).

2.4 Three-Dimensional Model

The Three-Dimensional Model proposed by Hu and Lee (2011) in this study presents a different managerial perspective compared to the previous two-dimensional framework. This research incorporates management's point of view in determining improvement priorities. Needing to consider the limited resources and capabilities of the company, the Three-Dimensional Model recognizes that the company may not have enough assets to improve all service quality attributes simultaneously (Hu dan Lee, 2017).

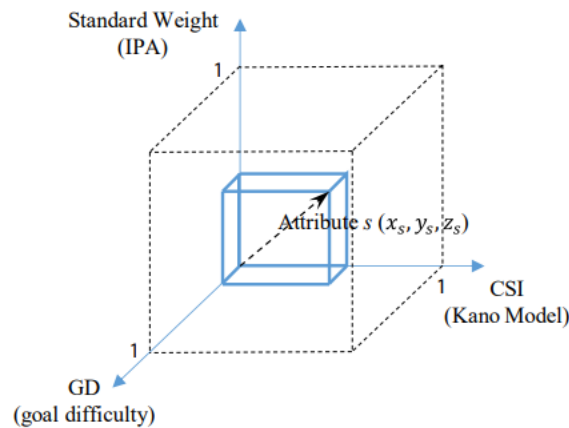


Figure 1. Three-Dimensional Model (Hu dan Lee 2017)

This graph depicts the composite satisfaction index (CSI) of the Kano model on the x-axis, which reflects the overall change in the level of customer satisfaction and dissatisfaction. The y-axis shows the standardized weights from the Importance-Performance Analysis (IPA) method, which examines the combined importance and satisfaction scores. The z-axis represents Goal Difficulty (GD), describing how easily the goal of a service quality attribute can be achieved. This approach is used to maintain consistency with the other coordinate axes (K. C. Hu et al., 2022).

By integrating the concept of Goal Difficulty (GD) into this model, companies can develop strategic improvement plans that are realistic and implementable considering the complexity and external constraints they may face (Hu and Lee, 2011). The Three-Dimensional Model provides a holistic approach that integrates managerial priorities, resource limitations, and external constraints to effectively improve service quality. The following is a modified Three-Dimensional Model (K. C. Hu et al., 2022).

2.4.1 Kano Model

The Kano model is a framework that analyses and classifies customer preferences for product or service attributes. The Kano framework on satisfaction helps identify a typology of product attributes, distinguishing attributes that contribute to satisfaction, dissatisfaction, or both (Rivière et al., 2006). This model identifies 6 quality elements namely Attractive (A), One-Dimensional (O), Must-be (M), Indifferent (I), Reverse (R), Questionable (Q) (Meng et al., 2011). The following is an image of the Kano model.

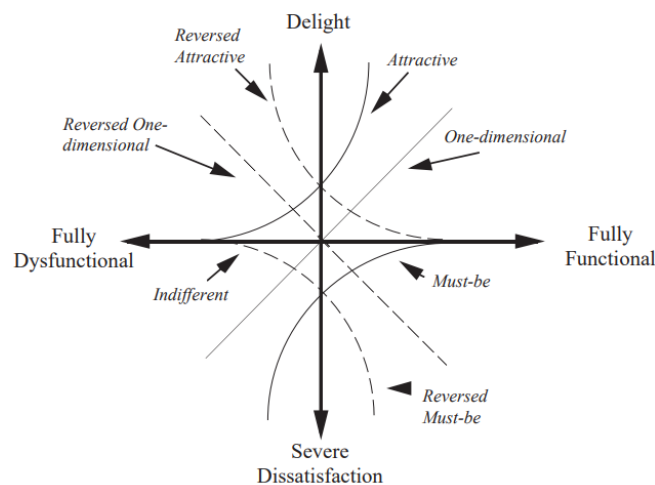


Figure 2. Kano Model Category (Berger et al., 1993)

The x-axis indicates the extent to which customer needs are met, reflecting product performance or functionality. The y-axis represents the customer's response to the product,

indicating the level of satisfaction, dissatisfaction, or neutrality (Rotar & Kozar, 2017). The dimensions of quality

attributes in the Kano model are as follows (Meng et al., 2011).

1. *Attractive (A)* – Attractive curve shows the area where customers feel more satisfied when the product is functional but not dissatisfied when the product is less functional.
2. *One-Dimensional (O)* – customer satisfaction is proportional to how functional/fulfilling the product is.
3. *Must-be (M)* – The Must-be curve shows that customers will be increasingly dissatisfied when the product is less functional, but customer satisfaction will never exceed neutral no matter what.
4. *Indifferent (I)* – customers are not concerned with whether the product works or not.
5. *Reverse (R)* – there is an opposite assessment such as customers are dissatisfied if it works, and satisfied when it doesn't work.
6. *Questionable (Q)* – there are contradictions in customer answers.

In the Kano questionnaire model, there are two main segments, namely questions about how customers feel about the presence of a feature in the product (functional questions), and conversely, how customers feel if the feature is absent

from the product (dysfunctional questions). Customers have the option to respond in one of five different ways to each part of the question. Respondents choose from five answer options "live-with", "must-be", "dislike", "neutral", or "like".

2.4.2 Importance-Performance Analysis (IPA)

Importance-Performance Analysis (IPA), first introduced by Martilla and James in 1977, is a management method used to plan company strategy by analysing customer views of products and services. IPA evaluates the importance and performance of service attributes, with importance reflecting customer expectations and performance reflecting the reality perceived by customers. By understanding the importance of attributes, companies can identify how important they are to customers and relate them to perceived performance.

The use of Importance-Performance Analysis (IPA) involves a four-quadrant matrix, where this analysis allows feedback from customers to determine the priority of service quality attributes (K. C. Hu et al., 2022). This method classifies service factors into four quadrants based on the level of performance satisfaction and attribute importance, represented by the x-axis and y-axis. Figure 2.3 shows the four-quadrant matrix of the IPA method as follows.

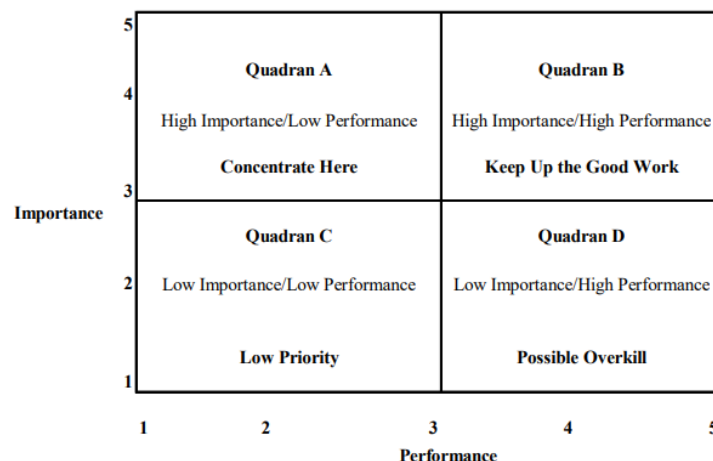


Figure 3. IPA Matrix (Martilla & James, 1977)

Here are four quadrants in the IPA matrix (Henmaidi et al., 2020; Tuan et al., 2022).

1. Quadrant I (Keep Up the Good Work): Attributes with high performance and high importance. Need to be maintained and improved.
2. Quadrant II (Concentrate Here): Attributes with low performance, high importance. Focus on repair and improvement.
3. Quadrant III (Low Priority): Attributes with low performance and low importance. May require minimal attention or can be ignored.
4. Quadrant IV (Possible Overkill): Attributes with high performance, low importance. Consider not giving too many resources.

2.4.3 Goal Difficulty

Goal Difficulty is defined as increasing difficulty through resource and ability constraints, in improving service quality attributes to achieve specific goals (Hu & Lee, 2017). The information researched through the Kano model or IPA method only reflects the customer's point of view. Managers who want to improve service quality are limited by the company's resources and capabilities (K. C. Hu et al., 2022). A low GD value indicates the goal can be easily achieved by the company without spending much effort and vice versa (Hu & Lee, 2017; Kenis, 1979). By using GD, the company can decide whether the goal is worth achieving when making strategic decisions (K. C. Hu et al., 2022)

3. METHODOLOGY

3.1 Research Stages

The first stage of the research involved topic identification, starting with problem recognition through field studies and relevant literature research. The focus was expanded to explore customer complaints in expedition services, with the aim of identifying barriers or difficulties through observation. The next step is to set research objectives to find alternative solutions to the problems identified through the external identification and observation process.

Next, determine the research population and sample which is continued to determine the research variables. The research variables are adopted from the Logistics Service Quality (LSQ) measurement scale which has been modified from the results of the literature study. This study evaluates the quality of expedition services using the Reliability Delivery (RD) dimension which consists of 2 attributes, Delivery Condition (DC) consists of 1 attribute, Accident Management (AM) consists of 4 attributes, Visibility (V) consists of 1 attribute, Response to Customers (RC) consists of 3 attributes, Ordering Procedures (OP) consists of 2

attributes, Physical Distribution (PD) consists of 2 attributes, Cost (C) consists of 1 attribute.

The next stage is data collection using google form questionnaires for customers and offline questionnaires for expedition service company managers. From the results of the questionnaire, validity and reliability testing is then carried out to see the accuracy and feasibility of research attributes to be used. The results of the customer questionnaire will be processed using the Kano model and the IPA method, while the results of the GD questionnaire will be processed using the GD calculation. After that the data is integrated using the Three-Dimensional Model (Kano, IPA, GD) with the calculation of the alliance index value. After that, a priority order of improvements that the company can consider is generated.

3.2 Data Collection

This study uses a modification of the Logistics Service Quality (LSQ) dimensions sourced from previous research. The attributes used in this study as shown in Table 1.

Table 1. Research Variables

Dimensions	Attributes	Attribute Code	Sources
Reliability Delivery (RD) , discusses the reliability of delivery services with service parameters set by the company	Delivery of products according to the estimated shipping method chosen by the customer	RD2	(K. C. Hu et al., 2022)
	Secure packing to minimize product damage	RD3	(K. C. Hu et al., 2022)
Delivery Condition (DC) , discusses the delivery conditions that occur when an order is shipped	Safe delivery of products without damage (free of damage, error, loss)	DC1	(K. C. Hu et al., 2022)
Accident Management (AM) , refers to how well the company can handle order discrepancies that occur to customers	The company provides fast and effective responses to customer complaints	AM1	(K. C. Hu et al., 2022)
	Provide real-time product state information (in case of damage, error, or loss)	AM2	(K. C. Hu et al., 2022)
	Prompt compensation for product damage during shipment	AM3	(K. C. Hu et al., 2022)
	Prompt compensation for late delivery	AM4	(K. C. Hu et al., 2022)
Visibility (V) , discusses the ability to monitor and view goods during the delivery process carried out by the company	Accurate shipment tracking information according to the receipt number	V1	(K. C. Hu et al., 2022)
Response to Customers (RC) , refers to the response of the company's customer care department to customers	Protection of customers' personal information	RC1	(K. C. Hu et al., 2022)
	Customer service/staff are kind and polite to customers	RC2	(Otsetova & Enimanev, 2014)

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	Customer service/staff have good competence to answer customer questions and reassure customers	RC3	(Otsetova, 2016)
Ordering Procedures (OP) , refers to the efficiency and effectiveness of service procedures made by the company	Delivery procedures are clearly stated and easy for customers to use	OP1	(Otsetova, 2016)
	The company offers other alternative options for sending and or receiving orders	OP2	(Otsetova, 2016)
Physical Distribution (PD) , discusses the physical aspects of services provided by the company to customers	Extensive reach to agents/counters spread across various regions	PD1	(Thai, 2013)
	24-hour operating hours for agents/counters	PD2	(K. C. Hu et al., 2022)
Cost (C) , relating to the provision of fees whether they are acceptable to customers based on the company's services	Terms of shipping cost can be accepted by customers	C1	(Kahnali & Esmaeili, 2015)

The first questionnaire in this study was addressed to customers of expedition services in Indonesia and used a closed-ended questionnaire type. The initial section includes the demographic characteristics of the respondents. The next section evaluates customer perceptions of service quality attributes using the Kano method, which includes questions on functional and dysfunctional satisfaction. The last section invites respondents to rate the level of satisfaction and importance of service quality attributes using the IPA method.

The second questionnaire was addressed to company managers or administrators, focusing on addressing service quality issues by applying the Goal Difficulty (GD) method. The first section covers the demographic characteristics of the respondents, while the next section evaluates the perceived difficulty of the company in improving aspects of service quality.

After that, the validity test is carried out using the Pearson Bivariate correlation and Corrected Item-Total Correlation If $r_{count} > r_{table}$ (0.05). Then the attribute is valid. The following is the validity testing formula :

$$r_{xy} = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{n(\sum x_i^2) - (\sum x_i)^2} \sqrt{n(\sum y_i^2) - (\sum y_i)^2}} \quad (1)$$

Description:

r_{xy} = coefficient of correlation

n = number of respondents

x_i = score of each item on the instrument

y_i = score of each item on the criteria

After the data is valid, the reliability test is continued using the Cronbach's Alpha (α) method to evaluate the reliability of the data according to the satisfaction variables. If the value > 0.7 means that the attribute has strong reliability (Hair dkk., 2017).

3.3 Three-Dimensional Model

The method used in this research is the Three-Dimensional Model which combines Kano, IPA, and GD. At

first, this section describes the Three-Dimensional Model applied in the research. Next, the process of developing the expedition service quality measurement and the steps of collecting data from customers and managers of the expedition service company are described.

1. Composite Satisfaction Index (CSI)

The data processing stage using the Kano model begins by determining each attribute into the Kano category, namely Attractive (A), One-Dimensional (O), Must-be (M), Indifferent (I), and Reverse (R) (Meng et al., 2011). Furthermore, each attribute is calculated Satisfaction Increment Index (SII) and Dissatisfaction Decrement Index (DDI) with the following formula (K. C. Hu et al., 2022).

$$SII = \frac{(A+O)}{(A+O+M+I)} \quad (2)$$

$$DDI = \frac{(O+M)}{(A+O+M+I) \times (-1)} \quad (3)$$

Description:

A = Attractive

O = One-Dimensional

M = Must-be

I = Indifferent

The Kano model requires a Composite Satisfaction Index (CSI) value to obtain a composite score that reflects the overall change in customer satisfaction levels. A higher CSI value has a greater effect on increasing satisfaction and reducing dissatisfaction after quality improvement. The formula for CSI is as follows (K. C. Hu et al., 2022).

$$CSI = \frac{\sqrt{SII^2 + DDI^2}}{\sqrt{2}} \quad (4)$$

2. Standard Weight

Processing IPA method data begins with calculating the average importance and performance then making the average value a two-dimensional graph to form a matrix.

After getting the importance value (Importance) and performance satisfaction (performance), the IPA method uses Standard Weight to test the combined importance and satisfaction values. If an attribute has a relatively high Standard Weight value, it means that its performance is poor, but the attribute is important according to consumers, so it needs to be prioritized for improvement. The following formula calculates the standard weight (K. C. Hu et al., 2022).

$$\text{Standard Weight}_i = \frac{\text{priority weight}_i}{\max(\text{priority weight}_i)} \quad (5)$$

Description:

$i = 1 \dots I$, I is the number of attributes

3. Goal Difficulty

GD refers to the degree of difficulty a company faces to achieve goals. GD compares customer perceptions with managers' evaluations of the complexity of service improvements. The GD index is calculated using the following equation (K. C. Hu et al., 2022).

$$GD_i = \frac{z_i}{\max(z_i)} \quad (6)$$

Z_i represents the original degree GD of attribute i , $0 \leq GD_i \leq 1$ and $i = 1 \dots I$, with I as the number of attributes

4. Alliance Index

The alliance index integrates the three previously processed methods. The following is the alliance index formula of attribute s (K. C. Hu et al., 2022).

$$\text{Alliance Index } s = \frac{x_s \times y_s \times z_s}{x_{\max} \times y_{\max} \times z_{\max}} = \frac{x_s \times y_s \times z_s}{1 \times 1 \times 1} = x_s \times y_s \times z_s \quad (7)$$

Because $x_s = \text{CSI}_s$, $y_s = \text{standard weight}$, and $z_s = \text{GD}_s$, the equation for the alliance index can be written as follows (K. C. Hu et al., 2022).

$$\text{Alliance Index } s = \text{CSI}_s \times \text{Standard Weight} \times \text{GD}_s \quad (8)$$

Companies can evaluate improvement strategies according to different situations because the alliance index is calculated using CSI from the Kano model, Standard Weight from IPA, and GD value (K. C. Hu et al., 2022)

4. RESULTS

Data collection begins by distributing questionnaires using the Kano and IPA methods to expedition service customers with 16 questions in each method. Using snowball sampling techniques (customer respondents) and purposive

sampling (company manager respondents) questionnaires were distributed and filled out online by getting 372 customer respondents and 11 respondents from expedition service companies. The sample criteria in this study are expedition service customers in Indonesia who have received or delivered goods and have felt a discrepancy in service with what the service provider promised (at least having contacted customer service or admin in the last 1 year). In addition, expedition service company managers who are considered experts and competent in dealing with service quality issues are also included in the required sample criteria.

The results of the demographic characteristics of respondents are that most respondents are female (66.7%), aged 20-30 years (67.5%), have a bachelor's degree (44.6%), students (31.7%), live in Central Java (40.6%), use the service 1-3 times a month (46.5%), and are located 1-5 km from the expedition service agent (56.2%). The most frequently used service is regular with an estimated 2-3 days to arrive (81.7%). J&T Express and JNE Express were the companies most often considered to provide poor service by customers (40.9% and 39.2% respectively). A total of 79.3% of customers use expedition services for online shopping. The results of validity and reliability testing show that all research attributes have a value of $r_{\text{count}} > r_{\text{table}}$ so that all attributes are valid. All research attributes also have a Cronbach Alpha value > 0.7 so that the data is declared reliable.

This research involves data processing consisting of several stages of calculation, using three main methods: Kano, IPA, and GD. The Kano model was used to classify the attributes, while the IPA and GD methods were used to explore customers' perceptions of service performance and managers' views on the difficulty of implementing service attribute improvements. The results of each method were then integrated using the Index Alliance, which helped create the Three-Dimensional Model graph and determine the priority order of service quality attributes. The processing results of the three methods can be seen in Table 2.

4.1 Kano Model Results

The Kano model categorizes indicators by attributes to describe the asymmetrical relationship between performance and satisfaction. Indicators are put into one of six categories: Must-be attribute (M), One-Dimensional (O), Attractive (A), Indifferent (I), Reverse (R), and Questionable (Q) (Kano et al., 1984). Each attribute category in the Kano model has a different influence on satisfaction (Nam et al., 2023). The results of the Kano model processing can also be depicted on the two-dimensional graph shown in Figure 4.

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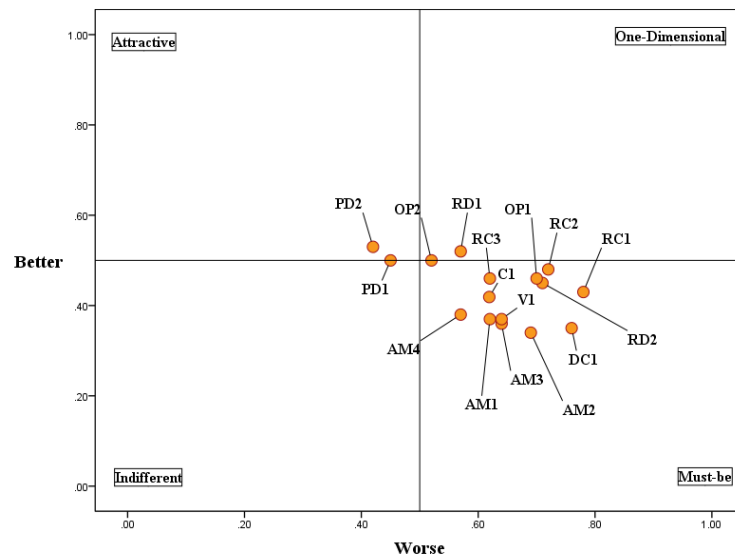


Figure 4. Better Worst Model Kano Graphics

Attributes RD1, RD2, DC1, AM1, AM2, AM3, AM4, V1, RC1, RC2, RC3, OP1, and C1 can be classified into the Must-be (M) category. These attributes discuss the reliability of shipping services provided by expedition services (RD), shipping conditions (DC), handling in the event of an accident (AM), the ability to track goods (V), response from customer care to customers (RC), service procedures (OP), and the terms of fees set by the company (C). These attributes fall into the Must-be (M) category because customers think these attributes should be given by the company to customers. When the company gives its maximum effort to improve it, customer satisfaction will only be at a neutral level. But when

this service attribute is not fulfilled/not functioning properly, it can trigger customer dissatisfaction.

The OP2 attribute is included in the One-Dimensional (O) category because the pick-up service facility makes it easier for customers in the delivery process without having to go to a branch/agent/counter. Pick-up services are expected to be provided by expedition services as a practical alternative for customers who want to send goods without having to go to a physical outlet. The company's success in providing a good pick-up service can increase customer satisfaction, but if this service is inadequate, customer satisfaction may decrease.

Table 2. Results of Kano model, IPA, GD and quality risk

Attributes	Model Kano							IPA							Goal Difficulty				Alliance Index		
	A	M	R	O	Q	I	Categories	SII	DDI	CSI	Rank CSI	Importance	Performance	GAP	Standard Weight	Rank SW	z	GD Value	Rank GD	Value	Rank
RD1	89	106	2	101	7	67	M	0.523	-0.570	0.547	6	4.454	3.247	1.207	0.774	9	4.455	0.925	7	0.392	10
RD2	48	145	0	117	5	57	M	0.450	-0.714	0.597	3	4.500	3.183	1.317	0.845	7	3.727	0.774	15	0.390	11
DC1	33	183	5	92	5	54	M	0.345	-0.760	0.590	5	4.470	3.118	1.352	0.867	6	3.909	0.811	14	0.415	6
AM1	49	140	4	84	6	89	M	0.367	-0.619	0.509	13	4.414	3.016	1.398	0.897	4	4.000	0.830	13	0.379	13
AM2	40	164	6	85	3	74	M	0.344	-0.686	0.543	8	4.422	3.043	1.379	0.884	5	4.273	0.887	11	0.426	5
AM3	44	145	6	87	4	86	M	0.362	-0.641	0.520	11	4.419	2.860	1.559	1.000	1	4.364	0.906	9	0.471	3
AM4	53	121	6	85	6	101	M	0.383	-0.572	0.487	14	4.419	2.976	1.444	0.926	3	4.364	0.906	10	0.408	7
V1	46	144	2	91	3	86	M	0.373	-0.640	0.524	10	4.371	3.239	1.132	0.726	13	4.818	1.000	1	0.380	12
RC1	37	166	3	121	2	43	M	0.431	-0.782	0.631	1	4.470	3.288	1.183	0.759	12	4.091	0.849	12	0.407	8
RC2	54	145	0	122	3	48	M	0.477	-0.724	0.613	2	4.449	3.132	1.317	0.845	8	4.818	1.000	2	0.518	1
RC3	71	130	1	98	2	70	M	0.458	-0.618	0.544	7	4.285	3.089	1.196	0.767	10	4.545	0.943	5	0.394	9
OP1	47	136	3	121	2	63	M	0.458	-0.700	0.592	4	4.417	3.231	1.185	0.760	11	4.636	0.962	4	0.433	4
OP2	88	94	1	98	1	90	O	0.503	-0.519	0.511	12	4.562	3.091	1.470	0.943	2	4.727	0.981	3	0.473	2
PD1	102	86	5	80	2	97	A	0.499	-0.455	0.477	15	4.258	3.215	1.043	0.669	15	4.455	0.925	8	0.295	15
PD2	116	76	5	77	2	96	A	0.529	-0.419	0.477	16	4.089	3.110	0.978	0.628	16	2.909	0.604	16	0.181	16
C1	54	127	4	99	3	85	M	0.419	-0.619	0.529	9	4.384	3.309	1.075	0.690	14	4.545	0.943	6	0.344	14

Attributes PD1 and PD2 fall into the Attractive (A) category, which includes physical aspects of service such as agent/counter distribution and 24-hour operating hours. Customers can easily reach the nearest agent/counter (PD1) and are satisfied with the 24-hour service availability (PD2), but the lack of fulfilment in this aspect only ends at the neutral line without causing customer dissatisfaction. Improving service quality in this area can increase customer satisfaction, but non-fulfilment of this attribute has no impact on customer dissatisfaction.

The three attributes with relatively high SII values are suitability of delivery estimates (RD1), alternative goods pick-up facilities (OP2), and 24-hour service at agents/counters (PD2). Increased customer satisfaction occurs when these three attributes function well. Protection of personal information (RC1), safe delivery of goods (DC1), and good customer service attitude (RC2) have relatively low DDI values, indicating the effectiveness of these attributes in reducing customer dissatisfaction if not optimal. Calculation of the Composite Satisfaction Index (CSI) shows that the

attributes with the highest CSI values are protection of personal information (RC1), good attitude of customer service (RC2), and safe packaging of goods (RD2). The RC1 attribute has the most influence on increasing customer satisfaction and decreasing customer dissatisfaction, although the value of increasing satisfaction is not close to the neutral line. The conclusion of this study helps companies know which attributes need to be improved to increase customer satisfaction.

4.2 IPA Results

The importance scores of all expedition service attributes are above 4, highlighting high importance. The attributes with the highest importance scores involve pick-up service (OP2), secure packaging (RD2), secure delivery (DC1), and protection of customer information (RC1).

Although high in importance, the performance of freight forwarding services performance is still in the range of 2.86 to 3.309, indicating performance from poor to fair only. Low-performing attributes involve prompt compensation for damages and delays (AM3 and AM4), and prompt response to customer complaints (AM1). This low performance reflects customer dissatisfaction, especially in terms of accident management, which is a high expectation but has not been met by the company. The IPA method uses a four-quadrant matrix to prioritize improvements to quality attributes. By placing the indicators in the quadrants, with importance on one axis and performance on the other, the indicators are interpreted and the order of priority for improvement is determined (Deng, 2007).

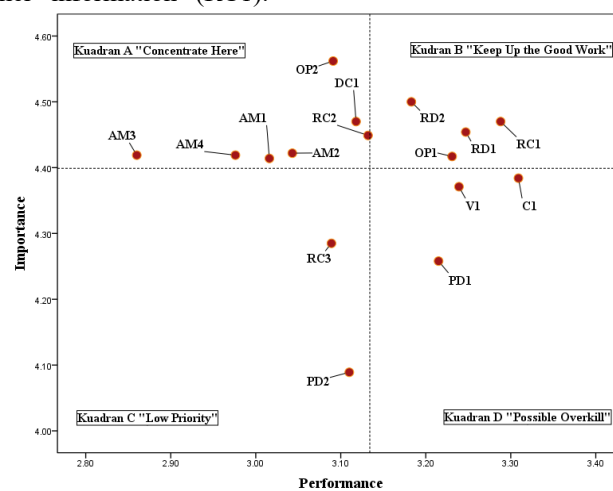


Figure 5. IPA Matrix

Quadrant A "Concentrate Here" includes attributes such as safe delivery (DC1), quick response to complaints (AM1), real-time product state information (AM2), and quick compensation (AM3 and AM4), as well as alternative pick-up services (OP2) and the ethics of customer service when serving (RC2). These attributes relate to the condition of goods and the handling of goods accidents, but expedition services have not met customer expectations, especially in quick response to complaints and management of goods accidents. Attributes in quadrant A are considered very important but the company has not provided performance that makes customers satisfied. The focus of improvement should be placed on attributes that are in quadrant A

Attributes such as suitability of delivery estimates (RD1), safe packing (RD2), protection of personal information (RC1), and clear delivery procedures (OP1) belong to quadrant B "Keep Up the Good Work". This attribute has a high level of importance and performance. Customers believe that the delivery estimate is in accordance with the method they choose, the packaging is safe, the protection of personal information is maintained, and the provision of delivery procedures is considered good. Efforts

to maintain or improve performance on this attribute are recommended because it is included in quadrant B

Attributes with low importance and performance are included in quadrant C "Low Priority". For example, 24-hour service at agents/counters (PD2) and customer service/staff competence (RC3). Customers consider it not very important, and performance is low. Agents/counters are often unable to provide 24-hour service, and customer service/staff competence is considered insignificant. It is worth reconsidering to improve service quality on this attribute because the benefits perceived by customers are relatively small.

Attributes in quadrant D "Possible Over-Kill" have high performance but low importance according to customers. For example, the spread of agents/counters in various regions (PD1), accurate tracking of goods (V1), and the appropriateness of fee terms (C1). Although performance is good, the spread of agents/counters is less important because customers can use the pick-up method. Although item tracking is accurate, its importance is low because customers tend to monitor only when there is a problem. Cost

terms are not important as they are appropriate, and delivery is a key customer requirement.

Standard weight is used to test the combined value of customer importance and satisfaction. Attributes with high standard weights indicate poor performance but are important according to customers. According to Table 4.11, the three attributes with the highest standard weights are the speed of compensating for damage (AM3), the availability of pick-up services (OP2), and quick compensation for late goods (AM4). These attributes relate to the expedition service's ability to handle service discrepancies. Although customers consider them important, their implementation is not satisfactory, leading to relatively low performance scores. With these attributes falling into quadrant A "Concentrate Here," the company can prioritize improving the quality of these three attributes.

4.3 GD Results

The Goal Difficulty questionnaire involved 11 respondents from 4 expedition service companies in Indonesia (JNE Express, J&T Express, TiKi, and Pos Indonesia) with 8 variables and 16 attributes modified from LSQ measurement dimensions related to service quality. Not all attributes have a major influence on customer satisfaction or a high level of importance. Influential attributes are not always easy to improve. The research process also identified constraints and considerations that expedition service companies need to consider in improving service quality.

The results of the calculation of the Goal Difficulty questionnaire from the expedition service company show that the attributes with a high level of difficulty to improve quality are 24-hour operating hours at agents/counters (PD2), safe packing (RD2), and safe delivery of goods (DC1). These attributes have low GD values, indicating a high level of difficulty. Increasing operating hours is difficult because agents/counters have their own operating hours, and some follow the provisions of the head office or franchise.

Providing packing is difficult to improve because not all expedition services provide packing facilities according to customer needs. Guaranteed delivery of goods without damage is difficult to improve because it involves many external factors that can only be minimized by the company.

Attributes that are easy to improve according to the company have a high GD value, meaning that the level of difficulty is low. Accurate tracking of goods according to the receipt (V1), a good and polite attitude from customer service/staff when serving customers (RC2), and alternative service facilities such as pick-up of goods (OP2) can be more easily improved. Tracking of goods can already be realized through the receipt system that exists on each item, the attitude of customer service/staff is easily improved by CCTV surveillance and direct reprimands from superiors, and pick-up service facilities can be improved because all expedition services provide this service.

The differences between the views of customers and managers were identified, and the attributes of delivering goods without damage, error, or loss (DC1) and providing proper packaging to goods (RD2) have high importance to customers but are considered quite difficult for companies to improve. Safe delivery of goods is desired by customers, but companies face difficulties due to many factors beyond their control. Packaging standards that suit customer needs are also considered difficult to implement.

24-hour service at agents/counters (PD2) and quick response to customer complaints (AM1) have low performance and are considered the most difficult to improve by freight forwarders. Although desired by customers, from a managerial perspective, 24-hour operations add costs, and quick handling of complaints takes time due to proper problem identification. Not all service quality attributes that are considered important and have low performance are easy to improve from a managerial perspective.

Table 3. Comparison of GD with IPA

Attributes	Original GD (z)		Importance			Performance		
	Value	Rank(1)	Value	Rank (2)	(1)-(2)	Value	Rank (3)*	(1)-(3)
RD1	4.455	7	4.454	5	2	3.247	14	-7
RD2	3.727	15	4.500	2	13	3.183	10	5
DC1	3.909	14	4.470	3	11	3.118	8	6
AM1	4.000	13	4.414	11	2	3.016	3	10
AM2	4.273	11	4.422	7	4	3.043	4	7
AM3	4.364	9	4.419	8	1	2.860	1	8
AM4	4.364	10	4.419	9	1	2.976	2	8
V1	4.818	1	4.371	13	-12	3.239	13	-12
RC1	4.091	12	4.470	4	8	3.288	15	-3
RC2	4.818	2	4.449	6	-4	3.132	9	-7
RC3	4.545	5	4.285	14	-9	3.089	5	0

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OP1	4.636	4	4.417	10	-6	3.231	12	-8
OP2	4.727	3	4.562	1	2	3.091	6	-3
PD1	4.455	8	4.258	15	-7	3.215	11	-3
PD2	2.909	16	4.089	16	0	3.110	7	9
C1	4.545	6	4.384	12	-6	3.309	16	-10

Note: * Rank ordered from smallest to largest

4.4 Alliance Index Results

The alliance index calculation combines the three methods by multiplying the values of the three. The x-axis is the CSI value of the Kano model, the y-axis comes from the standardized weight obtained in the IPA method, and the z-axis with an inverse value comes from the Goal Difficulty (GD) value. The alliance index values in Table 3 show that the ethics of customer service/staff when serving (RC2), prompt compensation for damage to goods during delivery (AM3), and pick-up service (PD2) have the highest alliance index values.

4.4.1 RC2 Attributes

RC2 attributes regarding customer service/staff behaviour at expedition service companies fall into the Must-be (M) category in the Kano model. In this category, customer satisfaction will decrease or even reach a level of dissatisfaction if CS/staff services do not meet good and polite standards. Even if the company improves this service, customer satisfaction will not exceed the neutral level, because the Must-be (M) category curve tends to curve below and end at the neutral line.

Attribute RC2, although in the Must-be (M) category, has a good slope because it is at the SII point and has a high DDI value in Figure 4. With a CSI value of 0.631, improvements in CS/staff behaviour will significantly increase customer satisfaction. Although constrained by the Must-be (M) category, which states that the level of customer satisfaction will not exceed neutral. Customers rate the importance of the treatment and service from customer service/staff highly (importance score of 4.387). The service received by customers is also not as low as other attributes in the same quadrant, the performance value is close to the average value of 3.228. Although the company has provided relatively good service, it needs to improve performance again, especially on aspects included in quadrant A "Concentrate Here" (attribute RC2) with a high level of importance and relatively low performance.

Hospitality is considered important because it has a positive impact on the customer experience, reduces stress, builds trust, and enhances the company's reputation. Customers seek not only quality service but also pleasant experiences during the purchase process and afterwards. This attribute has a great influence on increasing satisfaction and decreasing dissatisfaction because it is at a high tilt point compared to other attributes, in a quadrant that needs to be

maintained in performance and is considered very easy to improve according to the company. Therefore, this attribute is a top priority for quality improvement, the right decision to maintain customer satisfaction levels and prevent a decrease in satisfaction.

4.4.2 OP2 Attributes

Attribute OP2, related to the pick-up service, falls into the One-Dimensional (O) category, which means that customer satisfaction is in line with the functionality and fulfilment of needs related to the pick-up service. Although most respondents chose the One-Dimensional (O) category for this attribute, the slope level is low in the Kano model graph, indicating a limited effect of satisfaction improvement. Although OP2 is considered attractive for improvement, the low increase in satisfaction (SII) and decrease in dissatisfaction (DDI) values indicate limited improvement impact. With a near-average Composite Satisfaction Index (CSI) value of 0.511, OP2 is the second priority for attribute quality improvement, partly because not all customers regularly use the pick-up service, especially those with online businesses.

Attribute OP2, related to pick-up services, is considered very important by customers (importance score of 4.444). Customers expect expedition services to provide pick-up facilities as a practical option, especially for online business owners who send large quantities of goods outside of agent/counter operating hours. Despite its high importance, its performance is relatively low (3.091) due to issues such as discrepancies in pick-up times and couriers not confirming or even manipulating order status. Agents/counters with small sizes are also not all able to provide pick-up services. With high importance but low performance, attribute OP2 is categorized as A "Concentrate Here," indicating the need for the company to allocate more resources to improve this aspect.

The GD value from the questionnaire with the expedition service for attribute OP2 is relatively high (0.981) at rank 3, indicating that the company finds it easy to improve the quality of this aspect. The obstacles faced are related to the communication system with customers using the pick-up service, especially the mismatch of estimated schedules with factors beyond the company's control. Nonetheless, improving the quality of the OP2 attribute is considered appropriate because the One-Dimensional (O) category and falling into quadrant A "Concentrate Here," requires

significant resource allocation. The company can improve the pick-up service by focusing on things that can be controlled, such as providing real-time information, rescheduling courier shifts, and firm reprimands. Improved communication between customers and couriers, including clear confirmation when pick-up delays occur, can reduce customer concerns from uncertainty.

4.4.3 AM3 Attributes

Attribute AM3 regarding quick compensation for damaged products during delivery, falls into the Must-be (M) category in the Kano model. Indicates that customers are dissatisfied if there is no quick compensation for damaged goods. With the fulfilment of this aspect, customer satisfaction will not exceed the neutral limit. Most respondents chose AM3 as Must-be (M), considering the fulfilment of this aspect as the main responsibility of the expedition service. Customers expect compensation quickly when damage occurs. Despite being categorized as Must-be (M), the values of increasing satisfaction (SII) and decreasing dissatisfaction (DDI) are low, and the CSI is around 0.520 at rank 11, indicating a lower priority for quality improvement as shown in Figure 4. Although improving the quality of compensation can prevent a decrease in the level of customer dissatisfaction, the level of satisfaction will not exceed the neutral limit.

Attribute AM3 is considered very important by customers with an importance value of 4.419. Customers expect a quick and clear compensation process, according to the value of the damaged goods. However, the performance value of this aspect is low (2.973), which causes customer dissatisfaction. Customers feel that the compensation process is not as expected due to the lack of clarity of the scheme and the slow pace of completion. Therefore, attribute AM3 falls into category A "Concentrate Here," indicating an urgent need to improve the provision of damaged goods compensation, which is currently very low in performance.

With a GD value slightly above average (0.906, rank 8), attribute AM3 is the third priority for quality improvement. Improving the compensation aspect is challenging according to the company, but still considered surmountable. The constraints involve a complex and time-consuming claims scheme, including tracking, detecting the cause of damage, customer confirmation, and compensation disbursement by headquarters. Focus improvements on controllable aspects, such as increasing the speed of communication with customers, socializing the compensation scheme, and providing updates on the status of compensation. Although it is a Must-be, customers consider it very important with low performance (quadrant A "Concentrate Here"), indicating the need for improvement to increase satisfaction.

4.5 Attribute Quality Improvement Recommendation

4.5.1 Improved CS/Staff Ethics (RC2)

An alternative is to provide training to CS/staff of expedition services to improve their character and performance, which is in line with company norms. Good and courteous service from CS/staff contributes to the company's image, justifying the improvement of service quality. It is necessary to conduct customer satisfaction surveys at each branch/agent/counter and regular evaluations to assess CS/staff performance. Monitoring during working hours with CCTV can prevent unwanted incidents. The company can also improve customer service performance through customer care/call center/live chat on the website to address customer complaints quickly. A quick response from the head office, including a reprimand or warning letter to CS/staff who violate company norms, is the next step to provide a firm attitude towards employee.

4.5.2 Improved Pick-up Service Facility (OP2)

To improve the quality of this attribute, companies can develop drop points/collection points by increasing the number of couriers, especially at collection points. To make pick-up services available at small agents/counters, it is necessary to increase the number of human resources. Ineffective communication is a major issue; companies should ensure that couriers' phone numbers are active and engage in efficient communication with shippers. Good customer contact is critical to the efficiency of the delivery process, and to increase trust, companies can adopt real-time tracking technology for couriers picking up goods, like the system used in express delivery services. This allows customers to easily track the courier and avoid mistakes or misunderstandings in communication.

4.5.3 Improved Fulfilment of Damage Compensation (AM3)

The company considers improving this aspect challenging but achievable as it is important for improving customer satisfaction. Alternative improvements involve increasing compliance with the damaged goods compensation/insurance claims process in line with the company's promises to customers. Identifying the causes of damage, tracking potentially damaged goods, and socializing the compensation scheme can improve the claims process. Surveys of customer needs can help the company provide appropriate services, and the implementation of an online compensation claim menu can improve efficiency. Real-time status updates through an app or website can increase customers' confidence in their claims process.

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

The use of three evaluation models (Kano, IPA, GD) and alliance index values helped identify three high-priority attributes that need improvement: CS/staff behaviour (RC2), alternative delivery services (OP2), and prompt compensation (AM3). Improvement recommendations

involve Must-be and Attractive attributes with a focus on improving speed and efficiency. Low performance on key attributes is due to CS/staff behavioural issues, pick-up time mismatch, and slow compensation claim process. Improved communication and real-time status updates were identified as solutions to improve customer satisfaction.

Recommendations for improving service quality involve three high priority attributes. For attribute (RC1), which relates to customer service/staff response, it is recommended to improve employee character through training, conduct regular customer satisfaction surveys, and improve the performance of the website-based customer care/call centre/live chatting menu. Attribute (OP2) regarding goods pick-up service, it is recommended to improve communication by ensuring the courier's phone number is active and developing real-time tracking technology. For attribute (AM3) related to compensation for damaged goods, it is recommended to improve the compensation/insurance claim process, provide clear socialization, create an online compensation claim menu, provide real-time information on compensation status, and conduct a customer needs survey to provide services according to expectations.

5.2 Suggestions for Future Research

Suggestions for future research are to develop research attributes with more in-depth exploration to better suit customer needs. It is necessary to extract further information about stakeholders, cooperation with related parties, and other parties that are influential in improving the quality of expedition services. Researchers must also be more accurate in selecting the respondents involved to avoid bias.

The development of research samples, especially on the expedition services, may result in more varied recommendations due to differences in resources and capabilities. Therefore, future research is recommended to collect more sample data from this industry and apply the Three-Dimensional Model to service quality measurement in other industries as a reference for corporate strategic planning.

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