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Conjoint-Based Marketing Strategy to Increase the Natural Sandy Rocks (Sirtu) Commodity in The Non-Metallic Mineral and Rock Mining Industry at PT XYZ

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Abstrak

Penurunan signifikan penjualan kerikil berpasir alami (sirtu) di PT XYZ selama Januari–Desember 2024 berdampak negatif terhadap pendapatan perusahaan serta prospek perpanjangan izin tambang di masa depan. Penurunan ini diduga disebabkan oleh ketidaksesuaian antara produk yang ditawarkan dengan preferensi konsumen, meliputi jenis produk, harga, volume pembelian, transportasi pengiriman, layanan pembelian, dan metode pembayaran. Penelitian ini bertujuan mengidentifikasi faktor-faktor utama yang memengaruhi keputusan pembelian, menganalisis preferensi konsumen menggunakan analisis konjoin, serta merumuskan strategi pemasaran yang tepat. Pendekatan kuantitatif deskriptif dan eksplanatori digunakan dengan teknik purposive sampling pada 25 responden. Data dikumpulkan melalui kuesioner berbasis desain analisis konjoin dan dianalisis menggunakan SPSS Statistics Versi 30. Hasil penelitian menunjukkan bahwa kombinasi atribut produk yang paling disukai meliputi: sirtu kualitas sedang, harga menengah (Rp 200.000–270.000/m³), volume pembelian sedang, pengiriman menggunakan dump truck sedang (6–8 m³), pembelian langsung, dan metode pembayaran Cash on Delivery (COD), dengan total skor utilitas 1,638. Dari enam atribut, metode pembayaran memberikan pengaruh paling tinggi (24,326%), diikuti volume pembelian (20,096%) dan transportasi pengiriman (18,523%), sementara layanan pembelian memiliki pengaruh paling rendah (6,247%). Terdapat perbedaan preferensi konsumen antar segmen, di mana perusahaan konstruksi memprioritaskan transportasi dan harga, sedangkan konsumen individu lebih mengutamakan metode pembayaran dan fleksibilitas volume pembelian.

Kata Kunci: Konjoin Analisis; Sirtu; Preferensi Konsumen; Strategi Pemasaran; Pertambangan

Abstract

The significant decline in natural gravelly sand (sirtu) sales at PT XYZ during January–December 2024 adversely affected the company's revenue and jeopardized the prospects for future mining permit extensions. This decline is suspected to be caused by a mismatch between the offered product and consumer preferences, including product type, price, purchase volume, delivery transportation, purchasing services, and payment methods. This study aims to identify the key factors influencing purchasing decisions, analyze consumer preferences using conjoint analysis, and formulate an appropriate marketing strategy. A descriptive and explanatory quantitative approach was used, employing purposive sampling with 25 respondents. Data were collected through a conjoint analysis-based questionnaire and analyzed using SPSS Statistics Version 30. The results indicate that the most preferred product attribute combination includes: medium-quality sirtu, medium price (Rp 200,000–270,000/m³), medium purchase volume, delivery using medium-sized dump trucks (6–8 m³), direct purchase, and Cash on Delivery (COD) payment method, with a total utility score of 1.638. Among the six attributes, the payment method had the most significant influence (24.326%), followed by purchase volume (20.096%) and delivery transportation (18.523%), while purchasing services had the least influence (6.247%). Consumer preferences varied across segments, with construction companies prioritizing transportation and price, whereas individual consumers placed greater emphasis on payment methods and flexibility in purchase volume.

Keywords: Conjoint Analysis; Sirtu; Consumer Preferences; Marketing Strategy; Mining

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1. Introduction

The mining industry, particularly in the non-metallic mineral and rock sector, plays a crucial role in supporting national infrastructure development. Aggregates such as natural gravelly sand (Sirtu) are essential raw materials used in road construction, buildings, and other infrastructure projects [15]. In Indonesia, this sector contributes approximately 4.8% to the national GDP and emloyes over 1.2 million people [16]. However, increasing market demand for these materials has been accompanied by rising competition and shifting customer preferences, which challenge companies like PT XYZ to adopt more adaptive and data-driven marketing strategies.

PT XYZ is a developing mining company based in South Tapanuli, focused on the production and sale of Sirtu. Despite its advantageous location and rich natural resources, the company has experienced a significant decline in sales volume and revenue throughout 2024. Sales dropped from 5,010 m^3 in February to only 750 m^3 in December. Several factors may have contributed to this decline, including failure to meet customer preferences, reduced repeat orders, pricing mismatch, and poor service quality. Moreover, recurring customer complaints related to product quality, delivery delays, and pricing inconsistency reflect unresolved service gaps that could affect customer trust and loyalty. Unresolved issues pose a significant risk to PT XYZ's mining permit renewals, given that regulatory frameworks now place greater emphasis on demonstrated market competitiveness.

Despite attempts to lower product prices as a competitive strategy, PT XYZ's sales continued to decline, indicating that price alone is insufficient to retain or attract customers. The growing number of competitors in the same region—seven companies as recorded by the local mining authority—further intensifies the market pressure. New entrants are offering better pricing schemes, flexible ordering, improved logistics, and superior customer service, making it imperative for PT XYZ to reassess its marketing strategies and value proposition. Without a deep understanding of customer preferences, businesses risk misallocating resources and losing competitive ground Often, strategic decisions are based on subjective assumptions rather than empirical data, leading to a misalignment between product offerings and market expectations.

In light of these challenges, conventional marketing approaches are no longer sufficient. Firms need to transition toward strategies that effectively align with evolving customer expectations. Conjoint Analysis, a statistical technique used to measure consumer preferences by evaluating trade-offs among product attributes, offers a powerful solution. This method has proven effective in identifying the most valued product features, such as price, quality, delivery time, and payment method. By applying this approach, companies can better design their marketing mix, improve customer satisfaction, and enhance overall competitiveness.

Given these considerations, this study seeks to address the gap in understanding customer preferences in the mining sector, particularly regarding Sirtu product attributes. The research is guided by three key questions: (1) What factors influence consumer purchasing decisions for Sirtu? (2) What are consumer preferences regarding Sirtu product attributes based on conjoint analysis? and (3) What marketing strategies can be formulated from these preferences? The study aims to identify the most influential product attributes, analyze consumer preferences using conjoint analysis, and develop actionable marketing strategies based on the findings.

This research contributes theoretically by extending the application of conjoint analysis in the context of the non-metallic mining industry, an area that remains underexplored. Practically, it provides PT XYZ with data-driven insights for improving sales performance and competitiveness. The research results indicate that the most preferred product configuration consists of medium-sized Sirtu, moderate pricing, direct purchase method, COD (Cash On Delivery) payment, delivery using a medium-sized

dump truck, and moderate purchase volume. These findings provide strategic direction for PT XYZ in developing more targeted marketing campaigns and enhancing service quality.

2. Literature Review

Marketing strategy in the mining industry faces complex challenges, ranging from global price volatility and regulatory shifts to evolving customer preferences. Generally, marketing is defined as the process of delivering value to customers through communication, distribution, and exchange relationships that benefit all parties involved [19]. In the context of the mining sector, marketing strategy goes beyond promotion; it involves comprehensive efforts to understand the market, map customer needs, and strategically adjust product attributes.

The extractive industry, particularly the non-metallic mineral and rock sector, is characterized by its dependence on finite natural resources, commodity price volatility, stringent environmental and social regulations, and a long-term business-to-business (B2B) orientation [41]. Marketing in this sector is therefore less consumer-driven (B2C) and more focused on maintaining long-term partnerships through contracts, trust, and technical alignment.

In shaping marketing strategies, attribute-based approaches are crucial to capture diverse and dynamic consumer preferences. Conjoint Analysis, a widely utilized technique, allows researchers and firms to examine how trade-offs made by customers reveal the product attributes that most significantly drive purchasing decisions. Conjoint Analysis serves multiple strategic purposes, including the estimation of preference models, optimal product design, market segmentation, competitive positioning, and pricing strategy development [7].

Despite its widespread application in manufacturing and service sectors, the use of conjoint analysis in the mining industry remains relatively limited. Previous studies have shown that price, production volume, and payment schemes are among the dominant factors influencing consumer preferences in construction materials. However, these studies have not specifically examined key product attributes of natural gravelly sand (Sirtu**)** within the context of highly competitive and regionally dynamic markets. Furthermore, earlier research has not explicitly addressed the needs of B2B customers in marketing strategies grounded in empirical data.

Consumer preferences in the mining sector are shaped by both internal organizational factors (e.g., psychographics, values) and functional needs (e.g., technical specifications, quality standards, delivery schedules) [2]. In the case of Sirtu, attributes such as product type, price, purchase volume, delivery method, service quality, and payment options are instrumental in shaping customer decision-making [41].

Customer preference-based strategies have proven to significantly improve sales performance and distribution effectiveness, particularly when integrated with relevant communication strategies, flexible pricing systems, and distribution channels tailored to customer needs [4]. This study supports these insights by adopting a choice-based conjoint analysis approach to identify the most preferred attribute configurations for Sirtu products and propose data-driven marketing strategies.

Therefore, this study fills a gap in the existing literature by employing a quantitative conjoint analysis approach, which has been seldom utilized in the context of local mining marketing, particularly within dynamic market regions such as South Tapanuli Regency.It also extends the existing body of knowledge by focusing on the combined influence of multiple product attributes on purchasing decisions, ultimately contributing to the development of adaptive and competitive marketing strategies.

3. Methods

This study employs a quantitative research design with a descriptive–explanatory approach to analyze customer preferences for natural gravelly sand (Sirtu) products in the non-metallic mineral and rock mining sector. The descriptive aspect aims to capture the characteristics of product attributes, At the same time the explanatory component is used to analyze the influence of these attributes on consumer decision-making through conjoint analysis [22].

3.1 Study Context and Duration

The research was conducted at PT XYZ, a mining company located in South Tapanuli Regency, Indonesia, operating in the non-metallic mineral and rock sector. Conducted over two months, from February to April 2024, the study covered both the data collection and analysis phases.

3.2 Sample and Sampling Technique

The population includes all PT XYZ customers who made purchases within the last 12 months. A total of 25 respondents were selected using purposive sampling, based on the following inclusion criteria: (1) had made at least two purchases in the past year, (2) used Sirtu for construction-related purposes, and (3) were willing to participate in the study [33]. The sample represents both individual and institutional buyers.

3.3 Data Collection Instruments

Primary data were collected using a structured questionnaire designed based on a full-profile conjoint analysis framework. Respondents evaluated hypothetical product combinations using a seven-point Likert scale, where one represented "very unattractive" and seven represented "very attractive." Secondary data were obtained from company records, government publications, and industry reports to provide contextual information.

3.4 Product Attributes and Levels

Six product attributes were examined: product type, price, purchase volume, delivery method, purchase service, and payment method. Each attribute was defined with two to three levels based on expert input and relevance to the market. For example, product types included coarse, medium, and fine Sirtu; price levels ranged from IDR 150,000/m³ to IDR 350,000/m³; and delivery methods included pickup and medium-sized dump trucks (6–8 m³). These combinations reflect actual purchasing scenarios in the field.

3.5 Data Analysis Technique

3.5.1 Conjoint Analysis Model

Conjoint analysis employs linear regression to evaluate consumer preferences, where product attributes serve as independent variables and preference ratings act as the dependent variable, by decomposing total utility (Thompson & Anderson, 2023). The utility function used in this analysis is expressed as*:*

$$U(X) = \sum_{i=1}^{m} \sum_{i=1}^{k} \beta_i j^x i\, j \quad (1)$$

Where:

U(x) = Total utility

β_{ij} = Part-worth utility of the j-th level of the i-th attribute

$\mathbf{k_i}$ = The j-th level of the i-th attribute

m = Total number of attributes

$\mathbf{x_{ij}}$ = Dummy variable representing the j-th level of the i-th attribute

According to Martinez & Wilson (2024), the importance value of a particular attribute ($\mathbf{I_i}$) is calculated as:

$$Ii = \{\text{Max } (\alpha ij) - \text{Min } (\alpha ij)\} \text{ for each i} \quad (2)$$

Where:

$\mathbf{I_i}$ = Importance value of attribute *i*

$\boldsymbol{\alpha_{ij}}$ = Utility value of level *j* of attribute *i*

The Relative Importance ($\mathbf{W_i}$) of an attribute can be determined using the following formula (Lee & Park, 2023):

$$Wi = Ii = \{\text{Max } (\alpha ij) / \text{Min } (\alpha ij)\} \times 100\% \quad (3)$$

This study utilizes six attributes, each having a different number of levels. Specifically, the first, second, third, and fourth attributes each consist of three levels, the fifth attribute comprises two levels, and the sixth attribute consists of three levels. Accordingly, the total number of possible combinations (stimuli) is calculated using the following formula [10]:

$$\text{Total Combinations} = L_1 \times L_2 \times L_3 \times \ldots \times L_n \quad (4)$$

Where:

L = number of levels per attribute

n = Total number of attributes

The total number of combinations generated is 486 stimuli (3×3×3×3×2×3), which is regarded as excessively large and may lead to respondent fatigue and diminished data quality (Johnson & Orme, 2023). To address this issue, a fractional factorial design was employed, reducing the number of stimuli presented to each respondent to fewer than 30.

3.5.2 Data Analysis Procedure

Conjoint analysis was conducted using ordinary least squares (OLS) regression, in which the total utility of each product profile is decomposed into part-worth utilities for each attribute level. The relative importance of each attribute was calculated by comparing the range of part-worth utilities within each attribute. The analytical steps included:

1. Stimuli Design – Generating product profiles using SPSS.
2. Data Collection – Distributing questionnaires to selected respondents.
3. Estimation of Utilities – Running regression analysis to obtain part-worth utilities.
4. Importance Value Computation – Calculating the relative importance of each attribute.
5. Interpretation and Strategy Formulation – Using results to guide strategic marketing decisions.

3.6 Ethical Considerations

All respondents participated voluntarily and were informed about the purpose of the study. Anonymity and confidentiality of individual responses were ensured. Since no sensitive personal data were collected and the study posed minimal risk, formal ethics approval was not required.

3.7 Software and Tools

All data processing and statistical analyses were conducted using IBM SPSS Statistics v30. The software was utilized for stimulus design, regression analysis, and output interpretation, enabling efficient assessment of consumer preferences and precise estimation of attribute importance [2].

4. Results and Discussion

4.1 Respondent Characteristics

This study involved 25 respondents who were either potential or active customers of PT XYZ in of 2024. Respondents were categorized by gender, purchase status, and frequency of purchases.

The majority of respondents were male (80%), reflecting the male-dominated nature of the mining and construction sectors. Most were individual buyers (64%), indicating that PT XYZ's Sirtu market serves both personal and large-scale construction projects. In terms of purchase frequency, 44% made 1–2 purchases, 16% made 3–5 purchases, and 40% purchased more than 5 times over the past year.

Table 1 Respondent Characteristics

No	Category	Subcategory	Total	Percentage
1	**Gender**	Male	20	80%
		Female	5	20%
2	**Purchase Status**	Individual Buyer	16	64%
		Construction Company	9	36%
3	**Purchase Frequency**	1–2 times	11	44%
		3–5 times	4	16%
		More than 5 times	10	40%

Source**:** Processed Data, 2025

4.2 Conjoint Analysis Design

4.2.1 Product Attributes and Levels

The Sirtu product attributes were identified through interviews, FGDs with customers, complaint analysis, and literature review, forming the basis for a conjoint analysis using six key attributes and their levels. Six product attributes along with their corresponding levels were employed in the analysis, as presented in Table 4.2

Table 2 Product Attributes and Levels

No	Attribute	Attribute Levels
1	Product Type	Coarse Sirtu, Medium Sirtu, Fine Sirtu
2	Price	Premium (Rp 270,000–350,000/m³), Medium (Rp 200,000–270,000/m³), Economical (Rp 150,000–200,000/m³)
3	Purchase Volume	Large Volume, Medium Volume, Small Volume
4	Delivery Transportation	Large Dump Truck, Medium Dump Truck, pickup Truck
5	Purchase Service	Direct Purchase at Site, Email, or Other Electronic Methods
6	Payment Method	Cash on Delivery (COD), Down Payment (DP), Installment Credit

Source: Processed Data, 2025

4.2.3 Product Attribute Combinations

The combinations generated based on the product attributes and their respective levels amounted to 18 combinations. These 18 profiles were obtained by entering the attributes and levels into SPSS version 30 using a fractional factorial design. This method, especially with the use of an Orthogonal Array, allows researchers to estimate all main effects with fewer stimuli than a complite factorial design. It helps reduce respondent burden and research cost.

Table 4.3 lists the product combinations generated from SPSS, and respondents were asked to rate each combination on a scale of 1 (strongly disagree) to 7 (strongly agree)

Table 4 Product Attribute Combinations Generated from SPSS Processing

Package No.	Product Type	Price Range	Purchase Volume	Delivery Transportation	Purchase Service	Payment Method
1	Medium Sirtu	Medium (Rp 200,000 - 270,000/m³)	Large Volume	Medium Dump Truck	Indirect Purchase	Installment Credit
2	Coarse Sirtu	Economical (Rp 150,000 - 200,000/m³)	Small Volume	Medium Dump Truck	Indirect Purchase	Down Payment
3	Fine Sirtu	Premium (Rp 270,000 - 350,000/m³)	Large Volume	Medium Dump Truck	Direct Purchase	Installment Credit
4	Fine Sirtu	Premium (Rp 270,000 - 350,000/m³)	Small Volume	Medium Dump Truck	Direct Purchase	Down Payment
5	Medium Sirtu	Premium (Rp 270,000 - 350,000/m³)	Medium Volume	pickup Truck	Direct Purchase	Down Payment
6	Coarse Sirtu	Medium (Rp 200,000 - 270,000/m³)	Large Volume	pickup Truck	Direct Purchase	Down Payment
7	Coarse Sirtu	Premium (Rp 270,000 - 350,000/m³)	Medium Volume	Large Dump Truck	Indirect Purchase	Installment Credit
8	Medium Sirtu	Premium (Rp 270,000 - 350,000/m³)	Small Volume	pickup Truck	Indirect Purchase	Cash on Delivery (COD)
9	Coarse Sirtu	Medium (Rp 200,000 - 270,000/m³)	Small Volume	pickup Truck	Direct Purchase	Installment Credit
10	Fine Sirtu	Economical (Rp 150,000 - 200,000/m³)	Medium Volume	pickup Truck	Direct Purchase	Installment Credit
11	Medium Sirtu	Economical (Rp 150,000 - 200,000/m³)	Large Volume	Large Dump Truck	Direct Purchase	Down Payment
12	Medium Sirtu	Medium (Rp 200,000 - 270,000/m³)	Medium Volume	Medium Dump Truck	Direct Purchase	Cash on Delivery (COD)
13	Fine Sirtu	Medium (Rp 200,000 - 270,000/m³)	Large Volume	Large Dump Truck	Indirect Purchase	Cash on Delivery (COD)
14	Fine Sirtu	Economical (Rp 150,000 - 200,000/m³)	Small Volume	pickup Truck	Direct Purchase	Cash on Delivery (COD)
15	Coarse Sirtu	Premium (Rp 270,000 - 350,000/m³)	Large Volume	Large Dump Truck	Direct Purchase	Cash on Delivery (COD)

Package No.	Product Type	Price Range	Purchase Volume	Delivery Transportation	Purchase Service	Payment Method
Package No.	Product Type	Price Range	Purchase Volume	Delivery Transportation	Purchase Service	Payment Method
16	Fine Sirtu	Medium (Rp 200,000 - 270,000/m³)	Medium Volume	Large Dump Truck	Direct Purchase	Down Payment
17	Coarse Sirtu	Economical (Rp 150,000 - 200,000/m³)	Medium Volume	Medium Dump Truck	Direct Purchase	Cash on Delivery (COD)
18	Medium Sirtu	Economical (Rp 150,000 - 200,000/m³)	Small Volume	Large Dump Truck	Direct Purchase	Installment Credit

Source: Processed Data, 2025

4.3 Results of Conjoint Analysis

4.3.1 Part-Worth Utilities

Part-worth utilities reflect the contribution of each attribute level to the overall consumer preference. Positive values indicate a higher preference, while negative values represent a lower preference.

Table 5 Summary of Part-Worth Utilities by Attribute

Attribute	Level	Utility Estimate	Std. Error
Product Type	Coarse Sirtu	-0.056	0.239
	Medium Sirtu	**0.331**	0.239
	Fine Sirtu	-0.276	0.239
Price	Premium (Rp 270,000 – 350,000/m³)	-0.169	0.239
	Medium (Rp 200,000 – 270,000/m³)	**0.184**	0.239
	Economical (Rp 150,000 – 200,000/m³)	-0.016	0.239
Purchase Volume	Large Volume	-0.249	0.239
	Medium Volume	**0.404**	0.239
	Small Volume	-0.156	0.239
Delivery Transportation	Large Dump Truck	0.031	0.239
	Medium Dump Truck	**0.371**	0.239
	Pickup Truck	-0.402	0.239
Purchase Service	Direct Purchase	0.037	0.179
	Indirect Purchase	-0.037	0.179
Payment Method	COD (Cash on Delivery)	**0.311**	0.239
	Down Payment (DP)	-0.222	0.239
	Installment Credit	-0.089	0.239

Source**:** Processed Data, 2025

As shown in Table 4.4, which reports the part-worth utilities across attributes, Medium Sirtu recorded the highest utility score (+0.331), signifying its position as the most preferred product type among consumers. The medium price range (Rp 200,000–270,000/m³) was the most favored pricing level, with a utility value of +0.184. A medium purchase volume yielded the highest utility among the volume levels, scoring +0.404, suggesting that consumers prefer quantities that are neither too small nor too large. Medium dump trucks were the preferred mode of transportation (+0.371), whereas pickup trucks were the least preferred (–0.402). Direct purchase was slightly more preferred than indirect methods (+0.037 vs. –0.037), indicating a consumer inclination toward straightforward transactions. The Cash on Delivery (COD) payment method emerged as the most preferred option (+0.311), while Down Payment (DP) and Installment Credit were less favored, with utility values of –0.222 and –0.089, respectively. This estimate serves as a basis for identifying the ideal product configuration.

4.3.2 Importance Values

The importance value indicates the degree to which each attribute influences the customer's purchasing decision. The summary of importance values is shown in Table 6**:**

Table 6 Importance Level of Attributes

Attribute	Importance Value (%)
Payment Method	24.326
Purchase Volume	20.096
Delivery Transportation	18.523
Price	17.039
Product Type	13.769
Purchase Service	6.247

Source**:** Processed Data, 2025

The results indicate that payment method is the most influential factor in customer decision-making, followed by purchase volume, delivery logistics, and price. While product type and service play a role, they are relatively less critical.

4.3.3 Conjoint Model Fit (Correlations)

To evaluate how well the conjoint model predicts actual customer preferences, two correlation statistics were used:

Table 7 Conjoint Model Fit Test (Correlations)

Measure	Value	Significance
Pearson's R	0.807	< 0.001
Kendall's Tau	0.433	0.007

Source**:** Processed Data, 2025

The values in Table 4.6 show a strong and statistically significant correlation between observed and predicted preferences, indicating that the model is valid and reliable for predicting consumer behavior.

4.4.4 Optimal Product Attribute Combination

Based on the part-worth utility values, the optimal combination yielding the highest total utility (1.638) is presented in Table 4.6, which details the utilities of natural gravelly sand (Sirtu) product combinations at PT XYZ. This finding suggests that the identified combination represents the most favorable product configuration from the consumer perspective, thereby providing a strategic reference for optimizing marketing and product development decisions.

Table 8 Utility of Natural Gravelly Sand (Sirtu) Product Combinations at PT XYZ

Attribute	Optimal Level	Utility Value
Product Type	Medium Sirtu	0.331
Price	Medium (Rp 200,000–270,000/m³)	0.184
Purchase Volume	Medium	0.404
Delivery Transportation	Medium Dump Truck	0.371
Purchase Service	Direct	0.037
Payment Method	COD	0.311

Source**:** Processed Data, 2025

This combination represents the most preferred configuration from the customer's perspective and can be used as a foundation for the company's product offering strategy.

4.4 Marketing Strategy Based on Customer Segmentation

To formulate tailored strategies, conjoint analysis was performed for two consumer segments**:** individual buyers and construction companies**.**

Table 9 Relative Importance by Purchase Status

Attribute	Construction Company (%)	Individual (%)
Product Type	12.267	14.556
Price	19.214	17.185
Purchase Volume	16.306	20.736
Delivery Transportation	23.481	17.268
Purchase Service	7.451	6.356
Payment Method	21.280	23.898

Source**:** Processed Data, 2025

Table 4.7 presents the relative importance values based on purchase status, divided into two categories, namely nine respondents from construction companies and sixteen respondents from individual buyers, with a total of twenty-five respondents. For construction companies, the attribute with the highest relative importance value was delivery transportation (23.481), followed by payment method (21.280) and price (19.214). Indicates that the ease and type of transportation used for delivering Sirtu constitute the primary consideration for consumers, alongside flexibility in payment methods and the pricing level offered.

Meanwhile, for individual buyers, the most crucial attribute was payment method (23.898), followed by purchase volume (20.736) and delivery transportation (17.268). Suggests that individual buyers place greater emphasis on payment flexibility in their decision-making, followed by the quantity of purchase volume offered and the delivery transportation of Sirtu products.

These differences imply variations in consumer preferences, which may be attributed to distinct market segments or differing contexts of product utilization. Nevertheless, in general, the findings indicate that payment method, delivery transportation, and price or purchase volume are the most influential factors in determining consumer choices for Sirtu products. Therefore, the company should focus its marketing strategies on highlighting ease of access to transportation, flexible payment options, and competitive pricing aligned with customer volume needs.

4.5 Summary of Marketing Strategy Based on Conjoint Analysis

PT XYZ can optimize its marketing by aligning strategies with customer preferences identified in the conjoint analysis:

1. **Product Strategy**: Prioritize *Medium Sirtu* offered at a *medium price* to match the most preferred combination.
2. **Pricing Strategy**: Use *tiered pricing* based on purchase volume. Offer *progressive discounts* for large orders and *loyalty programs* for repeat buyers.
3. **Distribution Strategy**: Standardize delivery with *medium-sized dump trucks*. Implement *zonal delivery scheduling*, *GPS tracking*, and a *customer dashboard* for real-time monitoring and management.
4. **Payment Strategy**: Make *Cash on Delivery (COD)* the primary method. Complement with *digital payments* (QRIS, e-wallets) and *alternative schemes* (DP and credit) for business clients.
5. **Promotional Strategy:** Promote the optimal product combination through various digital marketing channels, such as social media platforms, company websites, and online marketplaces. To enhance customer engagement and encourage purchases, offer promotional incentives such as first-time buyer discounts, referral bonuses, and loyalty point rewards.

6. **Service Development**: Develop a *corporate website* with product info, online ordering, and shipment tracking. Implement features progressively as resources allow.

5. Conclusion

This study concludes that consumer preferences for natural gravelly sand (Sirtu) products at PT XYZ are strongly influenced by specific product attribute combinations, with the most preferred configuration being medium-grade Sirtu, a moderate price (Rp 200,000–270,000/m³), medium purchase volume, delivery using medium-sized dump trucks, direct purchasing, and Cash On Delivery (COD) as the payment method. These findings indicate that consumers in the non-metallic mineral and rock mining sector tend to prioritize technical aspects and operational efficiency in their purchasing decisions. The implications of this study underscore the importance for companies to design data-driven marketing strategies and product offerings that align with actual consumer preferences, while also implementing targeted market segmentation to effectively address the distinct needs of individual buyers and construction companies.

Although the conjoint analysis model used in this study demonstrated good validity, the research is limited by a relatively small sample size and a narrow geographical scope, which may restrict the generalizability of the findings. Therefore, future research is recommended to expand the respondent base and regional coverage, and to explore additional product attributes such as sustainability factors, brand reputation, and after-sales services to provide a more comprehensive understanding of consumer behavior in this sector.

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