

ANALISIS KEPUASAN KONSUMEN DALAM PEMBELIAN SKINCARE PADA APLIKASI TOKOPEDIA MENGGUNAKAN KLASIFIKASI TEKS DAN PEMODELAN TOPIK

ANALYSIS OF CUSTOMER SATISFACTION IN PURCHASING SKINCARE IN THE TOKOPEDIA APPLICATION USING TEXT CLASSIFICATION AND TOPIC MODELING

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Abstrak

Penelitian ini bertujuan untuk menganalisis tingkat kepuasan pelanggan dalam pembelian produk skincare di platform Tokopedia dengan pendekatan klasifikasi sentimen dan pemodelan topik. Di tengah meningkatnya aktivitas belanja online, ulasan pelanggan sebagai bentuk User-Generated Content (UGC) menjadi sumber informasi penting yang mencerminkan pengalaman dan persepsi konsumen secara langsung. Studi ini menggunakan 14.716 ulasan dari lima merek skincare lokal ternama yang dianalisis menggunakan model IndoBERT untuk klasifikasi sentimen serta BERTopic untuk mengidentifikasi tema utama pada beberapa dimensi e-satisfaction, yakni: Pengiriman, Kualitas Produk, Penawaran & Diskon, serta Layanan Pelanggan. Hasil analisis menunjukkan bahwa dimensi Pengiriman paling sering mendapat sentimen negatif, sedangkan dimensi Kualitas Produk mendominasi ulasan positif. Pemodelan topik mengungkap isu-isu utama yang dibicarakan pengguna, seperti keterlambatan pengiriman, kondisi kemasan, kualitas produk, dan program promosi, yang mencerminkan kekuatan sekaligus kelemahan layanan. Temuan ini memberikan masukan strategis bagi pelaku e-commerce dan brand skincare untuk meningkatkan layanan, mempertahankan kualitas produk, dan memperbaiki strategi pemasaran serta pengalaman pelanggan secara keseluruhan.

Kata kunci: Tokopedia, Customer Satisfaction, Skincare, Sentiment Analysis, BERTopic, E-Satisfaction

Abstract

This study aims to analyze customer satisfaction in purchasing skincare products on the Tokopedia platform using sentiment classification and topic modeling approaches. Amid the growing trend of online shopping, customer reviews as a form of User-Generated Content (UGC) have become a crucial source of information that directly reflects consumers' experiences and perceptions. The study uses 14,716 reviews from five leading local skincare brands, analyzed using the IndoBERT model for sentiment classification and BERTopic to identify the main themes across several e-satisfaction dimensions, namely: Delivery, Product Quality, Offers & Discount, and Customer Support. The analysis shows that the Delivery dimension most frequently receives negative sentiment, while Product Quality dominates positive reviews. Topic modeling reveals key issues discussed by users, such as delayed shipping, packaging conditions, product quality, and promotional programs, which reflect both the strengths and weaknesses of the services. These findings provide strategic insights for e-commerce platforms and skincare brands to enhance logistics, maintain product quality, refine marketing strategies, and improve the overall customer experience.

Keywords: Tokopedia, Customer Satisfaction, Skincare, Sentiment Analysis, BERTopic, E-Satisfaction

1. Introduction

The growth of internet technology has significantly influenced consumer behavior, especially in the online shopping sector. In Indonesia, the increasing number of internet users has led to a shift from traditional retail to digital platforms. The rise of smartphone usage and the convenience of online transactions have accelerated the adoption of e-commerce services, including the purchase of daily necessities and personal care products such as skincare. E-commerce transaction values in Indonesia have shown a consistent upward trend, with significant growth observed in recent years. This reflects the expansion of online retail and the increasing role of digital platforms in fulfilling consumer needs. Among these platforms, Tokopedia stands out as one of the most frequently used online marketplaces in Indonesia, providing a wide variety of products, including skincare.

Skincare products have become one of the most popular categories in online shopping, particularly among younger consumers. Local skincare brands such as Somethinc, Scarlett, MS Glow, Avoskin, and Whitelab frequently dominate sales on e-commerce platforms due to their affordability and marketing appeal. Consumer reviews and ratings play a crucial role in shaping purchasing decisions in this sector, making User-Generated Content (UGC) a valuable source of insight for companies. Several previous studies have examined consumer sentiment and satisfaction in the digital marketplace. Mahfudiyah & Alamsyah (2022) conducted sentiment analysis and topic modeling using IndoBERT on customer reviews in the Gojek application, finding a predominance of negative sentiment related to service quality. Another study by Firdaus et al. (2025) applied aspect-based sentiment analysis using Random Forest and Latent Dirichlet Allocation (LDA) on Alfagift reviews, identifying delivery and application performance as the most complained-about aspects. Building on these studies, this research analyzes customer satisfaction in Tokopedia skincare product purchases using sentiment classification with IndoBERT and topic modeling with BERTopic. The focus is on four e-satisfaction dimensions: Delivery, Product Quality, Offers & Discount, and Customer Support. By analyzing 14,716 reviews from five leading skincare brands, this study aims to provide meaningful insights into customer experience and service improvement opportunities in e-commerce.

2. Literature Review

2.1 Consumer Behaviour

Behavior is influenced by psychological factors, social context, and internal motivation. In e-commerce, consumer behavior is further shaped by online interactions and peer-generated reviews, which play a key role in shaping product perceptions and purchase intentions. Consumer behaviour is influenced by marketing stimuli and other factors that play a role in the purchase decision process, starting from awareness of the need to buy or repurchase (Rachmawati, 2020)

2.2 Consumer Decision-Making Process

The consumer decision-making process involves five stages (Kotler et al., 2018): Need Recognition, where consumers identify problems or desires; Information Search, where they gather product-related information, often through online reviews (Prasetio et al., 2022); Evaluation of Alternatives, where options are compared; Purchase Decision, influenced by preferences and situational factors; and Post-Purchase Behavior, where satisfaction or dissatisfaction leads to feedback, including online reviews (Candiwan et al., 2021). This process is closely related to user-generated content, making customer reviews a key data source in e-commerce research.

2.3 E-Satisfaction Dimensions

E-Satisfaction is defined as a customer's evaluation of their online shopping experience, particularly whether it meets or exceeds their expectations. Kumar et al. (2023) categorized e-satisfaction into multiple dimensions including Delivery, Product Quality, Customer Support, and Offers & Discount. These dimensions serve as benchmarks to measure customer satisfaction in online platforms and are central to this study.

2.4 Research Framework



Figure 2. 1 Research Framework
Source: Kumar et al. (2023)

The framework outlines eight essential components that reflect the user experience when shopping online: App Experience, Delivery, Customer Support, Offers & Discount, Offline Competition, Payment Refunds, Stock Availability, and Product Quality. To maintain contextual relevance, this study focuses only on four dimensions: Delivery, Product Quality, Customer Support, and Offers & Discount. These dimensions were selected based on their frequent appearance and significance in user-generated reviews related to skincare purchases on Tokopedia. Other dimensions such as App Experience and Payment Refunds were excluded due to minimal mention in the dataset or low relevance to the skincare product category. The framework is operationalized through a combination of sentiment analysis and topic modeling techniques. First, sentiment classification is conducted using the IndoBERT model to identify the emotional tone either positive or negative expressed in each review. Next, reviews are grouped based on the four selected dimensions of e-satisfaction. To explore deeper insights, BERTopic is applied to detect dominant themes within both positive and negative sentiment categories. This integrated approach enables a nuanced understanding of how customers perceive specific service aspects and highlights key issues that influence their satisfaction. In addition to the four e-satisfaction dimensions analyzed in this study Delivery, Product Quality, Customer Support, and Offers & Discount several other dimensions from the framework of Kumar et al. (2023) were excluded due to their limited relevance to the skincare-related reviews on Tokopedia. The *App Experience* dimension, which covers aspects such as interface usability, navigation, and system performance, was omitted because the collected reviews rarely mentioned issues related to the application's interface or technical usability (Alzahrani et al., 2022). Similarly, the *Offline Competition* dimension, which addresses user comparisons between online shopping and traditional offline retail experiences, was excluded as such comparisons did not appear in the dataset (Wu & Chang, 2020). The *Payment Refunds* dimension, which involves refund processes due to transaction failures or product cancellations, was also excluded because it was infrequently discussed in the reviews (Jiang, 2024). Lastly, the *Stock Availability* dimension, which refers to product availability and inventory accuracy, was not included since it did not emerge as a significant concern among skincare customers on Tokopedia (Jiang, 2024).

3. Research Methodology

No	Research Characteristics	Type
1	Based on the method	Quantitative
2	Based on the objectives	Causal

3	Based on researcher involvement	Does not intervene in the data
4	Based on the unit of analysis	Individuals
5	Based on implementation time	Cross Sectional

Table 3. 1 Research Characteristics
Source: Author's Process, (2025)

This study adopts a quantitative method to examine customer satisfaction in the context of skincare product purchases on the Tokopedia platform. The research uses primary data collected through web scraping of user-generated reviews from verified brand stores, and is supported by secondary sources such as journal literature and online market insights.

A descriptive approach is applied to analyze sentiment trends and thematic patterns using text classification and topic modeling techniques. Sentiment classification is conducted using the IndoBERT model to determine emotional polarity (positive or negative), while BERTopic is used to extract key discussion themes within selected satisfaction dimensions: Delivery, Product Quality, Offers & Discount, and Customer Support. The study is cross-sectional, conducted in a natural, non-contrived environment, with individual Tokopedia customer reviews serving as the unit of analysis (Sekaran & Bougie, 2025).

4. Result and Analysis

4.1 Sentiment Analysis

The performance of the sentiment classification model is illustrated in Figure 4.4 through a confusion matrix. The model correctly classified 18 negative reviews (true negative) and 8 positive reviews (true positive). Misclassifications were relatively minor, with only 2 false positives and 2 false negatives. Overall, the model demonstrated good predictive accuracy with minimal classification errors.

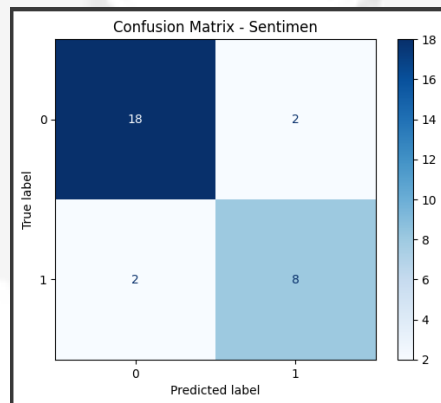


Figure 4. 1 Confusion Matrix Sentiment
Source: Author's Process, (2025)

4.2 Dimension Analysis

The sentiment classification using the IndoBERT model resulted in two sentiment categories: positive and negative. Out of 14,716 user reviews, 64.2% were classified as positive, while 35.8% were negative. The Delivery dimension received the highest total number of reviews overall, with more than 6,500 positive reviews and over 1,000 negative ones. This suggests that while many users expressed satisfaction with delivery performance, it also remains the most frequent source of complaints, especially concerning delays and packaging issues. Product Quality followed as the second most discussed dimension, dominated by positive sentiment. Offers & Discount also received largely positive feedback, whereas Customer Support had the fewest total mentions. These findings indicate that although delivery is the most engaging aspect of the user experience, it also carries the greatest risk of dissatisfaction and should be prioritized for improvement.

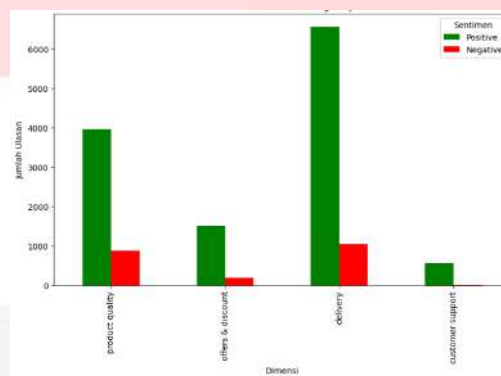


Figure 4. 2 Dimension Analysis Model Results
Source: Author's Process, (2025)

In the dimension classification task, the model achieved the highest accuracy in Product Quality, correctly classifying 49 reviews with only 4 misclassifications. For Offers & Discount, 46 reviews were correctly classified, with 4 minor errors. In the Delivery dimension, the model accurately predicted 32 reviews but misclassified 4. The Customer Support dimension had the lowest correct predictions, with 14 reviews correctly identified and 3 misclassified. Overall, the model performs reliably in distinguishing between dimensions, despite slight confusion in service-related categories.

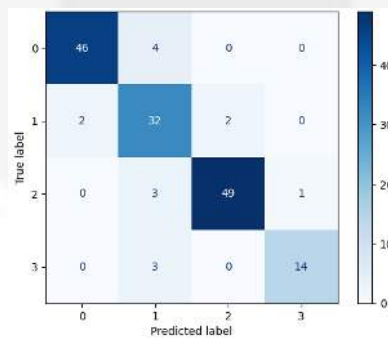


Figure 4. 3 Confusion Matrix Dimension
Source: Author's Process, (2025)

4.3 Topic Modelling

Topic modeling using BERTopic was applied to explore recurring themes within the **Delivery** dimension, which recorded the highest number of both positive and negative sentiments.

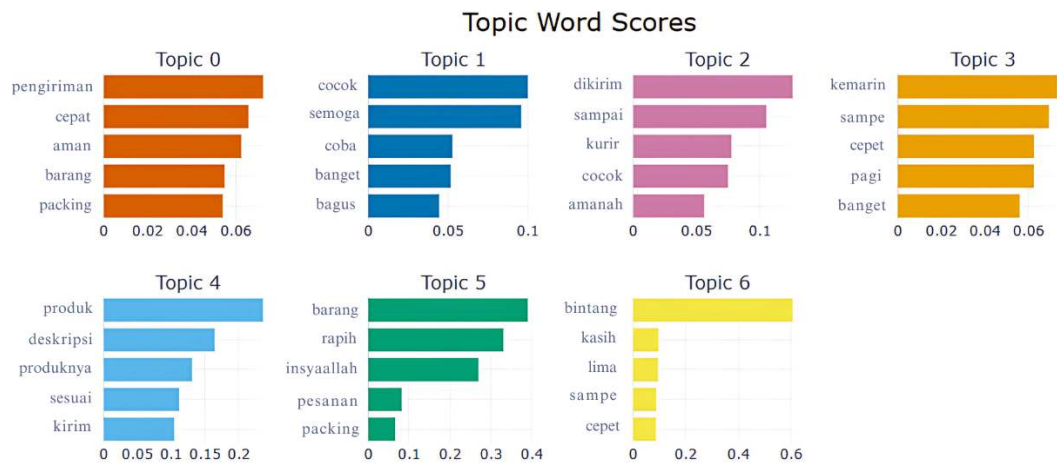


Figure 4. 4 Topic Word Scores Positive
Source: Author's Process, (2025)

As shown in Figure 1, positive reviews frequently mention keywords such as *"pengiriman"* (delivery), *"cepat"* (fast), *"aman"* (safe), *"barang"* (item), and *"packing"*. These topics suggest that many users expressed satisfaction with fast and secure delivery, as well as well-packaged items. Other clusters include terms like *"dikirim"*, *"sampai"*, and *"rapih"*, which reflect appreciation for timely and organized shipping processes.

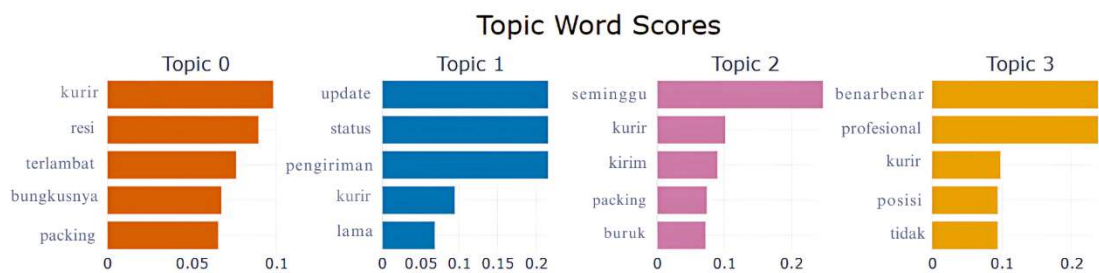


Figure 4. 5 Topic Word Scores Negative
Source: Author's Process, (2025)

In contrast, Figure 2 illustrates negative sentiment topics dominated by words such as *"kurir"* (courier), *"resi"* (tracking number), *"terlambat"* (delayed), *"pengiriman"* (delivery), and *"buruk"* (poor). These topics highlight user frustration regarding delayed deliveries, damaged packaging, unhelpful courier behavior, and lack of tracking updates. Phrases like *"update"*, *"status"*,

and "*seminggu*" reflect complaints about the absence of real-time delivery information and long wait times. The contrast between these two sets of topics shows that Delivery is a highly sensitive aspect of the customer experience. It is capable of generating both strong satisfaction and deep dissatisfaction depending on execution quality, emphasizing the need for consistent and reliable logistics services.

5. Discussion, Conclusion and Suggestion

5.1 Discussion

The sentiment analysis shows that most reviews (85.6% or 12,605 out of 14,716) are positive, while 14.4% (2,111 reviews) are negative. This finding is consistent with Firdaus et al. (2025), who found that e-commerce users generally have a positive perception of platforms, especially regarding delivery speed, promotions, product quality, and app usability. The relatively small proportion of negative sentiment indicates that issues occur less frequently compared to positive feedback. The *Delivery* dimension dominates with 51.6% (7,599 reviews: 6,566 positive; 1,033 negative), aligning with Kumar et al. (2023) who emphasized that delivery service is a key driver of customer satisfaction in e-commerce. In contrast, *Customer Support* has the smallest share (3.9% or 576 reviews), suggesting that direct support interactions are rare but, as noted by Kumar et al. (2023), remain important for maintaining overall satisfaction. Although *Delivery* records the highest number of positive reviews, it also has the largest number of negative reviews. Complaints often involve late deliveries, damaged packaging, courier professionalism, and inaccurate tracking systems. This indicates that delivery strongly influences perceptions both positively and negatively, differing from Firdaus et al. (2025) who identified app experience as the most negatively reviewed dimension. BERTopic analysis on the *Delivery* dimension revealed seven positive topics, highlighting speed, safety, accuracy, secure packaging, professional couriers, and promotions such as *free shipping*. Conversely, five negative topics included impolite courier behavior, inaccurate tracking, poor packaging, missed estimates, and slow complaint handling. These results confirm Kumar et al. (2023) in emphasizing the strategic importance of delivery quality, but also reveal that it is simultaneously Tokopedia's main strength and its vulnerability. Improvements in tracking accuracy, packaging quality, and customer communication are recommended to strengthen long-term trust.

5.2 Conclusion

This study confirms the value of combining sentiment classification with topic modeling to evaluate customer satisfaction in the skincare product segment on Tokopedia. The IndoBERT-based sentiment analysis revealed that a majority of reviews were positive, with Product Quality and Offers & Discount being the strongest contributors to customer satisfaction. However, the Delivery dimension generated the highest number of negative reviews, signaling recurring issues related to late shipments, damaged packaging, and courier service quality. Through BERTopic, the Delivery category was also found to dominate in both positive and negative topic clusters, showing it as the most emotionally impactful aspect of the shopping experience. The integration of these two analytical methods provides a comprehensive understanding of customer perceptions and highlights key service areas requiring strategic improvement.

5.3 Recommendation

1. E-commerce platforms and skincare sellers should focus on optimizing logistics performance by minimizing delivery delays and improving packaging standards. Enhancing courier coordination and providing clearer tracking updates can help reduce complaints and strengthen consumer trust.
2. For academic development, this study contributes to the use of natural language processing (NLP) in consumer behavior analysis, specifically by demonstrating the effectiveness of combining sentiment classification and topic modeling. Future research is encouraged to explore additional satisfaction dimensions such as Payment

Experience, Stock Availability, or App Interface, and to complement UGC-based findings with survey-based or interview-based primary data for greater depth and validation.



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