JISORA
JURNAL ILMU SOSIAL, POLITIK & HUMANIORA

VOLUME 1 NO 1 2023

Analyze Netizen Sentiment on the Shopee Application

Denica Emilia Vernanda[1)]
Fitrin Rawati Suganda[3)]
1) Affiliation: Faculty of Economics, Garut University, Garut, Indonesia

Abstract

Internet users in Indonesia continue to grow yearly, with the number of users in 2020 reaching 160 million. Most people access social media, primarily buying and selling e-commerce platforms. Based on data from the *Play Store* in 2020, Shopee is ranked first as the most frequently used e-commerce application. Seeing this phenomenon, a goal was formed to examine the sentiment of netizens towards the Shopee application. Researchers chose qualitative methods with extensive data analysis assisted by NVIVO applications to achieve this goal. This study uses secondary data by looking at the research unit in the form of comments in the application comment column on *Google Play* by *text mining*. The results of this study are that 52.39% of Shopee users give negative comments, 41.26% positive comments, and 6.35% neutral comments, so it can be concluded that Shopee still has many shortcomings that must be corrected to provide the best service to the user community.

Keyword: Netizen sentiment; big data; text mining

1. Introduction

Internet users continue to grow yearly (Ismulyaty et al., 2022). According to research Detiknet written by Haryanto (2020), there are 175.4 million Indonesians who are active internet users out of a total population of 272.1 million people. Most Indonesians use the internet to access social media, with an estimated 160 million users.

The function of the Internet is to store various types of information with large amounts as a medium of communication and transactions so that it is helpful to make purchase transactions at any time (Kopetz & Steiner, 2022). Various kinds of information on the internet make it easy for users to search for services extensively, adjust specification information according to needs, compare prices, types and even become a place to get products where sellers and buyers do not have to meet face to face or familiarly referred to as e-commerce (Mardatilla et al., 2017).

Putra (2019) said that the world e-commerce industry continues to grow, including in Indonesia. Each online shopping platform competes to provide attractive promos and innovations that pamper its users. The use of technology is also felt in the interaction between service providers and service users. The media that can bridge the community to use e-commerce applications is Google Play (Liu, 2022).

Google Play is an online storage place that provides various needed applications. Apart from providing multiple applications, Google Play offers detailed information regarding the applications we use, such as the number of downloads, ratings, and user comments (Yucedal, 2023). One of the proliferating e-commerce sites in Indonesia is Shopee (Hoiriyah et al., 2022). Based on ranking data from Playstore, As of 2020, Shopee is rated first. Following the application, the second, third, and so on are Tokopedia, Lazada, Bukalapak, Sale Stock Indonesia (Sorabel), BliBli, JD ID, Zalora, Ali Express, and in tenth place is Alfacart.

Shopee is a platform for Online-based shopping that provides various sales products ranging from electronics, household appliances, clothing, and accessories to fashion (Dwijantoro et al., 2022). In addition to providing multiple products, other advantages of Shopee are. The buyer can return the goods or funds if the goods received are less desired (Kurniawati & Ariyani, 2022). Users can also find items quickly in the search field by entering a picture of the item being searched. Shopee also provides a free shipping feature for shipping goods.

Based on the information in Google Play, the number of Shopee App downloaders until March 17, 2020, is already more than 40 million. This indicates that the interest of the Indonesian people in the Shopee application is relatively high (Rustam et al., 2022). Shopee also has a reasonably high rating of 4.6 out of 5. The number of comments on the Shopee application was 3,782,524 as of March 17, 2020. These numbers indicate that Shopee is an e-commerce app that provides a sense of security, comfort, and trust when shopping (Yunus et al., 2022). Although it has good value when viewed quantitatively, from a qualitative point of view, Shopee received various comments as a form of public sentiment toward the application (Pratiwi & India, 2022).

Sentiment analysis is a method of obtaining data from a variety of platforms on the internet and looking at technological advances to recognize a term that is considered a favorable opinion or vice versa (Tsalis, 2020). Some researchers have carried out This type of analysis by associating it with Big Data (Prime et al., 2022).

Big Data is popularly used to analyze data (Permadi, 2022). Use Big Data to identify more efficient ways of doing business. So, the decision-making process is faster and better to know the target market's desires (Ramdhani et al., 2019). In this study, Big Data was used to facilitate processing to strengthen arguments regarding the many positive and negative sentiments regarding the Shopee application.

2. Literature Review

Big Data

Data is the number, character, or symbol where operations are carried out by a computer, which can be stored and sent in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media (Pane & Saputra, 2020). Furthermore, Big data can be translated as a collection or integration of vast and complex amounts of data, making it difficult to manage by ordinary database management or conventional processing applications (Wijaya & Wijaya, 2018). Big data is also data but with a considerable size. Big data is a term used to describe data sets that are very large but grow exponentially over time (Hancock & Khoshgoftaar, 2020).

Big Data has characteristics known as 6V, namely volume, variety, velocity, veracity, variability, and value that define the modern view of big data (Ristevski & Chen, 2018). The name big data itself is associated with a considerable size. The size of the data plays a vital role in determining the value of the data. Also, whether a particular piece of data can be considered big data or not

depends on the volume of data. Therefore, "volume" is one of the characteristics to consider when dealing with Big Data (Hancock & Khoshgoftaar, 2020)

The next aspect of big data is its diversity. Variety refers to the heterogeneous sources and nature of structured and unstructured data. In the earlier days, spreadsheets and databases were the only data sources considered by most applications. Currently, data is in emails, photos, videos, monitoring devices, PDFs, audio, etc. It is also being considered in analytics applications. This diversity of unstructured data poses particular problems for data storage, mining, and analysis (Pane & Saputra, 2020).

The following characteristic of Big Data is velocity. The term velocity refers to the speed at which data is created. How quickly data is generated and processed to meet demand determines the real potential of the data. Big Data Velocity deals with the speed at which data flows from sources such as business processes, application logs, networks, social media sites, sensors, mobile devices, etc. Data flow is tremendous and continuous (Tabesh et al., 2019). Regarding Variability, this refers to the inconsistencies shown by data at a specific time, thus hampering the process of handling and managing data effectively (Pane & Saputra, 2020).

The next part is the truth (Veracity). As big data becomes more extensive and the variety of sources of significant data increases, there are many opportunities for huge inconsistencies and abnormalities in the data. The reliability or trustworthiness of the data needs to be improved. Data inconsistencies and irregularities are among the leading challenging factors indispensable to big data (Narasimhan, 2014).

The last characteristic of Big Data is Value (Value). Value relates to the costs that all organizations must pay attention to in implementing big data. It is necessary to implement software packages or framework implementations (Narasimhan, 2014).

Text Mining

Text mining is the process of mining data in the form of text where the data source is usually obtained from documents, and the goal is to find words that can represent the contents of the paper so that analysis of the relationship between the documents can be carried out (Aditya, 2015). According to (Larose & Larose, 2014), text mining is the analysis of information to acquire knowledge, including information retrieval, lexical or semantic analysis to study word frequency distribution, pattern recognition, information extraction, data mining techniques, including link and association analysis, visualization, and predictive analysis.

Data sources used in text mining are a text set with an unstructured or at least semi-structured format (Wang &; Lo, 2021). The specific tasks of text mining include categorizing and grouping text (Kushwaha et al., 2021). A process is needed to obtain the information in question for these texts to be used as data. This technique is known as sentiment analysis (Juditha, 2019).

Sentiment Analysis / Opinion Mining

Opinion mining or sentiment analysis is a branch of research from text mining, whose focus is to analyze the opinions of a document in text form (Chandrasekaran & Kumar De, 2021). Sentiment analysis is a growing field of research today. In this field, research is focused on the computational study of opinions, attitudes, and emotions written in text form (Medhat et al., 2014). Then Narasimhan (2014) Explains that sentiment analysis is a field of study that analyzes people's opinions, sentiments, evaluations, judgments, attitudes, and emotions towards entities such as products, services, organizations, individuals, issues, events, topics, and attributes.

Generally speaking, there are three sentiment analysis levels: document, sentence, entity, and aspect (Liu, 2022). Sentiment analysis is done automatically to classify opinions with contained words. Classification Multiclass is a classification method that has more than two target classes (Iwańkowicz, 2021).

In contrast, Grljević et al. (2022) which means opinion mining, Is a process of understanding, extracting, and processing textual data automatically to obtain information. In general, opinion mining is necessary to know the attitude of a speaker or writer concerning some topic or the contextual polarity of the whole document. Trend research on sentiment analysis focuses on opinions that state or imply a positive or negative sentiment. Opinions represent almost all human activities because opinions can influence a person's behavior. In the real world, businesses and organizations always want to see public opinion about a product or service (Liu, 2022).

Computer researchers widely use this analysis to determine the tendency to know about a particular figure or topic in online media such as news portals and social media (Juditha, 2019). Sentiment analysis is used to understand comments created by users (internet) and explain how they receive a product or brand (Grljević et al., 2022).

3. Methodology of Research

This research method includes qualitative method research. Based on its purpose, this study is included in descriptive research. Meanwhile, based on the analysis unit, this research is a type of research with individual analysis units, namely netizen accounts, in the comment column of the Shopee application on the Google Play Store. Based on the time of the study, this research is included in a *cross-sectional* analysis. In the data processing process, researchers use *Nvivo 12* software.

4. Result and Discussion

Coding

In the first stage, researchers coded the data and highlighted some of the most discussed parts. These details are shown in Table 1. In coding, the author interpreted from Indonesian to English.

Table 1.
Coding

Coding	***Quotation***
Quality of Information	1. "Why is the product so incomplete? Do you want to order until it does not happen?" 2. "Is it no longer allowed for Shopee to sell vape/pod products..." 3. "E-cigarette vape vapor, how can it be unopened..." 4. "... Just want to buy vape, it is difficult, please dong shops that sell vape, pods do not be blocked..." 5. "... Even though you have subscribed to use Shopee to buy vape equipment, now you cannot..." 6. "Going into the search for vape cannot be..." 7. "Why don't pod/vape products in search appear? while the beer (alcoholic beverage) products from the search can come up?" 8. "... I have been cheated on shopping at Shopee 3 times, starting from items that do not match..."

Coding	*Quotation*
	9. "The goods sold are not suitable..." 10. "... the goods ordered are not by those who come..."
Application Quality	1. "Please be clear about the shop application; you can enter but cannot see the picture..." 2. "... It has been two weeks since the picture did not appear." 3. "Slow, the latest is still slow..." 4. "I am sorry, I am disappointed since the picture update did not appear..." 5. "... open the application only the item name and the price of the item listed with a blank image is white..." 6. "... already in the update also continue to uninstall first hope there is a change but still..." 7. "... the application has also been updated until it is uninstalled again; it still cannot be opened..." 8. "It has been two days since the Shopee application could not be opened; I still cannot update it; I uninstall it and keep reinstalling, but it still cannot..." 9. "... But the application is cumbersome, and the response is too slow, slow to load item images and item information when selected, and slow when want to choose to return." 10. "... Tsel 4G network is stable, internet quota is a lot, internal memory is quite large, but the application runs very slowly..." 11. "... the app is getting heavier and slower..." 12. "... Why is it so slow, fini shopee?..." 13. "The performance is slow..."
Third Parties	1. "... my goods have not been delivered yet..." 2. "The delivery is long even though the East Jakarta area to East Jakarta..." 3. "... 1. The goods did not reach my hands, but I have received the statement, 2. I ordered three days ago, and until today, it has not been sent..." 4. "... goods are not delivered2, the delivery deadline changes as they please without thinking about consumer losses..." 5. "... I am not professional in the privacy policy when my goods are lost and not delivered by the courier..." 6. "... I was disappointed because the items I bought at Shopee did not come; the status check was only in process..." 7. "... I ordered one item, but the item has not been delivered yet..." 8. "... I have to set the delivery problem max two days after payment. this I paid on the 14th and sent on the 18th..." 9. "Why every time you buy at Shopee, it always takes so long to deliver five days..." 10. "Suck stuff has not been two weeks to the point..."
Transaction Convenience	1. "... The availability of ShopeePay and ShopeePayLater makes it very easy..." 2. "... The ShopeePayLater payment method is beneficial..."

Coding	*Quotation*
	3. "... given capital with shopeepaylater..." 4. "Shopee is good at making shopeepaylater; it is beneficial..." 5. "... Now there is a ShopeePayLater program, so you can shop first, pay later..." 6. "... Moreover, plus the ShopeePayLater feature, it is beneficial if you need urgent goods..." 7. "... Thank you for increasing your ShopeePayLater balance..." 8. "... Now there is ShopeePayLater that can credit without a card." 9. "... There is a ShopeePayLater system that can shop first, pay later..." 10. "... Pay via ShopeePay, which is simple and fast..."
Promotion	1. "... Shopee offers a lot of vouchers and cashback to reimburse the shipping costs..." 2. "... Free shipping and added cashback..." 3. "... Free shipping makes me addicted to shopping..." 4. "... The shipping is also often free..." 5. "... There is always free shipping or massive discounts..." 6. "... always free shipping..." 7. "Shopee 3.3 Fashion Sale is getting better..." 8. "... many discounts, free shipping vouchers..." 9. "Thank you, shopee 12.12 Birthday..." 10. "... many discounts from each of his stores..."
Price	1. "... the price is also quite cheap compared to others..." 2. "... I bought a cellphone, the price is cheap, not up to 1 million..." 3. "... cheap but not cheap..." 4. "Thank you, shopee cheap shopping..." 5. "... such a low price..." 6. "... low price and quality..." 7. "The goods are good, and the price is also low." 8. "Shopping at Shopee is safe, satisfying, reliable, cheap..." 9. "... This Shopee application is suitable for those of you who want to buy cheap goods, but the quality is good and ok." 10. "E-commerce is the cheapest of the others..."

Source: processed from secondary data

Sentiment Analysis

Sentiment analysis is carried out to discover the weaknesses in the output of the Shopee application so that the research results can provide valuable information for improving the Shopee application on *Google Play*.

Unlike the previous analysis tool, limited to 30 thousand comments, sentiment analysis arises from the overall comments presented by *Google Play*. This is certainly a determinant of the yield gap and a good comparison. However, there is a disadvantage of sentiment output provided by the application where it is unable to read words coming from non-standard Indonesian, writing

typos, and not being able to read words from the region, so the possibility of analysis errors can occur.

To discover these weaknesses, content validation is carried out by conducting a manual sentiment analysis with *text mining/opinion mining*. Of more than 30,000 comments, not all expressed sentiment; as many as 5,400 words were neutral. Comments containing negative sentiment were 17,100, and those containing positive sentiment were 18,300. The figure came about because a user expressed positive and negative sentiments in one comment.

From the results of the coding made in Table 1, the researcher read the comments from netizens again and then analyzed the sentiment. Table 2 is an example of several *Quotation* which is analyzed sentiment.

Table 2.
Sentiment Analysis

Coding	***Quotation***
Quality of Information	1. "Why is the product so incomplete? Do you want to penny until it does not happen?" <NEGATIVE> 2. "Is it no longer allowed for Shopee to sell vape/pod products..." <NEGATIVE> 3. "E-cigarette vape vapor, how can it be unopened..." <NEGATIVE> 4. "... Just want to buy vape, it is difficult, please dong shops that sell vape, pods do not be blocked..." <NEGATIVE> 5. "... Even though you have subscribed to use Shopee to buy vape equipment, now you cannot..." 6. "Going into the search for vape cannot be..." <NEGATIVE> 7. "Why don't pod/vape products in search appear? while beer products from the search can come up?" <NEGATIVE> 8. "... I have been cheated on shopping at Shopee 3 times, starting from items that do not match..." <NEGATIVE> 9. "The goods sold are not suitable..." <NEGATIVE> 10. "... the goods ordered are not following those who come..." <NEGATIVE>
Application Quality	1. "Please be clear about the shop application; you can enter but cannot see the picture..." <NEGATIVE> 2. "... It has been two weeks since the picture did not appear." <NEGATIVE> 3. "Slow, the latest is still slow..." <NEGATIVE> 4. "I am sorry, I am disappointed since the picture update did not appear..." <NEGATIVE> 5. "... open the application only the item name and the price of the item listed with a blank image is white..." <NEGATIVE> 6. "... already in the update also continue to uninstall first, hope there is a change, but still..." <NEGATIVE> 7. "... the application has also been updated until it is uninstalled again; it still cannot be opened..." <NEGATIVE>

Coding	*Quotation*
	8. "It has been two days since the Shopee application could not be opened; I still cannot update it; I uninstall it and keep reinstalling, but it still cannot..." <NEGATIVE> 9. "... But the application is cumbersome, and the response is too slow, slow to load item images and item information when selected and slow when you want to choose to return" <NEGATIVE> 10. "... Tsel 4G network is stable, internet quota is a lot, internal memory is quite large, but the application runs very slowly..." <NEGATIVE> 11. "... the app is getting heavier and slower..." <NEGATIVE> 12. "... Why is it so slow, fini shopee?..." <NEGATIVE> 13. "The performance is slow..." <NEGATIVE>
Third Parties	1. "... my goods have not been delivered yet..." <NEGATIVE> 2. "The delivery is long even though the East Jakarta area to East Jakarta..." <NEGATIVE> 3. "... 1. The goods did not reach my hands, but I have received the statement, 2. I ordered three days ago, and until today, it has not been sent..." <NEGATIVE> 4. "... goods are not delivered2, the delivery deadline changes as they please without thinking about consumer losses..." <NEGATIVE> 5. "... I am not professional in the privacy policy when my goods are lost and not delivered by the courier..." <NEGATIVE> 6. "... I am disappointed because the items I bought at Shopee did not go away; the status check is only in process..." <NEGATIVE> 7. "... I ordered one item, but the item has not been delivered yet..." <NEGATIVE> 8. "... must set the delivery problem also max two days after payment, this is the 14th paid on the 18th..." <NEGATIVE> 9. "Why every time you buy at Shopee, it always takes so long to deliver five days..." <NEGATIVE> 10. "Suck stuff has not been two weeks to the point..." <NEGATIVE>
Transaction Convenience	1. "... The availability of ShopeePay and ShopeePayLater makes it very easy..." <POSITIVE> 2. "... The ShopeePayLater payment method is beneficial..." <NEUTRAL> 3. "... given capital with shopeepaylater..." <NEUTRAL> 4. "Shopee is good at making shopeepaylater; it is beneficial..." <NEUTRAL> 5. "... Now there is a ShopeePayLater program, so you can shop first, pay later..." <POSITIVE> 6. "... Moreover, plus the ShopeePayLater feature, it is beneficial if you need urgent goods..." <POSITIVE> 7. "... Thank you for increasing your ShopeePayLater balance..." <POSITIVE> 8. "... Now there is ShopeePayLater can credit without a card" <POSITIVE>

Coding	*Quotation*
	9. "... There is a ShopeePayLater system that can shop first, pay later..." <POSITIVE> 10. "... Pay via ShopeePay, which is simple and fast..." <POSITIVE>
Promotion	1. "... Shopee offers a lot of vouchers and cashback to reimburse the shipping costs..." <POSITIVE> 2. "... Free shipping and added cashback..." <POSITIVE> 3. "... Free shipping makes me addicted to shopping..." <POSITIVE> 4. "... The shipping is also often free..." <POSITIVE> 5. "... There is always free shipping or massive discounts..." <POSITIVE> 6. "... always free shipping..." <POSITIVE> 7. "Shopee 3.3 Fashion Sale is getting better..." <POSITIVE> 8. "... many discounts, free shipping vouchers..." <POSITIVE> 9. "Thank you, shopee 12.12 Birthday..." <POSITIVE> 10. "... many discounts from each of his stores..." <POSITIVE>
Price	1. "... the price is also quite cheap compared to others..." <NEUTRAL> 2. "... I bought a cellphone, the price is cheap, not up to 1 million..." <POSITIVE> 3. "... cheap but not cheap..." <POSITIVE> 4. "Thank you, shopee cheap shopping..." <POSITIVE> 5. "... such a low price..." <POSITIVE> 6. "... low price and quality..." <POSITIVE> 7. "The goods are good, and the price is also cheap..." <POSITIVE> 8. "Shopping at Shopee is safe, satisfying, reliable, cheap..." <POSITIVE> 9. "... This Shopee application is suitable for those of you who want to buy cheap goods, but the quality is good and ok" <POSITIVE> 10. "E-commerce is the cheapest of the others..." <POSITIVE>

Source: processed from secondary data

After conducting sentiment analysis on all data, findings were obtained regarding the tendency of application users in their comments presented in Table 3.

Table 3.
User Sentiment Frequency

Coding	Types of Sentiment			Total
	Positive	Negative	Neutral	
Quality of Information		15.87%		15.87%
Application Quality		20.65%		20.65%
Third Parties		15.87%		15.87%
Transaction Convenience	11.11%		4.76%	15.87%

Coding	Types of Sentiment			Total
	Positive	Negative	Neutral	
Promotion	15.87%			15.87%
Price	14.28%		1.59%	15.87%
Total				100%

Source: processed from primary data

To simplify the data in Table 2, the author presents it as a pie chart in Figure 1.

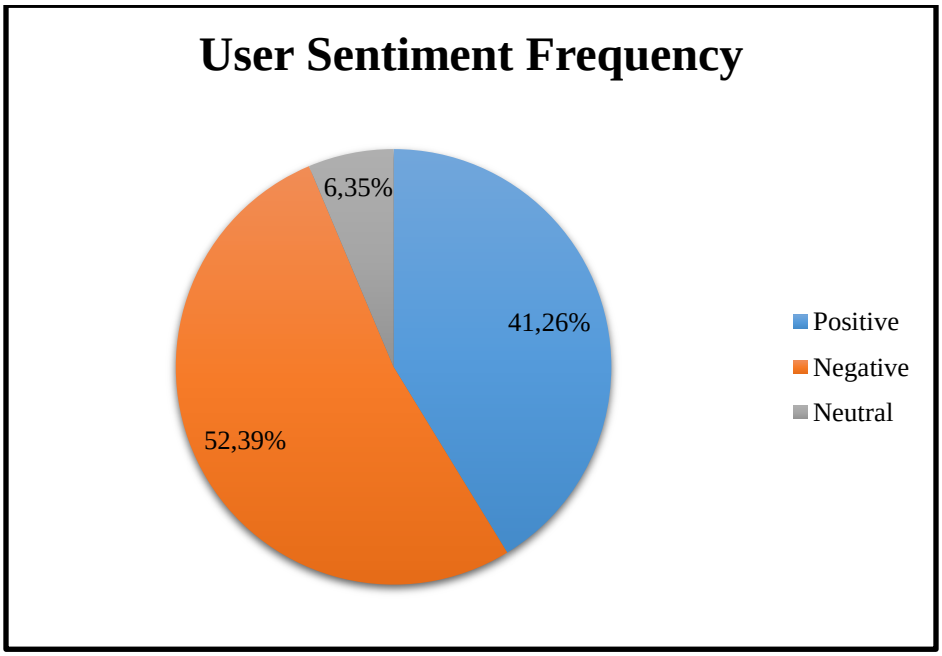


Figure 1.
User Sentiment Frequency
Source: proceed from primary data

The study's results in Figure 1 show that 41.26% of users gave positive comments, 52.39% gave negative comments, and 6.35% gave neutral comments. So, it can be concluded that Shopee users are dominated by users who comment negatively.

After reducing the data, words were found that refer to several things, namely, quality of information, quality of application, and third parties with negative comments; besides that, some words refer to the convenience of transactions, promotions, and prices with positive comments, so by conducting a discussion that refers to previous research by comparing whether there are other findings from the resulting findings. The following are presented findings produced with previous research findings in Figure 2.

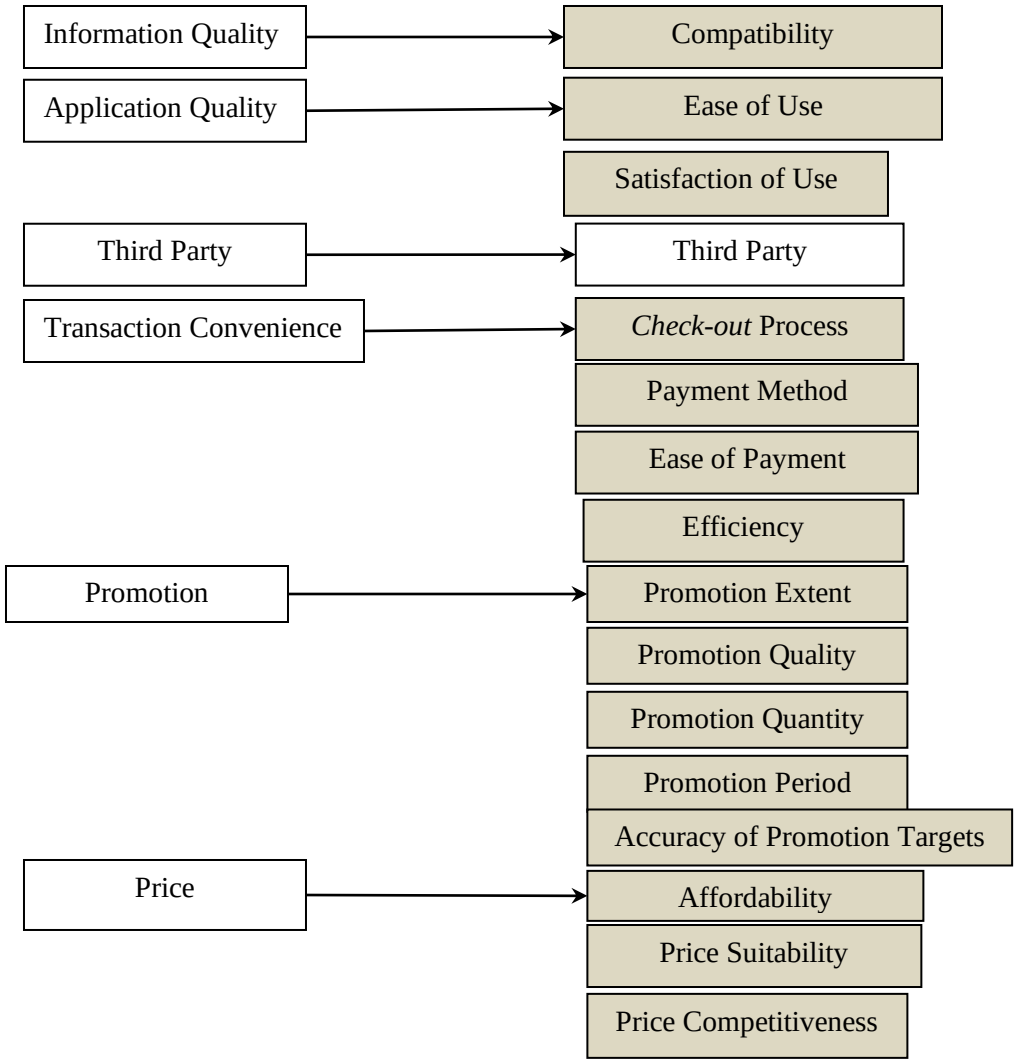


Figure 2 Findings with Previous Research Findings
Source: proceed from primary data

It can be seen in Figure 2 that the findings in this study and the conclusions of the previous research have no difference, and it will be explained as follows.

Quality of Information

Previous research has found that the quality of information affects purchasing decisions. Information quality factors determine the occurrence of buying decisions on products or goods because the quality of data is a factor that must be able to convince customers of the product being marketed. After all, with accurate information quality, customers can see the picture of the product being sold. Additionally, *up-to-date* information can comfort customers who want to continue to exist for products and goods in marketing (Rahmizal & Yuvendri, 2021). While in this study, Shopee users complained that the products they received were not as expected and information about products that were not *up-to-date*.

Application Quality

Shopee users complain that product images do not appear, making it difficult for users when they want to shop. Moreover, the reliability of the Shopee application has received much criticism because the slow application has been updated, but there has been no change.

Third Parties

Delivery of goods is often late, so many Shopee users complain that goods that do not reach the buyer but are in the product delivery description have been received.

Transaction Convenience

Previous studies had findings of transaction convenience as the mode of payment. The results show that consumers feel that shopping online provides freedom in the time and place of making a purchase and in terms of order payment. The app gives consumers a choice regarding which payment methods to choose from and use. For example, online credit or *debit cards,* bank transfers, Indomaret/Ceriamart, Alfamart, etc. This finding is also the same as the findings in previous studies; it is just more detailed about the payment methods provided by Shopee, such as ShopeePay, with ShopeePay making it easier for customers to shop without having to go to an ATM for other features, namely ShopeePayLater, ShopeePayLater itself is a shopping now pay later component that further spoils Shopee users in shopping. As Hadijah (2019) stated, Shopee's *pay later* service aims to make it easier for customers who shop or sell at Shopee.

Promotion

Previous research found that consumers like to shop at the Shopee marketplace because of the many promotional activities. This finding is also the same as the findings in the previous study; it is just more detailed, namely the promotional efforts carried out *by Shopee, such as flash sales*, gold rain shakes, *cashback*, free shipping, discounts, shopping *vouchers*, and Shopee also often holds campaigns such as Shopee 11.11 Big Sale, 12.12 *Big Sale by presenting the best choice of products.*

According to Yoebrilianti (2018), sales promotion is a form of direct persuasion through various incentives that can be arranged to stimulate immediate product purchases or increase the amount customers buy.

Price

On price, seen from previous research, it produced affordability findings, price suitability with benefits and quality received by consumers, and price competition with competing marketplaces. In previous research, it was discussed that the perception of prices that exist in consumers must be considered by sellers on the Shopee marketplace. So, they must pay attention to affordable prices and competition with *other marketplaces*.

Price is something that consumers must pay to get an item (Setiyaningrum, 2015). At this point, there are no additional findings between previous research and this study; it is just more detailed about the price provided, which is cheaper than other *e-commerce* and prices by quality.

5. Conclusion

Based on the results of research and discussion on the analysis of netizen sentiment on the Shopee application, from the results of sentiment analysis shopee users gave 52.39% negative comments, 41.26% positive comments, and 6.35% neutral comments, so it can be concluded that Shopee still has many shortcomings that its party must correct. One improvement that can be done is improving services so that these aspects can be maximized as a form of priority for the user community.

REFERENCE

Aditya, B. R. (2015). Penggunaan Web Crawler Untuk Menghimpun Tweets dengan Metode Pre-Processing Text Mining. *JURNAL INFOTEL - Informatika Telekomunikasi Elektronika*, *7*(2), 93. https://doi.org/10.20895/infotel.v7i2.35

Chandrasekaran, S., & Kumar De, S. (2021). Decoding User Interaction Dynamics on Facebook Fan Page: A Sentiment Mining Approach. *Global Business Review*, *22*(5), 1146–1159. https://doi.org/10.1177/0972150918825078

Dwijantoro, R., Dwi, B., & Syarief, N. (2022). PENGARUH HARGA, KUALITAS PRODUK, DAN PROMOSI TERHADAP KEPUTUSAN PEMBELIAN MARKETPLACE SHOPEE. *Jurnal Riset Manajemen Dan Bisnis*, *16*(2), 63. https://doi.org/10.21460/jrmb.2021.162.392

Grljević, O., Bošnjak, Z., & Kovačević, A. (2022). Opinion mining in higher education: A corpus-based approach. *Enterprise Information Systems*, *16*(5), 1773542. https://doi.org/10.1080/17517575.2020.1773542

Hadijah, S. (2019, Oktober 16). *Aplikasi Layanan Pay Later Makin Diminati, Yuk Cek Keuntungan dan Kerugiannya*. Retrieved November 7, 2020, from cermati.com: https://www.cermati.com/artikel/aplikasi-layanan-pay-later-makin-diminati-yuk-cek-keuntungan-dan-kerugiannya.

Hancock, J. T., & Khoshgoftaar, T. M. (2020). CatBoost for big data: An interdisciplinary review. *Journal of Big Data*, *7*(1), 94. https://doi.org/10.1186/s40537-020-00369-8

Haryanto, A. T. (2020, Februari 20). *Riset: Ada 175,2 Juta Pengguna Internet di Indonesia*. Retrieved Maret 15, 2020, from detikinet: https://inet.detik.com/cyberlife/d-4907674/riset-ada-1752-juta-pengguna-internet-di-indonesia?_ga=2.11293364.1854361021.1584421692-789618124.1584421692.

Hoiriyah, H., Darmansah, D., & Purbaya, M. E. (2022). Pengaruh User Experience dan Consumer-Based Brand Equity Terhadap Loyalitas Pengguna Shopee. *JURIKOM (Jurnal Riset Komputer)*, *9*(3), 688. https://doi.org/10.30865/jurikom.v9i3.4269

Ismulyaty, S., Nurmaini, & Roni, M. (2022). Pengaruh Kualitas Layanan Dan Kepuasan Pengguna Internet Banking Terhadap Loyalitas Nasabah Bank Syariah Indonesia (Bsi Kalirejo): The Effect Of Service Quality And Internet Banking User Satisfaction On Customer Loyalty Of Bank Syariah Indonesia (BSI KALIREJO). *NISBAH: Jurnal Perbanka Syariah*, *8*(1), 66–75. https://doi.org/10.30997/jn.v8i1.6117

Iwańkowicz, R. (2021). A Multi-Case-Based Assembly Management Method for the Shipbuilding Industry. *Polish Maritime Research*, *28*(2), 27–35. https://doi.org/10.2478/pomr-2021-0018

Juditha, C. (2019). Comparison of SARA Issues Sentiment between Online News Portal and Social Media Towards the 2019 Election. *Journal Pekommas*, *4*(1), 61. https://doi.org/10.30818/jpkm.2019.2040107

Kopetz, H., & Steiner, W. (2022). Internet of Things. In H. Kopetz & W. Steiner, *Real-Time Systems* (pp. 325–341). Springer International Publishing. https://doi.org/10.1007/978-3-031-11992-7_13

Kurniawati, A., & Ariyani, N. (2022). Strategi Promosi Penjualan pada Marketplace Shopee. *PROPAGANDA*, *2*(1), 65–79. https://doi.org/10.37010/prop.v2i1.514

Kushwaha, A. K., Kar, A. K., & Dwivedi, Y. K. (2021). Applications of big data in emerging management disciplines: A literature review using text mining. *International Journal of Information Management Data Insights*, *1*(2), 100017. https://doi.org/10.1016/j.jjimei.2021.100017

Larose, D. T., & Larose, C. D. (2014). *Discovering Knowledge in Data: An Introduction to Data Mining* (1st ed.). Wiley. https://doi.org/10.1002/9781118874059

Liu, G. (2022). An ecommerce recommendation algorithm based on link prediction. *Alexandria Engineering Journal*, *61*(1), 905–910. https://doi.org/10.1016/j.aej.2021.04.081

Mardatilla, R., Kusyanti, A., & Aryadita, H. (2017). Pengaruh Kualitas Layanan Terhadap Kepuasan, Kepercayaan dan Loyalitas Pelanggan Pada E-Commerce (Studi Kasus: Berrybenka). *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, *1*(12), 1822–1832.

Medhat, W., Hassan, A., & Korashy, H. (2014). Sentiment analysis algorithms and applications: A survey. *Ain Shams Engineering Journal*, *5*(4), 1093–1113. https://doi.org/10.1016/j.asej.2014.04.011

Narasimhan, R. (2014). Big Data – A Brief Study. *International Journal of Scientific & Engineering Research*, *5*(9).

Pane, S. F., & Saputra, Y. A. (2020). *Big Data Classification Behavior Menggunakan Python.* Bandung: Kreatif Industri Nusantara.

Perdana, A., Hermawan, A., & Avianto, D. (2022). Analisis Sentimen Terhadap Isu Penundaan Pemilu di Twitter Menggunakan Naive Bayes Clasifier. *Jurnal Sisfokom (Sistem Informasi Dan Komputer)*, *11*(2), 195–200. https://doi.org/10.32736/sisfokom.v11i2.1412

Permadi, H. (2022). Penambangan Opini Pada Data Multidomain Memanfaatkan Stream Big Data Twitter. *Seminar Nasional Official Statistics*, *2022*(1), 751–758. https://doi.org/10.34123/semnasoffstat.v2022i1.1144

Pratiwi, A. S., & Indita, S. (2022). Pengaruh Kualitas Pelayanan Shopee PayLater Terhadap Keputusan Pengguna. *Lisyabab : Jurnal Studi Islam Dan Sosial*, *3*(2), 244–254. https://doi.org/10.58326/jurnallisyabab.v3i2.140

Rahmizal, M., & Yuvendri, R. (2021). PENGARUH KEPERCAYAAN, KEMUDAHAN DAN KUALITAS INFORMASI TERHADAP KEPUTUSAN PEMBELIAN DARING DI APLIKASI SHOPEE PADA MAHASISWA DI KOTA PADANG. *JURNAL PUNDI*, *4*(3). https://doi.org/10.31575/jp.v4i3.336

Ramdhani, A., Muzadid, B. K., Alamanda, D. T., & Fahruroji, F. (2019). Persepsi Netizen Terhadap Kebijakan Pemerintah Pada Ojek Online Menggunakan Twitter Analysis. *SEMNATI 2019*. https://prosiding.uika-bogor.ac.id/index.php/semnati/article/view/276

Ristevski, B., & Chen, M. (2018). Big Data Analytics in Medicine and Healthcare. *Journal of Integrative Bioinformatics*, *15*(3), 20170030. https://doi.org/10.1515/jib-2017-0030

Rustam, D., Mulya, R., & Aisyah, S. (2022). Analisis Permintaan Pakaian Pada Marketplace Shopee di Generasi Milenial. *Jurnal Ekobistek*, 251–256. https://doi.org/10.35134/ekobistek.v11i3.368

Setiyaningrum, A. (2015). *Prinsip-Prinsip Pemasaran.* Yogyakarta: Andi Offset.

Tabesh, P., Mousavidin, E., & Hasani, S. (2019). Implementing big data strategies: A managerial perspective. *Business Horizons*, *62*(3), 347–358. https://doi.org/10.1016/j.bushor.2019.02.001

Tsalis, A. (2020, Januari 19). Mengenal peran sentiment analysis dalam data media sosial beserta cara kerjanya. Retrieved Juni 23, 2020, from EKRUT media: https://www.ekrut.com/media/sentiment-analysis-adalah.

Wang, L. L., & Lo, K. (2021). Text mining approaches for dealing with the rapidly expanding literature on COVID-19. *Briefings in Bioinformatics*, *22*(2), 781–799. https://doi.org/10.1093/bib/bbaa296

Wijaya, G. S., & Wijaya, I. (2018). Bedah Total Server: Referensi Lengkap Teknologi Server, Data Center, Virtualization, Cloud Computing & Enterprise System. Indonesia: M&C!.

Yoebrilianti, A. (2018). Pengaruh Promosi Penjualan Terhadap Minat Beli Produk Fashion Dengan Gaya Hidup Sebagai Variabel Moderator (Survei Konsumen pada Jejaring Sosial). *JURNAL MANAJEMEN*, *8*(1).

Yucedal. (2023). Using Google Play Applications to Improve Language Preparatory School Students` Pronunciation Skills (A Study on Tishk International University Students in Erbil, Iraq). *International Journal of Social Sciences & Educational Studies*, *10*(1). https://doi.org/10.23918/ijsses.v10i1p369

Yunus, M., Fauzi, A., & Rini, E. S. (2022). The Effect of E-Service Quality and Customer Satisfaction on Repurchase Intention Through Online Consumer Review as Intervening Variables in the Marketplace Shopee. *Journal Research of Social Science, Economics, and Management*, *1*(6), 669–679. https://doi.org/10.59141/jrssem.v1i6.75