

## User Sentiment Analysis Towards Islamic Banking Applications in Indonesia

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### Article History

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### Abstract

This study aims to analyze user sentiment towards Islamic banking applications in Indonesia, focusing on Islamic banking applications that have the lowest ratings on Google Playstore. The analysis was conducted to understand perceptions, satisfaction, and factors that influence user experience towards both applications in the context of Islamic economics. The research method used is a quantitative approach with sentiment analysis techniques on user reviews taken from Google Playstore. Data was collected by scraping user reviews and analyzed using the Natural Language Processing (NLP) method to identify positive and negative sentiments. In addition, descriptive analysis was used to explore the main themes that emerged in the user reviews. The results showed that the trust factor was the main contributor to positive sentiment, reaching 45.16% of the total positive sentiment. The feature factor was also significant, contributing 27.90%, while the Sharia aspect factor contributed 6.29%. The technical and service factors contributed 11.61% and 5.97%, respectively. These findings indicate that trust in the application, including security and integrity, as well as relevant features, is an essential element in shaping positive user sentiment. This study provides valuable insights for Islamic banking application developers and related parties to understand user needs and expectations. In addition, these findings highlight the importance of improving aspects of trust and application features to increase user satisfaction and loyalty. These findings contribute to the literature on Islamic economics and Islamic banking app development in the digital era and provide practical guidance to improve application performance in the Indonesian digital banking market.

**Keywords:** *Islamic Economics; Islamic Banking; Sentiment Analysis; User Reviews; Google Playstore*

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## I. Introduction

Islamic banking has grown significantly over the past few decades, not only in Indonesia but also globally. The principles of Islamic finance, rooted in Shariah law, have gained widespread acceptance as an alternative to conventional banking systems that rely heavily on interest-based transactions (*riba*) (Bashir & Gorton, 2023; Kadi, 2023; Lum, 2021). In regions such as the Middle East, South Asia, and Southeast Asia, the demand for Islamic banking products has increased in response to growing awareness of the ethical and moral considerations that underpin Islamic financial systems (Hassan et al., 2021; Primambudi & Muhammad Ariful Maarif, 2024). Islamic banking in Indonesia has experienced significant development in recent years, driven by increasing public awareness of Islamic economic principles and the growth of a sizeable Muslim population (Adekoya, 2022; Nursaid et al., 2023; Rehman et al., 2021). In an effort to provide financial services in accordance with Islamic principles, various banks in Indonesia have developed digital banking applications based on Islamic principles (Rahmayati, 2021; Satria et al., 2021). However, several Islamic banking applications have relatively low ratings on the Google Play store, reflecting negative perceptions from users (Alrizq & Alghamdi, 2024; Dey et al., 2023). This raises the question of what factors cause low user satisfaction with these applications.

Islamic banking has excellent potential for growth in Indonesia, given that the majority of the population is Muslim (Hasan & Putri, 2021; Nurhayati et al., 2022; Safarda et al., 2023). However, the successful implementation of Islamic banking in a digital context still faces significant challenges. Issues such as lack of features that meet user needs, less intuitive application interfaces, and other technical issues are often the main reasons for low application ratings (Khalajzadeh et al., 2023; Lee & Chen, 2022). Therefore, it is essential to understand better user perceptions of Islamic banking applications, especially in terms of positive and negative sentiments reflected in user reviews on Google Playstore.

Most previous studies on Islamic banking have focused on the analysis of policies and marketing strategies or studies on the level of consumer adoption and satisfaction in general (Jahan & Shahria, 2022; Kala Kamdjoug et al., 2021; Shahid et al., 2022). However, few studies have specifically highlighted the analysis of user sentiment towards Islamic banking applications with low ratings on digital platforms. This study fills this gap by highlighting user sentiment towards Islamic banking applications with low ratings on Google Playstore. Thus, this study provides a deeper understanding of user perception and satisfaction in the context of Islamic business in the digital era.

This study aims to analyze user sentiment towards Islamic banking applications in Indonesia, focusing only on applications with the lowest ratings. This study seeks to identify factors that influence these applications' low ratings and understand the patterns of user sentiment that emerge from reviews on Google Playstore. In the context of Islamic economics, it is essential to understand how digital technologies such as banking applications can facilitate transactions in accordance with Shariah principles and how users respond to such applications.

Islamic banking is not only a financial service that is free of *riba* (interest), *maisir* (gambling), and *gharar* (uncertainty) but also a system that aims to meet the economic needs of Muslims based on the principles of justice, transparency, and shared prosperity. Therefore, it is important to explore how users evaluate existing Shariah banking applications, especially those with the lowest ratings on the Google Play store.

The Qur'an, as the primary source of law and guidance for Muslims, encourages people to reflect and study the signs of Allah's greatness through observation, research, and

contemplation. Allah says in the Qur'an: "In the creation of the heavens and the earth, and the alternation of night and day, there are indeed Signs for men of understanding. (Those who remember Allah while standing, sitting, or lying down, and reflect on the creation of the heavens and the earth (and say) Our Lord! Thou didst not create all this in vain. Glory be to Thee. Protect us from the punishment of the Fire. (Q.S. Ali 'Imran/3:190-191) This verse emphasizes the importance of reflection, investigation, and observation to find the truth and gain a deeper understanding of the universe and the laws that govern human life. In the context of this study, such reflection can be applied to understand how financial technology, such as Islamic banking applications, can be used to improve the welfare of humanity while adhering to the principles of Shari'ah..

Theoretically, this study enriches the literature on Islamic banking in the digital era, especially those related to the analysis of user sentiment towards Islamic banking applications. This study also develops an understanding of how user perceptions of Islamic banking applications can affect the success and sustainability of these services. The results of this study can be used by application developers and Islamic banks to improve the quality of their digital services, understand user needs and expectations, and identify areas that need improvement in order to be more competitive in the digital banking market.

## II. Literature Review

### 2.1. Background Theory

In the context of Islamic economics, Islamic banking is based on Islamic principles that prohibit *riba* (interest), *gharar* (uncertainty), *maysir* (gambling), and transactions related to illegal goods or services (Arfaizar et al., 2024; Shahariman et al., 2022; Wan Ismail et al., 2020). Islamic banking aims to achieve economic justice and social welfare by implementing principles based on profit and loss sharing (PLS), such as *mudharabah* (business partnership) and *musyarakah* (equity participation) (Faisal et al., 2021; Fitria Yustiardi et al., 2020; Muhammad et al., 2020). The application of these principles requires a deep understanding of how digital applications can facilitate Shariah-compliant banking transactions, including meeting the diverse needs of users in the Islamic banking market (Syarif As'ad et al., 2024; Usman et al., 2022).

Islamic economics emphasizes the principles of fairness, transparency, and social responsibility in all economic transactions (Zulhildi, 2024). In Islamic banking, these principles are implemented through contracts such as *mudharabah*, *musyarakah*, *murabahah*, and *ijarah*, which replace the prohibited interest system (Bakti et al., 2022). Islamic banking applications must ensure that all transactions through their platforms meet these principles and comply with Shariah law (Islam, 2024).

Sentiment analysis is a method for determining a user's attitude, opinion, or emotion toward an object, service, or product based on user-generated textual data, such as reviews, comments, or social media posts (Singh et al., 2020). Sentiment analysis is often used in marketing research, politics, and other fields to understand how users feel or think about a particular topic (Birjali et al., 2021). In the context of digital banking, sentiment analysis can provide deeper insights into users' satisfaction with a banking application, including the features they like or complain about (Asali, 2021).

Natural language processing (NLP) techniques automatically extract and process text from large amounts of data to perform sentiment analysis. NLP is a branch of artificial intelligence (AI) that focuses on interactions between computers and human language (Fanni et al., 2023). NLP uses tokenization, part-of-speech tagging, stemming, lemmatization, and named entity recognition to understand the context and meaning of unstructured text (Budianto et

al., 2022). One of the most commonly used tools for NLP is the Natural Language Toolkit (NLTK). This Python-based library provides various functions for natural language processing, including sentiment analysis (Agustina & Putri, 2024).

The Natural Language Toolkit (NLTK) is a software library for processing natural language text using various NLP techniques. NLTK provides functions that allow researchers to perform tokenization, stemming, lemmatization, text classification, and sentiment analysis. In sentiment analysis, NLTK can be used to build lexicon-based or machine learning-based models that can classify text sentiment into positive or negative categories (Elbagir & Yang, 2019; George et al., 2022).

Lexicon-based sentiment analysis is a method that uses a list of words or phrases labeled with specific sentiment values (Machová et al., 2020). This method identifies words in the text with positive or negative connotations and calculates an overall sentiment score to determine the overall sentiment of the text. Meanwhile, machine learning-based methods use models trained on sentiment annotation datasets to predict the sentiment of new texts.

In This study uses sentiment analysis to assess user perceptions of two low-rated Islamic banking applications on the Google Play store. The use of NLP and NLTK techniques will enable this research to identify patterns of user sentiment, complaints, and needs and evaluate the extent to which this application meets Sharia principles and user expectations.

## 2.2. Previous Studies

Several previous studies have examined the factors influencing Islamic banking applications' adoption and user satisfaction. For example, Febriandika et al. (2023), in their study "Determinants of Consumer Adoption of Islamic Mobile Banking Services in Indonesia," found that perceived usefulness, internet connection quality, consumer awareness, and bank reputation significantly positively impact customers' willingness to use Islamic banking services. (Febriandika et al., 2023).

Another study by Yusfiarto (2021), "The Relationship Between M-Banking Service Quality and Loyalty: Evidence in Indonesian Islamic Banking," found that higher mobile banking service quality leads to higher customer loyalty in terms of attitude and behavior. This occurs when customers are satisfied with the quality of the system. Such satisfaction can be achieved when Islamic banking services effectively represent the quality dimensions characteristic of the system. (Yusfiarto, 2021).

Although there have been several studies on the factors that influence user adoption and satisfaction with Islamic banking apps, studies that specifically highlight low-rated apps on the Google Play store are still rare. In addition, a paucity of studies focus on users' sentiments and the technical challenges they experience in the context of low-rated Islamic banking apps. Therefore, this study attempts to fill the gap by analyzing user reviews of 2 Islamic banking apps, both of which have low ratings of 3.3 stars on Google Playstore.

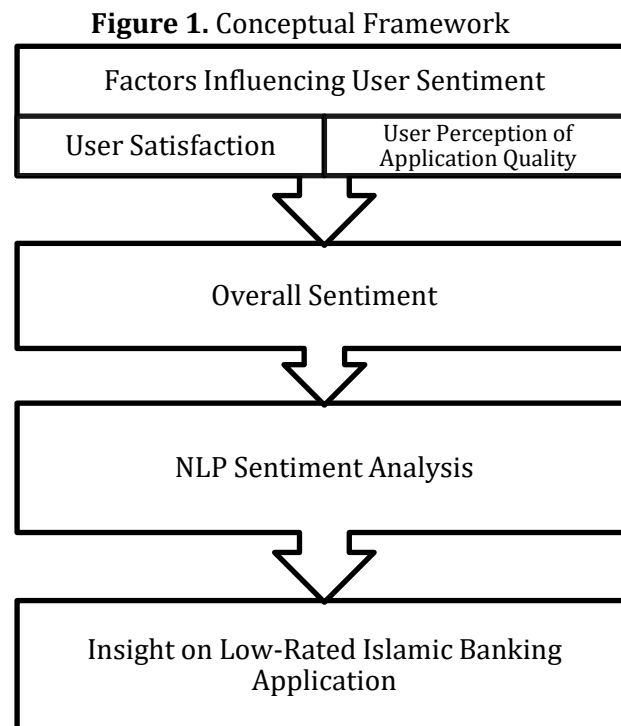
## 2.3. Conceptual Framework

The conceptual framework of this study aims to identify factors that influence user sentiment towards low-rated Islamic banking apps. The theories underlying the conceptual framework of this study are:

- a. Technology Acceptance Model (TAM):  
Explains how users accept and use technology, where perceived usefulness and perceived ease of use are important factors (Mohd Amir et al., 2020).

- b. ServQual Model:  
This theory can be used to assess service quality by highlighting factors such as agility, responsiveness, assurance, and empathy that are relevant to the elements of “trust” and “service”. (Sugiarto & Octaviana, 2021).
- c. Islamic Economics and Shariah Principles:  
This study incorporates Shariah compliance as a unique factor that can influence user sentiment, reflecting the app’s alignment with the core principles of Islamic banking: avoiding riba (interest), maisir (gambling), and gharar (uncertainty)(Kuyateh, 2022).
- d. Natural Language Processing (NLP) and Sentiment Analysis:  
This study uses NLP techniques (specifically NLTK and VADER) to extract insights from user reviews. NLP helps identify positive, negative sentiments while the VADER tool is particularly useful for analyzing the sentiment behind social media texts or customer reviews(Elbagir & Yang, 2019).

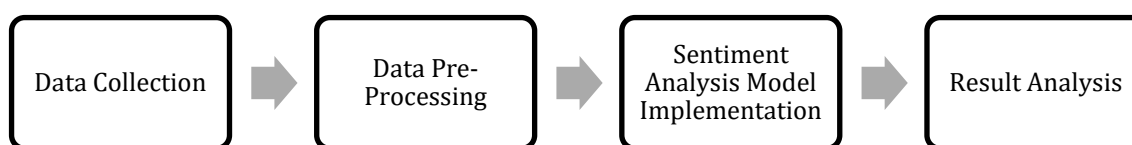
Based on these theories, this study focuses on three main elements: (1) Overall user satisfaction. This conceptual model will use Natural Language Processing (NLP) techniques to analyze user reviews on the Google Play store and identify the sentiments underlying their perceptions and satisfaction, (2) User perceptions of app quality (interface, features, trust, service, Shariah, and technical aspects). The conceptual framework of this study aims to identify factors that influence user sentiments towards low-rated Islamic banking apps. The conceptual framework can be seen in figure 1:



### III. Methodology

The research method used is a quantitative approach using sentiment analysis techniques on user reviews from the Google Play store. Data was collected by scraping user reviews and analyzed using Natural Language Processing (NLP) to identify positive and negative sentiments. In addition, descriptive analysis was used to explore the main themes that emerged in the user reviews. This study hypothesizes that user reviews for Islamic banking applications with low ratings will have significant negative sentiment. This study tests this hypothesis by analyzing review sentiment and identifying factors influencing user ratings. The model development in this study involves using Natural Language Processing (NLP) techniques for sentiment analysis. The model development process includes the steps shown in Figure 2 (Bordoloi & Biswas, 2023; Palomino, 2022):

Figure 2. Research Framework



#### 3.1. Data Collection

The data in this study came from user reviews on the Google Play store for two Islamic banking applications with the lowest ratings. The data was collected using the scraping technique using the Google Collab tool. These data were selected because low ratings indicate potential problems or user dissatisfaction that need further investigation. The user reviews collected include comments posted within the last two years, ensuring the relevance and timeliness of the data. This review data provides information about user sentiment and specific complaints or compliments related to the application. Data selection from the Google Play store is based on the availability of large, diverse data sets and ease of access. Google Play store is a platform that users frequently use to provide feedback on applications, making it representative for analyzing user sentiment about the application in question. This data will be processed to identify sentiment patterns and assess the quality and shortcomings of the two applications.

#### 3.2. Data Pre-Processing

Text data obtained from scraping goes through a pre-processing process that includes removing irrelevant elements such as punctuation, numbers, special characters, tokenization, stemming, and lemmatization to prepare the data for sentiment analysis.

#### 3.3. Sentiment Analysis Model Implementation

The sentiment analysis model is implemented using NLP techniques using the Natural Language Toolkit (NLTK). The methods used include lexicon-based analysis and machine learning-based models. The lexicon-based analysis uses NLTK's Sentiment Intensity Analyzer to identify positive and negative sentiments.

#### 3.4. Result Analysis

The model will be evaluated using metrics such as accuracy, precision, recall, and F1-score to assess the performance of sentiment analysis. Cross-validation will be applied to ensure the model generalizes to previously unseen data.

## IV. Results and Analysis

### 4.1. Data Collection

The data collected consists of user reviews for 2 Islamic Banking applications with the lowest rating of 3.3 from Google Playstore. The number of reviews collected for each application is in table 1 to table 4:

in table 1 this explains the amount of data that will be tested in first application and the second application

Application 1	Application 2
1,567 data	4,103 data

Table 2 explains the sample data in the first application test by crawling data from the Google Play store.

userName	score	at	content
User 1	1	2024-07-12 19:23:10	This application was initially very helpful, but after changing devices, facial verification continued to fail with a notification that appeared "An Error Occurred". Even though the data entered was all correct. It kept happening, until now it still can't verify the face. So it is very detrimental to customers who really need M banking.
User 2	1	2024-08-31 05:33:51	It's complicated just to register... how do you want to get the code... tell me to SMS first. Just about to send an SMS, I'm back to the start menu. Finally, fill in the data again, send another SMS, go back to the beginning again... I've tried 15 times, only to waste time sending SMS. Apk is not clear. I really regret downloading this apk... 1 star is too good for this apk if it exists I would give it 0.1 star
User 3	1	2024-08-25 09:15:14	I have trouble creating an account online, verification after a successful selfie, a notification appears that the name does not match. Please improve the IT department in reading data. Thank you.
User 4	2	2024-08-26 02:33:20	I am very disappointed because I have researched the data several times and then I was asked to log in again because the verification code said that an error had occurred until my credit ran out. I failed 5 times and then contacted CS and they definitely researched it again, in the end I registered again and still couldn't. Please fix it again.

Table 3 explains the sample data in the second application test by crawling data from the Google Play store.

userName	score	at	content
User 1	1	2024-07-12 19:23:10	Please remove the location access permission when you first enter the application, it is very annoying, I prefer the previous versions, it is more comfortable and not complicated
User 2	1	2024-08-31 05:33:51	Please update the application, add a feature to mark all read in the inbox, the inbox is so trashy, up to 200 inboxes, I have to open and delete 1/1, and please add another feature to top up e-money, funds and so on 🙏

User 3	1	2024-08-25 09:15:14	How do I do this, the application keeps crashing, after logging in, when I click transfer it immediately crashes, it's been done many times. Should I uninstall it first? Please answer 🙏
User 4	2	2024-08-26 02:33:20	Why after inputting the account number and nik the screen is just white, min, I've reinstalled it back and forth, it's the same, how come everything the admin explained in the reply column has been done before. all are stable, the credit has a network, there is a slot on the main card but it's still blank white

Table 4 explains the grouping of data based on rankings tested with the first application and the second application.

**Table 4.** Grouping Data Based on Rating

Rating	Application 1	Application 2
1	551	1,848
2	89	393
3	78	390
4	56	288
5	793	1,184
<b>Total</b>	<b>1,567</b>	<b>4,103</b>

#### 4.2. Data Pre-Processing

Data Pre-Processing implementation:

a. Text Tokenization

The word\_tokenize function from the nltk library is used to break the text into words. The text is converted to lowercase (text.lower()) to ensure consistency during processing, so words like "Bank" and "bank" are treated as the same token.

b. Stop Words Removal

Tokens that are not included in the stop words list from nltk.corpus.stopwords are removed. This stop words list is provided by the NLTK library and includes common English words that are often not important for sentiment analysis.

c. Lemmatization

The WordNetLemmatizer function from NLTK is used to convert the filtered tokens to their base form. This helps to equate words that have similar meanings, making the analysis more effective.

d. Token Merging

The lemmatized tokens are recombined into a string using '.join(lemmatized\_tokens)'. This creates a pre-processed text that is ready for the next stage of analysis.

#### 4.3. Sentiment Analysis Model Implementation

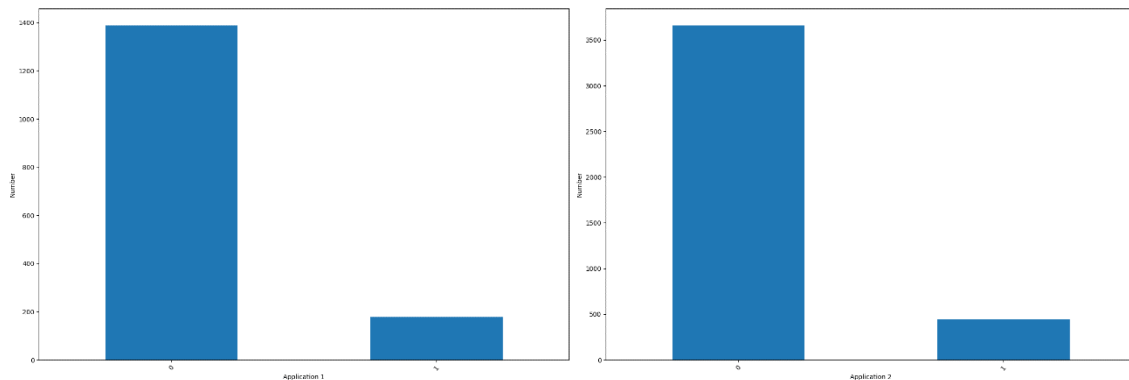
To start sentiment analysis, the VADER sentiment lexicon must first be downloaded. VADER is a sentiment analysis tool developed to assess sentiment in text, especially in the context of social media. This lexicon includes a list of words and phrases that have a clear sentiment assessment. SentimentIntensityAnalyzer is a component of NLTK that is used to provide a sentiment score to text. This analyzer calculates the sentiment polarity value based on the downloaded lexicon. The get\_sentiment function is designed to measure sentiment from review text using SentimentIntensityAnalyzer. This function calculates a polarity score consisting of positive and negative values. Based on the positive score, this function determines whether the sentiment is positive (1) or not positive (0).



The number of sentiment analysis labeling results for both applications can be seen in table 5 and Figure 3:

**Table 5.** Result of Sentiment Analysis

Application 1		Application 2	
Positive	Negative	Positive	Negative
178	1,389	442	3,661
11.36%	88.64%	10.77%	89.23%



**Figure 3.** Comparison Chart of Sentiment Analysis of Application 1 and Application 2

#### 4.4. Result Analysis

In addition to using SentimentIntensityAnalyzer to label data based on sentiment, this analysis also uses user ratings as the basis for sentiment labeling. Rating 1-3: Grouped as negative sentiment (0). Rating 4-5: Grouped as positive sentiment (1). The evaluation was carried out using a confusion matrix and other evaluation metrics, namely precision, recall, and f1-score. The results of the confusion matrix can be seen in table 6:

**Table 6.** Confusion Matrix of Application 1 and Application 2

	Application 1	Application 2
<b>True Negative (TN)</b>	663	2,462
<b>False Positive (FP)</b>	55	169
<b>False Negative (FN)</b>	726	1,199
<b>True Positive (TP)</b>	123	273

Description:

True Negative (TN): Number of negative reviews correctly identified as negative.

False Positive (FP): Number of negative reviews incorrectly identified as positive.

False Negative (FN): Number of positive reviews incorrectly identified as negative.

True Positive (TP): Number of positive reviews correctly identified as positive.

After obtaining the confusion matrix results, the model performance was evaluated using evaluation metrics such as precision, recall, and f1-score for both applications with the results in table 7:

**Table 7.** Confusion Matrix of Application 1 and Application 2

	Application 1				Application 2			
	precision	recall	f1-score	support	precision	recall	f1-score	support
<b>0</b>	0.48	0.92	0.63	718	0.67	0.94	0.78	2,631
<b>1</b>	0.69	0.14	0.24	849	0.62	0.19	0.29	1,472
<b>Accuracy</b>			0.50	1,567			0.67	4,103

Description:

- Precision for Label 0: Proportion of reviews that are truly negative out of all reviews predicted as negative
- Recall for Label 0: Proportion of negative reviews correctly identified out of all negative reviews
- F1-score for Label 1: Harmonic between precision and recall for negative labels.
- Precision for Label 1: Proportion of reviews that are truly positive out of all reviews predicted as positive.
- Recall for Label 1: Proportion of positive reviews correctly identified out of all positive reviews.
- F1-score for Label 1: Harmonic between precision and recall for positive labels. –
- Accuracy: Overall success rate of model prediction.

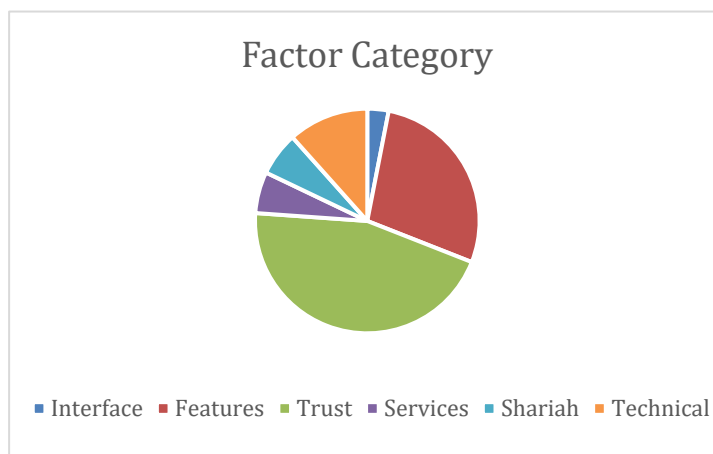
The evaluation results show that the model has moderate accuracy in classifying user review sentiment. Application 1 shows an accuracy of 50%, indicating that the model has difficulty in correctly identifying positive reviews, although it is quite good at identifying negative reviews (92% recall for negative labels). Application 2 shows a better accuracy of 67%. However, the model still shows weakness in correctly identifying positive reviews (19% recall for positive labels).

Overall, these results indicate that the sentiment analysis model based on VADER still has limitations in capturing positive sentiment from user reviews, which may be due to the complexity of the language or the nuances of the context in the reviews provided.

After obtaining the sentiment analysis results, 178 positive sentiments from application 1 and 442 positive sentiments from application 2 were then labeled with categories of factors that influence positive sentiment, namely interface, features, trust, service, sharia aspects, and technical. The results of category labeling can be seen in table 8:

**Table 8.** Positive Sentiment Analysis Factors

Factor	Application 1	Application 2	Summary	Percentage
Interface	8	11	19	3.06 %
Features	97	76	173	27.90 %
Trust	246	34	280	45.16 %
Services	25	12	37	5.97 %
Shariah	11	28	39	6.29 %
Technical	55	17	72	11.61 %
<b>Total</b>	<b>442</b>	<b>178</b>	<b>620</b>	<b>100 %</b>



**Figure 4.** Pie Chart of Positive Sentiment Analysis Factor

From the table 8 and Figure 4, it can be seen that Trust is the factor that most influences the overall positive sentiment, with the largest contribution from Application 1. Features is also an important factor, standing out as an area with many positive reviews in both applications. Other factors such as interface, service, sharia aspects, and technical have a smaller contribution to the overall positive sentiment.

This table provides insight into what users value most from both applications and helps in identifying areas that need to be improved or maintained to enhance the user experience.

#### 4.5. Discussion

The research results show that the factors influencing user sentiment towards Islamic banking applications include interface, features, trust, services, Sharia, and technical aspects. In the context of the Islamic economy, the principle of trust and mandate is fundamental. This is based on QS. An-Nisa verses 58-59 which states: "Verily, Allah commands you to give trust to those who are entitled to it, and (commands you) that when you establish law between people, you establish it with justice. Verily Allah teaches you the best of lessons, for Allah is All-Hearing, All-Seeing" (QS. An-Nisa/4:58-59). This verse emphasizes the importance of honesty, trustworthiness and justice in all aspects of life, including financial services such as Islamic banking. In this context, Islamic banking applications must meet standards of fairness and transparency to gain users' trust.

The results of the positive sentiment analysis of Islamic banking applications show that the factors influencing positive sentiment are diverse, with trust being the most dominant factor. Out of the total 620 positive sentiments analyzed, trust contributed 45.16% of the total positive sentiments, while features contributed 27.90%. These results indicate that users consider the security, integrity, and credibility of the application as very important aspects when choosing an Islamic banking application. In the context of Islamic economics, trust is also related to the application's compliance with Islamic principles that ensure fair and transparent transactions (Khasanah et al., 2022). This confirms that trust is a key element in users' perception of Islamic banking applications. From the perspective of Islamic law, trust includes not only material satisfaction but also spiritual satisfaction. In the Qur'an, Allah SWT emphasizes the importance of trust as a form of confidence, as stated in QS. Al-Anfal verse 27: "O you who believe! Do not betray Allah and His Messenger (Muhammad), and do not betray the trusts entrusted to you as long as you know. (QS. Al-Anfal / 8:27). Trust must be important to every Muslim's character. In Islamic banking, trust means that banks must operate honestly and transparently. This includes providing clear and non-misleading information about products and services and maintaining the confidentiality and security of customer information. This is consistent with the theory that trust is one of the critical factors in the relationship between users and service providers, especially in the context of Islamic financial services. In the Islamic economy, features such as ease of zakat transactions, almsgiving, and information on the location of mosques indicate the application's commitment to the user's needs within the Islamic framework. This study demonstrates the importance of relevant and consistent features with Islamic principles to attract and retain users. Other factors to consider are technical and service. Despite their relatively small contributions (11.61% and 5.97% respectively), technical factors such as application performance and bugs remain important concerns for users. Discussion of these factors includes the possibility that technical issues may impact user satisfaction even if they are not the primary factor in overall positive sentiment.

With a contribution of 6.29%, the Sharia Aspects factor suggests that while Sharia aspects are important, users may not always feel their impact directly in their experience with the app. This suggests the need for deeper integration of Sharia principles into app features and services to increase user satisfaction and promote Sharia values.

The finding that trust is an important factor in the formation of positive sentiment is consistent with the principles of Shariah (Islamic law), which emphasize the achievement of material and spiritual satisfaction. According to the rules of *al-kharaj bi al-daman* (income is a reward for responsibility) and *al-ghunm bi al-ghurm* (profit is a reward for the willingness to bear losses), every financial transaction must be conducted with full responsibility and awareness of the potential risks and rewards.

This study provides new insights into the factors that influence positive sentiment in the context of sharia banking apps, focusing on two specific apps. Previous studies may not have paid enough attention to trust as a primary factor, so this finding fills a gap in the literature on sharia banking apps.

The results of this study are consistent with related theories and literature that emphasize the importance of trust in banking apps (Zulhilmi, 2024). The finding that trust is a primary factor in positive sentiment supports this theory and confirms that Sharia banking apps should focus on building trust to increase user satisfaction.

Meanwhile, the emphasis on features is also consistent with the expectation that complete and useful application features can improve the user experience. This is consistent with other studies showing that innovative and practical features are important elements of technology-based applications.

The results of this study show significant differences compared to several other related studies. For example, in the study of Febriandika et al. (2023), perception of benefits, quality of internet connection, consumer awareness, and bank reputation significantly influence the customer's tendency to use Islamic banking services (Febriandika et al., 2023).

This difference may be due to contextual variables such as differences in research methodology, user demographics, or each application's approach to building relationships with users. In other words, while some studies, such as the research by Yusfiarto (2021), may find that other factors, such as service, are the most important factors, the results of this study indicate that trust plays a more dominant role in the context of Islamic banking applications. Overall, these findings contribute to a deeper understanding of the factors that influence positive sentiment in Islamic banking applications and can be used by application developers to focus on the areas that most influence user satisfaction (Yusfiarto, 2021).

The implications of this research extend across multiple domains, particularly in the context of Islamic economics, digital banking user experience, and operational strategies of Islamic financial institutions. By analyzing user sentiment towards Islamic banking applications, this study sheds light on key areas that require attention to better align Islamic banking services with the expectations and needs of their users. The study's findings have broad implications for the evolution of Islamic banking in the digital age. By focusing on technical excellence and adherence to Islamic principles, Islamic banks can improve user satisfaction, build trust, and foster customer loyalty. The insights gained from user sentiment analysis provide valuable guidance for developers, banks, regulators, and academics alike, contributing to the ongoing evolution of Islamic financial services in the digital age.

## V. Conclusion and Recommendation

### 5.1. Conclusion

This study aims to analyze the positive user sentiment towards two Islamic banking applications in Indonesia, Application 1 and Application 2, with a focus on the factors influencing positive sentiment. Based on the analysis, it was found that the trust factor is

the most dominant factor in influencing positive sentiment, contributing 45.16% of the total positive sentiment. This shows that user trust in the application, including the security and integrity of transactions, is very important in the context of Islamic banking applications.

In addition to trust, the feature factor also plays a significant role, contributing 27.90% of the total positive sentiment. This confirms that complete and useful features, such as transaction features and financial services, contribute greatly to user satisfaction. Meanwhile, the Shari'ah aspect factor contributed 6.29%, indicating that the Shari'ah aspect, although important, is not as important as trust and features in influencing positive sentiment. Other findings show that technical and service have relatively small contributions, 11.61% and 5.97% respectively. This shows that although technical and service aspects are important factors, they do not have as much impact as trust and features in shaping positive user sentiment.

In addition to the main findings on the factors influencing positive sentiment, the study also found significant differences between the two applications in terms of the contribution of these factors. Application 1 received mostly positive reviews related to trust, while Application 2 received more attention to features and Sharia aspects. This highlights the differences in app development and marketing strategies and their impact on user perception.

## 5.2. Recommendation for Future Research

Based on the findings of this study, several recommendations can be made for future research, particularly by acknowledging its limitations. A major limitation is the focus of the study on a specific geographical region, which may limit the generalizability of the findings. Therefore, future research could explore user sentiment and trust factors in Islamic banking applications in different cultural and economic contexts to provide a more comprehensive understanding of the factors that influence user satisfaction globally.

In addition, the current study primarily addressed user sentiment without delving deeply into the specific factors that contribute to building user trust in Islamic banking applications. Future research could explore aspects such as data security, privacy, and bank reputation in more detail. Understanding these trust factors can provide valuable insights for developers and practitioners seeking to increase user trust in their applications.

Another limitation is the lack of comparative analysis between the performance of Islamic banking applications that successfully build trust and those that do not. Future studies could compare these applications to identify best practices and effective strategies that lead to higher user satisfaction and loyalty. In addition, examining how the implementation of Shariah principles specifically impacts user satisfaction and trust within Islamic banking applications would enrich the current literature and guide improvements in service delivery.

Finally, collaboration between academics and practitioners is encouraged to foster the development of more relevant research. By working together, they can better address the needs of users and identify features that truly resonate with them. This collaboration could also facilitate longitudinal studies that assess the evolution of user sentiment and trust over time, leading to a more nuanced understanding of user engagement in the digital banking landscape.

In conclusion, future research should build on these limitations by exploring diverse contexts, examining trust factors in depth, conducting comparative analyses, and fostering

collaboration between academics and practitioners to improve the understanding and effectiveness of Islamic banking applications.

### **5.3. Managerial Implication**

This research provides some important management implications for Islamic banking app developers in Indonesia. First, user trust is an important factor influencing positive sentiment, so developers should prioritize improving security features and app integrity. Investing in strong security protocols and transparent communication about security measures will increase user trust. Second, app feature development should also be considered, as relevant and innovative features contribute significantly to user satisfaction.

Developers need to continuously update and improve features to meet user needs. In addition, although the Shariah-compliant aspect contributes less to positive sentiment, it is still important for developers to ensure that the app's features comply with Islamic principles and to communicate this to users actively. Technical and service issues are also factors that trigger negative sentiment, so optimizing the app's technical performance, including reliability, fast loading times, and bug reduction, should be a key focus. Improvements in customer support systems are also needed to handle issues more effectively.

Finally, app developers must adopt a user-driven approach, using user reviews and feedback to guide app development. Continuous feedback monitoring through sentiment analysis tools such as natural language processing (NLP) can help developers understand changing user expectations and improve user satisfaction and loyalty. Islamic banking apps can improve performance and strengthen their position in the increasingly competitive digital banking market by focusing on these aspects.

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### **Authors' Contribution**

The authors make several important contributions to this research. First, the authors conducted a user sentiment analysis by collecting and analyzing review data from Google Playstore using Natural Language Processing (NLP) techniques, thus providing in-depth insights into users' perceptions, satisfaction, and factors that influence their experience with Islamic banking apps in Indonesia. Secondly, the authors successfully identified key factors that contribute to positive sentiment, such as trust, app features, sharia compliance, and technical and service factors. This provides practical guidance for developers to improve those aspects that are important for user satisfaction.

Thirdly, the authors deepen the understanding of how Islamic economic principles influence the expectations and experiences of users of Islamic banking apps, thereby helping developers tailor apps to shariah-based user needs. In addition, the authors provide concrete recommendations for app developers to prioritize security, sharia compliance, and service and technical quality to increase user loyalty. Finally, this study contributes to the development of literature in the field of digital Islamic banking, especially in Indonesia, and can serve as a reference for further research related to digital applications and user experience in the context of Islamic economics.

## Disclosure Statement

The authors declare that there are no competing interests to be disclosed. All data and materials used in this study are publicly available and ethically obtained.

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## Data Availability Statement

In this research I took sample data on the google play store and Crawling using google Collab and if there is a need can visit my scholar account  
<https://scholar.google.com/citations?user=aEaqAF4AAAAJ&hl=id>

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