International Journal of Basic and Applied Sciences, 14 (7) (2025) 458-465

International Journal of Basic and Applied Sciences

Website: www.sciencepubco.com/index.php/IJBAS
https://doi.org/10.14419/52fkp465
Research paper



Netnography Analysis of Halal Food Finder Applications

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Received: September 1, 2025, Accepted: November 10, 2025, Published: November 19, 2025

Abstract

This study analyzes users' experiences and perceptions of halal food search applications using netnography on the Google Play Store. Six applications with a minimum rating of 3.5 were selected. User reviews were collected by June 18, 2025, and included 179 reviews from six different applications of Halal Food Finder. These reviews were then filtered into 163 reviews, comprising 134 positive reviews and 29 negative reviews. These were further analyzed. The results show that positive reviews are primarily driven by appreciation for informative features, halal restaurant location indicators, support for Muslim travellers, and ease of use. On the other hand, negative reviews highlight obstacles such as inaccurate data, feature updates needed, scan failures, local language limitations, and technical issues with the application. The findings indicate that while feature innovations strengthen user trust, data accuracy and update sustainability are still challenges. Development recommendations include proposing partnerships with global halal certification bodies for periodic updates of verified halal certification data, improving technical stability, implementing database management, using artificial intelligence (AI) and blockchain for information validation, and refining the interface to make the system more intuitive and user-friendly. The implementation of this step is expected to strengthen the halal digital ecosystem by providing reliable, accurate, and responsive services to user needs.

Keywords: *Digital Halal Ecosystem; Google Play Store; Halal Food Application; User Experience.*

1. Introduction

Halal food plays a central role in the lives of Muslims, not only as a means of fulfilling religious obligations but also as an integral part of their evolving lifestyle in modern society. (Junejo et al., 2023; Rohman & Ulinnuha, 2022; Sholahuddin et al., 2025). As public awareness grows, various needs for halal food assurance are increasing, especially in the Muslim community, because of the importance of consuming food that is in accordance with sharia and has an impact on spiritual, physical, and mental aspects. (Madjid et al., 2024).

With the ever-increasing Muslim population offset by the growth of the global halal food industry, the development of halal food trends in Indonesia and globally has shown significant progress. (Rizki et al., 2023; Rohman & Ulinnuha, 2022). The projected consumption of halal products in Indonesia in 2025 is estimated to reach US$282 billion, representing a 53% increase from 2020, with the food and beverage sector as the primary contributor. (Jauhari, 2024). The global halal product market is estimated to reach around USD 3.30 trillion. (Precedence Research, 2025). The growth of the halal market globally has encouraged countries with minority Muslim populations, such as the United Kingdom, Japan, Korea, Australia, New Zealand, China, and Italy, to get involved in the halal food industry through efforts to obtain halal certification. (Harati et al., 2024; Lubis et al., 2022).

The growth of the halal food industry is driven by an increase in the Muslim population, as well as awareness of the halal lifestyle among Muslims who travel or settle in the country, and among non-Muslims (Alam, Fuadati, et al., 2025; Alam, Ratnasari, et al., 2024). Additionally, the increasing penetration of halal products into the global market is contributing to this growth. (Alam, Ashfahany, et al., 2024; Globe Newswire, 2025). Social media also has a significant influence on building a halal ecosystem, especially among the younger generation. (Alam, Bulan, et al., 2025; Indriastuti et al., 2022; Naumi, 2023).

On the other hand, challenges in obtaining halal food often occur. Especially in countries with minority Muslim populations or when travelling abroad, because the food products primarily available come from non-Muslim business actors, so halal food is challenging to find (Yusuf et al., 2023). Limited information regarding the number of halal restaurants and the validity of halal certificates is the main obstacle for Muslim consumers. (Bima et al., 2025; Febriastuti, 2023; Rizqillah et al., 2025). This condition drives the need for digital solutions that can facilitate the practical and reliable search and verification of halal food. (Zahrah & Fawaid, 2019).

The development of digital technology offers a solution to facilitate access to halal food, ranging from halal restaurant search applications and GPS-based tracking systems to the integration of artificial intelligence and augmented reality. (Sayyidatunisa et al., 2020). Some apps still face issues, such as restaurants that are closed, inaccurate locations, or halal claims without official certificates. (Bakry, 2017). This situation has resulted in a decline in Muslim consumer interest and trust in the halal food finder application.

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This condition shows the need for continuous evaluation of the effectiveness of halal food search applications. (Sumartono, 2018). An in-depth understanding of user experience and perception is an essential aspect of app development. (Bakry, 2017). User experience (UX) can positively increase trust, loyalty, and sustainability of the Halal Food Finder application. (Suhendri & Putri, 2023).
Thus, this study aims to analyse the experiences and perceptions of halal food search application users through a netnography approach. The effectiveness of the application depends on understanding the behavior, preferences, and needs of Muslim consumers related to halal food in cyberspace. (Setiawan et al., 2018). The results of the research are expected to provide recommendations for developing features and improving the quality of halal food search application services, as well as supporting Muslim consumer protection and the growth of the halal industry in the world. (Hasanah et al., 2021; Mulyati et al., 2023).

2. Literature Review

The halal food industry is a significant part of the global sharia economy, which continues to experience rapid development as one of the main pillars of economic growth based on Islamic values. (Adamsah & Subakti, 2022; Silalahi et al., 2024).
The global halal food industry is experiencing significant growth, in line with the increasing global Muslim population, which is estimated to reach 1.8 billion people, and the high demand for halal food each year. (Adamsah & Subakti, 2022). This global market marks halal food as one of the crucial sectors in the world economy, including Muslim minority countries such as South Korea, Japan, China, and Europe, which are actively developing halal certification systems and infrastructure. (Nafisah & Nisa, 2024; Yuningsih et al., 2023).
In the realm of international tourism, halal food plays a vital role in supporting the growth of halal tourism that is responsive to the needs of Muslim tourists, as countries such as South Korea, Australia, the United Kingdom, and Malaysia have initiated the provision of Muslim-friendly facilities, authentic halal food certification, and the promotion of Muslim-friendly tourist destinations to increase international appeal and encourage local economic growth. (Tasya & Malahayatie, 2024). As in Putri (2025)The presence of halal facilities and services not only increases the confidence level of Muslim tourists but also attracts non-Muslim tourists to enjoy halal products based on quality, safety, and cleanliness, thus expanding the halal food market.
The digitalisation and technological innovation are the primary driving factors in the development of the halal food industry, enhancing supply chain efficiency, transparency in certification, and consumer experience, thereby accelerating the adaptation and expansion of the global market. (Jauhari, 2024; Rosana, 2024). Additionally, mobile-based apps specifically designed to assist Muslim consumers in finding halal products and restaurants are gaining popularity, featuring location search capabilities that utilize GPS, user reviews, and artificial intelligence integration for personalized recommendations. (Sayyidatunisa et al., 2020).
Advances in information technology have led to the emergence of various halal-based innovations. Studies by Rejeb et al. (2021) and Julian et al. (2025) Highlighted the role of Internet of Things (IoT) and Blockchain technologies in improving the transparency of the halal supply chain from upstream to downstream in real time and preventing certificate fraud. (Julian et al., 2025) The Study also confirms that artificial intelligence (AI) plays an essential role in predictive analytics, anomaly detection, and automatic halal certificate validation, all of which support halal supply chain operations to be more efficient and resilient to the risks of fraud and non-compliance. Digital certification technology has accelerated the halal verification process and reduced the risk of certificate forgery, which has been a significant obstacle in the global halal industry. (Ellahi et al., 2025; Iziiatullina et al., 2022)
Various innovations in halal food search applications, such as Halal Navi and Halalin, Verify Halal and Scan Halal, are available to help users find halal food locations, obtain halal status verification, and get reviews and recommendations based on the experiences of the international Muslim community. (Sayyidatunisa et al., 2020). This application utilizes integrated technologies such as GPS, digital maps, and a halal certificate database system connected to official authorities to help users find halal restaurants in various countries.
Various halal food search applications implement different methods to ensure the accuracy of halal restaurant data. For example, the "Halal Taiwan" application provides a directory of restaurants with official certification from local authorities, and makes it easy for users to verify through a database that is directly connected to the certification body. (Munandar & Fahrurrozi, 2025). Other applications, such as Halal Navi, rely on community input and barcode scanning, so they are supported by reviews and ratings, but are prone to outdated information if they are not integrated with the authorities directly. (Ibrahim & Hasim, 2023). Based on both studies, it appears that integrating official certification databases increases user trust and reduces the risk of misinformation. At the same time, community-based applications often offer broader coverage but may face data accuracy issues if there is no real-time verification.
Research by Riani et al. (2025) Confirms that the adoption of digital technologies such as IoT, blockchain, and artificial intelligence is crucial for the growth and sustainability of the halal industry in driving market expansion, operational efficiency, and regulatory compliance in the global halal sector. However, most applications still face obstacles such as location data accuracy, certificate validity, and information gaps related to restaurants that have closed or have not updated their halal status. (Sayyidatunisa et al., 2020).
In addition, digital platforms and social media play a crucial role in consumer education and building a stronger halal community, especially among the younger generation, who rely on technology in their consumption decision-making. Netnography studies indicate that social media serves as the primary agent in disseminating halal-related information and knowledge, contributing to the shaping of halal awareness within the community through virtual communities, such as groups or thematic accounts focused on halal lifestyles. (Khasanah, 2020). Educational content, reviews, and recommendations for halal products and services shared on social media can influence perceptions, guide choices, and foster awareness of the halal lifestyle, especially among the young generation of Muslims who are digitally active. (Yuliani et al., 2023).
This digital innovation not only facilitates access to halal products but also enhances the user experience in selecting and verifying the halal status of food, providing practical and reliable verification through the Halal Food Finder application. (Kurniawati & Cakravastia, 2023).
Based on literature studies, user experience (UX) plays a crucial role in enhancing the trust and loyalty of users of halal food search applications. Research shows that perceived usefulness, ease of use, and trust significantly influence the decision to use halal applications in Malaysia. (Ismail et al., 2024).
The application of Nielsen usability principles, such as "recognition rather than recall," "consistency," "error prevention," and "flexibility and efficiency of use", has an impact on ease of navigation, efficiency of restaurant searches, and overall user satisfaction. (Rozanah & Santoso, 2024). Applications that adopt Nielsen's heuristics tend to score higher on the System Usability Score (SUS) and demonstrate stronger user loyalty, but there are still challenges in presenting halal certification status information clearly and concisely. Other studies suggest that halal food application developers improve certification database integration and strengthen user feedback loops to maintain accuracy and digital trust. (Ismail et al., 2024). Therefore, further research is needed to explore users' perceptions of the features, ease of use, and trustworthiness provided by halal food search applications in depth.

Although the need for halal food search applications is high, the literature examining the experience of using these applications based on an analysis of reviews and ratings through netnography remains limited. Previous research has broadly discussed the features and functions of applications or user perception quantitatively. However, it has rarely examined how digital user interaction influences the user experience on application download platforms, such as the Play Store.
Therefore, a comprehensive and contextual study is necessary to investigate the digital interactions of users on app download platforms, such as the Google Play Store. This study aims to analyse the experiences and perceptions of halal food search application users, with the hope that the results will inform the future development of the application.

3. Research Methods

This study aims to analyse the experiences and perceptions of users of halal food search applications, as reflected in positive and negative reviews on the Google Play Store platform. This research employs a netnography approach, a qualitative method that adapts traditional ethnographic participant observation techniques to study cultures and online communities. (Addeo et al., 2019). The online community that researchers use to understand social interaction is social media, forums, blogs, and other online communities (Bansal et al., 2024). Additionally, netnography can identify industry trends and consumer preferences, making it beneficial for developing business strategies and digital products. (Bansal et al., 2024).
The netnography method enables researchers to understand the cultures and values that naturally emerge in digital spaces without disrupting the activities of those communities. (Addeo et al., 2019). Kozinets (2010) Underlined that netnography is an evolution of traditional ethnography and is very relevant in the digital era because it can capture social dynamics and human interactions in real time without geographical or time boundaries (Khasanah, 2020).
The netnography methodology is consistent with scientific standards in computer science and social science, as it applies the principles of validity, accuracy, and transparency typical of conventional qualitative research. Netnography emphasizes immersive data collection through online communities, systematic data analysis, and the maintenance of digital research ethics standards. (Salzmann-Erikson & Eriksson, 2023). The netnography can be combined with real-time data analysis to provide insights into digital application development. (Philomath Research, 2025). This study emphasizes the use of netnography in the mobile apps and e-commerce ecosystem as an innovative method for monitoring the experiences, complaints, satisfaction, and desires of user communities directly and systematically, thereby facilitating product innovation and application development strategies, including features, design, and community-based digital services. (Philomath Research, 2025).
This method has been widely used in various fields of social sciences, demonstrating the flexibility and relevance of its methodology in the digital age. (Salzmann-Erikson & Eriksson, 2023). Netnography is considered highly relevant for understanding social transformation in the technological era, as well as changes in consumption patterns and the Education of digital society, especially on the topic of a halal lifestyle, which is very dynamic in online media. (Khasanah, 2020). Therefore, the study follows the following steps.

	Step One: Observing the Halal Food Search App on the Google Play Store
I	Observing the Halal Food Search Application on the Google Play Store by paying attention to the app's rating data and the number of reviews
	Step Two: Data Selection Procedure
II	The research data were obtained from user reviews on the Google Play Store platform for six halal food search applications. The applications were selected using the criteria of a minimum rating of 3.5 stars, more than 10,000 downloads, and active and updated applications in the last two years (2023–2025), as well as having a public review column that can be accessed without regional restrictions. These criteria ensured that the selected applications were relevant, accessible, and represented active user engagement.
	Step Three: Data Collection and Reduction
III	The study collected 171 data reviews on June 18, 2025, and then filtered the relevant data to classify it into positive and negative reviews, resulting in 163 data points.
	Step Four: Analyzing and Interpreting Data
IV	This study employs content analysis and thematic analysis to interpret the review of the collected data and subsequently categorise it into positive and negative reviews.
	Step Five: Presenting Results
V	This study presents the results of interpreting the survey data, categorising them into themes or points based on both positive and negative reviews, and provides an overview of the frequency distribution.

Fig. 1: The Data Analysis Measures Were Adopted and Modified Using Netnography Methods from the Model (Vizentin Et Al., 2021).

Table 1. Describe the total data from the six halal food search applications collected. Due to time constraints, researchers only selected six halal food finder applications from the Google Play Store, not including other platforms such as the App Store, Reddit, or social media. However, these limitations do not reduce the validity of the results, as the focus of the study was to understand the general patterns of user experience with digital halal applications. The overall data classification results comprised 179 reviews that were selected based on their

relevance to the topic of halal food finder apps, resulting in 163 final reviews consisting of 134 positive reviews and 29 negative reviews. Furthermore, the data will undergo a process of codification and categorisation into nodes according to relevant themes or topics. Thematic analysis was conducted using content analysis and manual categorization based on the model developed by Vizentin et al. (2021), in which data were classified into nodes/themes according to positive and negative reviews. To ensure coding reliability, the data were processed by two researchers in parallel, and the classification results were compared independently before being reconciled to strengthen the reliability of the thematic analysis. We also acknowledge the limitations of our sample and recommend that future studies use specialized analysis software (e.g., NVivo). In this study, manual techniques were chosen because the volume and type of data were manageable, thus still meeting the criteria of qualitative research trustworthiness.

Table 1: Halal Food Finder APP Review Data

Yes	Review Points	Reviews	Precentage (%)
1	Positive reviews	134	75
2	Negative reviews	29	16
3	Out of category	16	9
4	Total data collected	179	100

Table 2 shows that the data from this study were obtained from the comment column on the download platform, specifically the Google Play Store, regarding user reviews of six halal food search applications.

Table 2: App Data, Research Reviewer form, Google Play Store

Yes	Application	Rating	Reviews
1	Halalin	4,8	20
2	Mufko	4,7	113
3	Halal Guide	4,7	2
4	Halal Gourmet Japan	4,4	16
5	Halal Navi	4,3	10
6	Halal Japan	4,2	10
	Total reviews		171

In this study, the researcher examined halal food search applications that have received user comments, as text-based reviews can convey complex sentiments, offer specific recommendations, and provide valuable diagnostic information for other consumers in their decision-making. (Bigne et al., 2023). As of June 18, 2025, researchers received 179 review comments from the six applications. Next, the researcher evaluates the content of the comments and then categorises them based on specific themes. The analysis then continues with a content analysis to identify patterns, tendencies, and dominant perceptions among users, which will be interpreted to determine the driving factors of positive reviews and the primary obstacles that contribute to negative reviews.

4. Result and Discussion

4.1. Result

The data for this study were collected from the user review columns of six halal food search applications available on the Google Play Store: Halal Navi, Halal Guide, Halalin, Mufko, Halal Gourmet Japan, and Halal Japan. Data collection was carried out starting from March 18, 2025 to June 18, 2025 and produced initial data of 171 user reviews, which then became 179 reviews after going through a classification process into several categories, namely 75% were included in the category of positive reviews, 16% were negative reviews and 9% were not included in the two categories because they explicitly did not show a certain sentiment tendency.

Positive and negative reviews are further analysed using the nodes method, which involves classification by specific theme, category, or topic. From the analysis results, 134 positive reviews expanded to 249 data points after being categorised into various themes. The same also applies to the 29 negative reviews, which, after undergoing the classification process, resulted in 47 data points. The following table 3 contains positive review points.

Table 3: Positive Reviews Analysis

Yes	Review Points	Precentage (%)
1	Positive recommendations and testimonials, informative features, and beneficial apps.	58.63
2	It features a directory of halal restaurants, location information for places of worship, prayer times, Qibla directions, food scans, and a section for questions and answers.	16.87
3	Helping travelers and Muslims abroad.	15.66
4	Ease of finding halal food, ease of use of the application, and accessibility.	8.84

Table 3 shows that most of the positive reviews are based on positive recommendations and testimonials, informative features, and good applications, which are very helpful and valuable, accounting for as much as 58.63%. Additionally, the main features, including identifying halal restaurants, locating places of worship, prayer times, Qibla directions, food scans, and frequently asked questions, account for 16.87% of the total. The application is beneficial for travellers and Muslims abroad, with a 15.66% increase. However, positive reviews related to the ease of finding halal food, ease of use of the application, and accessibility were the lowest, at only 8.73%.

The highest percentage was found in the categories of satisfaction expressions and positive affirmations, such as the words "very helpful" and "good application". On the other hand, the lowest percentage is found in the ease and accessibility codes, as the review says, "The app makes it very easy to find halal food for Muslims in Korea, which is good...".

On the other hand, negative reviews are also categorised by grouping the obstacles experienced by users when using halal food search applications, as shown in Table 4.

Table 4: Negative Reviews Analysis

Yes	Review Points	Precentage (%)
1	The application needs repair and updating	31.91
2	Halal label data is incomplete, and non-halal products still appear.	21.28
3	The scan feature is not working, and I am unable to search for products—this is an incomplete feature.	21.28
4	Food/restaurant products are not listed, and products in other countries cannot be searched	10.64
5	The application frequently exits unexpectedly due to technical errors; they cannot upload profile photos.	6.38
6	Difficulty using the app.	4.26
7	Lack of language options	4.26

Table 4 shows that the emergence of various obstacles with the highest percentage of negative reviews, users complained that the application needed to be improved and updated in terms of features and application data by as much as 31.91%. In addition, problems with the incompleteness and accuracy of data, such as incomplete halal label data and non-halal products, still arise. Furthermore, application function constraints, including scan features that do not work and incomplete features, have a complaint rate of up to 21.28%. Users also complained about the issue of unregistered products and restaurants from other countries that could not be searched for, affecting 10.64% of searches. The problem with the application mechanism often becomes apparent, as it is unable to upload a profile photo in 6.38% of cases. Users find it difficult to use the application, and the problem of the lack of Indonesian support has the same percentage, which is 4.26%.

These findings underscore the need for enhancements in terms of ease of use, data reliability, and application responsiveness to effectively meet user needs. These negative reviews are a serious concern because they can lower user satisfaction levels, which in turn may lead to the formation of negative perceptions and potential refusal to continue using the application.

4.2. Discussion

Based on the research results, most users leave positive reviews, particularly regarding recommendations, testimonials, and informative features, which are considered very helpful. These findings align with previous research, which suggests that perceived usefulness and ease of use have a significant influence on user satisfaction with applications. Specifically, the more valuable and accessible features an application offers, the higher the level of user satisfaction (Prasetia & Suwitho, 2022). Such satisfaction drives the emergence of positive feedback and reviews that can reinforce a positive perception of the app as a valuable and accessible tool, while increasing user trust and loyalty. (Kurnia et al., 2024).

Some users appreciate the presence of features to support worship and halal food identification, such as prayer times, Qibla directions, and food scans. The availability of various features is an innovation that users appreciate. It is a primary driver in halal applications, as also found in consumer perception studies of halal product applications and other digital services. (Nurcahyani, 2022; Rasyidah, 2023).

The user's helpful experience on the go, especially in Muslim-minority countries, is one of the reasons the app is so appreciated. Based on research, halal literacy in the international world is still uneven. (Harati et al., 2024). Therefore, applications that provide accurate information are necessary to support the needs of global Muslims, as revealed in research on the challenges of choosing halal food in minority countries. The support of applications for Muslim mobility endorses the globalisation of halal lifestyles. (Azzochrah et al., 2021).

On the other hand, negative reviews highlight various obstacles, such as the incompleteness and accuracy of the data, including incomplete halal label data, the presence of non-halal food/restaurant products that are not registered, and products from other countries that cannot be traced. This phenomenon can be linked to the fundamental issue of data inaccuracy in halal applications, as identified in the study by Harati et al. (2024), which highlights the problems of incomplete data, fake halal labels, and weak digital audits, especially in Muslim minority countries and for cross-border products. Meanwhile, Voak et al. (2021) Found that differences in certification standards and weak global harmonization of oversight have resulted in many halal-labelled products failing to meet criteria in other countries, thereby increasing the risk of fraud and consumer uncertainty.

The study in Malaysia even found that there is a modus operandi of illegal meat cartels in Malaysia that manipulates halal certification through the smuggling of non-halal meat, such as pork, and collusion with customs officials, which causes damage to consumer trust and causes profound legal implications. (Halim et al., 2023).

Data incompleteness and accuracy constraints can also be caused by limitations in the data input process, verification, digital literacy, and limited connections and human resources in the field, especially in business actors and regions with limited internet access, so that applications require close collaboration with halal institutions, improved user education, and supporting technology, so that applications can run optimally. (Khairawati et al., 2025; Pohan et al., 2024).

Other complaints include the scan feature not working and the app being considered incomplete. Given that this feature is one of the main advantages, its failure lowers users' trust in the application. Another problem is that the application often crashes, such as when it exits unexpectedly, and cannot upload a profile photo, which is also a source of negative reviews. This problem can result in technical issues, and a lack of contextual adjustments can decrease user confidence, encouraging them to abandon the app. (Lutfiah, 2021).

In app reviews, many users complain about the lack of language options, including the absence of Indonesian support, despite the multilanguage feature being essential for reaching different user groups. (Khairawati et al., 2025). This lack of local language support can lead to difficulties in understanding important information, such as product halal assurance, which lowers user comfort and trust. (Dewi & Hakiki, 2023).

From the various obstacles experienced by users, the need for repair and update is evident. This obstacle demonstrates the expectation that users will continue to receive updates to the application, both in terms of features and data, as the need for halal information is dynamic. Given the various challenges faced by users, improvements and updates are necessary. This phenomenon indicates the expectation that users will continue to receive application updates, both in terms of features and data, as the need for halal information is dynamic. Based on research, the implementation of effective database management technologies, such as digital databases, admin dashboards, or cloud storage, is critical in halal food information systems so that product, location, and certification data can be accessed in real-time with high accuracy. (Nawaz et al., 2025).

However, implementing global halal database integration into a single application faces technical challenges in the form of data heterogeneity, interoperability requirements, and real-time validation maintenance, as well as legal challenges such as cross-border regulatory

harmonization, the risk of fake certificates, and global user data protection. (Anwar et al., 2025). Solutions that can be developed include the use of cloud databases, AI for automatic validation, blockchain for certification auditing, and formal partnerships between global halal certification bodies. (Astiwara, 2023; Ridho, 2025). Based on research, the use of advanced technologies such as Artificial Intelligence and Blockchain is highly recommended to increase the transparency and accuracy of halal information, ensuring that users receive data that is always up-to-date and trustworthy. (Sunmola et al., 2025).

AI-based data validation can overcome these problems through the application of anomaly detection algorithms, text mining in halal certification databases, and audit automation. AI can detect discrepancies in real time, correct data, and monitor changes in product status from multiple digital sources. Through machine learning, the system can learn from historical data to identify patterns of fraud and monitor the halal certification verification process more efficiently and accurately. (Julian et al., 2025).

Sunmola et al. (2025) Recommended building a digital ecosystem with blockchain integration that acts as an immutable database, so that the entire history of audits and halal certification can be accessed and verified transparently without the risk of document falsification or information duplication. The simultaneous application of blockchain and AI not only increases the transparency and trust of the halal industry but also speeds up audits, reduces administrative costs, and accelerates digital adoption by certification bodies and halal industry players.

Thus, the application of database management technology, accompanied by innovations in AI and blockchain, as well as partnerships with global halal certification bodies, forms an essential foundation for the modernization of digital halal certification, while offering concrete solutions to the challenges of data inaccuracy and fraud in the international halal market. Strengthening this digital ecosystem makes it easier to fulfil various user desires, ranging from ease of access, development of relevant features, continuous technical maintenance, to application adjustments to meet the dynamic needs of users, thereby contributing to increased user satisfaction and loyalty in halal food search applications. Research also shows that user satisfaction is significantly influenced by whether the application continues to be improved, particularly in terms of ease of navigation, response speed, and accessibility to key features that meet the needs of today's digital generation users. (Aditya & Damayanti, 2024).

5. Conclusion

Based on the results of the research that has been conducted, the analysis of 179 user reviews of five halal food search applications (Halal Navi, Halal Guide, Halalin, Mufko, and Zabihah) shows that the importance of halal food search applications in daily life as a digital solution needed by Muslims, especially in countries with minority Muslim populations, to facilitate access to trusted halal food information. The results of user analysis indicate that the majority of user reviews are positive, highlighting the benefits of informative features, ease of use, and support for Muslim travellers in Muslim-minority countries. Features such as halal restaurant search, Qibla direction, prayer times, and food scanning are added values that users appreciate. However, several obstacles remain, including the incompleteness and inaccuracy of halal food and restaurant product data, as well as the emergence of non-halal products in search results. Additionally, technical issues such as malfunctioning scan features, frequent app crashes, and limited language support pose obstacles to their use. This shortcoming certainly hurts user trust and loyalty. Therefore, close collaboration is needed between application developers and halal certification agencies, such as establishing partnerships with global halal certification bodies, to ensure that applications provide accurate information. In addition, the importance of implementing database management technology accompanied by AI and blockchain innovations in feature updates, improving data accuracy and completeness, expanding language support, and increasing application stability to enhance user satisfaction and loyalty, as well as supporting the development of the halal industry ecosystem.

Acknowledgement

The authors would like to thank the Faculty of Islamic Studies at the Universitas Muhammadiyah Surakarta for providing support and facilities that enabled the completion of this research. Special awards are also presented to colleagues and reviewers who have provided valuable input to enrich the quality of this article.

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