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Digital halal ecosystem development: Applications and institutions in Japan, 2010–2025

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A B S T R A C T

The development of digital halal applications and the institutional frameworks in Japan from 2010 to 2025 has been driven by the expanding Muslim community, comprising both residents and tourists, who require reliable digital access to halal products, restaurants, and other services. Therefore, this qualitative descriptive study conducted a literature review, application testing, and secondary data analysis from academic articles, association reports, and online sources to identify seven key halal applications in Japan, namely Halal Gourmet Japan, Halal Navi, Halal Japan, software Halal Japan, Shinjuku Halal Food, and eHalal. A comparative overview of their technological features was also presented, including barcode scanning, GPS integration, AI-based functions, and optical character recognition capabilities. Institutions such as the Japan Halal Association, Japan Islamic Trust, Japan Muslim Association, Nippon Asia Halal Association, Muslim Professional Japan Association, and the diaspora-led Halal International Trust Organization provided certification, standardization, and training, supported by government tourism initiatives since 2016. Ongoing challenges included fragmented certification standards in the absence of a national halal authority, data silos lacking AI and blockchain integration, and cultural adaptation within Japan's non-Muslim majority, where halal was increasingly perceived as a hygienic lifestyle choice. These seven halal software applications contributed to tourism, economic growth, and community cohesion, positioning Japan as an inclusive halal model through government, private, and diaspora collaboration. By bringing together application features, institutional support, and policy-related developments, this study offers a reference point for further discussion on the development of digital halal ecosystems in Japan and comparable settings.

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1 Introduction

The halal industry and halal lifestyle in Japan have shown steady growth alongside the expansion of Muslim residents and international tourists. This trend is reflected in Japan's tourism statistics, namely in 2025, Japan recorded 42.68 million inbound tourists, the highest annual total on record, while several markets with substantial Muslim populations, including Malaysia, Indonesia, and the Middle East, also reached record highs in annual arrivals (Japan National Tourism Organization 2025). These developments have increased demand for accessible and reliable halal information, products, and services in Japan.

Contrary to Muslim-majority countries, the development of halal technology, particularly mobile software applications and digital halal platforms, since the mid-2010s in Muslim-minority countries such as Japan has been closely related to the need to provide accessible and reliable halal information for Muslim residents and tourists (Imelda 2023). Applications such as Halal Gourmet Japan (HGJ) and Japan Masjid Finder have pioneered practical services by helping users locate halal food, places of worship, and other essential information through digital devices.

Japan's Muslim community, formed after the arrival of Muslim immigrants and the establishment of the first mosques in major cities such as Kobe and Tokyo, provides the foundation for the institutional developments underpinning the current halal industry (Al-Samarrai 2019). These community institutions in Japan have grown steadily over the years, as evidenced by the founding of various Muslim organizations such as the Japan Muslim Association (JMA) and Nippon Asia Halal Association (NAHA), which play crucial roles in halal standardization and certification (Imronnatsir 2023). The institutions serve as the main pillars in ensuring the validity of halal certifications and building Muslim consumers' trust in Japanese halal products.

Awareness among Japanese industry players of halal values has risen, primarily spurred by Muslim tourist demand and synergistic government efforts with local and international Muslim organizations (Rahmah 2023). Since 2016, the Japanese government has supported halal tourism development, including the provisions of supporting facilities such as prayer rooms, certified halal restaurants, and halal travel guides in collaboration with Japanese Muslim institutions (Ery *et al.* 2020).

Institutionally, halal applications in Japan function not only as information tools but also as platforms that strengthen networks among halal organizations, producers, and Muslim consumers. Halal Media Japan, as the initiator of halal and Muslim-friendly information dissemination, plays a central role in public communication and promoting the halal lifestyle in the digital era (Imelda 2023). Through social media and applications, it successfully bridges consumer information needs with halal service providers while promoting Japan as a promising Muslim-friendly destination.

Based on the description above, this study aimed to examine the development of halal software applications and their institutions in Japan from 2010 to 2025. It is expected to provide comprehensive contributions to halal industry stakeholders, technology developers, and the Muslim community in Japan, while reinforcing Japan's position as an inclusive and adaptive halal market model.

Beyond describing individual applications or institutions, this study proposes an integrated view of Japan's digital halal ecosystem, connecting app-based services, certification organizations, diaspora initiatives, and government tourism policies into a single analytical framework.

This integrated mapping is expected to serve as a reference point for scholars, policymakers, and developers who seek to understand how digital tools and institutional arrangements co-evolve in a Muslim-minority setting.

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2 Materials and Methods

This study used a qualitative descriptive method combining document analysis, application testing, and secondary data review. The analysis focused on halal-related mobile applications usable in Japan and on the institutional actors supporting halal certification, information dissemination, and Muslim-friendly services between 2010 and 2025. The application analysis covered seven applications identified through application-store searches, institutional references, and prior literature, namely Halal Gourmet Japan, HalalMinds, Halal Navi, Halal Japan, Software Halal Japan, Shinjuku Halal Food, and eHalal. Furthermore, relevant secondary data related to halal software applications in Japan from 2010 to 2025 were analyzed, including academic articles, reports from Japanese halal associations, developer portfolios, and online news. The qualitative analysis aimed to synthesize historical data on the development of halal applications and their institutional aspects.

3 Results

3.1 History of Halal Application Development in Japan

The emergence of halal applications in Japan originated from the practical needs of the minority Muslim community to ensure certainty regarding halal products and services, particularly food ingredients. This study identified a minimum of seven halal software applications usable in Japan at the time of investigation. The first halal software to appear in the early 2010s was HGJ, which pioneered a platform for searching halal restaurants, enabling users to easily find dining options and halal services across major Japanese cities. Developed by Food Diversity Inc. and Moving Squad in response to the growing needs of Muslim tourists and residents (Imelda 2023), HGJ has since transcended restaurant information to include barcode scanning features for instant product halal verification.

As of December 2025, the active HGJ version was 5.0.8, supporting nine languages, namely Japanese, Arabic, Indonesian, Malay, English, French, Turkish, German, and Chinese. The application allows searches for more than 775 halal/Muslim-friendly restaurants with filters for location, cuisine type, and certification. HGJ also features Halal Lens, which scans barcodes or photos of ingredients to detect haram substances using AI, a tool ideal for shopping at Japanese supermarkets and convenience stores (konbini).

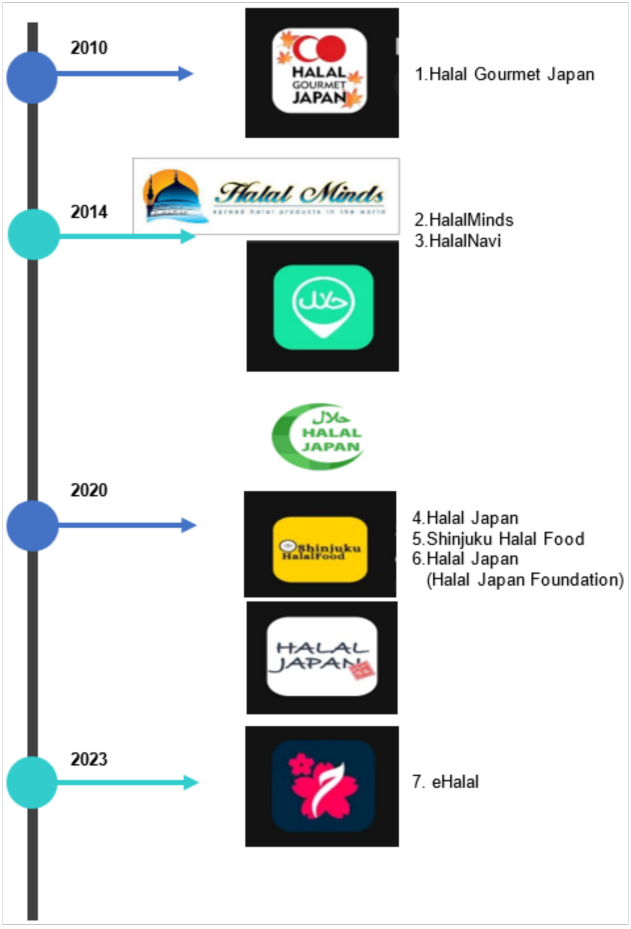

Figure 1: Timeline of the establishment of halal software applications in Japan

Table 1: Seven halal software applications in Japan

No	Name of application	Year Established	Developer Name
1	Halal Gourmet Japan	2010	Food Diversity Inc. & Moving Squad
2	HalalMinds	2014	Agung Pambudi, Dai Ishiro & Hironori Goto
3	Halal Navi	2014	Asiana Tech Sdn. Bhd. & Ikuto Hongu
4	Halal Japan	2020	Ash Sheikh Mufti Anas & Atif Mahir
5	Software Halal Japan	2020	Azrul Azwar & Agus Suharto
6	Shinjuku Halal Food	2020	Gold Lavender Co., Ltd.
7	eHalal	2023	East Bridge Co., Ltd.

Following HGJ, HalalMinds emerged, developed by Indonesian students at Kyushu University. This application showed significant advancements in halal application development by integrating cloud technology and a database. It combined barcode scanning with halal education features to raise public awareness of the halal lifestyle in Japan. The creation of applications such as HalalMinds exemplifies how participation by the Indonesian diaspora has positively contributed to strengthening Japan's digital halal ecosystem. However, the application was no longer available by early December 2025.

Halal Navi serves as a social platform application that helps users locate halal restaurants, prayer spaces, and other related halal information. It also enables users to join and interact within Muslim communities to share tips on the halal status of dining venues. Initially developed by Ryotaro Ejima, the application is currently led by Ikuto Hongu, who has driven its revitalization since 2014, with significant enhancements in 2023-2024.

Halal Navi operates globally, with an initial focus on Japan and other regions hosting Muslim minority communities. The application aims to assist Muslims in finding halal food and services in Muslim-minority countries, alleviating doubts about the halal status of food while keeping communities connected. Its features include halal restaurant searches, community reviews, user-submitted halal tips, map navigation, nearby restaurant and mosque locations, and social media sharing capabilities.

Halal Japan followed as a mobile application for identifying halal and Muslim-friendly products in Japan via barcode scanning, providing details on halal status, ingredient sources, and purchase locations. It features a database of more than 25,750 products, with search options by category, store, and brand, supporting rapid halal verification for Muslim users. Launched in 2021 as a halal food identifier tool, Halal Japan received significant updates through 2024 and remains available on the Application Store in 2025, active as of December 2025 with no signs of discontinuation.

Halal Japan users can scan product barcodes for instant halal status results or search manually through category menus, with the application analyzing ingredients and displaying detailed explanations. Camera integration simplifies on-site verification, with a seven-day free trial for premium features. The application's office is located at 108/4, Palleweliketiya, Akurana, 20850, Kandy District, Central Province, Sri Lanka, led by CEO Ash Sheikh Mufti Anas (Deobandi) and lead developer Aatif Mahir.

Another application named Software Halal Japan provides information on halal restaurants, products, and services in Japan, featuring searches and verification for food halal status and worship places for Muslims. Developed by Azrul Azwar and Agus Suharto, it evolved in the 2020s to serve Japan's Muslim market. Focused on areas with Muslim communities, it aims to simplify halal information access and support the growing halal industry. Users access restaurant and product databases through the mobile application, using location-based searches and user reviews. It operates under the authority of the Halal Japan Foundation.

Shinjuku Halal Food is an online grocery e-commerce application offering various halal food products, Indian spices, rice, general groceries, and electronics like mobile phones. Targeted at Japan's Muslim community and halal buyers, it was developed by Gold Lavender Co., Ltd., released around 2020, and updated through 2025. Based in Shinjuku, Tokyo, with nationwide delivery, it facilitates access to fresh, quality halal products for Muslims in Japan. Users place orders through iOS or Android applications, select items from catalogs, and receive home deliveries with secure payments and order tracking.

Finally, eHalal is another halal application usable in Japan, a Muslim travel application combining instant ingredient scanners for food verification, halal-friendly restaurant searches, and global eSIM services for Wi-Fi-free connectivity. Key features include product ingredient scanning for halal checks, discounts of up to 5% at selected restaurants, and expansion to countries such as Japan, Korea, Taiwan, Thailand, China, and Vietnam. The application is available for free on iOS (version 1.6.2, 171 MB, iOS 16+ compatible, Travel category) and Android.

Developed by East Bridge Co., Ltd., located at 1-11-9 Ueno Imasu Sunny Bldg. 8F, Taito-ku, Tokyo, eHalal was launched around 2023. The latest updates were released in August 2025 (bug fixes and improvements), and the application remained active on the App Store/Google Play through December 2025. It facilitates Muslim travel by enabling quick halal verification in Japan, providing access to certified restaurants, and offering

affordable eSIM connectivity.

Currently, halal software transcends mere halal food search applications, as educational and gamification tools have emerged as instruments to improve understanding and training in the halal lifestyle, particularly among student communities and young Muslims in Japan (Imronnatsir 2023). This gamification and interactive learning method disseminates halal values while reinforcing the identity of Muslim minority communities in a predominantly non-Muslim country.

3.2 Supporting Institutions

The development of halal applications in Japan does not occur in isolation but is supported by various institutions that play crucial roles in halal standardization and promotion. The Japan Halal Association (JHA) is one key organization facilitating the consolidation of halal certifications and supporting application integration into more standardized systems (Imelda 2023). Institutions such as JHA are vital, as Japan lacks a single national halal organization unifying all halal certification standards, leading to fragmentation that complicates access to reliable, integrated certification data for consumers and application developers.

Further support comes from the Indonesian Embassy in Tokyo (KBRI) and the Indonesian Muslim diaspora community, which serve as key catalysts for halal application innovations. The establishment of the Halal International Trust Organization (HITO), operating under the Indonesian Muslim Community in Japan (KMII) as a non-profit legal entity, provides concrete diaspora support through functions such as setting locally contextualized halal standards, halal auditor training, and certification facilitation for community micro, small, and medium enterprises (MSMEs) (Gandhi *et al.* 2024).

In addition, a Mutual Recognition Agreement (MRA) for halal certification has been established between the Indonesian Halal Product Assurance Agency (BPJPH) and halal certification organizations in Japan (HCOJ), allowing mutual acceptance of halal certificates and facilitating trade by eliminating duplicate certifications for products entering each other's markets. BPJPH has established MRAs with several HCOJ, allowing their certificates to be automatically recognized in Indonesia and vice versa. These HCOJ include JHA; Japan Islamic Trust (JIT), which signed an MRA in 2023 to accelerate assessments; JMA; NAHA and Muslim Professional Japan Association (MPJA), all confirmed as completed by late 2024.

The MRA process involves accreditation assessments, including document reviews, audits, and bilateral agreements, ensuring compliance with Indonesia's SJPH (Halal Product Assurance System) standards. As of October 2024, all imported halal food and beverages into Indonesia are expected to bear certificates from BPJPH-recognized foreign organizations such as these Japanese institutions. This development strengthens bilateral trade and supports more than 1,000 Japanese companies pursuing halal certification.

Through dialogues, research collaborations, and funding, application developers gain access to technologies tailored to the needs of Muslim users in Japan (Ery *et al.* 2023). Close collaborations also exist between application developers, halal certification organizations, halal restaurant operators, and food producers to enrich application databases with comprehensive and trustworthy service and product information.

Taken together, these institutional arrangements show that the development of halal applications in Japan is closely linked to certification practices, diaspora initiatives, and cross-border cooperation. This institutional overview may help inform future studies examining halal governance, digital verification, and transnational certification networks in similar contexts.

3.3 Comparison of Key Technologies in Japan's Halal Applications

The seven halal applications identified in Japan have different levels of technological sophistication depending on their core functions and development periods. Earlier platforms such as HGJ and HalalMinds adopted barcode scanning and cloud-based databases to support halal verification, while more recent services such as eHalal integrate multi-service features aimed at Muslim travelers. However, consistent with Hasnan & Kohda (2023) on the fragmented nature of Japan's halal data environment, most applications still lack advanced technological components such as blockchain-based traceability or AI-driven classification. Digital platforms continue to play an essential role in enabling access to halal information for users (Imelda 2023). However, the technological landscape remains uneven, reflecting broader challenges in standardization, data integration, and certification interoperability.

The comparative technological overview of seven applications compiled in this study fills an empirical gap in the literature, which has largely discussed halal apps conceptually without systematically benchmarking their concrete features.

Overall, this comparison illustrates that while Japan's halal applications have made significant progress in digital service provision, their technological foundations remain uneven, highlighting the need for stronger standardization, integrated data frameworks, and the adoption of more advanced technologies to support a fully reliable halal digital ecosystem.

Table 2: Comparison of key technologies used in seven halal applications in Japan

Software	Barcode	OCR	AI	GPS	Database	Blockchain	E-commerce
Halal Gourmet Japan	✓	✓	✓*	✓	✓	X	X
HalalMinds	✓	X	X	X	✓	X	X
Halal Navi	X	X	X	✓	✓	X	X
Halal Japan	✓	X	X	✓	✓	X	X
Software Halal Japan	X	X	X	X	✓	X	X
Shinjuku Halal Food	X	X	X	X	✓	X	✓
eHalal	✓	?	?	✓	✓	X	X

Notes:
✓ = available
X = not available
? = no official evidence (may exist but not publicly documented)
*HGJ uses AI-based image recognition for its Halal Lens ingredient-detection feature.

The comparison also indicates that halal applications in Japan differ not only in function, but also in their level of technological integration.

For this reason, the table may serve as a starting point for future studies on application design, user experience, data interoperability, and the adoption of emerging technologies in halal services.

4 Discussion

The evolution of halal applications in Japan originated from the practical needs of minority Muslim communities to ensure halal certainty in daily activities. As the Muslim population grows, particularly among diaspora communities and tourists, the demand for easily accessible digital halal information systems has surged. However, development faces significant challenges, especially in institutional aspects and data standardization.

The first challenge is the variation in halal certification standards across institutions due to the absence of a centralized national halal organization, creating opportunities for applications that integrate multiple certification sources. The second challenge involves addressing the diverse needs of Japan's Muslim minority, from students and migrant workers to tourists, through localized features such as language support, prayer schedules, and community services for broader acceptance (Imronnatsir 2023). Technology penetration also depends on sociocultural context, requiring halal concepts to align with Japanese societal values for acceptance by both Muslim consumers and the general public (Ramdani 2025).

The third challenge is the absence of a national standard integrating halal certification data into digital systems, causing information fragmentation and eroding user trust in data accuracy (Imelda 2023). The seven halal applications operate somewhat independently without strong data interconnections and have not fully leveraged advanced technologies such as blockchain and AI to improve halal supply chain transparency (Hasnan & Kohda 2023).

From an information technology standpoint, the limited use of blockchain and AI in Japan's halal applications shows that the digital ecosystem remains in an early stage of technological maturity. Although existing applications provide essential features such as restaurant search, barcode scanning, and ingredient lookup, certification databases, verification mechanisms, and backend systems operate independently without interoperability.

Global studies have shown how emerging technologies could strengthen these types of ecosystems. Blockchain is considered a reliable mechanism for improving halal supply chain transparency through immutable traceability records and decentralized verification, thereby reducing fragmentation and increasing consumer trust (Handayani & Vanany 2021). Similarly, mobile-based halal checking tools enhanced with Optical Character Recognition (OCR) and interactive interfaces have been proven effective in recognizing ingredient lists and assisting users in identifying non-halal components directly from product packaging (Lam *et al.* 2017).

Combined with insights from Imelda (2023) on the central role of digital platforms in halal information dissemination, Hasnan & Kohda (2023) on certification fragmentation, and Ramdani (2025) emphasis on sociocultural factors in technology adoption, these technological opportunities suggest Japan's halal applications could evolve toward more integrated, automated, and user-centered verification systems. This method can support stronger institutional collaboration, improve data consistency, and foster user trust in a non-Muslim-majority context.

Transcending technical hurdles, sociocultural aspects pose significant challenges. Halal application development is expected to adapt to local values in Japan's predominantly non-Muslim society. Recent studies have shown that halal acceptance in Japan transcends religiosity to perceptions of healthy, hygienic lifestyles (Ramdani 2025). Therefore, applications need inclusive features such as Japanese-language support, ethical consumption guides, prayer schedules, and community services to accommodate diverse users, including students, migrant workers, and Muslim tourists.

Institutionally, the Japanese government's role in supporting digital halal innovation remains limited. Primary initiatives are driven by private sectors and diaspora communities, especially from Indonesia and Malaysia, acting as key catalysts for halal technology development in Japan. Nonetheless, advances in mobile technology, web services, and big data offer substantial opportunities for more integrated digital halal ecosystems. Forming halal technology consortia, developing unified digital halal certification standards, and fostering cross-country collaborations are strategic steps to bolster institutional foundations and expand global halal application adoption.

Economically and socially, halal application development positively impacts Japan's halal industry and tourism sector. Enhanced halal facilities, including restaurants, cafes, and accommodations, have boosted Muslim tourist numbers (Saleh *et al.* 2019). In addition to economic growth, easier access to halal services strengthens Muslim community identity and social cohesion in Japan, positioning the country as an attractive model for halal market development among muslim-minority countries (Rahmah 2023).This study suggests that Japan's experience offers a transferable model for how community-driven initiatives, private developers, and government tourism policies can jointly nurture an inclusive digital halal ecosystem in a Muslim-minority country.

Future research can build on these findings through comparative case studies, longitudinal analyses of specific apps, and evaluations of emerging technologies such as blockchain-based halal traceability and AI-driven recommendation systems. In this way, the article aims to function not only as a descriptive account of Japan's halal applications and institutions, but also as a widely usable reference for designing, governing, and evaluating digital halal ecosystems in other contexts.

Overall, the findings suggest that the development of halal applications in Japan should be understood not only as a technological issue, but also as an institutional and sociocultural process. This perspective may be relevant for future research on digital religion, halal governance, minority-market innovation, and Muslim-friendly service development.

5 Conclusion

Japan's halal industry and lifestyle have continued to expand with growth in Muslim communities and tourism. Currently, seven halal-related software applications serve Japanese Muslims. The development of these applications represented key innovations that facilitated access to halal products and services. Institutions such as the JHA, JIT, JMA, NAHA, MPJA, government initiatives, and Indonesian diaspora efforts forming HITO further strengthened Japan's halal ecosystem. However, major challenges persisted in halal certification standardization and centralized digital data integration. Advancements in digital technology and cross-institutional collaborations, such as the MRA between the BPJPH and HCOJ, provided vast opportunities to establish Japan as an inclusive, adaptive halal market model in Muslim-minority countries, positively impacting its halal economy and tourism.

The interaction between application development, institutional support, and cross-border cooperation suggests that Japan offers a useful case for understanding the evolution of halal digital ecosystems in Muslim-minority settings. These findings may provide a basis for further research on halal technology, institutional coordination, and digital service development in comparable national contexts.

Conflict of Interest

The authors declare no conflict of interest.

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