



Leveraging Digital Technology to Promote Halal Gastronomy Tourism

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Abstract

Halal Gastronomy tourism is one of the fastest-growing branches of tourism globally. Borneo, with its cultural diversity and unique traditional cuisine, has the potential to become a major destination for halal culinary tourism. However, the application of digital technology in promoting this tourism is still in its early stages. This study examines the use of digital technologies such as social media, mobile applications and virtual reality in marketing halal culinary tourism. The study also discusses the challenges faced by tour operators and Muslim tourists and suggests effective digital marketing strategies. Data was collected through interviews with industry players and tourists. The results of the study show the great potential of digital technology in strengthening the promotion of halal culinary tourism, with an emphasis on a cultural and religious sensitive approach.

Keywords: Halal Gastronomy Tourism, Borneo, tourism, halal

1. Introduction

Halal culinary tourism has become a sector that received special attention due to its increasing demand from global Muslim tourists. Borneo, which includes the states of Sabah, Sarawak, and Brunei, is rich in local culinary traditions that meet halal requirements. Digital technology offers new opportunities to promote and expand halal culinary tourism through various interactive platforms. To date, a total of 896 premises in Sarawak, which include restaurants, food and beverage products, logistics and consumer goods, have obtained halal certificates issued by the relevant authorities (TVS, 2024). However, the use of digital technology is still facing infrastructure challenges and digital awareness among small and medium entrepreneurs. This study aims to identify the potential and challenges of using digital technology in halal culinary tourism in Borneo, with a focus on effective digital marketing strategies that are appropriate to the cultural and religious context.

2. Literature review

2.1 Halal Awareness

The issue of halal and haram is often discussed given the abundance of food-based products and restaurants serving food to consumers, including Muslim consumers. Indeed, Islamic teachings have outlined that every Muslim is obliged to only consume food exclusively from halal sources. This is explained from the words of Allah s.w.t in the Quran:

“O mankind, eat of what is lawful and good from what is on earth, and do not follow the footsteps of Satan, for indeed Satan is to you a clear enemy.” (Quran. al-Baqarah: 16)

According to Jusoh et al. (2022), Islam encourages its followers to eat halal and nutritious food, because halal and nutritious food not only affect the health of the body, but also the purity of the heart. It is clear here that Muslim consumers are aware of how important it is to consume halal food to influence quality of worship. *Halal* is a term derived from Arabic word which means ‘permissible’ by Islamic teaching. Meanwhile, the word *Thoyyiban* which comes from Arabic means good and clean. According to Abang Hasni (2012), *Halalan Thoyyiban* food is food obtained from halal, safe sources and is able to improve physical health when eaten, which means food and nutrition are obtained from halal, good and safe sources to improve health and well-being.



According to Samat and Mohd Rodzi (2010), Muslim consumers are hesitant to buy anything from non-Muslim premises, especially shops that serve food, even if the halal logo is displayed on the premises. This is due to many cases that have arisen involving fraud halal logo and thus, increasing Muslim consumers' awareness to be more careful in selecting the food products.

2.2 The Role of Digital Platforms in Advancing Halal Gastronomy

Previous studies have found that technologies such as halal food delivery services, AI-based food recommendations, and online information resources facilitate the discovery of halal food for Muslim tourists. This helps them enjoy local cuisine while remaining compliant to Sharia principles. User-generated content and AR technology also provide a more authentic virtual culinary experience. In addition, studies have shown that halal tourism has a social and economic impact on local communities, and it is important to implement its sustainability and respect of the local culture. The integration of technology into halal tourism has grown rapidly with the emergence of Industry 4.0, which offers various conveniences for Muslim travellers through innovations such as halal food apps, virtual tours, AI, and VR (Mukherjee et al., 2022; Azam et al., 2024). These technologies facilitate access to halal information, enrich cultural experiences, and make informed travel decisions, although they still face challenges such as standardising halal terminology and developing effective local promotional strategies (Mukherjee et al., 2022). VR specifically helps showcase cultural and religious heritage in an engaging way (Kamarulzaman et al., 2020; Suhartanto et al., 2021), while digital platforms such as HalalTrip and CrescentRating, as well as mobile apps and AI-based recommendation systems, personalize travel services and enhance convenience of Muslim travelers (Hashim et al., 2007; CrescentRating, 2020; Rahman et al., 2017; Taecharunroj & Mathayomchan, 2021). Furthermore, user content on social media platforms such as Instagram and TripAdvisor contributes to the formation of trust and travel intentions through positive reviews and narratives (Zeng & Gerritsen, 2014; Abubakar & Ilkan, 2016).

2.3 Barriers to Adoption or Use of Digital Technology in the Halal Culinary Tourism Industry

Despite the significant potential and ongoing initiatives, the adoption and effective utilization of digital technology in Sarawak's halal culinary tourism industry face several formidable barriers. These challenges span technological, human capital, and regulatory domains, requiring concerted efforts to overcome them.

2.3.1 Technological and Infrastructure Challenges

A primary impediment to digital technology adoption, particularly in the context of tourism, is the prevailing technological and infrastructure deficits, especially in remote areas. The current level of digital marketing adoption in rural tourism destinations in Sarawak is noted as "zero to minimal" (Cheuk et al, 2018). This stark reality suggests that while urban centers may have adequate connectivity and digital literacy, many authentic culinary experiences found in Sarawak's diverse rural landscapes remain largely undiscovered by digital means. Physical, logistical, and social constraints inherent to remote areas further impede overall digital marketing adoption, highlighting a significant digital divide (Cheuk et al, 2018). Furthermore, there is a recognized scarcity of reliable empirical investigations into the factors driving e-commerce adoption among Small and Medium-sized Enterprises (SMEs) in Sabah and Sarawak (Lian et al., 2022). This lack of localized research means that specific barriers unique to Borneo's business environment, such as internet penetration, digital infrastructure quality, and cost of technology, may not be fully understood or adequately addressed by current policies.

Within the halal food supply chain itself, technological shortcomings contribute to critical issues. Outdated information systems and communication gaps make it difficult to verify halal compliance and ensure traceability of products (Ellahi et al., 2025). The presence of slow and unreliable traceability systems intensifies consumer uncertainty, which is particularly detrimental in a sector where trust and integrity are paramount (Ellahi et al., 2025). Issues like cross-contamination and fraud (e.g., mislabeling, use of fake or non-halal ingredients) are amplified by these technological deficiencies, raising concerns about the integrity of the halal certification systems (Ellahi et al., 2025). The stark contrast between Sarawak's overall digital transformation ambitions and the "zero to minimal" adoption in rural tourism highlights a significant rural-urban digital divide. This implies that infrastructure limitations, such as inconsistent internet connectivity and logistical challenges in remote areas are critical barriers, potentially excluding a substantial portion of authentic culinary experiences from digital promotion and access.

2.3.2 Human Capital and Knowledge Gaps

Beyond technological infrastructure, a significant barrier lies in human capital and prevailing knowledge gaps. As previously mentioned, the lack of comprehensive studies on e-commerce adoption among SMEs in Sabah and Sarawak



contributes to a broader understanding deficit (Lian et al., 2022). Many tourism providers in rural Sarawak currently rely on traditional methods like word-of-mouth recommendations or direct contact for bookings. While they express willingness to adopt digital marketing, this is contingent upon receiving assistance from knowledgeable parties, indicating a clear need for targeted training and support (Cheuk et al, 2018). Challenges also permeate the halal certification process, which is crucial for culinary tourism. There is a noted lack of manpower and insufficient skills and knowledge among halal auditors (Muhammad et al., 2020). Moreover, the complexity of halal certification manuals can be a significant hurdle, particularly for non-Muslim entrepreneurs who may struggle to fully grasp the intricate *halal* and *toyyiban* concepts. A general lack of information about halal procedures in mass media further aggravates this issue, leading to misunderstandings and potential non-compliance (Muhammad et al., 2020). The broader societal digital literacy also plays a critical role. While digital platforms offer immense opportunities, they also present risks. The ease with which misleading information can spread through social media, as seen in cases like the Cadbury Malaysia Porcine DNA Case or allegations against fast-food brands, can quickly erode consumer trust in halal products and authorities (Andiani, 2024). This highlights the importance of digital literacy and critical thinking skills, not only for businesses to leverage technology effectively but also for consumers to discern credible information.

The identified gaps in digital literacy, auditor skills, and general understanding of halal procedures suggest that technological infrastructure alone is insufficient. There is a fundamental human capital challenge. This implies that training programs, simplified guidelines, and cross-sector collaborations (e.g., between digital experts and Islamic scholars) are essential to empower businesses and individuals to effectively leverage digital tools and combat misinformation.

2.3.3 Regulatory, Certification, and Trust Hurdles in the Digital Halal Ecosystem

The digital transformation of the halal industry, while promising, introduces its own set of regulatory, certification, and trust-related challenges. The core integrity of halal products, particularly in the culinary sector, is vulnerable to issues such as cross-contamination, fraud (e.g., the use of formalin, fake meat, or adulterants), and difficulties in traceability (Ellahi et al., 2025). These problems often stem from shared facilities, inadequate segregation during handling and storage, and unreliable documentation across complex supply chains (Ellahi et al., 2025). Even existing digital systems designed to streamline halal certification face operational hurdles. Problems with Malaysia's online halal application system, MYeHALAL, and inefficiencies in reviewing halal certification applications have been reported (Ellahi et al., 2025). Such issues can lead to delays in certification and potentially undermine confidence with the system. The worst outcome is a potential lack of trust by consumers in Malaysia towards the halal certification authorities, such as JAKIM, if the integrity of the process is perceived to be compromised (Muhammad et al., 2020). Furthermore, there is a recognized need for a standardized framework for digital halal certification. The absence of such a framework can lead to inconsistencies in standards and practices across different regions or countries, complicating international trade and tourism. Furthermore, more empirical research is needed on consumer behavior within the digital halal context to understand how digital tools influence their trust and purchasing decisions (Mohd Najib et al., 2024). The rapid evolution of digital technologies, including 3D printing and in vitro meat, also presents new challenges regarding their compliance with halal standards and sustainability, prompting its importance for further research and regulatory adaptation (Ellahi et al., 2025).

While digital technology offers solutions for traceability and transparency, the challenges highlighted indicate that existing digital systems can have problems, and the ease of information dissemination via social media can also spread misleading halal information. This implies that digitalization in the halal sector is a double-edged sword: it offers immense potential for building trust through transparency, but also introduces new vulnerabilities related to data integrity, system reliability, and the spread of misinformation, which can erode consumer confidence.

Table 1: Identified Barriers to Digital Technology Adoption in Halal Culinary Tourism

Category of Barrier	Specific Barrier	Description/Impact	Relevant Context
Technological and Infrastructure	Limited Digital Adoption in Rural Areas	Current adoption is "zero to minimal," excluding authentic culinary experiences from digital promotion.	Rural tourism destinations in Sarawak (Cheuk et al, 2018).
	Scarcity of E-commerce Adoption Studies	Lack of localized empirical data on factors driving digital uptake among SMEs in Borneo.	SMEs in Sabah and Sarawak (Lian et al., 2022).



	Outdated Information Systems & Traceability	Difficulties in verifying halal compliance and tracking products due to unreliable, slow systems.	Halal meat supply chain, consumer uncertainty (Ellahi et al., 2025)
Human Capital and Knowledge Gaps	Low Digital Literacy & Skills	Tourism providers in rural areas rely on word-of-mouth; require assistance for digital marketing adoption.	Rural tourism providers in Sarawak (Cheuk et al, 2018).
	Lack of Halal Auditor Skills & Manpower	Inadequate expertise and insufficient personnel in the halal certification process.	Halal certification authorities (Muhammad et al., 2020).
	Complex Halal Certification Guidelines	Difficulty for entrepreneurs (especially non-Muslims) to understand and comply with halal procedures.	Halal certification applicants (Muhammad et al., 2020).
	Misinformation on Digital Platforms	Ease of spreading misleading halal information through social media, eroding consumer trust.	Muslim consumers, social media users (Andiani, 2024).
Regulatory, Certification and Trust	Halal Integrity Issues (Fraud, Contamination)	Challenges in maintaining halal purity due to cross-contamination, fake products, and adulterants.	Halal supply chain (Ellahi et al., 2025)
	Problems with Digital Certification Systems	Operational issues with online halal application systems (e.g., MYeHALAL) and application review.	JAKIM's MYeHALAL system (Muhammad et al., 2020)
	Lack of Standardized Digital Halal Framework	Absence of consistent guidelines for digital halal certification, leading to inconsistencies and trust issues.	Global halal industry, consumer confidence (Mohd Najib et al., 2024)

3. Methodology

This study uses a qualitative approach to explore the use of digital technology in promoting halal gastronomy tourism in detail. The main method of data collection is through semi-structured interviews. A total of 12 (twelve) respondents were interviewed face-to-face and online. Qualitative studies typically require at least 12 participants to achieve data saturation, and this number is also considered appropriate to support quantitative analysis in the context of this study (Clarke & Braun, 2013; Fugard & Potts, 2014). The respondents consist of halal tourism operators, local food entrepreneurs, as well as Muslim tourists who have experience or knowledge in related fields. The selection of respondents is done through purposive sampling to ensure that the information obtained is relevant and in-depth. The collected data was analyzed using thematic analysis to identify the main patterns related to the use of digital technology, such as social media, mobile applications and virtual reality technology, as well as challenges and support for its use in the context of halal cuisine tourism. Emphasis is placed on cultural and religious sensitivity in each strategy identified.

4. Result and Discussion

Table 2 details the demographic and background analysis of the respondents involved in this study. Elements analyzed include gender, age, purpose of visit, experience of traveling in Borneo, level of competence in digital technology, and use of technology to obtain halal-related information. This data provides an initial insight into the respondent profile and helps in understanding their tendencies and level of involvement in using technology related to halal information while traveling in Borneo.



Table 2: Respondents Demographic Analysis

Respondents	Gender	Age	Purpose of Visit	Borneo Tour Experience	Competency Level Scale for Digital Technology	The Use of Technology to Find Halal Information
R1	Female	28	Holidays & food exploration	First time	4	Use YouTube & IG to find halal places to eat
R2	Male	34	Backpacking & local cuisine	Second time	3	Guna Google Maps, TripAdvisor, TikTok
R3	Female	45	Family & cultural visits	Third time	5	Use Facebook group Muslim tourists & travel blogs
R4	Male	30	Long holidays & meals	First time	4	use i Muslim Pro, Instagram & Google applications
R5	Female	39	Holidays with Muslim friends	Second time	3	Use IG Reels, TikTok & food blogs
R6	Male	29	Adventure Tourism	Visited 3 locations	3	Yes – Uses HalalTrip app
R7	Male	42	Business & Leisure	Visited 1 location	2	Occasionally – Uses Google
R8	Female	35	Cultural Exploration	First-time visitor	5	Uses HalalTrip app
R9	Female	40	Business Trip	Returning visitor	3	Relies on travel blogs
R10	Male	27	Eco-tourism	Visited 4+ locations	4	Uses mobile apps
R11	Female	39	Gastronomy tourism	First-time	3	Asks locals for info
R12	Male	38	Leisure	First-time	4	-Social Media and blog

Based on Table 3, this study also found that the use of social media such as Facebook and Instagram is the most popular method for promoting halal culinary tourism. Industry players identified a lack of technological training and digital infrastructure as a major barrier. Muslim tourists showed high interest in mobile applications that provide halal food location information and reviews. The adoption of virtual reality remains limited. However, it holds a significant potential to enhance and transform the tourism experience.

Table 3: Use of Technology in the Promotion of Halal Culinary Tourism

Aspects/Themes	Study Findings	Implication
Popular Promotional Platforms	Facebook and Instagram are the most frequently used platforms	Social media is effective as a broad and easily accessible promotional tool
Barriers to Technology Use	Lack of technology training and digital infrastructure among industry players	Social media is effective as a broad and easily accessible promotional tool
Muslim Tourists' Choice	Muslim tourists are keen on mobile apps that provide halal food locations and reviews	Great potential for halal-focused mobile app development
New Technologies (Virtual Reality)	The use of Virtual Reality (VR) is still low but has the potential to enrich the tourism experience	Opportunities for innovation in improving the halal culinary tourism experience



Table 4 lists halal culinary-related applications available globally. These applications are developed to meet the needs of Muslim users in finding information about halal food, halal restaurant locations, food ingredients, and syariah-based dietary guides. Meanwhile, Table 5 presents data related to respondents' perceptions and tendencies towards the use of halal food search applications. The information presented includes the level of interest in the application based on a 1 to 5 Likert scale, the use of social media for halal culinary search purposes (yes or no), and the technological challenges faced by the respondents. These findings provide an initial picture of the level of acceptance of digital technology among Muslim users, particularly in the context of halal food search, and identify the main barriers that may restrict the widespread use of the application. This analysis is important to understand the extent to which technology can be effectively utilized in supporting a halal lifestyle in the digital age.

Table 4: Example Halal Related Culinary Applications that are Available

Categories	Examples	Website/Application URL
Halal Food Search Application	Where Halal, Halal Navi	https://www.wherehalal.com/ https://www.halal-navi.com/
Halal Web Guide & Directory	Zabihah (halalplaces.com), HalalPlaces.org, KuchingBorneo.info	https://www.zabihah.com/ https://halalplaces.org/ https://kuchingborneo.info/
Delivery Applications & Digital E-Services	Halal2Go, Ketek	https://www.halal-2go.com/ https://ketekajak.com/

Table 5: Respondents Perceptions on Halal Culinary Platforms

Respondent ID	Interest in Halal Food Search Apps (1-5)	Media Social Usage for halal Culinary (Yes/No)	Technological Challenges Faced
R1	3	Yes	Unstable Internet connection
R2	2	Yes	Disadvantages of halal special applications
R3	4	Yes	Difficulty accessing the app
R4	1	Yes	The quality of information in the application is inaccurate
R5	4	No	Difficulty accessing the app
R6	3	Yes	Limited internet access in rural areas
R7	2	No	Low digital literacy
R8	4	Yes	Inconsistent app accuracy
R9	5	Yes	Overwhelmed by too many app choices
R10	4	Yes	Language barrier in app interface
R11	3	No	Reluctance to trust online information
R12	5	Yes	Outdated Information Systems & Traceability

5. Conclusion

In conclusion, this study shows that digital technology has great potential in strengthening the promotion of halal culinary tourism in Borneo. With its cultural diversity and unique traditional Sharia-compliant food, Borneo has the potential to become a major destination for international Muslim tourists. While the use of social media and mobile applications has shown effectiveness, there is still a need for investment in training, infrastructure, and the production of culturally and religiously sensitive digital content. This study emphasizes the importance of an inclusive strategic approach that is



aligned with Islamic principles while fostering innovation. Integrated collaboration between stakeholders – including government, industry players, and technology developers – is essential to realize the full potential of halal culinary tourism in the region.

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