

Halal Certification in The Digital Age: Leveraging Online Platforms for Enhanced Transparency and Accessibility

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ARTICLE INFO	ABSTRACT
<p>Keywords: Halal Certification, Digital Technology, Transparency, Accessibility, Global Impact</p> <hr/> <p>Email : muhammad.nusran@umi.ac.id</p>	<p>This article discusses the role of digital technology in halal certification in the digital era. The research aims to understand the impact of digital technology on halal certification and its global implications. The research method used is literature analysis, which helps researchers formulate a comprehensive understanding of this topic. In the literature analysis, researchers explore the history of halal certification, the development of digital technology in the context of halal certification, and its impact on transparency and accessibility. Additionally, researchers also consider the challenges and ethical considerations that arise with the use of digital technology in halal certification. The article also discusses the role of the Internet of Things (IoT), Artificial Intelligence (AI), and blockchain technology in enhancing halal certification. IoT enables real-time monitoring in the supply chain, while AI supports in-depth data analysis. Blockchain technology provides integrity and transparency in certification. Mobile applications also create greater accessibility for consumers to check the halal status of products. The research findings indicate that digital halal certification has a significant global impact, not only meeting the needs of Muslim consumers but also gaining recognition from non-Muslim communities. Despite challenges such as data security and ethical considerations, the use of digital technology in halal certification opens the door to the growth of a more inclusive, transparent, and halal-compliant food and beverage industry.</p> <p>Copyright © 2023 Jurnal JEAMI .All rights reserved is Licensed under a Creative Commons Attribution- NonCommercial 4.0 International License (CC BY-NC 4.0)</p>

INTRODUCTION

The global community is increasingly recognizing the importance of food and products that adhere to the principles of Islamic halal (Aniqoh & Hanastiana, 2020). Halal, which means "permissible" in Arabic, refers to products and food that meet the standards established by Islamic law (Abdallah et al., 2021). Halal certification is not only a religious requirement but also a choice embraced by a growing number of consumers globally (Azam & Abdullah, 2020).

In the past few decades, the demand for halal products has experienced significant growth (Aghwan, 2018). This growth is influenced not only by the expanding Muslim population but also by a global shift in consumer awareness regarding the quality and ethics of food and products (Wilkins et al., 2019). Even non-Muslim communities increasingly value halal products because they believe such products provide assurances of quality and cleanliness (Bashir, 2019).

With the increasing demand, there is a need to ensure that products claiming to be halal genuinely meet these requirements. This underscores the vital importance of halal certification. However, the certification process must be transparent and easily accessible to an increasingly savvy and discerning consumer base. This is where digital technology plays a crucial role in facilitating the development and improvement of halal certification.

Through the use of online platforms, consumers can now easily search for information about the halal status of products, access certificates, and even receive notifications about changes in certification status (Rejeb et al., 2021). This is a significant step in supporting consumers' rights to choose products that align with their religious beliefs and preferences. Moreover, it also provides incentives for manufacturers and stakeholders in the industry to adhere more seriously to halal standards, thereby enhancing trust and integrity in the global market.

It is essential to note that the challenges in halal certification are not limited solely to technical aspects but also involve social, cultural, and economic factors. A robust and trustworthy halal certification must integrate Islamic legal principles with sustainable business practices. This requires close collaboration among certification bodies, manufacturers, government regulators, and consumers. In this digital era, it is crucial to integrate halal certification regulations and standards into the online environment. This will enable better monitoring, more transparent audits, and faster information access for all parties involved.

Halal certification is not merely a label but also a cornerstone in maintaining consumer trust, safeguarding the rights of individuals of faith, and fostering innovation in the food and beverage industry. In this article, researchers will elucidate how digital technology and online platforms have become key in addressing these challenges and providing benefits to all stakeholders in the halal product supply chain.

METHODS

This research used the literature analysis method to delve into the topic of halal certification in the digital age. The researcher conducted a systematic search in academic literature, scientific articles, books, and related sources that focused on the topic of halal certification and the use of digital technology in that context. This approach helped the researcher formulate a comprehensive understanding of the research topic. In this literature analysis, the researcher identified the history of halal certification, the latest developments in the use of digital technology in halal certification, and its impact on transparency and accessibility. The researcher also paid particular attention to the challenges and ethical considerations that arose with the use of digital technology in halal certification. This approach allowed the researcher to establish a strong research framework based on a deep understanding of the topic of halal certification in the digital age.

RESULT AND DISCUSSION

Role of Technology in Halal Certification

Halal certification, referring to the process of verifying food and beverage products in accordance with the principles of Islamic halal (Santoso et al., 2021), has undergone significant developments thanks to the crucial role of technology in the digital era. The implementation of

technology has transformed how halal certification is conducted and has had a substantial impact on various aspects of the process.

1. Integrating Technology into Halal Certification:

- a. Digital Documentation: Technology has enabled the use of digital documents in the halal certification process (Jamal et al., 2019). This encompasses data recording, information storage, and more efficient document exchange. In this context, blockchain has proven to be a valuable tool for ensuring the security and authenticity of certification documents.
- b. Real-time Monitoring: The use of sensors and monitoring technology in food production facilities allows real-time monitoring of the production process (Miranda et al., 2019). This enables certification bodies to ensure compliance with halal standards at every stage of production.

2. Enhancing Efficiency and Accuracy:

- a. Automation: The automation of the certification process has improved efficiency, reduced human errors, and expedited the completion of certification procedures (Khatib et al., 2021). Technology enables the automatic identification and tracking of products, including the traceability of raw materials and production methods.
- b. Data Analysis: Analytical technology and artificial intelligence are used to analyze certification data more precisely, identify potential violations, and ensure the integrity of the certification process.

3. Challenges and Ethical Considerations:

- a. Data Security and Privacy: Technology-based digital halal certification requires strict protection of sensitive data. Challenges involve secure data handling and consumer privacy, as well as compliance with data protection regulations.
- b. Ethical Use of Technology: The use of technology in halal certification must adhere to Islamic ethical and moral principles. Halal is a sacred religious principle, and it is essential to ensure that technology is used with the same integrity and sanctity.

The use of technology in halal certification has brought significant changes to how certification is conducted. It has enabled a more efficient and accurate process, increased transparency, and provided benefits to all stakeholders in the food and beverage supply chain. With technology continually advancing, the role of technology in halal certification is likely to become even more vital in the future.

Global Impact of Digital Halal Certification

Halal certification has experienced rapid development and garnered significant global attention (Mohd Nawawi et al., 2019). The use of digital technology in the halal certification process has influenced various aspects on a global scale, bringing about significant changes in the halal product market, international standards, and global trade.

1. Expanding Halal Markets:

- a. Market Growth: The utilization of digital technology has helped expand the global market for halal products (Berakon et al., 2023). The growth of the Muslim population and consumer awareness of halal have led to a significant increase in demand for halal products worldwide (Jannah & Al-Banna, 2021). Manufacturers and exporters of halal products are leveraging technology to reach a broader market than ever before.

- b. **Diversification of Products:** Originally focused on food and beverages, the halal industry has undergone significant diversification. Now, halal products include cosmetics, pharmaceuticals, tourism, and many other industries (Hassan et al., 2021). This diversification has created more business opportunities and extended the influence of halal products into various aspects of daily life in different countries.
2. **Standardization and Harmonization:**
 - a. **Global Halal Standards:** The use of technology in halal certification has driven greater standardization efforts at the global level. Various countries and institutions are working to adopt uniform standards to facilitate the international trade of halal products (Suryawan et al., 2022). This is a crucial step in creating a consistent and internationally recognized framework.
 - b. **Facilitating Trade:** Efforts to harmonize halal certification have facilitated international trade in halal products (Johan & Plana-Casado, 2023). This enables manufacturers to export their products to different countries more easily and reduces trade barriers. This is a positive step in connecting producers with global consumers seeking halal products.
 3. **Consumer Awareness and Trust:**
 - a. **Consumer Confidence:** Digital technology plays a crucial role in building consumer trust in halal products (Aminah, 2023). Consumers worldwide now have quick access to information about the halal status of the products they purchase (Adekunle & Filson, 2020). This allows them to independently verify and confirm the halal status of products, creating greater trust in halal products.
 - b. **Cross-Cultural Appeal:** While halal products may have initially targeted Muslim consumers, the use of digital technology has helped halal products appeal to non-Muslim consumers seeking products with higher quality standards. This creates a larger and more diverse market for halal products, which, in turn, enhances the sustainability and competitiveness of the halal industry on a global scale.
 4. **Economic and Trade Impact:**
 - a. **Economic Growth:** The growth of the halal product market has created significant economic opportunities in countries with large Muslim populations (Hafiz, 2020). It has contributed to economic growth and job creation. With the use of digital technology, these economic prospects are expanding further.
 - b. **International Trade:** In the era of globalization, halal products have become highly sought-after commodities in international trade. Digital technology has facilitated the global trade of halal products, allowing manufacturers to reach global consumers more easily and efficiently (Rejeb et al., 2021). In this regard, technology has played a crucial role in streamlining the flow of halal products worldwide.

The use of technology in halal certification has profound and global impacts. It has transformed the landscape of halal products, expanded the global market, influenced standards, and international trade. With the continuous advancement of technology, halal certification will continue to be a vital instrument in the global economy and a significant factor in promoting halal products as the preferred choice for consumers worldwide.

Transparency and Accessibility through Online Platforms for Halal Certification

The implementation of digital technology in halal certification has brought about fundamental changes in how certification processes are conducted. This has created greater transparency and improved accessibility for all stakeholders, including producers, consumers, and certification bodies. In this context, let's delve deeper into how digital technology affects halal certification:

1. Online Certification Portals:

- a. **Instant Verification:** Online certification platforms allow consumers and other stakeholders to quickly verify the halal status of products with easy access to digital certificates. This reduces uncertainty and enhances consumer trust in the products they purchase. Furthermore, these platforms establish systems that ensure the certificates are valid and cannot be forged, eliminating doubts often associated with conventional certification.
- b. **Efficient Record-Keeping:** The use of online portals enables manufacturers to maintain well-organized digital records of the entire production process. This creates robust evidence related to compliance with halal standards that can be accessed by authorities and stakeholders. This process replaces error-prone manual record-keeping that is often difficult for relevant parties to access.

2. Consumer Empowerment:

- a. **Informed Choices:** Consumers now have the ability to make choices based on their religious beliefs and preferences with more information. They can easily check the halal status of products before making a purchase, making them more conscious of the products they buy. This empowers consumers and encourages manufacturers to adhere more closely to halal standards.
- b. **Feedback Mechanisms:** Some online platforms allow consumers to provide feedback and report suspicious products. This helps stakeholders identify potential violations and maintain the integrity of the certification process. Consumers who can provide input become an extra set of eyes and ears in safeguarding the integrity of the certification process.

3. Efficiency and Accuracy:

- a. **Automation of Processes:** Online certification platforms enable the automation of many certification processes, from application submissions to data collection. This reduces human errors and ensures that the certification process is conducted more swiftly and accurately. Automation includes more efficient checks on product components, tracking of raw materials, and ensuring that all aspects of production comply with halal standards.
- b. **Real-time Updates:** Real-time updates on halal certification information enable stakeholders to stay abreast of the latest developments in the certification process and identify status changes promptly. This is crucial in a rapidly changing business environment facing fast regulatory changes.

4. Challenges and Ethical Considerations:

- a. **Data Security and Privacy:** In the context of online platforms, data security and privacy are challenges that must be addressed. Secure data management and compliance with data protection regulations are essential aspects in maintaining trust in digital halal

certification. Data handlers must ensure that consumer's personal data and sensitive company information are adequately protected.

- b. **Ethical Use of Technology:** The use of technology in halal certification must adhere to Islamic ethical principles. In the certification process, it's important to ensure that technology is used with integrity and sanctity in line with Islamic values. This includes ensuring that technology is not used to falsify information or deceive authorities or consumers.

Through the implementation of digital technology in halal certification via online platforms, transparency has significantly increased, enabling easier access for all stakeholders and empowering consumers to make more informed choices. In this regard, digital technology has brought about positive changes in halal certification, bringing the food and beverage industry closer to the principles of Islamic halal.

Future Trends in Digital Halal Certification

When considering the future of halal certification in the digital era, there are several important trends to keep an eye on. These trends include the continuous development of technology and various innovations that will influence how halal certification is conducted in the future.

1. Internet of Things (IoT) Integration

The future of halal certification will be closely tied to the Internet of Things (IoT). This technology allows for the use of sensors and connected devices to monitor production processes in real-time (Chen, 2020). For example, sensors can measure temperature, humidity, and product location throughout the supply chain. This information can then be accessed by certification bodies to ensure compliance with halal standards. Thus, IoT can enhance transparency and accuracy in certification.

2. Artificial Intelligence and Machine Learning

Artificial intelligence (AI) and machine learning will play a crucial role in the analysis of halal certification data in the future. AI can be used to detect patterns and trends that may not be easily identified by humans (Bharadiya, 2023). For instance, AI can assist in monitoring production operations and identifying potential violations of halal standards. This will ensure that certification is conducted more precisely and accurately.

3. Blockchain Technology

The use of blockchain technology will continue to grow in halal certification. Blockchain provides evidence of transparency and reliability (Bux et al., 2022). It creates an unbroken trail that follows the product's journey from raw materials to the finished product. This information can be accessed by all stakeholders, including consumers, ensuring that the product complies with Islamic halal requirements. Furthermore, blockchain enables easy auditing and verification by authorities.

4. Mobile Applications

Easily accessible mobile applications will remain a crucial tool in halal certification (Hasan et al., 2020). Consumers can quickly check the halal status of products through mobile apps, even when they are in a store (Petiwala et al., 2021). This creates convenience and greater accessibility for consumers. Mobile apps can also be used by manufacturers and stakeholders to track and manage certifications.

5. International Collaboration and Standardization

In the future, there will be greater efforts towards international collaboration and standardization of halal certification. This will facilitate the global trade of halal products and create a consistent framework for certification. Various countries and certification bodies will work together to achieve consistency in halal standards.

6. Consumer-Centric Approaches

Consumers will play an increasing role in halal certification in the future. They will have more control over their purchasing decisions through online platforms and mobile apps. Consumer interest in ensuring the halal status of products will influence manufacturers, and manufacturers will respond more seriously to consumer demands.

Halal certification in the digital era will continue to evolve and adapt to technological developments. With the above-mentioned trends, halal certification will become more transparent, efficient, and accurate. This will benefit manufacturers, consumers, and the entire food and beverage industry in upholding the principles of Islamic halal.

Challenges and Ethical Considerations

While digital halal certification brings many benefits, there are several challenges and ethical considerations that need to be addressed. These include the following aspects:

1. Data Security and Privacy

One of the primary challenges in digital halal certification is data security and privacy. Strict data protection is crucial when managing information about products, production, and consumers (Hoofnagle et al., 2019). In this context, the use of blockchain technology and data encryption becomes key to safeguard sensitive data and personal information of consumers (Raddatz et al., 2023). Companies and certification bodies must comply with data protection regulations to maintain consumer trust and certification integrity.

2. Ethical Use of Technology

When using technology in halal certification, it is important to ensure that the use of technology adheres to Islamic ethical principles. Halal is a highly sacred religious principle, and therefore, technology must be used with the same integrity and purity. This includes avoiding data manipulation, falsification of information, or actions that contradict halal principles.

3. Misuse of Technology

There is potential for dishonest parties to misuse technology for unethical purposes in halal certification. For example, non-compliant manufacturers may attempt to falsify certification data or avoid disclosing accurate information. Therefore, strict monitoring and audits must be implemented to prevent the misuse of technology in certification.

4. Equitable Access

There are ethical considerations in ensuring that access to digital halal certification is fair and equal for all stakeholders, especially small and medium-sized producers. Limited access to technology or a lack of technological understanding can affect a producer's ability to comply with halal standards and obtain certification. Therefore, initiatives are needed to ensure that producers from various backgrounds can easily access halal certification technology.

5. Consumer Trust and Education

Increased transparency in halal certification can impact consumer trust in halal products (Rohmah et al., 2019). However, it is important to ensure that consumers have an adequate

understanding of halal certification and the technology used in the process. Consumer education on how digital halal certification works and what they should look for in halal products is important to support informed purchasing decisions.

6. Global Harmonization of Standards

Challenges in halal certification include differences in halal standards in various countries and institutions. International standard harmonization will become increasingly important in the future to facilitate the trade of halal products and ensure consistency in certification (Khan et al., 2019). This involves a significant role for countries and international institutions in defining globally adoptable standards.

In implementing digital halal certification, there needs to be a strong awareness and commitment to ethical aspects and data security. Stakeholders in the food and beverage industry, along with certification bodies and authorities, must work together to address these challenges and ensure that digital halal certification can be applied with integrity and in line with Islamic halal principles.

CONCLUSION

With an increasingly global awareness of the importance of halal in food and products, digital technology has become key to enhancing transparency and accessibility in halal certification. The development of digital technology has enabled a more transparent and efficient approach to halal certification. Through the use of online platforms, consumers can now easily check the halal status of products, access digital certificates, and even receive notifications about certification status changes. This not only empowers consumers but also provides incentives for manufacturers and stakeholders in the industry to adhere more seriously to halal standards, thereby enhancing trust and integrity in the global market. Halal certification in the digital age also has a significant global impact. It caters not only to the growing needs of Muslim consumers but also gains recognition from non-Muslim communities that value halal products for their perceived quality and cleanliness. This creates broader market expansion opportunities for manufacturers complying with halal standards. Despite challenges in the use of digital technology, such as data security, privacy, and ethical considerations, recent technological advancements like the Internet of Things, artificial intelligence, and blockchain technology offer significant potential to ensure compliance with halal standards more efficiently and accurately. In the execution of digital halal certification, it is important to always consider Islamic ethical values and ensure that technology is used with integrity and purity in line with halal principles. Furthermore, international collaboration and standard harmonization will be essential factors in guiding the future of halal certification towards greater consistency and global impact. Thus, halal certification in the digital age has opened the door to significant advancements in meeting consumer needs, improving product quality, and driving economic growth. This creates substantial opportunities for the development of a more inclusive, transparent, and halal-compliant food and beverage industry.

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