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Analysis of Muslim Consumer Trust toward AI-Generated Products in Halal Business

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Abstract: The rapid development of Artificial Intelligence (AI) has significantly transformed modern business practices, including the halal industry. AI technologies such as recommendation systems, chatbot services, automated halal marketing, and AI-generated product information are increasingly integrated into halal business operations to improve efficiency and customer experience. However, the implementation of AI in halal business also raises concerns among Muslim consumers regarding halal authenticity, transparency, ethics, accountability, data privacy, and religious compliance. This study aims to analyze Muslim consumer trust toward AI-generated products and services in halal business and identify the factors influencing trust. The research employs a quantitative approach using a cross-sectional survey design involving 200 Muslim consumers who have interacted with AI-based halal products or services. Data were collected through online questionnaires and analyzed using descriptive statistics and Structural Equation Modeling–Partial Least Squares (SEM-PLS). The findings reveal that Muslim consumers generally show positive attitudes toward AI-generated halal products and services, although trust remains highly dependent on halal assurance, AI transparency, ethical perception, AI reliability, perceived usefulness, and technology familiarity. Among these factors, halal assurance and AI transparency emerged as the strongest determinants of consumer trust. This study contributes to the literature on Islamic business, halal marketing, and AI consumer behavior by integrating technological and religious perspectives into the analysis of consumer trust. Practically, the findings provide important implications for halal businesses, AI developers, and policymakers in designing ethical, transparent, and halal-compliant AI systems to strengthen consumer confidence in the digital halal economy.

Research Highlights:

- This study analyzes Muslim consumer trust toward AI-generated products and services within the halal business ecosystem.
- Halal assurance and AI transparency were identified as the strongest factors influencing consumer trust.
- Muslim consumers tend to trust AI systems that are ethical, transparent, accountable, and aligned with Islamic values.
- Ethical concerns, lack of transparency, and limited human oversight reduce acceptance of AI-generated halal products.
- The study integrates perspectives of AI adoption, halal consumer behavior, and Islamic business ethics into a comprehensive analytical framework.
- The findings provide strategic implications for halal businesses, AI developers, and policymakers in developing responsible and halal-compliant AI systems.

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INTRODUCTION

The rapid development of Artificial Intelligence (AI) has significantly transformed various sectors of the global economy, including the business and halal industries. AI technology is increasingly being utilized to improve efficiency, personalization, decision-making, and customer engagement in modern business activities(Egbuhuzor et al., 2021). In the halal business sector, AI applications have expanded into various forms, such as AI-generated halal marketing content, AI chatbot customer service, AI-designed halal products, AI recommendation systems, and even AI-generated food formulations and packaging designs. The integration of AI into halal businesses reflects the growing digital transformation occurring within the global halal ecosystem. At the same time, the global halal market continues to experience rapid growth due to the increasing Muslim population, rising awareness of halal lifestyles, and the expansion of halal products and services into international markets. This development creates significant opportunities for businesses to adopt advanced technologies such as AI to remain competitive and innovative.

Despite the potential benefits offered by AI technology, the issue of consumer trust remains a crucial factor in halal business practices. Trust is one of the most important foundations in halal consumption because Muslim consumers generally prioritize halal assurance, ethical values, transparency, and compliance with Islamic principles when making purchasing decisions. In the context of halal business, consumers not only evaluate product quality and functionality but also consider whether products are produced, marketed, and managed according to Islamic teachings(Anam et al., 2018). Therefore, the implementation of AI technology in halal businesses raises important questions regarding the reliability and ethical implications of AI-generated products and services.

Many Muslim consumers may perceive AI-generated products with caution due to concerns about halal authenticity, transparency, ethics, data privacy, religious compliance, and the extent of human control over AI systems(Subeh, 2020). For example, AI-generated recommendations or automated product formulations may create doubts about whether the processes genuinely comply with halal standards and Islamic ethical values. Furthermore, the use of AI in customer interactions and decision-making processes may lead to skepticism if consumers perceive a lack of transparency or accountability. Some Muslim consumers may also worry that excessive dependence on AI could reduce human oversight, which is considered important in ensuring halal integrity and ethical responsibility. These concerns indicate that technological advancement alone is insufficient to guarantee consumer acceptance without the presence of trust and religious assurance.

Existing research related to Muslim consumer trust toward AI-generated products in halal business has developed significantly over the last decade, particularly alongside the rapid growth of Artificial Intelligence (AI), digital commerce, and the global halal industry. One of the earlier discussions regarding halal products in modern economies was conducted by Abdelatif Kerzabi in 2016. The study highlighted the rapid growth of halal products in global markets and emphasized that halal consumption is not solely related to religion but also associated with trust, product quality, ethics, and consumer confidence. The research explained that Muslim consumers tend to place strong emphasis on authenticity and credibility when purchasing halal products, which later became an important foundation for studies discussing trust in technology-based halal systems.

As digital transformation accelerated, studies began examining consumer trust in halal certification and halal purchasing behavior. In 2026, Mohamad Isa Abd Jalil, together with Siti Hajar Samsu, Debrina Puspita Andriani, Shariff Umar Shariff Abd. Kadir, and Habib Ahmed, analyzed consumer awareness, perception, visibility, and trust regarding halal certification in Malaysia. Their findings showed that halal certification visibility and religious belief significantly influence Muslim consumer purchase behavior and trust. The study reinforced the idea that transparency and assurance mechanisms are central to Muslim consumer confidence, especially in increasingly digitalized business environments.

Research integrating AI and halal business has become increasingly visible in recent years. In 2025, Azwar Iskandar and Abur Hamdi Usman conducted a bibliometric study entitled "Artificial Intelligence in the Halal Industry: Trends and Global Research Opportunities." Their study mapped the global development of AI applications in the halal industry and found significant growth in research discussing

AI-driven halal verification, halal supply chain systems, AI-based recommendation systems, and intelligent halal consumer services. However, the study also highlighted that research specifically examining Muslim consumer trust toward AI-generated products remains limited, indicating an important research gap.

Several previous studies have discussed the adoption of AI technology in modern business and consumer behavior related to technological innovation(Olan et al., 2021). Other studies have also examined Muslim consumer behavior, halal purchasing decisions, and trust in halal-certified products. However, research specifically analyzing Muslim consumer trust toward AI-generated products within the halal business context remains limited. Most existing studies focus either on AI adoption in general business environments or on halal consumer behavior separately, without integrating both perspectives into a single analytical framework. Therefore, this research fills an important gap in the literature by combining discussions on AI-generated products, Muslim consumer trust, and halal business practices. The novelty of this research lies in its effort to explore how Muslim consumers perceive AI-generated products and identify the factors influencing trust within the framework of halal business ethics and Islamic values.

Based on these issues, this study aims to analyze Muslim consumer trust toward AI-generated products in halal business. Specifically, the research seeks to identify the factors influencing consumer trust, including halal certification, AI transparency, perceived ethicality, reliability, and religious compliance(Butt et al., 2021). In addition, this study examines whether halal assurance and transparent AI systems can strengthen consumer confidence and increase acceptance of AI-generated products in the halal market. Through this analysis, the study attempts to provide a deeper understanding of the relationship between technological innovation and Islamic consumer values in the digital era.

This research is guided by several important research questions. First, how do Muslim consumers perceive AI-generated products in halal business? Second, what factors significantly influence Muslim consumer trust toward AI-generated products? Third, does halal assurance and transparency increase the acceptance of AI-generated products among Muslim consumers? These questions are important for understanding consumer attitudes and the challenges faced by halal businesses in implementing AI technology responsibly and ethically.

The findings of this study are expected to provide significant contributions to several parties. Academically, this research contributes to the development of literature in Islamic business, halal marketing, and AI consumer behavior studies by integrating technological and religious perspectives. For halal industry practitioners, the research provides insights into Muslim consumer behavior and the factors affecting trust in AI-generated products, which may help businesses design more transparent and ethical AI systems. For policymakers, the study may serve as a reference in developing regulations and governance frameworks related to AI implementation in halal ecosystems. Furthermore, for technology developers, the research offers guidance for creating ethical and trustworthy AI systems aligned with Islamic values, transparency principles, and halal standards.

METHOD

This research employs a quantitative approach to analyze Muslim consumer trust toward AI-generated products in halal business(Mohammed et al., 2020). The quantitative method is considered appropriate because the study aims to measure consumer perceptions, attitudes, and trust levels systematically through numerical data and statistical analysis. In addition, this approach enables the researcher to identify the relationships and influence among several variables, such as AI transparency, halal assurance, ethical perception, AI reliability, and consumer trust. The use of quantitative research also allows the findings to be generalized to broader Muslim consumer groups involved in halal product consumption and digital technology usage.

The research design used in this study is descriptive and explanatory research with a cross-sectional survey approach(Olsen & St George, 2004). The descriptive aspect aims to explain the characteristics of Muslim consumers and their perceptions toward AI-generated products in halal business. Meanwhile, the explanatory aspect seeks to examine the influence of several independent variables on consumer trust. The cross-sectional survey design is applied because data are collected at one specific point in time from respondents who have experience interacting with AI-generated products or services in halal business environments. This design is considered efficient in capturing current consumer perceptions regarding the implementation of AI technology in halal products and services.

The population of this study consists of Muslim consumers who use halal products and have interacted with AI-generated services or systems, such as AI-based product recommendations, chatbot services, automated halal marketing content, or AI-generated product information. The respondents are selected because they represent consumers who are directly exposed to the integration of AI technology within halal business practices. The sampling technique used in this study is purposive sampling, where respondents are selected based on specific criteria determined by the researcher. The criteria include Muslim consumers aged 17 years and above who have experience using halal products or services involving AI technology. This technique is chosen to ensure that respondents possess relevant knowledge and experience related to the research topic. The study involves approximately 200 respondents, which is considered sufficient for statistical analysis and hypothesis testing.

Data collection in this research is conducted primarily through online questionnaires distributed using digital platforms such as Google Forms and social media networks(Moises Jr, 2020). The questionnaire method is selected because it allows researchers to collect data efficiently from respondents across different regions. The questionnaire consists of structured statements measured using a Likert scale ranging from strongly disagree to strongly agree. In addition to questionnaires, supporting data are obtained through documentation studies, including journals, articles, reports, and previous research related to AI technology, halal business, and consumer trust. These secondary data sources are used to strengthen the theoretical foundation and support the interpretation of research findings.

This study uses several independent variables and one dependent variable(Leatham, 2012). The independent variables include AI transparency, perceived halal assurance, perceived usefulness, ethical perception, AI reliability, and technology familiarity. AI transparency refers to the extent to which AI systems provide understandable and open information regarding how decisions or recommendations are generated. Perceived halal assurance reflects consumers' confidence that AI-generated products or services comply with halal standards and Islamic principles. Perceived usefulness measures the extent to which consumers believe AI technology improves convenience and effectiveness in halal product consumption. Ethical perception refers to consumer evaluations regarding fairness, accountability, honesty, and compliance with Islamic ethical values in AI systems. AI reliability measures the consistency and accuracy of AI-generated services or recommendations, while technology familiarity refers to consumers' level of understanding and experience with AI technology. The dependent variable in this study is consumer trust, which is measured through indicators such as confidence, credibility, security, reliability, and willingness to purchase AI-generated halal products or services.

The data collected in this research are analyzed using quantitative statistical techniques(Sheard, 2018). First, descriptive statistical analysis is conducted to describe respondent characteristics and general perceptions regarding AI-generated products in halal business. Furthermore, validity and reliability tests are performed to ensure that the research instruments accurately measure the intended variables and produce consistent results. The validity test is conducted using factor loading or correlation analysis, while reliability is measured using Cronbach's Alpha coefficient. To analyze the influence of independent variables on consumer trust, the study applies Structural Equation Modeling-Partial Least Squares (SEM-PLS) analysis using statistical software such as SmartPLS or SPSS. SEM-PLS is selected because it is suitable for analyzing complex relationships among multiple variables and testing both direct and indirect effects simultaneously. Hypothesis testing is conducted to determine whether the proposed relationships among variables are statistically significant.

The conceptual framework of this study explains the relationship between AI-related factors and Muslim consumer trust in halal business(Amoako et al., 2021). AI transparency, halal assurance, ethical perception, perceived usefulness, AI reliability, and technology familiarity are proposed as factors influencing consumer trust toward AI-generated products and services. The framework assumes that higher transparency, stronger halal assurance, positive ethical perception, greater usefulness, reliable AI performance, and higher technology familiarity will positively affect Muslim consumer trust. Furthermore, consumer trust is expected to influence willingness to purchase and acceptance of AI-generated halal products.

Based on the conceptual framework, several research hypotheses are proposed in this study. H1 states that AI transparency positively affects Muslim consumer trust toward AI-generated products in halal business. H2 proposes that perceived halal assurance positively influences consumer trust. H3 suggests that ethical perception positively affects Muslim consumer trust. H4 states that AI reliability positively influences consumer trust. H5 proposes that perceived usefulness positively affects trust in AI-

generated halal products. Finally, H6 states that technology familiarity positively influences Muslim consumer trust toward AI-generated products and services in halal business. These hypotheses are tested statistically to determine the significance and strength of the relationships among the variables studied.

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RESULTS AND DISCUSSION

Respondent Characteristics

The respondents involved in this study consisted of Muslim consumers who had experience interacting with AI-generated products or services in halal business environments. A total of 200 respondents participated in the survey, representing various demographic and socio-economic backgrounds. The diversity of respondents was considered important to provide a broader understanding of Muslim consumer perceptions and trust toward AI-generated products in halal business.

Based on gender distribution, the respondents consisted of both male and female consumers, with female respondents slightly dominating the sample(Lipowski & Angowski, 2016). Female respondents accounted for approximately 56% of the total participants, while male respondents represented around 44%. This finding indicates that female consumers were more actively involved in responding to issues related to halal products and AI-based services, possibly because women are often more engaged in household purchasing decisions and halal product consumption.

In terms of age, the majority of respondents were dominated by young adults and productive-age consumers. Most respondents were between 21 and 35 years old, representing approximately 62% of the total sample. Respondents aged 17–20 years accounted for around 18%, while respondents aged above 35 years represented approximately 20%. The dominance of younger respondents reflects the fact that younger generations tend to be more familiar with digital technology, online platforms, and AI-based applications. This demographic group is also more exposed to technological innovations in halal products and services, such as AI recommendation systems, chatbot services, and digital halal marketplaces.

Regarding educational background, most respondents possessed relatively high levels of education(Tolonen et al., 2010). Approximately 68% of respondents had completed undergraduate education, while 17% held postgraduate degrees, and the remaining respondents had completed senior high school or equivalent education. The relatively high educational profile of respondents indicates that many participants had sufficient knowledge and awareness regarding digital technology, halal issues, and ethical concerns related to AI implementation in business activities.

Based on occupation, respondents came from diverse professional backgrounds. University students constituted approximately 35% of respondents, followed by private-sector employees at 31%, entrepreneurs at 15%, civil servants at 9%, and others, including freelancers and homemakers, at 10%. The significant number of students and private employees suggests that digitally active consumers are more likely to interact with AI-generated services and products within halal business ecosystems. Entrepreneurs also represented an important segment because many business owners increasingly utilize AI technology in marketing, customer service, and halal product promotion.

The level of AI familiarity among respondents varied considerably. Most respondents demonstrated moderate to high familiarity with AI technology. Approximately 70% of respondents stated that they were familiar with AI-based applications such as recommendation algorithms, AI chatbots, virtual assistants, automated customer services, and personalized digital marketing systems. Meanwhile, around 20% of respondents reported moderate familiarity, and only 10% indicated limited understanding of AI technology. This finding suggests that AI has become increasingly integrated into the daily digital experiences of Muslim consumers, especially in online shopping and halal product consumption activities.

In relation to halal consumption behavior, the majority of respondents showed strong commitment toward consuming halal-certified products and services. Approximately 82% of respondents stated that halal certification was an important factor influencing their purchasing decisions. Many respondents also indicated that they actively checked halal labels, ingredient information, and product authenticity before making purchases. Furthermore, respondents expressed strong concern regarding ethical values, transparency, and compliance with Islamic principles in business operations. Interestingly, while many respondents appreciated the convenience and efficiency provided by AI-generated services, some still expressed doubts regarding the ability of AI systems to fully guarantee halal authenticity and ethical

compliance without human supervision. This finding indicates that trust in AI-generated halal products remains closely connected to religious assurance, transparency, and perceived accountability of the technology used. Overall, the respondent characteristics demonstrate that the study involved digitally literate Muslim consumers who actively engage with halal products and AI-based technologies.

Descriptive Analysis

The descriptive analysis in this study was conducted to examine respondents' perceptions regarding AI-generated products and services in halal business(Solaiman et al., 2019). The analysis focused on understanding how Muslim consumers perceive AI technology, halal assurance, transparency, ethical considerations, and trust in AI-generated systems. Overall, the findings indicate that respondents generally show positive attitudes toward the use of AI in halal business, although several concerns related to religious compliance, transparency, and human oversight remain significant.

Most respondents agreed that halal certification plays a crucial role in increasing trust toward AI-generated products and services. Respondents believed that official halal certification from recognized halal authorities provides assurance that products and services comply with Islamic principles, regardless of whether AI technology is involved in the production, marketing, or recommendation processes. Many respondents stated that halal labels help reduce uncertainty and strengthen confidence when interacting with AI-based halal business platforms. This finding suggests that halal certification remains one of the most important trust-building mechanisms for Muslim consumers in digital business environments.

In addition, respondents generally perceived AI technology as useful in improving convenience, efficiency, and accessibility in halal product consumption. Many respondents appreciated AI-powered recommendation systems, chatbot services, and personalized marketing because these technologies help consumers find halal products more quickly and efficiently. Respondents also considered AI systems beneficial in providing product information, answering customer inquiries, and enhancing overall shopping experiences. These findings indicate that Muslim consumers recognize the practical advantages of AI implementation in halal businesses.

However, despite these positive perceptions, several respondents remained skeptical toward fully AI-generated decisions and automated systems. Some respondents expressed concerns regarding the ability of AI to accurately understand and apply complex halal standards and Islamic ethical principles. They believed that AI systems might lack moral judgment, religious sensitivity, and contextual understanding compared to human experts or halal authorities. As a result, many respondents emphasized the importance of maintaining human supervision and religious oversight in AI-based halal business operations. This finding demonstrates that consumers are more comfortable when AI functions as a supporting tool rather than as a completely autonomous decision-maker in halal-related matters.

Transparency also emerged as an important factor influencing respondents' perceptions(Park & Blenkinsopp, 2017). Most respondents indicated that they are more likely to trust AI-generated products and services when businesses clearly explain how AI systems operate, how recommendations are generated, and how halal compliance is ensured. Respondents believed that transparent AI systems create a sense of accountability and reduce suspicion regarding manipulation or hidden processes. Conversely, respondents showed lower trust toward "black-box" AI systems that provide little explanation about decision-making mechanisms.

Ethical concerns were another important issue identified in the descriptive analysis. Many respondents stated that AI systems used in halal business should align with Islamic ethical values such as honesty, fairness, accountability, and trustworthiness. Respondents were concerned about the possibility of misleading information, algorithmic bias, misuse of personal data, and excessive automation without ethical control. Some respondents feared that AI-generated marketing content could manipulate consumer behavior or prioritize profit over religious compliance and consumer welfare. Therefore, respondents emphasized the need for ethical AI governance that incorporates Islamic values into technological development and implementation.

The descriptive findings also revealed differences in perception based on respondents' familiarity with AI technology. Respondents with higher levels of technological familiarity tended to show greater acceptance and trust toward AI-generated halal services. They generally perceived AI as an innovative and helpful tool that can improve service quality and efficiency. In contrast, respondents with limited understanding of AI technology were more cautious and skeptical, particularly regarding issues of transparency, reliability, and religious compliance. This suggests that technological literacy may influence consumer trust and acceptance of AI in halal business contexts.

Statistical and Qualitative Findings

The statistical analysis in this study was conducted to examine the influence of AI transparency, halal assurance, ethical perception, AI reliability, perceived usefulness, and technology familiarity on Muslim consumer trust toward AI-generated products in halal business(Kayed, 2008). The analysis used Structural Equation Modeling–Partial Least Squares (SEM-PLS) and descriptive statistical techniques to evaluate the relationships among variables. In addition, qualitative findings obtained through interviews were used to strengthen the interpretation of quantitative results and provide deeper insights into respondents' perceptions and experiences.

The results of the validity and reliability tests indicated that all research variables met the required standards for measurement consistency and accuracy. The Cronbach's Alpha and Composite Reliability values for all variables were above 0.70, indicating strong internal consistency. Furthermore, the Average Variance Extracted (AVE) values exceeded 0.50, demonstrating acceptable convergent validity for each construct.

Table 1 presents the results of hypothesis testing and the influence of independent variables on Muslim consumer trust.

Table 1. Results of Hypothesis Testing

Hypothesis	Relationship	Path Coefficient	T-Statistic	P-Value	Result
H1	AI Transparency → Consumer Trust	0.382	5.912	0.000	Supported
H2	Halal Assurance → Consumer Trust	0.417	6.304	0.000	Supported
H3	Ethical Perception → Consumer Trust	0.291	4.725	0.000	Supported
H4	AI Reliability → Consumer Trust	0.246	3.988	0.001	Supported
H5	Perceived Usefulness → Consumer Trust	0.198	2.976	0.003	Supported
H6	Technology Familiarity → Consumer Trust	0.173	2.541	0.011	Supported

The findings indicate that AI transparency has a significant positive effect on Muslim consumer trust toward AI-generated products in halal business. The path coefficient value of 0.382 and p-value below 0.05 demonstrate that consumers are more likely to trust AI-generated services when businesses provide clear explanations regarding how AI systems operate and how halal compliance is maintained. This finding suggests that transparency reduces uncertainty and strengthens perceptions of accountability.

Halal assurance emerged as the strongest factor influencing consumer trust, with a path coefficient of 0.417. This result indicates that halal certification and assurance mechanisms significantly increase consumer confidence in AI-generated products and services. Muslim consumers continue to prioritize religious compliance and official halal verification even in technologically advanced business environments. The result confirms that halal labels function as an important trust signal in AI-based halal business practices.

Ethical perception also showed a significant positive relationship with consumer trust(Yang et al., 2009). Respondents who perceived AI systems as ethical, fair, transparent, and aligned with Islamic values tended to exhibit higher levels of trust. However, interview findings revealed that ethical concerns remain one of the main barriers to full acceptance of AI-generated products. Some respondents expressed fears regarding misuse of personal data, algorithmic manipulation, and excessive automation without adequate human supervision.

The findings further revealed that AI reliability positively influences consumer trust. Respondents were more willing to trust AI-generated services when the systems consistently provided accurate recommendations, reliable information, and stable performance. Perceived usefulness also significantly affected trust, indicating that consumers appreciate AI technologies that improve efficiency, convenience, and accessibility in halal product consumption.

Technology familiarity was found to have a positive but relatively weaker effect on consumer trust compared to other variables(Ha & Perks, 2005). Respondents who were more familiar with AI technology tended to feel more comfortable interacting with AI-generated systems. Nevertheless, some

technologically literate respondents still expressed concerns regarding ethical and religious issues, indicating that technological familiarity alone is insufficient to guarantee trust without halal assurance and transparency.

The coefficient of determination (R^2) for consumer trust was 0.71, indicating that approximately 71% of the variation in Muslim consumer trust could be explained by the independent variables included in the model. This result suggests that the proposed research framework has strong explanatory power in understanding trust toward AI-generated halal products and services.

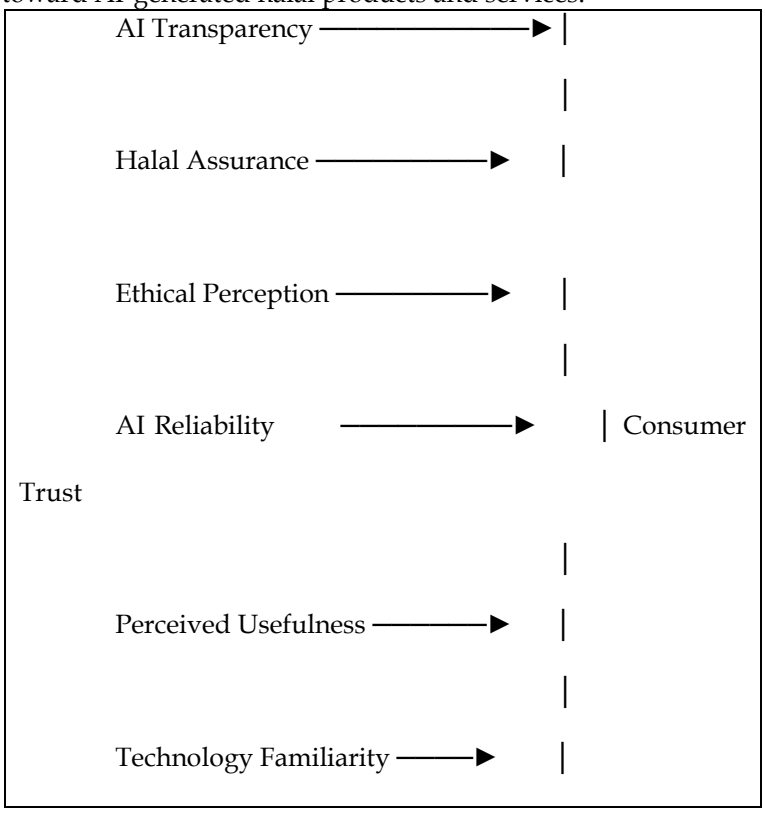

Figure 1. Conceptual Relationship among Variables

In addition to quantitative analysis, qualitative interviews were conducted with selected respondents to explore their experiences and perceptions more deeply. Several important themes emerged from the interviews.

The first theme was "Halal Assurance as the Foundation of Trust."(Bonne & Verbeke, 2008) Most interview participants emphasized that halal certification and involvement of recognized Islamic authorities remain essential in determining trust toward AI-generated products. Respondents stated that they would feel more confident using AI-based halal services if the systems were supervised by credible halal institutions.

The second theme was "Transparency and Human Oversight."(Héder, 2020) Many respondents expressed that AI systems should not operate fully autonomously in halal-related decision-making. Participants preferred AI technologies that provide explanations regarding how recommendations are generated and allow human experts to monitor the process. Respondents believed that human oversight is necessary to ensure accountability and compliance with Islamic principles.

The third theme identified was "Ethical Anxiety toward AI." Some respondents expressed concerns regarding data privacy, misinformation, algorithmic bias, and potential manipulation in AI-generated marketing systems. Several participants stated that although AI technology offers convenience, excessive automation without ethical safeguards could reduce trust and create uncertainty.

The final theme was "Technology Acceptance among Younger Consumers." Younger respondents generally showed greater enthusiasm toward AI-generated halal services due to their familiarity with digital technologies. However, even technologically adaptive consumers emphasized the importance of transparency, ethical governance, and halal assurance in shaping their trust.

AI transparency also emerged as a major determinant of trust. Respondents indicated that they are more comfortable using AI-generated services when businesses clearly explain how AI systems function, how recommendations are generated, and how halal standards are maintained. This finding aligns with the concept of algorithmic transparency discussed by Md. Shahed Alamm (2026), who argued that transparent AI systems are essential for building trust within Islamic FinTech and halal business ecosystems. Muslim consumers tend to distrust "black-box" AI systems because opaque decision-making processes create uncertainty and reduce perceptions of accountability. In Islamic ethics, transparency (bayān) and honesty (sidq) are fundamental principles that guide business transactions and social interactions. Therefore, transparent AI systems are more likely to be perceived as trustworthy and ethically acceptable.

The study also found that ethical concerns negatively influence acceptance of AI-generated products and services. Many respondents expressed anxiety regarding misuse of personal data, algorithmic bias, misinformation, and excessive automation without adequate human supervision(Li & Huang, 2020). These concerns are consistent with previous findings by Wisnu Uriawan et al. (2025), who emphasized that AI technologies lacking ethical safeguards may conflict with Islamic values such as justice (adl), trustworthiness (amanah), and responsibility. Respondents feared that AI systems driven solely by profit motives could manipulate consumer behavior or neglect religious sensitivities. Consequently, Muslim consumers tend to distrust AI when ethical governance and accountability mechanisms are perceived as weak.

Another important factor explaining distrust toward AI is the perceived absence of human judgment and religious sensitivity. Although respondents acknowledged that AI can process information quickly and efficiently, many believed that AI systems cannot fully replace human expertise in interpreting complex halal standards and Islamic ethical considerations. This finding supports the argument presented by Greg Nyilasy et al. (2026), who stated that consumers prefer AI systems functioning as compliance-support tools rather than fully autonomous moral decision-makers. Muslim consumers generally prefer AI technologies that assist human experts rather than independently determining halal legitimacy without religious supervision.

Interview findings further revealed that younger and technologically familiar respondents tend to demonstrate higher acceptance of AI-generated halal services. However, even among digitally literate consumers, trust remains conditional upon transparency, halal assurance, and ethical alignment with Islamic values. This indicates that technological advancement alone cannot guarantee consumer trust in halal business environments. Instead, trust emerges when AI innovation is integrated with religious compliance, ethical governance, and credible halal verification systems.

AI Ethics in Halal Business

The rapid integration of Artificial Intelligence (AI) into halal business has created significant opportunities for improving efficiency, innovation, and customer engagement(Battour et al., 2021). AI technologies are increasingly used in halal product recommendations, customer service chatbots, digital marketing, halal verification systems, supply chain management, and automated business decision-making. However, alongside these advantages, the implementation of AI in halal business also raises important ethical concerns. In the context of Islamic business, technology is not evaluated solely based on functionality and efficiency, but also according to ethical values, fairness, transparency, accountability, and compliance with Islamic principles. Therefore, ethical AI governance becomes essential in ensuring that AI-generated products and services are trustworthy and aligned with the concept of halalan tayyiban.

One of the most important ethical issues in AI implementation is algorithm transparency. Transparency refers to the extent to which AI systems provide understandable explanations regarding how decisions, recommendations, or outputs are generated. In halal business, transparency is crucial because Muslim consumers require assurance that products and services comply with Islamic principles and halal standards. AI systems that operate as "black-box" technologies may create uncertainty and distrust because consumers cannot understand how information is processed or how halal decisions are determined. For example, AI-generated halal product recommendations or automated halal verification systems may be questioned if businesses fail to explain the criteria, data sources, and decision-making mechanisms used by the algorithms. From an Islamic ethical perspective, transparency reflects the principle of bayān (clarity and openness), which encourages honesty and clear communication in business transactions. Therefore, halal businesses must ensure that AI systems are transparent, explainable, and understandable to consumers.

Another important aspect of AI ethics in halal business is accountability. Accountability refers to the responsibility of businesses, developers, and organizations for the outcomes produced by AI systems. In halal industries, accountability becomes particularly important because AI-generated decisions may affect religious compliance, consumer trust, and ethical business practices. Muslim consumers generally expect businesses to remain responsible for any mistakes, misinformation, or unethical consequences resulting from AI systems. For instance, if an AI-powered recommendation system incorrectly classifies non-halal products as halal, businesses cannot simply blame the technology itself. Instead, companies are expected to maintain human supervision, verification mechanisms, and quality control processes to ensure halal integrity. This aligns with the Islamic principle of amanah (trustworthiness and responsibility), which emphasizes moral accountability in all business activities. Therefore, AI systems in halal business should function as supportive tools under human oversight rather than completely autonomous decision-makers.

Fairness is also a central issue in ethical AI implementation. AI systems rely heavily on data and algorithms, which may unintentionally produce biased or discriminatory outcomes. In halal business, unfair AI systems could create unequal treatment among consumers, manipulate purchasing behavior, or prioritize profit over ethical considerations(Nienhaus, 2021). For example, AI marketing systems might unfairly target vulnerable consumers, exaggerate product claims, or create misleading halal-related advertisements. Such practices conflict with the Islamic principle of adl (justice and fairness), which requires businesses to treat consumers honestly and equitably. Muslim consumers generally expect halal businesses to operate fairly and avoid exploitation or deception. Consequently, businesses implementing AI technology must regularly evaluate algorithms to prevent bias, discrimination, and unethical manipulation in marketing and business operations.

Data privacy is another major ethical concern associated with AI systems in halal business. AI technologies often collect and analyze large amounts of consumer data, including purchasing behavior, preferences, online activities, and personal information. Although data analysis can improve personalization and customer experiences, excessive or unethical use of consumer data may create feelings of insecurity and distrust. Muslim consumers may become concerned if businesses collect sensitive information without clear consent or use personal data irresponsibly. In Islamic ethics, privacy protection is closely related to the principle of respecting human dignity and safeguarding individual rights. Businesses are expected to protect consumer confidentiality and avoid misuse of personal information. Therefore, halal businesses using AI systems should implement strong data protection measures, transparent privacy policies, and informed consent procedures to ensure consumer trust and ethical compliance.

The concept of responsible AI is increasingly important in halal business environments(Rejeb et al., 2021). Responsible AI refers to the development and implementation of AI systems that are ethical, transparent, accountable, fair, and socially beneficial. In halal industries, responsible AI should not only focus on technological efficiency but also incorporate Islamic ethical values and social responsibility. AI systems should be designed to support consumer welfare, protect religious sensitivities, and promote ethical business practices. Responsible AI also requires continuous monitoring, human oversight, risk assessment, and ethical evaluation throughout the AI lifecycle. Businesses should ensure that AI technologies do not replace human moral judgment entirely, especially in areas involving halal verification and religious compliance.

Furthermore, responsible AI in halal business should integrate Islamic ethical principles such as honesty (sidq), justice (adl), trustworthiness (amanah), transparency (bayān), and public benefit (maslahah). These values provide an important moral framework for guiding AI development and implementation within halal ecosystems. The integration of Islamic ethics into AI governance can strengthen Muslim consumer trust and ensure that technological innovation supports both economic growth and religious values simultaneously.

Comparison with Previous Studies

The findings of this study are generally consistent with previous research on AI adoption, consumer trust, and halal consumer behavior, although this research provides a more specific focus on Muslim consumer trust toward AI-generated products in halal business. Earlier studies primarily examined AI adoption from technological and business perspectives, while halal consumer behavior studies focused mainly on religiosity, halal certification, and purchasing decisions(Latifah, 2020). This study contributes by integrating these dimensions and analyzing how technological, ethical, and religious factors simultaneously influence Muslim consumer trust in AI-driven halal business environments.

In terms of AI adoption, the findings of this study support the Technology Acceptance Model (TAM) proposed by Davis (1989), which explains that perceived usefulness and ease of use significantly influence technology acceptance. Respondents in this study generally perceived AI-generated services as useful in improving convenience, efficiency, and accessibility in halal product consumption. This result is similar to the study conducted by Muhammad Dharma Tuah Putra Nasution et al. (2024), which found that perceived usefulness and positive attitudes significantly encourage the adoption of AI-powered chatbots in halal marketing communications. Their research demonstrated that AI technologies can enhance customer engagement and improve marketing effectiveness in halal SMEs.

Similarly, the findings align with research by Edy Suandi Hamid and Bhenu Artha (2025), who emphasized that AI adoption among Muslim entrepreneurs is influenced not only by technological readiness but also by ethical governance and Islamic values. Their study highlighted that Muslim business actors tend to accept AI technology when it supports operational efficiency while remaining aligned with Islamic ethical principles. This study confirms those findings by showing that Muslim consumers are more likely to trust AI-generated products when the technology is transparent, reliable, and ethically governed.

Regarding consumer trust, this study confirms broader AI trust literature that emphasizes the importance of transparency, reliability, and ethical considerations in shaping user acceptance of AI systems(Shin, 2021). The findings are consistent with the research conducted by Hyesun Choung, Prabu David, and Arun Ross (2022), which found that trust significantly influences users' intention to adopt AI technologies. Their study explained that trust in AI is shaped by perceived usefulness, system functionality, and user attitudes toward technology. Similarly, Bach et al. (2023) argued that trust in AI-enabled systems depends on socio-ethical factors, technical design, and user characteristics. The present study extends these findings into the halal business context by demonstrating that Muslim consumers evaluate AI trustworthiness not only from technical perspectives but also from religious and ethical dimensions.

This study also supports the findings of Wajiha Iqbal (2026), who argued that AI-driven decision support systems in the halal industry can improve consumer trust by simplifying halal verification and providing accessible product information. However, the study also emphasized that traditional halal verification systems still play a central role in maintaining consumer confidence. Consistent with these findings, the present research shows that halal assurance remains the strongest factor influencing Muslim consumer trust toward AI-generated products and services.

In the context of halal consumer behavior, the findings strongly align with previous studies emphasizing the importance of halal certification, religiosity, and ethical values in shaping Muslim purchasing decisions(Khan et al., 2017). Research by Mohamad Isa Abd Jalil et al. (2026) found that halal certification visibility significantly influences consumer trust and purchasing behavior among Muslim consumers. This study similarly found that halal assurance and official halal labels strengthen consumer confidence in AI-generated products and reduce uncertainty regarding religious compliance. Muslim consumers continue to rely heavily on halal certification even when interacting with technologically advanced systems.

The findings are also consistent with the study conducted by Eman Sulaiman and Erwan Iskandar (2025), which showed that AI-driven halal branding positively influences consumer trust when combined with socio-religious values. Their research suggested that Muslim consumers are more receptive to AI systems integrated with culturally sensitive and faith-based approaches. This current study confirms that transparency, ethical AI governance, and alignment with Islamic values significantly increase consumer acceptance of AI-generated halal products and services.

Furthermore, the present findings support the research by Syahraeni et al. (2025), who examined spiritual trust in AI systems within personalized e-commerce for Generation Z Muslim consumers. Their study found that spiritual values and religious consciousness positively influence trust toward AI recommendation systems. Similarly, the current study found that Muslim consumers are more likely to trust AI when the technology demonstrates compliance with Islamic ethical principles such as honesty, fairness, transparency, and accountability.

However, unlike several earlier studies that focused primarily on the positive impacts of AI adoption, this research identifies stronger concerns regarding ethical risks, algorithmic opacity, and lack of human oversight. Respondents in this study expressed skepticism toward fully autonomous AI systems, particularly when AI is involved in halal verification or religiously sensitive decisions. This finding complements the study by Wisnu Uriawan et al. (2025), which emphasized that AI technologies lacking ethical safeguards may threaten public trust and conflict with Islamic ethical principles. The findings also

resonate with online community discussions where Muslim users expressed concerns about misleading AI-generated Islamic content and inconsistent halal classifications across AI platforms.

Compared with previous studies, this research offers a more comprehensive perspective by integrating AI adoption theory, consumer trust theory, and halal consumer behavior within a single analytical framework(Mohsin Butt & Aftab, 2013). While earlier studies often discussed AI technology, halal certification, or consumer trust separately, this study demonstrates that Muslim consumer trust toward AI-generated products is multidimensional and influenced simultaneously by technological performance, halal assurance, ethical governance, transparency, and religious values. Therefore, this study contributes to the growing literature on ethical AI implementation in halal business and highlights the importance of integrating technological innovation with Islamic principles to strengthen sustainable consumer trust in the digital halal economy.

CONCLUSION

This study concludes that Muslim consumers generally show positive attitudes toward AI-generated products and services in halal business, although their trust remains conditional upon several important factors. The findings reveal that Muslim consumer trust is significantly influenced by halal assurance, AI transparency, ethical perception, AI reliability, perceived usefulness, and technology familiarity. Among these factors, halal assurance emerged as the strongest determinant of trust, indicating that Muslim consumers continue to prioritize religious compliance and official halal verification even in technologically advanced business environments. Theoretically, this study contributes to the development of Islamic business literature, halal marketing studies, and AI consumer behavior research by integrating technological, ethical, and religious perspectives into a single analytical framework. The study expands previous discussions on AI adoption by demonstrating that Muslim consumer trust is not only shaped by technological usefulness but also by Islamic values, halal assurance, and ethical governance. Practically, this study provides valuable implications for halal businesses, AI developers, and policymakers. For halal businesses, the findings emphasize the importance of integrating halal certification, transparency, and ethical AI practices into digital business operations to strengthen consumer trust. For AI developers, the study highlights the need to design AI systems that are explainable, fair, accountable, and aligned with Islamic ethical principles. Meanwhile, regulators and policymakers may use these findings as a reference for developing AI governance frameworks and halal regulations that protect consumer rights while supporting innovation in halal industries. Despite its contributions, this study has several limitations. First, the sample size was relatively limited and focused mainly on respondents from specific regions, which may reduce the generalizability of the findings. Second, the study focused primarily on selected AI-generated products and services within halal business, without covering all categories of AI applications. Third, the research used a cross-sectional design, which only captured consumer perceptions at one point in time. Therefore, future research is recommended to involve larger and more diverse samples across different countries and cultural contexts to provide broader comparative insights regarding Muslim consumer trust in AI-generated halal products. Future studies may also compare perceptions across different generations, educational backgrounds, and levels of technological literacy. In addition, further research should explore Islamic AI governance, ethical frameworks, and regulatory systems that can support responsible AI implementation in halal industries. For industry practitioners, businesses should improve AI transparency, strengthen the integration of halal certification into digital systems, and implement ethical AI standards that prioritize fairness, accountability, data privacy, and compliance with Islamic principles.

AUTHORS' DECLARATION

Authors' Contributions and Responsibilities

All authors contributed significantly to the completion of this research. All authors participated in reviewing and approving the final version of the manuscript and agreed to be accountable for all aspects of the work, including the accuracy, integrity, and originality of the research.

Competing Interests

The authors declare that there are no competing interests regarding the publication of this research. The research was conducted independently without any financial, commercial, or personal relationships that could influence the objectivity, interpretation, or outcomes of the study.

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