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Enhancing consumer trust through sharia-compliant system quality in halal e-commerce platforms: A case study

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Abstract

This study examined the system quality requirements of halal e-commerce platforms from a Sharia compliance perspective. Utilizing a qualitative approach, in-depth interviews were conducted with key stakeholders from two Malaysian halal e-commerce platforms. Thematic analysis revealed three key system quality criteria: user-friendliness, website quality, and system adaptability. The study highlights the necessity of quality management practices that align with Islamic principles to foster consumer trust and enhance the online shopping experience. Findings emphasize the importance of incorporating technological advancements, such as mobile apps and blockchain, to enhance transparency and streamline operations in halal e-commerce. The findings highlighted the need for halal e-commerce platforms to integrate quality management practices that align with Sharia requirements to meet the growing demand for halal products in the global market. Additionally, the findings of this research provide valuable recommendations for e-commerce stakeholders, policymakers, and halal business owners to strengthen system quality and enhance market competitiveness in the halal digital economy.

Keywords: Halal E-commerce, Information systems, Sharia compliance, System quality.

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1. Introduction

E-commerce has revolutionized the business landscape, offering numerous benefits such as enhanced market reach and improved customer service. In the context of the halal business ecosystem, e-commerce enables businesses to provide halal products and halal services to a broader audience. However, in terms of tangible and intangible halal products, the most important element will be the compulsory compliance with its Sharia requirements. This element causes the adoption of e-commerce in the halal industry to face unique challenges.

As a technological innovation, e-commerce provides an efficient platform for halal businesses to reach a global market. However, the success of halal e-commerce platforms depends on their ability to manage information quality, system quality, and service quality in compliance with Sharia principles [1].

The internet has transformed trade, allowing consumers to prefer online shopping and businesses to adopt technology, reducing the need for physical contact and interaction. For online customers, the experience is totally different compared to brick-and-mortar business entities, as the products they purchase will only materialize when they are received. Thus, both parties involved in this type of business must adequately fulfill each other's requirements to ensure successful transactions. The business side needs to provide adequate and fair information to ensure their customers are well-informed and protected in the transaction. Sellers must disclose specific information about their products, and customers are required to provide their personal details as needed by the sellers. Therefore, issues of trust, privacy, and security of information are inherent when it comes to online trading [1, 2].

As e-commerce grows and online fraud increases, researchers are focusing their efforts on this, concerning area. Zhang et al. [3] conducted a case study on Abdullah et al. [4] to explore how the companies reformed their corporate reputation after several online fraud and credit crises since 2010, they identified issues such as fake customer details, fictitious trades, incompatible product information, false promotions, and poor after-sales service. Other studies also indicated issues related to security, trust, confidence, and poor information access as major problems encountered in online trade. For example, a study by Watabaji et al. [5] reported very low trust among malt barley traders in Ethiopia to share information. AlGhamdi et al. [6] stated that trustworthy and secure online payment methods can convince retailers to adopt e-commerce in their business. However, regarding halal products and services available through e-commerce, the concerns may be more pronounced to Muslim consumers.

Muslim consumers are well aware of what they procure and consume because they are very attentive to the product's status in terms of halal and the quality of the product itself [7, 8]. Thus, it is very imperative and crucial for sellers to ensure accurate and comprehensive halal information is available and readily accessible to customers [9]. For online transactions, these customers depend on the information provided on the seller’s website to make informed decisions about their purchases. Unfortunately, some websites are either filled with irrelevant information, inundated with excessive content, or contain incomplete details, which hinder effective procurement by the customer. Bojang [10] as well as Ho and Ismail [9] stated that the website interface significantly impacts online consumers' trust, and B2C e-commerce consumers are convinced when online vendors develop user-friendly interfaces. E-commerce platforms that provide detailed halal product descriptions, live demonstrations, and user reviews encourage trust among consumers and would help to increase users’ retention [11].

Additionally, the growth of halal e-commerce faced challenges due to some e-commerce sites that claimed to be halal but listed non-halal products in their halal category, such as items labeled 'halal pork' or 'halal beer' [12]. This indicates a lack of understanding of what is halal and haram as directed by Sharia. This irresponsible conduct is also caused by the absence of mechanisms to verify the authenticity of the halal status provided by sellers. Majid et al. [7] highlighted in their studies that some companies put fake halal logos on their products without proper qualification or understanding of the actual concept of halal, but do so merely for profit by gaining Muslims' confidence.

Therefore, to instill consumers’ confidence and trust, it is necessary for halal businesses to obtain halal certification. As suggested by the studies of many researchers (e.g. [2, 5, 13, 14]), halal logo and certification are very crucial for businesses involved in the halal industry. According to Kolkman [15] study, having halal certification could enhance customers’ satisfaction, confidence, and trust in halal products, as well as increase market competitiveness. Meanwhile, the adoption of halal warehousing [13] and efficient transportation technologies and halal logistics [16] is also very crucial so that the integrity of halal products can be upheld. As a result of globalization, halal crosses country borders, which has triggered various differing standards, certifications, and practices to be monitored. Thus, a halal assurance system is suggested to assist in carrying out this function.

2. Literature Review

The halal business ecosystem encompasses various segments, including food, beverages, cosmetics, and finance, all of which require strict adherence to Sharia principles. Previous studies have highlighted the importance of quality management in e-commerce, emphasizing information quality, system quality, and service quality as key determinants of success [17]. However, limited research has focused on these aspects from a Sharia compliance perspective.

The halal industry has experienced significant growth beyond Muslim countries and consumers. By 2019, the global halal food sector was projected to reach USD 2.537 billion, representing a 51% increase over five years [18]. This growth is driven by the increasing Muslim population, which is projected to grow from 1.7 billion in 2014 to 2.2 billion by 2030, and the rising awareness among non-Muslim consumers about clean and quality products. The expansion of the halal industry is also attributed to the need for Muslims to seek God's blessing in their business and lifestyle choices, as mandated by Islamic teachings (Holy Quran 33:70-71).

2.1. Halal E-Commerce Background

The global Halal market is expected to reach USD 9.71 trillion by 2025, driven by the increasing Muslim population and growing awareness of Halal products among non-Muslims [19]. E-commerce has significantly contributed to this growth by offering consumers easy access to a wide range of Halal products. Hamid et al. [20] state that technological advancements, increased internet penetration, and mobile device usage have facilitated e-commerce adoption in the Halal industry.

Research by Latif et al. [21] indicates that Muslim consumers are increasingly using online platforms to purchase Halal products due to convenience, variety, and competitive pricing. The study highlights that trust in Halal certification and the authenticity of products are critical factors influencing purchasing decisions. Similarly, a study by Shafie and Othman [22] found that consumers prefer e-commerce platforms that provide detailed information about Halal certification, ingredients, and production processes.

Despite its growth, e-commerce in the Halal industry faces challenges like ensuring product authenticity and integrity. Zailani et al. [23] note that the lack of standard global Halal certification and counterfeit products can undermine consumer trust. Additionally, logistical challenges such as maintaining Halal compliance during transportation and storage present obstacles [4]. Another challenge is the digital divide, particularly in predominantly Muslim countries, where internet penetration and digital literacy may be lower. Ahmed et al. [24] highlights that limited access to technology and poor digital infrastructure can restrict the reach of e-commerce platforms in these regions.

2.2. Integration of E-Commerce in the Malaysia Halal Industry

E-commerce is becoming integral to meeting the rising demand for halal products and services. Trading platforms such as DinarStandard [19] have emerged, contributing significantly to Malaysia's GDP. However, challenges such as ensuring Sharia compliance and managing the quality of systems, information, and services remain. The integration of e-commerce in the halal industry requires businesses to adhere strictly to Islamic principles, avoiding elements like riba (usury), gharar (uncertainty), maysir (gambling), and haram (forbidden).

The future of e-commerce in the halal industry appears promising, with several opportunities for growth. Current technology, such as blockchain, can enhance the halal supply chain in terms of traceability and transparency if implemented effectively throughout the system. Blockchain can provide immutable records of product history, ensuring compliance with halal standards [25]. Moreover, the increasing popularity of social media and influencer marketing presents an avenue for businesses to connect with younger, tech-savvy Muslim consumers. Social media platforms can be used to promote Halal products, educate consumers about Halal practices, and build brand loyalty [26].

2.3. System Quality and Customers Experience

A system in an e-commerce application refers to the technical components of the e-commerce platform, including the website interface, design, payment gateway, network, and other infrastructure. DeLone and McLean [17] itemized the system's quality metrics: adaptability, availability, reliability, response time, and usability. The model used system quality and information quality to measure success. It is shown in a study by Haleem and Raisal [27] that companies with information technology (IT) usage sophistication have improved the quality of accounting systems in ERP environments. System quality is the evaluation of system performance by the user, based on whether it manages to deliver information that meets the user's needs [2, 28]. Thus, high-quality systems lead to user satisfaction and adoption. Additionally, numerous investigations have revealed that system quality positively affects user satisfaction [29-31]. Operating systems control both hardware and software resources. The quality of a system is determined by its operating system, which is critical in the context of the Internet of Things (IoT). Consumers might be hesitant to use the internet if there are frequent response delays, disconnections, loss of connectivity, or security flaws in the system [32]. A study by Shrivastava and Pateriya [33] discussed the concerns regarding security issues in e-commerce. To make e-commerce sites safer and more effective, a framework was proposed for detecting credit card and identity fraud using big data analytics and machine learning techniques.

Huang and Chen [34], explored tourism website user experience, it was found that consumers' satisfaction is positively affected by the website's system quality. Once consumers perceive a higher quality of the website's system, their flow experience increases. In contrast, poor system quality significantly undermines consumer experience. Numerous other research findings have verified that the perceived usefulness of system quality can increase user satisfaction and customer loyalty (e.g. [29]).

Interestingly, for instance, a study by Han et al. [35] demonstrated that system quality had contributed to the enjoyment of the IOT users. The more robust and convenient, the higher the pleasure. Also, Gashti and Chirani [36] in their studies resolved that factors such as positive feelings, website attractiveness, user friendliness, quality of interaction, and quality of information influenced buyers' decisions in online shopping. This situation was also supported by Birudaraju and Rao [37], who highlighted the importance of web interface design that could increase web traffic. It is thus possible to conclude that a quality system can attract more users.

2.4. Theoretical Underpinnings: Information Systems Theories and E-commerce

Various theories and models from information systems and other fields have been applied to e-commerce research. These include the Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of Technology (UTAUT) at the individual level, and the Diffusion of Innovations (DoI) theory, Technology-Organization-Environment (TOE) framework, and Resource-Based View (RBV) at the organizational level.

However, this current study aimed to measure the effectiveness or success of the system in use. Therefore, it utilized a system-oriented model of IS success, as discussed in the next section.

An information system (IS) combines hardware, software, infrastructure, and trained personnel to support planning, control, coordination, and decision-making in an organization (BusinessDictionary.com). Many researchers have developed various success models in the past to evaluate the success of IS [38]. The DeLone and McLean [17]. Information System Success Model (D&M ISSM) is one of the most imperative models used in IS success studies. DeLone and McLean [17] synthesized theoretical and empirical communication and IS research conducted by various researchers in the 1970s and 1980s to establish the model. According to the author, the model was also constructed based on Shannon and Weaver's [39] communication theory (1949) and Mason's [40] expansion of "influence" theory (1978). The model identifies six interdependent variables: information quality, system quality, use, user satisfaction, individual impact, and organizational impact, based on process and causal factors. According to DeLone and McLean [17], a "process" model is characterized by having system quality and information quality being used by users, exhibiting their satisfaction (or dissatisfaction) with the system or the information it produces. Then, after using the system or its information products, it will impact the individual user and subsequently result in organizational impacts. DeLone and McLean [17] came out with the updated, further improved version of their D&M IS Success Model in 2003. The updated model evaluates information systems' success using six variables: information quality, system quality, service quality, use/intention to use, user satisfaction, and net benefits. Considering the competitive force of recent e-commerce and various opinions from researchers, a new variable "service quality" is added to the original system dimension information quality and system quality. The variable "use" is retained and extended along with "intention to use". By means of responding to Seddon [18] research, the variables "individual impacts" and "organizational impacts" were grouped into a single variable known as "net benefits". The application of the updated D&M ISSM can be seen from the studies by Kim and Niehm [41] and Xin [42] who stressed the important role of website system quality that aspires a pleasant shopping experience. Consumers would be drawn to a website that provides high-quality information [42]. This will enhance consumers' confidence in the products and enable them to make quick purchase decisions. Indeed, the weights for each of these quality dimensions are subject to the level of analysis the study is concerned with. For example, when assessing the success of an individual system, "information quality" or "system quality" may be considered the most critical quality components. The context of the study should dictate the appropriate specification and application of the D&M IS Success Model [17]. Internet technology has revolutionized trading through e-commerce, a powerful communication medium. Internal and external users, including customers, suppliers, and business owners, use this system to make decisions and conduct transactions. These actions impact individuals, organizations, industries, and national economies. As noted, the D&M ISSM is based on communication theory, making it suitable for this study's focus on communication and trading processes. This updated model is widely used and cited by IS researchers to assess information systems' success, especially in e-auction and e-commerce contexts (e.g. [43-45]).

E-commerce success research often uses models that evaluate internal factors such as information quality, system quality, and technology characteristics, as well as external factors such as service quality, usage, and user satisfaction. Both internal and external factors (see Figure 2.8) have been tested and validated by many studies (e.g., [43, 46]). The D&M ISSM is considered a general model of IS success [17] that researchers have applied to study e-commerce success [43].

2.5. System Quality and the Success of E-commerce

This study agrees that system quality in e-commerce practice is very important. The functions of a business website are just the same as a business shop lot itself in brick-and-mortar commerce. Consumers experience shopping through websites as they use e-commerce. Consequently, halal e-commerce providers have the responsibility to deliver a quality system to meet Muslims' expectations when shopping online. Apart from the indicators of usability, adaptability, availability, reliability, response time, and examples discussed above, the comprehension of systems' conformity to Sharia requirements may also need to be expanded. Since there is limited, specific study elaborating on this matter, this study asked: what are the system quality criteria of halal e-commerce as required by Sharia?

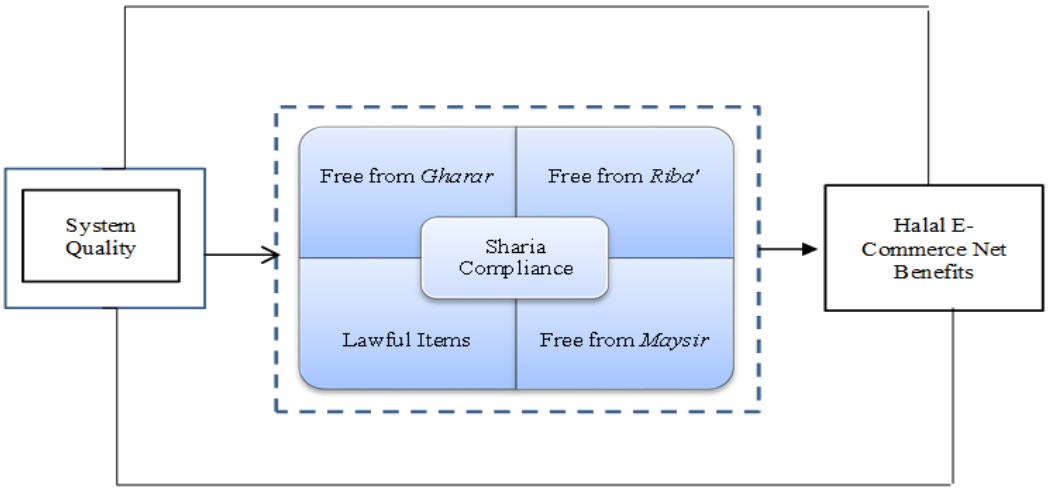

Figure 1.
Proposed conceptual framework.

"System quality" encompasses internet speed, hardware, and software within the network environment. It can refer to a website, payment portal, or delivery mode. Users demand accessibility, availability, reliability, adaptability, and quick response times [17]. In adherence to Sharia requirements and the quality aspects of the e-commerce system, for instance, Muslims are advised to value time and avoid waste. In today's lifestyle, people prefer online commerce because of its benefits, such as time savings and convenience. Therefore, a good e-commerce system should facilitate transactions between sellers and consumers through the e-marketplace. Additionally, conventional credit cards can be replaced with non-riba alternatives such as debit cards or cash on delivery. Meanwhile, gharar can be minimized by websites displaying actual images of products, providing access to user reviews, and offering reliable third-party assurances [9, 47].

3. Research Methodology

This research employed a qualitative approach using case studies to investigate quality management practices on halal e-commerce platforms. Data was gathered through in-depth interviews with key stakeholders such as business owners, IT managers, and consumers. Thematic analysis identified patterns and themes related to system quality. Field-based insights were obtained from key information custodians, and activities or transaction processes in halal e-commerce information management were explored. The study collected data from two Malaysian e-commerce platform providers, recognizing the suitability of case study design for capturing practitioner knowledge, as noted by Myers and Avison [48].
Semi-structured in-depth interviews were conducted with participants from two Malaysian halal e-commerce platforms for case studies. These companies were selected based on specific criteria, which include

a) The firms selected must use an online platform for operating businesses.
b) The firms must only offer halal products or services on their online platform.
c) The firms must fulfill the halal B2C criteria.
d) The firms must have at least an interactive website, with sales and payments online and integrated in the aforementioned platform.

The application of multiple case studies facilitates a comprehensive understanding and comparison of e-commerce practices across various organizations, thereby contributing to the development or enhancement of theoretical frameworks [32]. Table 1 provides detailed information on the selected respondent for this:

Table 1.
Overview of organizations.

Company Identification	Year of establishment	Business Description	Description
A	2015	Halal e-commerce marketplace	The first B2C e-marketplace providing halalan toyyiban products and services.
B	2007	R&D of organic health products	Malaysia's leading healthcare and wellness provider focuses primarily on the well-being of its customers. The Group also manages a varied portfolio of businesses in Agri-biotechnology, secure technology, healthcare, and wellness.

Table 2.
Case studies respondents' details.

Company	Gender/Age	Interviewee's Position	Interviewee's Role in the organisation
A	Male/40s	Senior Vice President	In charge of the global halal marketing and networking functions
	Male/40s	Halal Advisor	Advise the company regarding halal aspects and integrity
B	Male/60s	President & Group CEO	Make high-level decisions about operational policy & strategic plan
	Male/50s	General Manager	As a marketing director and product specialist for R&D

3.1. Company A

Company A is an e-marketplace established in mid-2015, focused on being the world's first platform offering premium quality halalan toyyiban products and services across all industries worldwide. It offers a wide range of exclusive brands from pharmaceuticals, fashion, cosmetics, food and beverages, and financial products and services. Catering to both the B2B and B2C communities, this e-marketplace provides businesses and consumers with easy access to trade on its highly secure and efficient e-platform via the World Wide Web from the convenience and comfort of both computers and mobile devices.

The company intends to rectify the deficiencies within the unregulated halal supply chain by carefully selecting its merchants. It will also provide comprehensive back-end services through partnerships with local logistics providers, payment gateways, warehouses, and retail management firms to ensure that products remain halal throughout the trading process. The company also has acquired and established co-branding partnerships with leading social media platforms, government agencies, trade and business associations, as well as halal certification authorities worldwide to support its global strategy.

Close cooperation with government and religious bodies is important to promote halal e-commerce and to further boost consumers' acceptance and trust, especially in the halal space. To ensure all the products offered are of premium quality, merchant participation on the site is by invitation only. The company will check the merchants' backgrounds, their companies' track records, shareholders, and product quality to meet the standards. To certify compliance with halal standards, the company has formed a Business Integrity Task Force, which is a panel of experts on halal and Shariah matters, to perform due diligence on each merchant.

Since its establishment, the company has expanded to over 20 countries and secured operations in 12 additional countries, in addition to its presence in Malaysia, Singapore, China, Indonesia, and Kazakhstan. Currently, the company continues to focus on fundraising efforts and building a strong business network with government and religious bodies in various countries to increase acceptance of halal e-commerce. Furthermore, the company's efforts in strategic partnerships with several domestic and international sports clubs and associations create synergistic collaborations that enable the company to leverage the clubs' worldwide reach of fans. To prepare for global trade, the company is now upgrading its operating system to handle higher traffic loads resulting from its expansion.

3.2. Company B

Company B is one of the strategic business units of XYZ Group, Malaysia's leading healthcare and wellness group, with a central focus on the well-being of its customers. XYZ Group started its business in 2007 and now operates a diverse portfolio of companies in agri-biotechnology, secure technology, healthcare, and wellness. It aims to become the leading biotechnological producer and supplier of premium-quality raw or processed ingredients to manufacturers of skincare, nutraceuticals, healing, and wellness products. Therefore, the group concentrates on algae and herbal industry research, as well as the production and commercialization of products. For this reason, in June 2019, the group signed an MoU with a local university to collaborate on the incubation and cultivation of algae.

Aside from partnering with local universities, manufacturers, and governments, the group has also actively participated in and supported various programs by NGOs and women's associations. The group has received numerous awards and recognitions throughout its operation, such as the Malaysian Business Leadership Award in 2011, the Malaysia Power Brand Award (2016-2017), the Asia Entrepreneur of the Year Award (2016 & 2017), The Grandeur International Business Award (2017 & 2018), and the SME Dynamic Brand Presence (2017-2018). These notable achievements have contributed to the business expanding its presence in the e-commerce market.

From 2018 to 2019, XYZ Group invested RM58 million, or 37 percent of its revenue, into the growth of the business. Its main investments were in research and development (R&D) of new products, business models, production, market expansion, and market stock-keeping units (SKUs). The group's strategic business unit (SBU), Company B, focuses on producing and marketing organic, algae-based cosmeceutical products. These products are said to show noticeable results in addressing signs of aging, wrinkles, pigmentation, uneven skin tone, and other aging-related issues within a few weeks. The company has a website featuring a wide range of cosmetic products under its own brand. Customers can purchase products directly through the platform or via the e-marketplace Lazada.

Cases were selected through purposive sampling based on participants' management levels and roles in e-commerce. Key interviewees included business owners and top managers involved in decision-making. Yunus and Rashid [26] and Eisenhardt and Graebner [49] recommended interviewing people from different positions within organizations. Snowball sampling identified system workers who signed consent forms to participate. Interviews covered information quality in e-commerce, Sharia compliance, halal concepts, and quality in online transactions. The digitally recorded interviews were transcribed.

Yunus and Rashid [26] suggested that pattern-matching logic for case study analysis involves comparing empirical patterns with predicted ones to confirm propositions and strengthen internal validity. Content analysis was also employed to describe and quantify phenomena in this qualitative research.

4. Findings

4.1. Identification of the System Quality Requirements

The systems quality requirements in this study refer to the qualitative criteria of both software and hardware deployed by the halal e-commerce company, including the website, the apps, and the online payment gateway. The findings from the interviews with both companies uncovered three main criteria of systems quality needed by halal e-commerce: user-friendly, website quality, and system adaptability.

4.2. User Friendly

Users of all systems require a system that is user-friendly and easy to maintain. User-friendly describes a hardware device or software interface that is easy to use. A website with simplified information, easy navigation, a pleasant layout, suitable fonts, and colors is preferred by users. The CEO of Company A expressed her frustration with the back-end system of her company's website. The system was complicated and required "a lot of clicks." What she meant was that users needed to navigate through different pages to complete even simple tasks, such as filling in a product's description form. She hoped the company would be able to hire a more experienced IT expert to help develop a user-friendly system for the company's e-commerce.

The CEO's opinion was supported by respondents from Company B, who emphasized that a user-friendly system is essential for businesses practicing e-commerce. A user-friendly system helps customers complete transactions and provides a pleasant shopping experience. Additionally, respondents mentioned that the system should have fast loading times and use simple instructions when users are required to perform certain tasks. This is because users, especially customers, may become bored, tend to leave the site, and seek alternative options.

4.3. Website Quality

To acquire a good system, the CEO of Company A insisted on the need to involve an IT expert in system development. According to her, the existing staff at Company A did not possess sufficient knowledge or skills to develop a website. The staff only managed the website, but the technical aspects required maintenance by experts. Therefore, whenever problems occurred with the website, the company sometimes hired freelance system developers or IT experts to fix the issues.

Company B, in another instance, saw a well-deployed shopping platform and a good website. The website must be able to display a product's picture as clearly as possible. She mentioned that it would be beneficial if 3-D images of the products could be provided to increase customers' confidence. This improvement is expected to lead to increased sales for the company.

4.4. System Adaptability

In this era of rapid technological advancement, it is important for an online business to keep up to date with users' needs. The CEO of Company A emphasized the wholesomeness that a halal e-commerce company could offer to customers. She said the halal e-marketplace should not only offer halal products in the list but also use payment and delivery methods that comply with Sharia. Therefore, she hoped that one day, Company A would be able to provide its own e-wallet as one of the payment gateways and halal logistics for modes of delivery.

While the representatives from company B highlighted the current trends where mobile phone users prefer to access platforms through apps instead of websites, using the apps allows users to save time by avoiding navigation through websites, and there is no need to log in every time to make a purchase. The participant also anticipated that a good system should be ready to adapt to further changes or technological updates.

5. Discussion

Several criteria for system quality requirements were identified by participating companies and categorized into four main groups: (1) user friendliness, (2) integration, (3) availability, and (4) adaptability. E-commerce depends on the Internet and operating systems to manage hardware and software. The quality of these systems is crucial in an IoT context. Consumers may avoid e-commerce due to response delays, disconnections, lack of access, or poor security [50].

Both companies in this study consistently identified the desired criteria for an e-commerce operating system and their importance in halal platforms. A user-friendly system, including web appearance and payment gateway functions, was given significant emphasis by the participants because these criteria influence customer satisfaction. Huang and Chen [34] found that a website's system quality positively influences user satisfaction. Higher perceived quality enhances flow experience and increases purchase or repurchase intentions [12]. On the contrary, poor system quality greatly harms the consumer experience. Perceived usefulness of system quality positively affects user satisfaction and customer loyalty [29, 30].

With the growing popularity of e-commerce, more consumers are becoming accustomed to online consumption. Therefore, e-commerce providers are competing to deliver a superior system compared to their competitors. The interface flow, functionality, and visual design are the facade of the website [51]. The interface flow verifies the logic of the user's operation flow while navigating the web page, and it determines whether the system is user-friendly. The basic functions of a website are divided into external service functions and internal management functions. The external functions primarily target consumers, displaying products and providing related services. The internal management functions integrate website

information, such as product details and consumer requirements. Visual design also conveys key elements of a web page. To ensure smooth acceptance of information by users, the visual design should not only be aesthetically pleasing and visually impactful but also meet user expectations and needs.

Accordingly, DeLone and McLean [17] itemized the system quality criteria to adaptability, availability, reliability, response time, and usability. The model emphasized the importance of these characteristics, especially when the users of the system are customers, not employees. This is because customers may have many other choices, i.e., to shop from other attractive websites. The participating companies also established the same criteria as used in the D&M ISSM, where poor usability, usefulness, or responsiveness of e-commerce systems can discourage customer usage and decrease satisfaction. These criteria were reflected by a user-friendly system. Therefore, as halal e-commerce providers, they have the responsibility to deliver a quality system to meet Muslims' expectations when shopping online.

Additionally, the use of e-commerce systems needs integration with other application systems [52]. E-commerce is not a stand-alone system, but rather, it includes coordination between front-end and back-end accounting and inventory systems, as well as suppliers' or partners' e-commerce systems. For example, the e-commerce system needs to be integrated with an ordering system, a payment gateway, and a delivery system. Moreover, in this new industrial revolution era, almost all logistics, purchases, and sales processes are digitized. Thus, halal e-commerce should have a compatible system that can integrate with other recent technologies to be functional in a digitalized system.

In other words, the business process and e-commerce are integrated with the entire business participants' networks and cannot be managed in isolation anymore, as highlighted by Hitpass and Astudillo [53]. Company A in this study emphasized probable issues that may arise if the company's e-commerce system is not compatible with the suppliers' or partners' systems. The company suggested that the parties involved need to attend training to fix the problems. While Company C highlighted the benefits of the systems' integration, that would be helpful in providing supporting information to the company's system.

The other commonly identified criteria of a qualified system by the CEOs and other senior management in this study have interesting relationships with the current development of the digital business environment. The use of e-commerce requires a variety of media such as social media, apps, and mobile commerce. Most businesses now have to adapt and embrace digital technology in their activities, either partly or wholly. This reflects the widespread acceptance and use of e-commerce in daily transactions. Many recent studies have demonstrated changes in consumers' shopping behaviors towards using social media, apps, and mobile commerce for shopping. While businesses use these media as effective channels to market their products or services (for example, [54, 55])

The findings suggest that e-commerce providers should offer multiple options, such as mobile apps, to enhance customer convenience. This approach would eliminate the need for customers to log in or search the website repeatedly when shopping. As more users access e-commerce platforms via mobile devices, the demand for mobile commerce and mobile applications appears increasingly relevant. This shift is driven by a desire for convenience, with systems built on the latest technological advancements becoming simpler yet more efficient.

Moreover, various payment and delivery methods help enhance users' experiences while shopping. By increasing the number of options available, businesses have an opportunity to gain an advantage over their competitors. Besides the use of credit cards, debit cards, and e-wallets, cash on delivery (COD) is also considered a good alternative for halal e-commerce platforms. In Halaweh's [56] study, it was suggested that the use of the COD method should clearly state any related terms and conditions of the transactions. This could avoid uncertainty or the gharar element, which is prohibited in Islam. Among the most popular gateways available for executing payments are PayPal, Billplz, Google Pay, and Alipay. Normally, customers prefer to choose the payment method they frequently use. If the option is not available to them, there is a strong potential for cart abandonment.

Availability could also have manifested the state of being ready and available to use as and when needed. As proposed by Iivari [52], a good system must be quickly recovered after a system downtime and respond to a new alternative system. Even though various media are available and being proposed, the capability to adopt various technologies by the halal e-commerce players involved in this study was still limited. Their limitation was mainly due to capital constraints. For example, the adoption of mobile commerce and several payment methods might cause additional costs to companies. Therefore, most of them only deployed e-commerce websites with a few choices of payment methods. Similarly, their aim to implement halal logistics as a mode of delivery may also be constrained by accessibility to the service and cost issues. Some of them also justified that their size and transaction volumes were not yet significant enough to diversify into additional methods. However, they were looking forward to expanding as soon as their market grew bigger.

As technology advances, neither businesses nor consumers can ignore the use of digital technology in their daily transactions. The acceptance of this scenario is not limited to conventional trade but also extends to halal e-commerce. Islam encourages all Muslims to seek knowledge, and it supports the development of technology in daily life. According to al-Hadith, which is the second source of reference for Muslims, issues related to knowledge and information technology have been indirectly addressed by the Prophet (PBUH). One such hadith from Sahih al-Bukhari, narrated by Abu Hurairah (RA), states: "None of the Prophet's companions collected more hadith than I did, except Abdullah bin Amr bin Ash: he was good at writing, but I was not."

It shows that the Prophet (PBUH) was sent to convey God's message regarding everything in the heavens and on the earth, demonstrating the greatness and power of Allah. As the word in Ar-Rahmaan verse 33 means "O you assembly of jinn and men! If you can pass beyond the zones of the heavens and the earth, pass! Not without authority shall you be able to pass!" Some scholars have debated the meaning of "authority" in this verse as the power of knowledge and the

advancement of technology that enable humans to explore the boundaries of heaven and earth, such as outer space, but within the limits of Allah's will.

Consequently, since Islam has already emphasized the importance of equipping ourselves with knowledge and technology, the application of these elements cannot be denied in our daily transactions. From the findings of this study, it is also possible to conclude that a quality system can attract and assist more Muslim customers in using halal e-commerce platforms to search for halal products.

6. Conclusion

The research emphasized the need for detailed guidelines for halal enterprises to effectively manage their e-commerce platforms. The proposed framework aids e-commerce stakeholders in understanding the criteria necessary for the success measures of halal e-commerce prior to implementation. The study highlighted the necessity for halal entrepreneurs to manage system quality effectively in online business to ensure compliance with Sharia requirements, given its significance for customer satisfaction. The framework, when complemented by adequate knowledge and dedication to its implementation, may serve as a reference for halal business owners aiming to establish a successful halal e-commerce firm. Consumers concerned about the halal status of products and compliance with Sharia principles should be informed of the criteria for assessing halal e-commerce during purchase transactions. The automation of online transactions reduces physical interaction between sellers and buyers; however, an effectively designed website and interactive customer service features can fulfill customer expectations and foster trust in the business.

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