E-Commerce Quality Evaluation Metrics: A Sharia Compliance Approach

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Abstract—there is a growing concern and need for Sharia compliance e-commerce quality metrics to evaluate policies and practice that will ensure that Sharia principles are adhered and user's desirable characteristics are provided. Therefore, extant conventional e-commerce quality metrics from the literature are critically reviewed. Furthermore, an exploratory study involving Sharia compliance experts was conducted, revealing adherence to the *maqasid* Sharia and the principles of Islamic law of contract as the fundamental Sharia compliance requirements for e-commerce systems. Hence, we integrated the relevant conventional e-commerce quality metrics and the Sharia compliance requirements deduced to propose a set of Sharia compliance e-commerce quality metrics based Information, systems and service quality dimensions. The Sharia compliance e-commerce information quality metrics proffered are accuracy, relevance, timeliness, understandability, completeness, and currency. System quality metrics involves being devoid of *riba*, devoid of *gharar*, devoid of *haram* objects, ethical advertisements, usability, reliability, functionality, customization, security, and privacy. While Service quality metrics are Sharia compliance assurance, *khiyar* policy, responsiveness, empathy, follow-up services, and the effectiveness of online support capabilities. Developing and evaluating Sharia compliance e-commerce quality based on the proposed metrics is envisaged to foster Muslim consumer trust, use and user satisfaction with e-commerce systems.

Index Terms—E-commerce; Information Quality; Service Quality; Sharia Compliance System Quality.

I. INTRODUCTION

The scope of e-commerce quality covers information quality, system quality, and service quality dimensions of e-commerce success prescribed by DeLone & McLean [1] and contextualized in DeLone & McLean [2]. Over the years, these quality dimensions have been evaluated using different metrics depending on the context and desired characteristics of a system. However, the emerging Islamic perspective to e-commerce has not been adequately examined to determine both the required and desired characteristics of e-commerce systems in that regard. Although, there have been studies highlighting Sharia requirements for e-commerce systems [3]–[7], e-commerce trust from an Islamic perspective [6], [8]–[11], Muslim consumer behavior [12]–[14] and attempts to design of Sharia compliant models for e-commerce [15]–[17].

Nevertheless, there is no known comprehensive Sharia compliance e-commerce (SCE-C) quality metrics upon which Sharia compliance policies and practice can be evaluated. Because, in addition to Sharia compliance, e-commerce quality is a fundamental factor that positively influences Muslim consumer trust, intention to use and user satisfaction with an e-commerce system [12]–[14], [18].

Therefore, we deduced and integrate Sharia compliance expert opinion on the requirements for SCE-C systems and extant e-commerce quality metrics from literature. It culminated into a proposed SCE-C quality metrics and evaluation criteria for guiding development efforts, measuring policies and practice of e-commerce systems. It is primarily aimed at promoting the development of SCE-C system to enhance Muslim consumer trust, participation and overall satisfaction with e-commerce. Because the fundamental objectives and principles of SCE-C quality are to enhance the welfare and best practice, non-Muslim consumers and businesses are also expected to partake in offering an/or patronizing SCE systems in a similar way that was witnessed in the case of Islamic banking.

The ensuing sections of this article are organized as follows: A review of literature highlighting extant e-commerce quality evaluation metrics, Issues of Sharia compliance in e-commerce systems. The research methodology highlights the design and conduct of the exploratory study. Furthermore, results on SCE-C requirements; the proposed SCE-C quality metrics and evaluation criteria for e-commerce systems and lastly, the conclusion of the study.

II. LITERATURE REVIEW

A. E-commerce Quality Evaluation Metrics

E-commerce quality is the desired characteristics of an e-commerce system [2], [19]. It is multidimensional in nature and comprises of information quality, system quality, and service quality dimensions. Each of these dimensions is characterized by metrics that enables quality evaluation of e-commerce systems [19], [20]. A major milestone in e-commerce quality evaluation task is the success Model [21] which prescribed Information and system quality dimensions. Furthermore, Molla & Licker [22] added a support dimension which the updated Delone & Mclean [1] IS model referred to as service quality dimension. These quality dimensions and attributes are general and applicable to all kinds of IS, e-commerce inclusive. However, Delone & Mclean [2] contextually highlighted the distinct nature of e-commerce and suitable metrics for evaluating Information quality, system quality, and service quality of e-commerce systems. This necessitates the need to appropriately select and adopt quality evaluation metrics from extant literature, modify or

expand them, and/or develop new quality metrics only when necessary [2]. The information quality, systems quality, and service quality dimensions of the updated D&M IS success model is illustrated as part of a comprehensive and multi-dimensional framework in Figure 1.
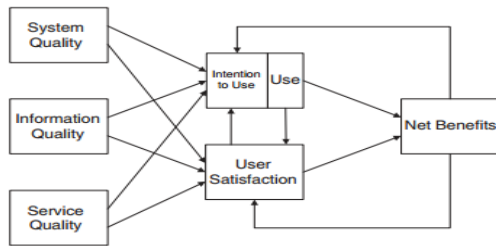

Figure 1: The Updated DeLone & McLean IS Success Model

1) Information Quality

The information quality of an e-commerce system represents the desired characteristics of the system output in the form of web pages and management reports [19]. DeLone & McLean [21] highlighted the prominence of information quality as a dimension of IS success in their D&M IS success model. Nonetheless, in a subsequent study, they contextually highlighted information quality as a measure of e-commerce success. Information quality involves e-commerce content issues that can enable prospective customers or suppliers to initiate and accomplish transactions through the internet and regularly make return visits to a site [2].

Information quality which is referred to as content quality by some literature is recognized to be one of the determinants of use and user satisfaction in e-commerce systems [2], [19], [22], [23]. Some existing and validated information quality metrics used for evaluating e-commerce systems include accuracy, up-to-datedness, comprehensiveness, understandability, completeness, timeliness, reliability, relevancy, currency, and preciseness [22]. Personalization of web content, complete, relevant, easy to understand, and secure information [2]; and information relevance, understandability, accuracy, conciseness, completeness, currency, timeliness, and usability [19]. Although some of the metrics proffered by different authors have similar meanings and attributes, for example, up-to-datedness [22] and currency [2], [19]. Therefore, a need to scrutinize these metrics and ensure they are appropriately selected to avoid duplications in measurement.

2) System Quality

System quality is measured by the desired characteristics of an e-commerce system [2]. Stockdale & Borovicka, (2006) referred to system quality as the elements of a system that affects the way an end user interacts and use an e-commerce system. Some of the e-commerce system quality metrics valued by customers are usefulness, usability, availability, reliability, adaptability, responsiveness, functionality and security [2], [20]. Furthermore, Petter et al., (2008) highlight ease of use, system flexibility, system reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times as the desired system quality characteristics of e-commerce systems.

Ensuring system quality of e-commerce systems has become essential due to the volitional nature of its users (customers), unlike other IS that are used by employees within organizations [1]. Because the system quality attributes of e-commerce are essential in determining use,

user satisfaction and net-benefits for customers [2], [23], [24]. Whereas, its absence can result in non-use, customer dissatisfaction, and loss that will provide competitors with an edge [19], [22].

3) Service Quality

The service quality of an e-commerce system is an important dimension of e-commerce success, especially as customers increasingly demand support from their web providers [1], [22]. It can be perceived as the gap between consumer expectations and the actual service performance [25]. It encompasses the multifaceted support and guidance delivered to customers in pre-sale, during the sale and post-sale activities that contribute to customer satisfaction. Some of the widely adopted and empirically validated e-commerce service quality metrics are responsiveness, assurance, empathy, following-up service and the effectiveness of on-line support capabilities of an e-commerce system [1], [26].

Sharma et al., [27] stressed that service quality of an e-commerce system can be enhanced by ensuring user friendliness, customer sensitivity, personalized services, quick response to complaints and upholding sufficient security levels in communication and data protection. Whereas, Stockdale & Borovicka [20] used the perception of service quality trust building mechanisms, empathy, follow-up services and customization in their evaluation of e-commerce service quality metrics. Providing support services is a critical requirement in the e-commerce environment because the lack of it will translate to a loss of customers and sales [2], [19], [27].

B. Sharia Compliance of e-commerce Systems

The issue of SCE-C systems is derived from the Islamic obligation upon all Muslims to adhere to Sharia teachings and way of life. It should be based on the *maqasid* Sharia (fundamental objectives of Sharia) which is aimed at ensuring *maslahah* (welfare) of the society. Imam Al-Ghazali explained *maslahah* as the preservation of religion, life, mind, progeny, and wealth. Therefore, everything that leads to the preservation of these five foundations is considered *maslahah*, and everything that leads to their disruption is *mafsadah* (evil), and its removal is *maslahah* [28]. Hence, *maslahah* is the guiding Sharia compliance principle for motive, ethics, wisdom and practice of e-commerce systems. The Sharia doctrines are derived from the holy Quran, the Sunnah (practices of the holy prophet), *Qiyas* (deductive analogy from the Quran and Sunnah) and *Ijma* (consensus of scholars) [4].

But despite e-commerce been a recent medium for buying and selling of goods and services, Sharia accords it with a similar inference as for the traditional commerce [3], [29]. Therefore, Sharia permits and promotes innovations such as e-commerce, so long as they fulfil all required obligations. Furthermore, these involves conformity to the principles of Islamic law of contract form (offer and acceptance), contracting parties (buyer and seller) and the subject matter (object and price) and to be devoid of any fundamentally prohibited element of *riba* (usury), *gharar* (uncertainty), *haram* (forbidden) and *maysir* (gambling) [4], [11], [15]. These requirements are mainly aimed at obedience to God and ensuring mutual good among buyers, sellers and the society at large.

There have been a couple of studies that evaluated system and information quality attributes of some Islamic websites

[30]–[32], but the websites are religious advocacy based rather than for commercial transactions. Because of the absence of studies on e-commerce quality from a Sharia perspective, there are yet no clearly defined desired characteristics for SCE-C systems. Although Ribadu & Wan Nurhayati [18] proffered Sharia compliance service quality metrics for e-commerce systems, it only focused on the support service obligations of vendors to users and did not include aspects of information and systems quality characteristics. Therefore, there is a need for a comprehensive approach to the issue of SCE-C quality. Because, Mehad et al., [32] stressed the need to preserve the cultural characteristics of Muslim society, rather than to allow online technology norms and limitations to dictate the way Muslims behave and conduct transactions online. This advocacy tends to be very potent when put to the perspective of the need for SCE-C quality metrics and evaluation criteria for e-commerce systems.

III. RESEARCH METHODOLOGY

To reliably and sufficiently harness the SCE-C quality metrics, we conducted a qualitative exploratory study involving semi-structured interviews with eight participants (P1-P8) who are scholars/experts on Sharia compliance transactions. The participants are all academics with affiliations to universities in Malaysia and beyond. Furthermore, they serve as Sharia compliance advisors for several national and international institutions which include financial services and Sharia regulatory bodies. Employing their wealth of knowledge and experience is aimed at gaining an in-depth understanding of the phenomenon and to generate new theoretical insights on SCE-C requirements [33], [34]. Although these sample size seems narrow and confined to experts in Malaysia, they are found to be reliable due to their antecedents and Malaysia's foremost role in evolving Sharia compliance research and practice. Furthermore, the application of Sharia is universal and the justifications given are based on Quran, Sunnah, *Ijma* and *Qiyas* which is universally applicable regardless of location. Therefore, interviews were conducted, audio recorded and transcribed to enable credible analysis of participant's opinion of e-commerce quality measures that will ensure Sharia compliance and other generic characteristics that e-commerce user's desire.

The qualitative data analysis process was carried out systematically in a transparent process in order to enhance credibility. This process began during the interview sessions where participants emphasis where noted. Thereafter, the audio records of interviews were transcribed and transmitted to participants for content validity to ensure that data is reliable and validly represented. The systematic process of qualitative data analysis is illustrated in Figure 2.

Content analysis of data was deductively carried out using computer-aided qualitative data analysis software, NVivo 11. The concepts of SCE-C quality requirements were identified and organized into codes and consequently, codes were categorized based on similarities, differences, and hierarchy. This approach was deemed necessary to enhance the adoption of existing and validated e-commerce success measures to enable replication and consistency in research findings. However, in the circumstance where extant measures did not suffice, new once were developed. Therefore, the SCE-C quality metrics deduced from Scholars/experts which

proffered similar meaning and implications with conventional e-commerce service quality metrics were consolidated and contextually defined. These constitute the proposed SCE-C quality metrics aimed to foster Muslim consumer trust, use, user satisfaction and net benefits from e-commerce.
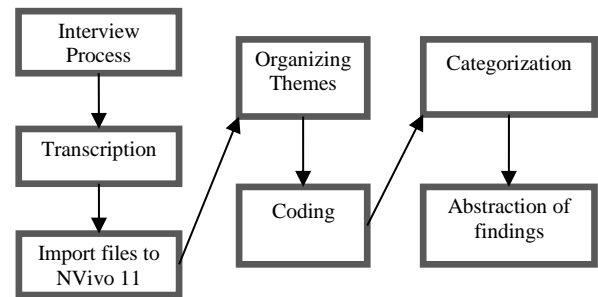

Figure 2: Qualitative Data Analysis Process

IV. SHARIA COMPLIANCE E-COMMERCE REQUIREMENTS

There is a unanimous agreement among the participating scholars/experts on the need to absolutely ensure Sharia compliance of e-commerce systems. Therefore, e-commerce stakeholders are required to prudently device suitable approach that will ensure Sharia compliance and best practices. The Sharia compliance obligations entail adherence to the *maqasid* Sharia and the Islamic law of contract which fundamentally aims at ensuring the best interest of all parties. P5 stressed that *"e-commerce is only a modern means; it is only a new means of transactions between parties. Sharia doesn't have any problem with that; it follows the developments of humankind that is involved in this world as long as you observe the requirements and principles."*

A. Maqasid Sharia

The *maqasid* Sharia is the fundamental objective of Sharia which is aimed at ensuring the *maslaha*. P4 cited Al-Ghazali's explanation of *maslaha* as, *"preservation of the religion, life, mind, progeny, and wealth."* Accordingly, *"everything that leads to the preservation of these five foundations is considered maslaha, and everything that leads to the disruption of these foundations is mafsadah, and its removal is maslaha,"* [28]. Therefore, P4, P2, and P1 expressed that, *maslaha* must be the guiding principle for motive, ethics, wisdom and practice in any Sharia compliance of e-commerce systems. In an emphasis, P2 expressed that, *"The intention is very important! Any Muslim business, the intention is to please the creator and serve the people in terms of realising their maslaha. This must be paramount as far as maqasid Sharia is concerned."* Therefore, e-commerce as a mechanism that facilitates buying and selling must provide similar protection of the *maslaha* as required in a real market. It is indeed very important to ensure that e-commerce systems and practices are aimed at enhancing the welfare of contracting parties and the society at large. This involves ensuring Sharia compliant e-commerce quality attributes aimed at enhancing user satisfaction are championed. It should be able to cater for the welfare of all people irrespective of religious belief, as it is the case with Islamic banking today.

B. *Islamic Law of Contract*

Islamic law of contract is found to be a fundamental requirement for Sharia compliance in e-commerce systems. Participants unanimously defined this Sharia obligation as, fulfilling the requirements of form, contracting parties and the subject matter. The e-commerce form is referred to as offer and acceptance (*ijab and qabul*), the contracting parties are the buyers and sellers, while the subject matter is the object and price of a sale contract. Therefore, it is an essential Sharia compliance requirement for e-commerce systems to adhere to these principles. P8 highlighted that *"As a principle, we must look into the basics in Sharia conditions for every transaction."* Therefore, the underlying conditions and principles for form, contracting parties and subject matter requirements of Islamic law of contract are presented in the ensuing sub-sections.

1) *Form (Offer and Acceptance)*

The form of an e-commerce contract is the offer and acceptance (*ijab and qabul*) made by a seller and a buyer on an online platform. Where an offer is a proposal initiated by either party (buyer or seller) in a contract, while acceptance is the consent of the other party to accept the proposed terms of the offer. P3 explained that *"Offer and acceptance can be done in many ways, four at least, we can consider that in writing. With regard to the method of ijab and qabul, I think there is no issue there because once you read and understand the terms and conditions, click okay or accept button then it is considered an acceptance. The listing of all the features of a product is considered as ijab."* However, participants unanimously highlighted that Sharia stipulates that the objects must be permissible and the buyer must be presented with accurate terms of the contract which includes price, object, deliverability, and *khiyar*. These requirements are presented in ensuing sub-sections.

a) *Clarity of Form*

Clarity of form has been denoted as, ensuring the enclosure of the full description and features of a product, it's pricing, the mode and precise time of delivery (P1; P2; P6; P8). Participants acknowledged the fact that, the issue of clarity is not just a concern for Sharia but for the conventional e-commerce as well. P8 highlighted, *"Sharia gives certain requirements that the item must be fully enclosed about the specifications and a certain time for delivery."* Furthermore, in a response on what constitutes the most critical Sharia concern in e-commerce form, P1 stressed: *"Yes the issue of clarity, transparency, and deliverability but on top of that is the items traded."* Similarly, P2 expressed that, *"there should be transparency about the goods, the processes and the terms and conditions have to be very clear."* These Sharia stipulations are indeed best practices that enhance the quality of e-commerce systems which would surely foster the appeal for Sharia compliance in e-commerce.

b) *Khiyar Policy*

Khiyar (option) is the authority given to the customer to revoke a contract in a spot or deferred sale transaction (P3; P4; P8). The seller or e-commerce vendor is required to offer *khiyar* so that a buyer can have the option of revoking a contract based on agreed contingency. Therefore the seller and especially the buyer must ensure that they fully realise the detail and terms of the contract they engross. In his attestation to the significance and scope of *khiyar*, P3

explained: *"it is quite a big issue because in muamalat you have also apart from khiyarul shart that I mentioned, you have khiyarul aib, khiyarul ru'yah and some others, even seventeen, nearly 20 types of khiyar from different mazhabs."* Therefore, *khiyarul shart, khiyarul aib, and khiyarul ru'yah* are identified as contextually relevant in ensuring Sharia compliance service quality for e-commerce. Because it is an essential support service that can safeguard customer welfare and promote satisfaction.

i. *Khiyar ru'yah*

Khiyarul ru'yah is deemed a necessary option in an e-commerce transaction which gives a customer the right to revoke a contract upon receiving and examining the object (P3; P8). Therefore, upon receipt, if a customer is not satisfied with the physical or functional description of the object he can return it back to the e-commerce vendor and seek a refund. In a response to the most important features for Sharia compliance in e-commerce, P8 emphasized *"So, focus on the customer satisfaction first. Like ebay, aliexpress where there is a very detailed explanation about the products and if customers are not satisfied, give them khiyar ru'yah. When people see the products and are not satisfied they should just send back and give a full return. I think the satisfaction of the customer will reflect the Sharia compliance of e-commerce platform."* It is, therefore, necessary for e-commerce systems to make provision and offer customers *khiyar ru'yah* to fulfil the obligations of *muamalat* and enhance their *maslaha* through service quality and customer satisfaction.

ii. *Khiyar al-aib*

Khiyar al-aib is expressed as a term that denotes option of defect or the option given to a buyer to revoke a contract upon establishing a defect in a bought object (P3; P4; P8). Therefore, any uncommon attribute that results in the diminution of an object or its value, or inhibits its proper use is regarded a defect. *"Say you bought a coloured TV over an e-commerce transaction, you brought it home and find that it radiates. So, radiation is, of course, harmful to the health, so you will have to return it back. Neither is it an option, but these days there is a department of consumer services which will protect you no questions asked. You have to really develop this extra kind of things, a department which will protect the consumer against insecure products"* P4. Furthermore, P8 stressed, *"So if you find any defect in the product you can open the dispute."* Therefore, incorporating *khiyar aib* into the *khiyar* policies of an e-commerce system is deemed necessary to resolve the issue of *qabut* (posession) and ensuring the *maslaha*, thereby fulfilling Sharia obligations.

iii. *Khiyarul Shart*

Khiyarul shart is an option given to one or both of the contracting parties the right to terminate a sale contract for any reason within a clearly specified period of time (P3; P4; P8). It is plausible to provide customers with the right to return bought items within certain agreed timeframe. P3 elucidated, *"I think it is better if we can incorporate to e-commerce that kind of feature, I think some e-commerce sites do include that. If the customers feel that they don't want the bought item they can freely refund back their money and sent back the item."* However, the specified tenure proffered by Imam Shafie and Imam Abu Hanifah for khiyar shart does not exceed three days. But, this is not tenable in an e-commerce

environment where it could take a longer time for a buyer to get delivery and evaluate the efficacy and cost benefits of an object. Therefore, due to their alternate jurisprudence, it becomes necessary to heed to Imam Malik and Imam Ahmad Ibn Hanbali's prescription that allows parties to fix a mutually agreed tenure for *khiyarul shart* (Noor et al. 2013).

c) Permissibility of Subject

The permissibility of the subject of an e-commerce sale is necessary and a prerequisite to the validity of ijab and qabul (P1; P2; P6; P8). It is unanimously established that the subject matter of an e-commerce transaction must be devoid of haram objects, gharar, and riba. Sharia also requires the mushaf be bought and sold by only verifiable Muslims which is a predicament in the e-commerce context. Therefore, buying or selling of mushaf online should be avoided (P1). Furthermore, buying or selling of ribawi items online has been prohibited by Sharia. The ribawi items include currencies, silver and gold which Sharia stipulates must be sold and exchanged on a real time basis by ensuring instant delivery. It is also advocated that, although some items might be halal, selling them online might constitute a danger or encourage Sharia prohibitive behaviour (P1; P8). Likewise, items that might pose a threat to the security and privacy of individuals should be restricted online as a way of blocking the means. Therefore, buyers and sellers must ensure that offer and acceptance done online is only for permissible (halal) goods and services that are meant for a good cause.

2) Contracting Parties (Buyer and Seller)

Participants unanimously acknowledged, both e-commerce vendors and customers are mandated to ensure Sharia compliance in transactions they engage. Therefore, they must not buy or sell mushaf except where both parties are certified Muslims. They are also prohibited from advertising, buying or selling of *haram* objects or engaging in transactions that involve *riba* or *gharar*. Vitally, both parties must have the *ahliyyah* and *wilayah* (legal capacity and legal authority) to execute a legitimate contract based on mutual consent. Furthermore, vendors must ensure the privacy of customers and the security of transactions conducted on an e-commerce site. Similarly, e-commerce vendors are obliged to focus on fulfilling the *maslaha* rather than just profit maximisation which will ensure that they don't engage in unethical practices that are detrimental to public interest. These Sharia compliance requirements highlighted are further discussed in the ensuing sub-sections.

a) Ahliyyah and Wilayah

The *ahliyyah* (legal capacity) and *wilayah* (legal authority) of contracting parties in an e-commerce transaction are obligations that must be fulfilled to ensure Sharia compliance (P3; P4; P5). Sharia stipulates that both contracting parties must be eligible to acquire rights and execute same. This is elucidated by P3, "*In the Sharia principle, we have conditions for the contracting parties and one of the conditions is that, contracting parties should be an akhir (sane) and reach the puberty*" (P5). Furthermore, "*If you can verify the capacity of the contracting parties using whatever means that is available I think that is not going to be an issue. But the challenge is how do you ascertain that the other party is?*" However, participants acknowledged that it is justifiable to assume that a person who possesses a debit or credit card which are the predominant mediums of payment can be

inferred to have both legal capacity and authority to engage in an e-commerce transaction. Because a person must meet the minimum legal requirements such as age and must be of a sane mind to be issued with such a card. However, this cannot be applied in the case of *mushaf* (printed copy of complete Quran) where both parties must be qualified Muslims. Therefore, online sale of *mushaf* is not tenable because there is currently no online verification mechanism that will certify a buyer is Muslim.

b) Mutual consent

The mutual consent of contracting parties is a prerequisite requirement for the legitimacy and validity of an e-commerce transaction in Sharia (P2; P5). It is emphasised that "*The main concern of Sharia is the mutual agreement, that the contract has been concluded not under force but under voluntary basis. That is the most important thing the principle of Sharia tries to preserve in dealing with this kind of things*" (P5). Furthermore, "*For you to get the consent of the other party then there has to be a lot of details about the products so that people can have informed judgment for their consent.*" Therefore, it is a fundamental requirement that *ijab* and *qabul* in e-commerce are done with absolute clarity so that contracting parties especially the buyers can make informed decisions. This requires a detailed description of the object and price and the contract terms to enable their mutual consent. In a bid to further ensure justice and cohesion, Islam stipulates *khiyar* obligations for parties in seeking redress in the event of any anomaly.

c) Security and Privacy

Ensuring the security and privacy of e-commerce systems is emphasised to be a best practice and a Sharia compliance obligation of contracting parties. P2 expressed that, "*When we look at the communications scheme, technically the other thing which will be a concern for Sharia is how you protect the privacy of the contracting parties and is it safe? The issue of safety! So I think this is a concern for both conventional as well as Sharia.*" Therefore, as a custodian of an e-commerce site, the seller must ensure that transactions are safe and confidential. Similarly, customers are obligated to patronise only safe and credible sites. P3 expressed a cogent and comprehensive approach to the security of e-commerce transactions, "*Another issue is the security, if you are talking about the security aspects of e-commerce then it would involve some other parties, the government, banking system, the payment system, the internet provider, all of them must make sure that the system is secured enough to guaranty if you pay 1 ringgit then 1 ringgit is deducted from your account and credited to the seller, not another party*." Therefore, it is the responsibility of contracting parties and other stakeholders to ensure an e-commerce site is safe and customer information is protected to be deemed Sharia compliant.

d) Sharia compliance Assurance

In a bid to resolve the issues of scepticism and ambiguity with regards to Sharia compliant e-commerce, participants unanimously underscored the need for Sharia compliance assurance. *"I mean we should have, for the time been, we haven't developed any guideline for e-commerce. Perhaps it is a good idea to propose particular guidelines for governance"* (P5). A sharia compliance assurance is to provide governance through internal and external controls for

e-commerce systems (P1; P2; P3; P5; P6; P8). Internal control can be achieved by providing an effective Sharia compliance governance structure that would enable Sharia compliance advisors to stipulate and guide the operating procedures (P1; P2: P3; P5; P8). Furthermore, a Sharia compliance audit unit must be established for the routine inspection of products and process to ensure validity (P1; P2; P8). While an external control of Sharia compliance of e-commerce systems should be exercised by Islamic religious authorities or councils in Islamic states or influential Islamic bodies for non-Islamic or secular states. They should serve as Sharia compliance assurance organs for e-commerce systems, engage in declarations of Sharia compliance guidelines, certification of internal controls of e-commerce systems, provide seals of trust, and ensure regulatory oversight. Indeed, it is a viable and necessary step towards ensuring credible Sharia compliance assurance. Because *"without governance what we are talking about wouldn't work. There must be governance, good governance!"* (P1). Therefore any e-commerce system that is deemed Sharia-compliant should be certified Sharia-compliant to enable consumer confidence to foster trust and patronage by Muslims.

3) Subject Matter (object and Price)

The subject matter is referred to as the object and price in an e-commerce contract. Therefore, participants unanimously established that it is a fundamental Sharia requirement for the subject matter to conform to *halal* for validity. *"First, the goods and services sold whether they are Sharia-compliant or not. If it is not Sharia-compliant it will render their e-commerce platform not to be Sharia-compliant"* (P2). Thus, the object of e-commerce contract must be *halal*; it must be devoid of *gharar* over existence or deliverability and devoid of unethical advertisements. Furthermore, the price must be devoid of *gharar*, the medium of payment must be devoid of any form of *riba* and online payment for *ribawi* items. Interestingly, it was noted that participant's discussions of Sharia compliance in e-commerce were mostly centred on the subject matter. Because most of the fundamental obligations of ijab and qabul or the buyer and seller are focused on ensuring the objects of the contract are permissible and the price and payment are devoid of *riba* and *gharar*. These requirements are further expounded in the ensuing sub-sections.

a) Devoid of Riba

The issue of *riba* has been a longstanding predicament which requires Muslims to devise a prudent way to resolve it. Participants, unanimously and unequivocally expressed that, Sharia prohibits *riba* and any e-commerce payment proffered on *riba* is a Sharia violation. *"The doctrines suggest that it is not acceptable, you can't justify the unjustifiable or defend the indefensible"* P7 highlighted. Consequently, P4 advocates, *"in the Quran, the abolishing of riba is a necessary but not a sufficient condition. You are going to do business and transactions without riba, but if you do not replace riba by something else which is better, it wouldn't work. It is necessary it is a ruling but is not sufficient you got to find alternatives that can effectively replace. This is the whole idea, that which is very important in e-commerce as well."* Therefore, a necessity to abolish the use of the conventional credit cards and its replacement with viable alternative payment options such as Islamic credit cards, the use of debit cards, pay on delivery and other permissible

methods to ensure Sharia compliance in payment processing.

b) Devoid of Haram Objects

Participants unanimously upheld that, the object of an e-commerce contract must be devoid of any fundamentally prohibited element. These include prohibited items such as alcohol and pork, online sales of *ribawi* items such as currencies, gold and silver, and selling *mushaf* to non-Muslims. P2 highlighted that *"in Sharia, in terms of the subject matter is that, the subject matter must be things that are halal (lawful)."* Although, *ribawi* objects and *mushaf* are halal there are certain stipulated conditions that they must fulfil to be deemed Sharia compliant. Therefore, P1 expressed, *"There are goods which cannot be traded except by making a cash payment, for example, currencies, gold, and silver because they are ribawi items. I mean we have a restriction for that; you can't do such transactions online. If you buy gold on deferred payment or deferred delivery then it is not accepted."* Similarly, *"buying and selling for example very specific goods, mushaf for example, that can only be done between Muslims and not between Muslims and non-Muslims or between non-Muslim"* P3 highlights. Thus, an e-commerce system must be devoid of *haram* objects as a prerequisite for Sharia compliance.

c) Devoid of Gharar

The elimination of *gharar* is a prerequisite for Sharia compliance in any e-commerce transaction. Therefore, Participants associated the term *gharar* with uncertainty, risk and also a derivative of *ghaish* (deceit) depending on context. They unanimously emphasised that transactions must be devoid of *gharar* over existence or specification of an object, price, deferment or delivery in an e-commerce system. P8 highlighted *"Rasulullah Sallallahu Alaihi Wasallam prohibits the sale of gharar. Sale of gharar refers to the sale of things that are uncertain."* Furthermore, P5 stressed, *"the most important principle is the certainty, certainty of the contract, meaning they know exactly the features of the item, when it will be delivered and when and how and the amount they are going to pay."* Therefore, *gharar* free transactions are deemed fundamental for both conventional and Sharia compliant e-commerce systems.

d) Ethical Advertisement

Ensuring ethical advertisement is deemed a fundamental Sharia compliance requirement for e-commerce sites (P1; P2; P3; P5; P8). Thus, e-commerce vendors are obligated to engage ethical advertisements that are devoid of deceit or promotion of Sharia prohibited objects. A Sharia compliant and ethically guided advertisement must ensure the permissibility, full disclosure of the features of an object or service, its cost and delivery (P1; P2; P3; P5; P8). P2 expressed, *"advertisements should also be something ethical. You don't advertise things which will erode the moral fabrics of the people, like having things which are almost near to phonographic kind of pictures and advertisement or like advertising harmful things such as alcohol, cigarettes which Sharia deem very harmful. So, those things should not be advertised. The other thing also is to avoid deceit (ghaish). Whatever you advertise should as much as possible reflect what you have in reality. Because you know with the technology and media, really, people can falsify a lot of things."* Therefore, e-commerce vendors must carry out their advertisements not only in a manner that promotes sales but

also public interest and in compliance with Sharia.

V. PROPOSED SHARIA COMPLIANCE E-COMMERCE QUALITY METRICS

Based on existing IS and software engineering tradition, we proffer SCE-C quality metrics and evaluation criteria. It is aimed to guide and evaluate e-commerce systems in fulfilling Sharia obligations and users expectation of information, system, and service quality needs. The SCE-C quality metrics and criteria are developed through enhancement, expansion, and modification of existing and validated metrics and criteria to incorporate Sharia compliance obligations. Furthermore, new Sharia compliance metrics and criteria's are developed based on literature and findings from Sharia compliance experts in the exploratory study conducted. This became necessary due to the nonexistence of Sharia compliance quality measures and evaluation criteria for e-commerce systems in the extant literature.

Therefore, the approach used in developing the SCE-C quality metrics and criteria conforms with D&M 2003 recommendation to researchers and practitioners involved in IS success measurement. Therefore, the proposed framework for SCE-C quality metrics and evaluation criteria proffers a convergence of SCE-C information quality metrics and criteria, SCE-C system quality metrics and criteria, and SCE-C service quality metrics and criteria the components of SCE-C quality metrics and evaluation criteria for e-commerce systems as illustrated in Figure 3. It indicates a positive relationship between the three dimensions of SCE-C quality metrics and criteria and the overall SCE-C quality of an e-commerce system.
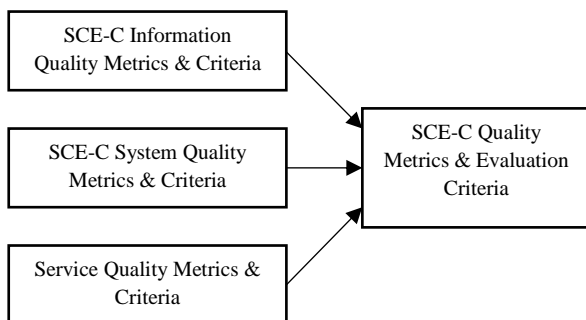

Figure 3: A framework for SCE-C Quality Metrics & Evaluation Criteria

A. SCE-C Information Quality Metrics & Criteria

The existing information quality metrics and evaluation criteria in literature are found to be in consonance with Sharia compliance requirements for e-commerce systems. Therefore, the proposed SCE-C information quality dimension denotes the desired characteristics of information output from an e-commerce system. The measures for information quality of SCE-C systems are accuracy, relevance, timeliness, understandability, completeness, and currency. These extant measures have sufficed the Sharia compliance requirements deduced from our exploratory study. The SCE-C information quality metrics proffered and their sources are depicted in Table 1.

The issue of information quality as defined in the conventional e-commerce context fulfills the SCE-C quality obligation of e-commerce systems. However, to ensure clarity we proffer the definition and criteria for each of the SCE-C information quality metrics in Table 2.

Table 1
SCE-C Information Quality Metrics & Sources

SCE-C Information Quality Metrics	Sources
Accuracy	Exploratory Study, [2], [19], [22]
Relevance	Exploratory Study, [2], [22], [35], [36]
Timeliness	Exploratory Study, [2], [19], [22]
Understandability	Exploratory Study, [2], [19], [22], [35]
Completeness	Exploratory Study, [2], [19], [22]
Currency	Exploratory Study, [2], [19], [22], [35]

Table 2
SCE-C Information Quality Metrics & Criteria

SCE-C Information Quality Metrics	Criteria
Accuracy: *The degree to which information is correct.*	Reliability of information relating to the vendor, products/services, and cost descriptions, and terms of the contract. These must be unambiguous, believable and consistent.
Relevance: *The extent of information significance.*	Provide all important information relating to good/service, price, delivery, and *khiyar* policies.
Timeliness: *Providing information at the appropriate time.*	Providing quick response to information request at the time users need it.
Understandability: *Clarity and ease of comprehending information.*	Information provided must be clear in meaning, easy to read and easy to understand.
Completeness: *The degree to which all relevant information is represented.*	Provision of complete and detailed information of goods/services, cost, delivery, promotions and return policies are represented.
Currency: *The degree to which information is up-to-date.*	Information precisely reflects the current state it represents.

B. SCE-C Systems Quality Metrics & Criteria

The system quality characteristic of an SCE-C implies the desired measures of the SCE-C system. Therefore, four new Sharia compliance specific metrics are developed to ensure e-commerce systems are devoid of *riba*, *haram* objects, *gharar*, and adhere to ethical advertisement practices. These metrics are fundamental Sharia compliance requirements for e-commerce system quality that have not been considered by extant literature. Furthermore, usability, reliability, functionality, customization, security, and privacy system quality metrics are also considered as SCE-C system quality metrics. These existing and validated metrics are as well deemed to be essential to ensure Sharia compliance. The fact that, most of the Sharia compliance concerns are also addressed by the conventional e-commerce systems; For example, ensuring that an e-commerce system is reliable and safe is a conventional e-commerce best practice that attracts use and user satisfaction, whereas the consequence of failing in that regard will lead to loss of customers.

In Sharia, it is not just an obligation upon the vendor to ensure reliability and safety of the e-commerce system, but also an obligation upon the user to only patronize reliable and safe e-commerce systems. Therefore, the need to provide SCE-C system quality to Muslim users will not only foster use, user satisfaction and a fulfillment of a religious obligation as part of their net benefits from e-commerce. The new SCE-C quality metrics from the conducted exploratory study and the adopted system quality metrics from literature with sources are illustrated in Table 3.

Table 3
SCE-C Information Quality Metrics & Sources

SCE-C System Quality Metrics	Sources
Devoid of *riba*	Exploratory Study
Devoid of *haram* objects	Exploratory Study
Devoid of *gharar*	Exploratory Study
Ethical advertisement	Exploratory Study
Usability	Exploratory Study, [2], [19], [22]
Reliability	Exploratory Study, [2], [19], [22]
Functionality	Exploratory Study, [2], [19]
Customization	[2], [19]
Security	Exploratory Study, [2], [22]
Privacy	Exploratory Study, [2], [22]

The SCE-C System quality metrics presented in Table 3 are each defined and provided with a set of criteria that must be fulfilled to ensure an SCE-C system in Table 4. The criteria for each SCE-C system quality metric are a performance measure for evaluating SCE-C system quality.

Table 4
SCE-C System Quality Metrics & Criteria

SCE-C System Quality Metrics	Criteria
Devoid of *riba:* *The absence of usury.*	The absence of *riba* based medium of payments and *ribawi* items.
Devoid of *haram* objects: *The absence of Sharia prohibited goods/ services.*	The absence of *haram* goods and services.
Devoid of *gharar:* *The absence of uncertainty.*	The system must be free from *gharar* over product, price, delivery, terms of the contract, and deceit.
Ethical advertisement: *Engaging in lawful advertisements.*	The permissibility or *Halal* nature of advertised objects and the advertisement process, sincerity of claims, and the motive must be to enhance welfare.
Usability: *The ease of user interface use.*	Ease of use, help features, response time, navigation, intuitiveness, attractiveness, and operability.
Reliability: *The degree of system dependability over time.*	System responsiveness, response time, dependability, and availability, accuracy and consistency of the system
Functionality: *The degree to which a system performs functions to satisfy stated or implied user needs.*	Flexibility, usefulness, transaction and customer feedback capabilities of an e-commerce system.
Customization: *Configuring layout, content or system functionalities to meet user needs.*	Enable user control to allow them to specify and get what they want, such as preferences on how information is organized or displayed.
Security: *Safety of transaction and payment processing.*	Ensuring confidentiality, authentication, access control, and data integrity of transaction and payment processing systems.
Privacy: *Confidentiality of personal information.*	Protecting personal information from unauthorized access and usage.

C. SCE-C Service Quality Metrics & Criteria

The SCE-C service quality metrics represents the overall support service delivery to e-commerce users. It is a measure of Sharia compliance as well as conventional e-commerce service quality best practices that can enhance customer satisfaction with SCE-C systems. Therefore, two new service quality metrics of Sharia compliance assurance and *khiyar* policy in addition to the existing and validated metrics of responsiveness, empathy, follow-up services, and the effectiveness of online support capabilities are proposed. The Sharia compliance assurance service quality metric is a

modification and expansion of the assurance metric proffered by DeLone & McLean [2]. This became necessary in order to fulfil the Sharia compliance assurance requirements which include but goes beyond the conventional e-commerce content, process, and technology assurances. Whereas, despite the fact that providing e-commerce customers with return options and warranty policies is a criterion for measuring empathy of an e-commerce system, highlighting *khiyar* as a service quality metric becomes necessary to ensure the Sharia compliance provisions are fulfilled. Whereas, the other adopted service quality metrics illustrated in Table 5 are adjudged to promote *maslaha* and compliance with Islamic law of contract. Furthermore, they constitute important SCE-C service quality metrics that can foster trust, use, user satisfaction and net-benefits from an SCE-C system.

Table 5
SCE-C Service Quality Metrics & Sources

SCE-C Service Quality Metrics	Criteria
Sharia compliance assurance	Exploratory Study
Khiyar policies	Exploratory Study
Responsiveness	Exploratory Study, [2], [19], [23], [25], [26]
Empathy	Exploratory Study, [2], [19], [25], [26]
Following-up service	Exploratory Study, [2], [23], [26]
Effectiveness of online support capabilities	Exploratory Study, [2], [19], [22], [23], [26]

Fundamentally, Sharia compliance assurance metrics is meant to ensure that e-commerce systems are guided by both internal and external control mechanism that ensures compliance with Sharia principles. The external control is to be developed by Islamic religious authorities to provide Sharia compliance guidelines, monitoring, evaluation and certification of SCE-C systems. Furthermore, ensure that SCE-C systems develop internal control mechanism that will guarantee a routine Sharia compliance process. Table 6 presents the SCE-C service quality metric definitions and the criteria for evaluating them.

Table 6
SCE-C System Quality Metrics & Criteria

SCE-C Service Quality Metrics	Criteria
Sharia compliance assurance: *The ability to inspire Sharia compliance trust and confidence based on evidence.*	Sharia compliance certification, Privacy statements, security attributes, evident regards for Intellectual property, system reliability, ethical advertisements, evidence of brand building and use of recognisable logo
Khiyar policies: *Options for products return policies and warranties.*	Providing customers with the option of returns after careful review, within a specified period of time or due to a defect which can be through warranty.
Responsiveness: *The ability to reliably render services.*	Quick responsiveness to customer queries and needs such as fast response to orders and ease of cancelling orders.
Empathy: *An indication of having user's best interests at heart that is aimed at enhancing their maslaha.*	Positive staff attitude, doing things that are promised such as fulfilling an order, provide help when users have problems, a variety of distribution methods, real-time update of order information, and reliable delivery.
Following-up service: *Post-sales support service delivery to users.*	After-sale services such as order tracking, order status and after order e-mails and information updates.

SCE-C Service Quality Metrics	Criteria
Online-support capabilities: *Rendering effective on-line support services to users.*	Providing online support such as answers to FAQ's, order tracking/shipment status, customized site intelligence, hotlines, service centres, relevant search facilities, feedbacks such as reviews and ratings, calculators, currency converters.

VI. CONCLUSION

The SCE-C requirements deduced from the exploratory analysis are found to conform to the Sharia compliance principles prescribed by both classical and contemporary literature. Fundamentally, it entails compliance with the *maqasid* Sharia and the principles of Islamic law of contract. Existing conventional e-commerce quality metrics and evaluation criteria's are also deemed to conform and promote Sharia principles. In the case of information quality metrics, extant metrics of accuracy, relevance, timeliness, understandability, completeness, and currency are found to suffice the Sharia compliance obligations for e-commerce systems. However, new system quality metrics of avoidance of *riba, gharar, haram* objects, and engaging in only ethical advertisements are developed in addition to existing metrics of usability, reliability, functionality, customization, security, and privacy to propose the SCE-E system quality Metrics. Furthermore, service quality metrics of Sharia compliance assurance and *khiyar* policies are proffered in addition to responsiveness, empathy, follow-up services, and the effectiveness of online support capabilities in order to enhance the support services and *maslaha* of SCE-C users.

The SCE-C metrics under each of the quality dimensions are guided by contextual definition and criteria's upon which the metrics can be evaluated. Therefore, the proposed SCE-C quality metrics is envisaged to provide a mechanism for guiding the development of e-commerce systems that comply with Sharia and embraces conventional e-commerce best practices. This is aimed to enhance e-commerce use, user satisfaction, and the net benefits from e-commerce among all stakeholders. Such enormous net-benefits will cut-across individual users, the Muslim community, vendors and the e-commerce industry. Fundamentally, SCE-C quality metrics will serve as a tool for evaluating policy and practice of e-commerce systems. Therefore, further research should be carried out to verify the validity of the SCE-C quality metrics proffered. This should involve a sample of Sharia compliance experts, IS experts and e-commerce users to enhance reliability.

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