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A mathematical model to adopt B2C ecommerce based on special customer requirement in social values with an emphasis on Islamic beliefs

Customer
requirement in
social values

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Abstract

Purpose – This paper aims to propose a mathematical model for describing and clarifying the relationships among the indicators governing the social values of special customers in business-to-consumer (B2C) e-commerce systems. This mathematical model is also able to describe the degree of adaptability of e-commerce systems to the social values of specific clients, and commercial firms are able to use the parameters described in this paper to increase the versatility and has the power to trade with special customers in different areas.

Design/methodology/approach – In this paper, while analyzing the issue of trading from the point of view of the customer as an element of trading, the affecting factors the trading space have been extracted. These affecting factors are categorized in three major groups: culture, technology and customers. This classification is based on the e-commerce and developing the traditional commerce. Using the mapping functions, the effects of each element in these three spaces on the concept of social values have been analyzed. The result of this analysis is the mathematical model governing each parameter and its semantic relation with the concept of social value.

Findings – The presence of a mathematical model between the indicators influencing the model adaptability and social values space allows e-commerce system designers to be able to make decisions on the adaptability of the model with a quantitative approach. To examine the proposed mathematical models, important frameworks and patterns in the field of e-commerce have been analyzed with an Islamic approach, as one of the adaptations of B2C e-commerce model.

Research limitations/implications – Regarding the innovation of the work, the case has been made, and the concept of social value and the model governing the elements of social values in this paper, in a B2C e-commerce model, has been discussed in general; the problem is parametric solved.

Practical implications – One of the key concepts in commerce is the ability of the commerce model to adapt to the requirements of special customers. This is more important in customer-based e-commerce



models. In these types of systems, if the commerce cannot match the customer's characteristics, it will not be accepted and used by customers. This is especially more important in the field of social values for customers.

Originality/value – In this paper, a mathematical model is presented to examine the adaptability of e-commerce systems to the social values of special customers. In examining this model, the relationship between each element affecting the social value of specific customers and the factors affecting trade has been studied.

Keywords Adoption, Social value, B2C ecommerce model, Islamic e-commerce, Mapping function, Religion value

Paper type Research paper

1. Introduction

With the increasing use of computer systems, we are witnessing the emergence of new concepts in various fields of industry and commerce. E-commerce systems are one of the most important systems developed in the context of the internet. E-commerce systems were designed to eliminate constraints and restrictions related to transacting at a specific time and space (Turban *et al.*, 2016; Khaneghah *et al.*, 2017; Turban *et al.*, 2016). The nature of traditional commerce is in such a way that transaction must be done at a specific time and space so that if the transaction occurs at the right time and space, the seller's and buyer's needs will be met (Turban *et al.*, 2016; Lin *et al.*, 2017). E-commerce is trying to add the ability to transact anytime and anywhere to traditional commerce by exploiting the capabilities of the internet. The development of traditional commerce by e-commerce causes transaction not to be limited to a specific time and space (Turban *et al.*, 2016; Akter and Wamba, 2016). This issue should be acceptable by the Islamic values, as the Islamic e-commerce should satisfy the concepts, values and constraints of the Islamic *Sharia*.

In e-commerce, the seller and the buyer can start transaction anytime they need. E-commerce use the internet network, the use of this context allows for the geographic and numerical span and enables sellers and buyers to communicate with other systems (Turban *et al.*, 2016; Khaneghah *et al.*, 2017; Pappas *et al.*, 2017; Choe, 2016). In traditional commerce, when the buyer or the seller has a requirement, it should be at the right time and space so that the mechanism governing the commerce can meet it.

To meet the requirements of the buyer and the seller, the time and space constraint is important. However, in e-commerce, due to the high range of customers and vendors and the use of the internet for the transaction, the mechanism governing e-commerce can respond to requests and requirements whenever and wherever a buyer or a seller requires something. In the Islamic marketing, however, the time needed for the seller and buyer to form the transaction is the beginning of the deal, but trading is not feasible until the rules of Halal and Haram are specified (Turban *et al.*, 2016; Rodriguez *et al.*, 2018; Koay, 2018).

Eliminating time and space constraints has increased the use of e-commerce. This caused the need to develop the concepts used in traditional commerce systems to be proposed as a necessity in e-commerce (Choe, 2016; Cui *et al.*, 2016). Considering that e-commerce helps in the development of traditional commerce to eliminate time constraints, the need to redefine the concepts, constraints and capabilities of the three mentioned elements is more tangible in e-commerce. Taking this into account, the values of the user society and recipients of e-commerce services are one of the most important concepts, limitations and capabilities that should be considered in e-commerce (Zhang *et al.*, 2017; Jiao *et al.*, 2017). The e-commerce model should have the ability to provide a model that is adjusted to its users by considering the values governing the provider society and recipients of services and goods. If an e-commerce system fails to meet this requirement, then there will be a decrease in

users' consumption. The reason is fundamental and constitutive elements of the commerce system and, consequently, the e-commerce.

The two core elements of customer and seller have a human nature (Mamonov and Benbunan-Fich, 2017; Connolly *et al.*, 2016). The human nature of these two elements causes a set of economic, social and cultural values to rule them. If the e-commerce, like any other system, does not have the adaptability to the value spaces of these two elements, then the system will not be accepted and used. This causes the concept of adopting e-commerce to the set of economic, social and cultural values to be considered as a necessity. Elimination of constraints and limitations by the e-commerce system is acceptable to the client as long as its religious values are not violated. This is especially true in Islamic commerce, in which the rules of dealing are completely cleared and have a high priority. The laws may be laid down by Islam, if a conflict among the values and removal of time and space constraints happens.

The values governing the society of service providers and consumers are different in e-commerce models and systems. Thus, if the model lacks the inherent ability to be adaptable, it will fail to be publicly used by users. Given the definition of several models for e-commerce based on the role of the buyer and the seller, the business-to-consumer (B2C) model is discussed in this paper as a basic model, with an emphasis on the Islamic values (Kumar *et al.*, 2016; Habibi *et al.*, 2016).

Given that developing the system is based on the customer in B2C model, the model must have adaptability so that it can define considering customer values space. In this paper, from a set of customer space values in the B2C e-commerce model, social values space that is defined based on the economic, social and cultural spaces will be discussed (Zhao, 2017; Kannan and Raja, 2016; Yan and Du, 2016; Hara *et al.*, 2016). This paper attempts to propose indices as benchmarks and criteria of B2C (or any other model which is customer-oriented) adaptability and develop a mathematical model governing each of these indicators in comparison with the concept of social values adaptability.

Determining the effective indices in the proposed mathematical models allows deciding on the elements affecting value spaces in the transaction process. To the extent that the e-commerce model has flexibility in the mentioned parameters, it will then be able to provide an appropriate adaptation between customer-specific features in social value space and the transaction process. Among the indicators that affect the social values space, the value from the point of view of Islam is discussed. While examining the activities undertaken to adapt B2C commerce mode, this paper has also defined a set of effective indicators to determine; the proposed B2C e-commerce model is adaptable to customers with specific characteristics.

To verify the validity of these models and indices, frameworks, mechanisms and methods used in B2C e-commerce are used to take the Islamic *Sharia* into account (Kadirov, 2014; El-Bassiouny *et al.*, 2017; Dean, 2014). By examining each proposed approach, to consider the conditions governing the Islamic commerce in B2C e-commerce (Dean, 2014), their capabilities and weaknesses are discussed and analyzed. In analyzing the capabilities, strengths, and weaknesses of the proposed solutions, an attempt has been made to identify and use indicators that can be used to assess adapting B2C e-commerce models to the requirements of specific customers in the field of socio-religious values space, with the emphasis of Islamic beliefs (Arham, 2010).

To that end, it has been attempted to define indicators that are:

- a suitable criterion for assessing commerce adaptation; and
- able to discuss the actual function of the commerce when used by specific customers.

In Section 2, the conceptual model of e-commerce is examined from customer's perspective and the specific customer model. Section 3 investigates the concept of the transaction from customer's perspective in B2C e-commerce and effect parameters in the degree of

e-commerce model adaptability to social value space. In Section 4, important models of Islamic e-commerce are analyzed from the approach of the examined parameters, and in Section 5, the conclusions are presented.

2. Customer definition in B2C

As this paper tries to examine the capabilities of the presented strategies in adapting B2C e-commerce model to customer needs in the field of social values governing services recipients, it will be discussed in the section of B2C e-commerce model and the concept of adapting the model to the customer and its parameters.

2.1 Business-to-consumer model from customer's perspective

B2C includes retail transactions of products or services from businesses to individual shoppers (Jiang *et al.*, 2016; Guo and Wu, 2016). In B2C-based e-commerce models, the central role of the e-commerce is customer-based. The centrality of the customer has caused the provided services in this model to be based on the customers' requirements.

In B2C model, the main hypothesis of the model is the presence of a high number of service providers and vendors. Accordingly, the hypothesis is that each firm should provide what services by considering which model so that the customer can choose a firm to transact with (Nyadzayo and Khajehzadeh, 2016; Lin *et al.*, 2017; Lee *et al.*, 2016).

Concepts such as time and space value, some services provided to the customer, a user interface for the customer, customer loyalty, value-added services and the ability to provide special services be among the most important concepts that should be addressed and discussed by the firm in this model.

Given the customer centrality in this model, if the space ruling the customer is not taken into account in implementing the model, its implementation will fail. In B2C model, the firm has a direct relationship with the service recipient element. Because of this, with systems thinking approach, exact cycles of customer feedbacks need to be defined in this model so that the system can survive more efficiently.

In a B2C e-commerce model, traditional commerce concepts are redefined based on the customer. In this model, each concept should be designed based on the characteristics of the customer. This makes the space of customer generating more sophisticated than other e-commerce models. In addition to the customer's characteristics and the features that the customer needs to transact with, customer space must also include commerce features.

Although in traditional commerce, features such as time constraints of the transaction are considered as a commerce feature, they are considered as part of a customer attributes in B2C e-commerce model. This results from the assumption of the existence of a large number of firms in B2C model. Such an assumption results in discussing the acceptability of transaction timing from customer's perspective in this model. Customer space can be modeled according to equation (1):

$$\left[\int \text{Traditional Commerce} \blacksquare \sum \text{Technology} \blacksquare \int \text{Culture} \right] \\ F(\text{customer}) \hat{=} (\text{Request}) \rightarrow \text{Response} \quad (1)$$

As can be seen in equation (1), the customer space creates a function to respond to customer demands based on the three sub-spaces of traditional commerce, technology and culture. This means the customer starts to transact in B2C e-commerce models under the influence of the continuous space of traditional commerce, the discrete space of technology and the continuous space of culture (Kang and Sohaib, 2016; Hallikainen and Laukkanen, 2018).

The continuous space of traditional commerce includes all constraints, limitations and capabilities that govern transaction and are the result of activities that lead to a transaction and are defined in the user's space. This space is a continuous space. The reason is the nature of the time governing this space. In traditional commerce space, time is considered continuous at a specified interval [start, end].

The discrete space of technology (Pagani and Pardo, 2017; Mangiaracina *et al.*, 2016) includes all features, constraints, limitations and capabilities governing a transaction that derives from technology or its subcategories. The technology spaces are concepts or tools that make one of the constituent features or processes of the commerce improve regarding constituent elements. Technology space, regarding the nature of the time governing it, is a discrete space.

As stated, commercial space is a continuous space, and sometimes in this continuous space, elements forming technology space may affect the commerce process. The elements of technology space improve the characteristics or processes relating to the commerce at special intervals or periods.

The continuous space of culture represents the constraints, limitations and abilities to transact. The elements of this space include the culture of the buyer and the seller community and represent the norms and anomalies governing transaction. These elements directly or implicitly affect the transaction process. The nature of these elements is in such a way that the type of the transaction directly influences them. The nature of the commerce causes a set of elements of continuous space of culture to influence transacting and determine what events are considered norms or anomalies in transacting. Culture space is a continuous space, and its elements influence the transaction space and are affected by it from the beginning to the end.

2.2 Special customer requirements

The concept of special customers is a concept taken from traditional commerce. As in traditional commerce, where the nature of transaction must be defined in a way that is by the characteristics of the customer and the seller, in e-commerce the e-commerce model must also match the specific characteristics of the customer or seller (Leimstoll and Wölfle, 2017; Karcz and Ślusarczyk, 2016).

As stated in Section 2.1, the core element of commerce in B2C is the customer; thus, the special customer in these systems is the customer whose generating space has specific attributes. This particular feature can be derived from considering one (or more than one) concept or one (or more than one) law in the customer's generating space.

The mentioned concept (or concepts) or the law (or laws) must have a key nature. This results in the customer violating the concept of transacting if the concept or law is not taken into account in e-commerce model. Breaching the transaction is whether due to the lack of transaction acceptability in customer's social, economic and cultural space or dissatisfaction with transaction activity in customer's perspective.

To better understand the concept of a special customer, there is a need to redefine the customer's function based on a concept (or law) that makes the customer special. All three spaces of technology, customer and culture mentioned in equation (1) are spaces with complex elements, which is due to the general nature of these spaces. The general nature of the three spaces mentioned in equation (1) causes them to be a heterogeneous set of sub-spaces that may have different natures.

As the purpose of this paper is to adapt B2C to special customer requirements in the field of social values space, we need to define mathematical functions such as Archway function stated in equation (2) (Treves, 2016; Kosambi, 2016; Zhang, 2017), which maps the elements of the three spaces into equivalent spaces regarding social values.

$$F(Archway_{Socialvalues}) : \begin{pmatrix} Customer, \\ Technology, \\ Culture \end{pmatrix} \xrightarrow{Mapping} \begin{pmatrix} \overrightarrow{Customer_{Socialvalues}}, \\ \overrightarrow{Technology_{Socialvalues}}, \\ \overrightarrow{Culture_{Socialvalues}} \end{pmatrix} \text{ SocialvaluesSpace} \tag{2}$$

Equation (2) suggests that an equation such as $(Archway_{Socialvalues})$ function can be proposed so that the three spaces of culture, technology and customer are mapped to three equivalent vector spaces. This mapping transfers only elements from the three spaces that are effective in the field of social values into equivalent vector space. Conducting equation (2) on the three

mentioned spaces creates three spaces of $\begin{pmatrix} \overrightarrow{Customer_{Socialvalues}}, \\ \overrightarrow{Technology_{Socialvalues}}, \\ \overrightarrow{Culture_{Socialvalues}} \end{pmatrix} \text{ SocialvaluesSpace}$. Each

element of $\begin{pmatrix} \overrightarrow{Customer_{Socialvalues}}, \\ \overrightarrow{Technology_{Socialvalues}}, \\ \overrightarrow{Culture_{Socialvalues}} \end{pmatrix} \text{ SocialvaluesSpace}$ Spaces are in fact an element of

$\begin{pmatrix} Customer, \\ Technology, \\ Culture \end{pmatrix}$ equivalent spaces that influence the concept of social values. This paper

focuses solely on concepts of religious values from among a set of elements that can be defined on the concept of social values. An Archway function can be defined to transfer the vector spaces derived from equation (2) to the religious values space (Murphy *et al.*, 2016; Ardiansyah *et al.*, 2016; Alqahtani, 2016). As stated, in this article, by customer, we mean a function such as equation (3).

$$\left[\int Traditional\ Commerce_{SocialValues} \blacksquare \sum Technology_{SocialValues} \blacksquare \int Culture_{SocialValues} \right] \\ F(customer) \overset{\sim}{\rightsquigarrow} (Request) \rightarrow \lim_{SocialValues} Response \tag{3}$$

As seen in equation (3), the customer function is a mapping from the customer's request space to space responding to the customer when the customer's social values are taken into account. The space of responding to customer's requests is a limit space.

This is due to the nature of social values concept that after a certain period, the commerce will be able to carry out the transaction process based on social values. Most of the social value concepts are quantitative and, after a certain time, the commerce system must be able to consider quantities and weights based on the custom of the society in which it is being implemented. In equation (3), the transaction between the two spaces of demand ad response takes place based on three spaces of factors influencing social values defined in technology, traditional commerce and culture.

Transaction-based spaces cause the elements of technology, the nature of the transaction (traditional commerce) and the culture, according to the notion of social values, to influence the process of responding to the request at any given time for the implementing the transaction processes.

If in e-commerce the concept of the customer and, consequently, the process of responding to the customer's request is considered based on [equation \(3\)](#), then the e-commerce:

- has been designed based on the customer; and
- can adapt to the customer's social values.

To analyze special customer, and given the broadness of the three cultural, economic and social spaces that govern the generating spaces of customer characteristics, this paper emphasizes social values space. Therefore, it can be stated that the purpose of this paper, by examining the activities carried out in the field of B2C e-commerce adaptation to social values, is to determine the indicators that should be considered in each of the three effective spaces in transactions described in [equation \(3\)](#).

The elements affecting social values, which are defined in the three spaces, create a concept (or concepts) or law (or laws) that:

- shows the intrinsic nature of the transaction; and
- causes customer satisfaction in transacting.

If any of the constituent elements of social values concept in any of the three spaces are violated during the transaction process, then the nature of the transaction will be violated for the customer.

The nature of the majority of the elements generating social values concept is quantitative. Thus,

- For different customers using the commerce system, the acceptable value is different.
- After a specific period and the stable state of the commerce system, the acceptable values in the society can be decided upon.
- They have a direct impact on the concept of customer satisfaction.

A special customer in this article is a customer who has concepts or laws in its features that arise from customer's social values, and disregarding it in the e-commerce model is a violation of the transaction by the customer. The customer needs the B2C e-commerce model to support the customer's specific features.

3. Business-to-consumer parameters from customer perspective

By examining ([Kang and Sohaib, 2016](#); [Sohaib and Kang, 2016](#); [Kim and Peterson, 2017](#); [Collier and Bienstock, 2015](#); [Sohaib and Kang, 2014](#)), it can be suggested that in B2C e-commerce models, e-commerce space from customers' perspective is as shown in [equation \(4\)](#).

$$B2C_{Space\ from\ Customer\ view} : Request_{buy} \xrightarrow{\text{Alpha}} Answer_{sell} \therefore \text{Alpha} = \{Customer\ Satisfaction, \text{Online Purchase intention}_{SocietySpace, EconomicSpace, CultureSpace}, \text{Online Shopping Behavior}\} \quad (4)$$

[Equation \(4\)](#) states that, from a customer's point of view, B2C is a mapping from seller's sale request space to seller's response space based on the alpha space. The alpha space includes parameters that should be considered by B2C model to make the transaction process

meaningful from customer's perspective. As seen in [equation \(4\)](#), from the customer's perspective, if the variables forming alpha space are not observed in a transaction process, the mapping of the two spaces of customer's request and seller's response will be meaningless.

One of the most important variables of alpha space is the definition of customer's satisfaction variable within the space society space variable, part of which is underlined by this paper as the religious values of Muslim customers' society. The nature of the constituent variables of alpha space is such that in any transaction process:

- they are interdependent;
- they overlap; and
- the value of their impact on the mapping equivalent to the transaction is dependent on the nature of the transaction activity and the customer's space.

When an e-commerce model tries to adapt and specify for certain conditions, it is increasing the weight and impact of influence coefficient for a member of the alpha space.

Now, a mathematical vision about adapting B2C models to specific customers can be obtained. When B2C model tries to adapt to the prevailing pattern of a particular type of customers, one (or more than one) specific variable of alpha space must be specified for each special pattern of the customer.

It should be noted that each constituent element of alpha space can be analyzed and defined in three spaces of *SocietySpace*, *EconomicSpace* and *CultureSpace*. Therefore, when a model is adapting to a particular concept, mathematically and according to [equation \(4\)](#), one (or more than one) variable must be defined in one (or more than one) space.

Through changing the weight and significance of the effect of the equivalent variable (or variables) with the concept requires adaptation, B2C model should be able to manage the transaction activity [corresponding to the mapping in [equation \(4\)](#)] in a way that the mentioned variable (or variables) are considered as the core element of the mapping.

In this case, it can be said that B2C model adapts based on the specific needs of the customer. It is important to note that when the element-performing mapping is equal to one (or more than one) variable that forms alpha space, and then the change of this core element affects both the customer's space and the transaction space and will change them.

Knowing the elements that make up alpha space is, in general, very complicated and difficult. The reason is the high dependence of the definition and the nature of alpha space members on the type of transaction and conditions governing the customer's space.

Given the purpose of this paper, which is to examine the adaptation of B2C models to customer needs by taking into account social values, studies that have mostly been conducted in societies that need adaptability, especially in Islamic societies, will be investigated to understand the elements of alpha space in three spaces of *SocietySpace*, *EconomicSpace* and *CultureSpace*.

3.1 Customer satisfaction

The concept of customer satisfaction is defined in all spaces that either generate customers or customers influence them in some way. The concept of satisfaction, in general, indicates the acceptability or unacceptability of the transaction from customer's perspective. Satisfaction is a quantitative concept, and after e-commerce operates and reaches a stable state, the values of the elements forming satisfaction can be decided on.

As satisfaction can be defined and developed in any customer generating or influencing space, it has some sub-elements. In [Mobarakabadi et al. \(2013\)](#), a conceptual framework is

presented to examine the factors of online shopping behavior. In [Mobarakabadi et al. \(2013\)](#), the four factors of trust, privacy, perceived value and firm reputation have been proposed as the most important factors affecting customer satisfaction. This indicates that customer's satisfaction variable is a space consisting four concepts. These four factors are of great importance in online shopping behavior and have a significant function in customer satisfaction with firms.

[Ali et al. \(2016\)](#) present a framework based on the concepts of financial security, privacy, system security, cybercrime and trust to obtain customer's satisfaction in online shopping. The most important point of these five concepts is that all of them affect customer's trust and, consequently, customer's satisfaction.

[Saleem-ur-Rahman et al. \(2013\)](#) examine factors related to the ability to use the firm for customer's satisfaction and presents site interactivity, site informativeness, site trust, site contact and site ease of use as the main components of customer's satisfaction.

[Sheikh and Basti \(2015\)](#) deal with studying customers' satisfaction factors in B2C e-commerce model. According to this article, product, service, network system, payment, privacy protection and website characteristic are the factors affecting customer's satisfaction.

[Kooistra \(2016\)](#), [Wang et al. \(2016\)](#), [Oliveira et al. \(2017\)](#) and [Madlberger and Matook \(2017\)](#) analyze the behavior of customer's purchase behavior on the internet. The factors discussed in this paper can be classified as trust and privacy.

The focus of papers [Kaur \(2017\)](#) and [Al-dweeri et al. \(2017\)](#) is on security, privacy and trust and their impact on customer's satisfaction.

In [Hasan \(2016\)](#), the factor of website designing (in all dimensions) for customer satisfaction is studied, and in [Safa and Von Solms \(2016\)](#), the factors influencing the product or service, security and payment in customer satisfaction are discussed. As noted in [equations \(3\) and \(4\)](#), and because customer-generating space can be defined in the form of <Economic, Culture, Social>, it can be suggested that satisfaction concept has been made up of three main sub-spaces stated in [equation \(5\)](#).

$$Satisfaction_{Space} \stackrel{\text{is define}}{\ddot{::}} \lim_{t \rightarrow Stable} \left[\begin{array}{l} (Satisfaction)_{Traditional}, \\ (Satisfaction)_{Technology}, \\ (Satisfaction)_{SocialValue} \end{array} \right] \begin{array}{l} Culture_{space} \\ \\ Economic_{space} \end{array} \quad (5)$$

[Equation \(5\)](#) represents the definition of satisfaction function from the customer perspective in B2C e-commerce models. As a show, in [equation \(5\)](#), satisfaction space is itself defined by three spaces of satisfaction defined on the elements of technology, commerce nature and social values.

These three spaces are defined on two spaces of culture and economics and, given the quantitative nature of satisfaction; these three spaces should be examined in a stable and equilibrium situation. As can be seen in [equation \(5\)](#), using the three functions of Archway, it is possible to extract some elements of technology spaces, commerce nature and social values, which affect satisfaction concept.

In a situation where e-commerce is not in equilibrium, the elements that make satisfaction space in technology, culture and commerce nature spaces may contradict each other. The objective representation of this issue can be seen in traditional commerce when shopping from a store.

It is important for the customer to buy what goods or services from which store. This is because the shopper does not like to shop at every store. However, in e-commerce, when

shopping from department stores such as Amazon, the shopper does not pay attention to the nature of the store during the transaction process.

Technology space in e-commerce directly affects the concept of satisfaction. The elements of this space that affect satisfaction concept are conventionally interdisciplinary parameters. Some of these parameters are defined based on the concepts of computer engineering, website designing, graphics interface designing and psychology.

Social values space, especially religious values, is one of the most complicated and, at the same time, the most important spaces that influence satisfaction concepts. Given investigating conducted studies on factors affecting customer satisfaction variable in this section, these factors can be outlined in three general categories in [equation \(5\)](#).

3.2 Online purchase intention

The concept of purchase intention is taken from traditional commerce, and the tools used by the customer to purchase (or repurchase) differentiate between the two concepts of traditional and e-commerce. The concept of purchasing refers to all activities that the customer performs as he/she decides to purchase until he/she receives a product or service.

The concept of purchase in traditional and electronic commerce uses a single model in its entirety, and the difference between e-commerce systems and traditional commerce is in the tools used to carry out any activity related to the concept of purchasing.

In [Sohaib and Kang \(2014\)](#), trust is proposed as the main element influencing the variable of an effective response to online shopping. In this paper, the impact of culture, including individualistic and collectivist, on individual trust in the intention and commencement of electronic transaction has been studied. It also examines the impacts of shopper's behavioral aspects and the patterns governing the vendor's website on this issue. This indicates that customers' trust influences the variable of electronic transaction intention to the firm.

In [Sohaib and Kang \(2014\)](#), other various aspects of variables affecting the intention of conducting an electronic transaction such as security, privacy and risk are also considered. These factors all make the customer trust the firm. On the other hand, these factors directly affect the aspects of the firm representative websites. This effect on designing aspects creates a trust to the firm based on the knowledge and behavioral aspects of the buyer, which itself leads to a trust based on the effect and these two types of trust are known as interpersonal trust and lead to purchasing intention.

In [Yadav et al. \(2016\)](#), a model is developed to test the relationship between the dimensions of electronic services quality, general services quality, customer satisfaction and purchasing intention. The dimensions of electronic services quality include factors of website designing, reliability, accountability, trust and personalization. The results of this article suggest that all factors, except personalization, significantly affect the quality of general services and customer satisfaction and, subsequently, customers' purchase intention.

In [Meskaran et al. \(2013\)](#), a comprehensive model is presented that describes the factors affecting online shopping intention. These factors are adopted from the theory of planned behavior (TPB), the theory of rational act (TRA), and the theory acceptance model (TAM), as well as the records of trust and security. The factors adopted from these theories include attitude, subject norm, perceived behavioral control, perceived usefulness, perceived ease of use, online shopping orientation, perceived behavior control, online shopping perceived benefit, and demographic, which influence online purchase intention.

In [Khaneghah et al. \(2017\)](#) and [Khaneghah et al. \(2017\)](#), a model for calculating time value is presented which can be used to calculate the amount of quantitative customers' satisfaction in receiving a response from a firm.

Abdulgani and Suhaimi (2014) have investigated the factors Muslims' online purchase intention. It discusses the concerns about online studies regarding technology and *Sharia*, which need to be addressed by scholars. Thus, given these two perspectives, the factors of *Sharia*-compliant, integrity, trust, third-party assurance, Web quality, benevolence, competence, thrusters propensity, trustworthiness, religious commitment and perceived risk are proposed in this article in the form of a conceptual model to study the concept of an electronic transaction.

In Howladar *et al.* (2012), the main factors affecting e-transaction intention are trust, social support, attitude to behavior, subjective norms and perceived norms.

Lee *et al.* (2017) investigate the factors that may affect online re-purchase of goods and customer services. These factors are perceived value, perceived ease of use, perceived usefulness, firm's reputation, privacy, trust, trust and functionality.

In Soufivand *et al.* (2014), factors that are based on the relationship between the factors affecting online shopping and customer retention are investigated. This paper states that factors of online communication quality, pre and post sales service, brand, seller's reputation, ordering ability, advertising and marketing, and in other words, promotions and using the website and attracting customer's trust and satisfaction, maintaining security and privacy have a positive effect on online shopping and customers' repurchase intention.

Rezaei *et al.* (2014) focus on finding records of online repurchase intention. In this paper, the effect of users' perceived attitudes before purchase, users' attitude before purchase and users' attitude after purchase towards online repurchase have been investigated. In users' perceived attitudes before purchase factors of perceived value, perceived ease of use, perceived usefulness and perceived risk are investigated. In users' attitude before purchase, factors of trust, privacy concern and internet literacy, and in users' attitude after purchase, satisfaction factor is proposed.

Mostafavi and Moghadam (2016) suggest identifying factors influencing online repurchasing and provide them in the form of an integrated model. This paper examines the issue that increased customer satisfaction directly affects the maintenance of online stores customers, and factors of perceived ease of use, confirmation, trust, perceived usefulness, perceived enjoyment and reputation directly influences online repurchase. In general, purchasing or re-purchasing is a five-step process that begins with consumer (customer's) purchase decisions.

This process involves the steps the customer takes to decide what kind of products and services to purchase. The process includes periods for discovering customer's required resources, products or services selection, requests submission, request analysis by the firm and, ultimately, after purchase customer's behavior (Khaneghah *et al.*, 2017).

The first time interval is Resource Discovery (RD), in which the customer attempts to discover resource within firms providing goods or services. This time interval begins with customer's search for resources and continues until the required resources are found. The nature of this time interval is of resource discovery. In the time interval, RD understands its customers' needs, collects the necessary information for purchase and searches the databases for a firm that can meet customers' requirements.

Typically, one of the main differences between e-commerce and traditional e-commerce is RD time interval. The mechanisms of discovering the resource used in the two types of commerce are different.

At the end of the RD period, the firm determines the requirements, constraints and restrictions governing the process of responding customer's demand. The second time interval is S or Selecting, in which the customer selects the available products and services.

In this time interval, among the discovered resources, the customer selects a resource that meets the needs (Marković *et al.*, 2016). In the third time interval, Req or Request Sending, the customer sends a request to the firm and the transaction takes place based on the request. In the fourth time interval, ReqA or Request Analysis, after the correspondence between the customer and the firm and the analysis of the customer’s request details by the firm, the firm notifies the conditions governing the response to the request and the customer purchases goods and services based on the obtained information.

The fifth time interval, After Exchange (AE), is the time interval after purchasing goods and services. After completing the transaction process, the customer examines the outcomes of the transaction and the initial expectations and feeds back to the firm. This feedback serves as a customer’s benchmark for whether to repurchase from the firm. Regarding equations (1) and (4), and given the five-step model of the purchasing process, an equation such as equation (6) can be used to explain the concept of the transaction process and its relation to social values.

$$Exchange_{space} \overset{\text{is define}}{\ddots} \lim_{t \rightarrow Stable} \left[\begin{array}{c} \overbrace{\left[\begin{array}{cc} RD & S \end{array} \right]}^{AE} \\ \left[\begin{array}{c} Req \\ ReqA \end{array} \right] \end{array} \right] \begin{array}{l} Technology_{influence} \\ Social_{value} \end{array} \quad (6)$$

Equation (6) suggests that the transaction process, whether in purchasing or re-purchasing phase, is a limit function in the matrix and vector space. Thus, the function of transaction process indicates that:

- Each entry of a matrix represents elements from *Technology_{influence}* and *Social_{value}* spaces, which affect the transaction, whether the initial transaction or the re-transaction. Each matrix element is defined as $s \left[\begin{array}{cc} RD & S \\ Req & ReqA \end{array} \right] < SV, TI >_{t=Alpha}^{t=Beta}$
- The matrix is defined based on vector AE. Based on this definition of AE element, anytime during the transaction, the customer status after the transaction is also taken into account. The AE vector represents the effects of each activity performed in each of the four transaction processes on the customer’s status after trading. This vector is a criterion for defining matrix elements. The elements of this vector indicate what indices should be discussed in every four processes of the transaction. The indices implicitly suggest what effects the two spaces of *Techonology_{influence}* and *Social_{value}* should have on the activities carried out in each four transaction processes. In addition to the two spaces mentioned above, the elements of this vector also include the main indices of the proper transaction (including primary transaction or re-transaction).
- The transaction process in e-commerce, like traditional commerce, has an iterative nature. Because of this, at each moment of $t = \Omega$, where Ω is s part of the transaction time, parts of the activities associated with each of the five transaction processes be carried out. This causes the elements of $\left[\begin{array}{cc} RD & S \\ Req & ReqA \end{array} \right]$ to have a value at any moment of Ω . As in the case of the AE vector, this vector is a set of directional indicators, each representing the effects of one (or more than one) concept or law (or laws) on the transaction. Each element belongs to one (or more than one) technology space, social values (in this article Islamic religious values), as

well as the transaction nature. Obviously, AE vector is different for each special service or goods and in each society. The nature of AE vector is such, that if it is not true for a transaction, then at each stage of the transaction because $\begin{bmatrix} RD & S \\ Req & ReqA \end{bmatrix}$ matrix is inconsistent with AE vector, the transaction process has been violated from customer's perspective. In traditional commerce, many elements of AE vector have time and space constraints; however, there are not such limitations in e-commerce systems.

3.3 Online shopping behavior

One of the special-purpose e-commerce concepts, derived from traditional commerce, is the concept of customer's behavior at the time of shopping. The nature of the behavior in traditional e-commerce is such that it has a high degree of dependence on time and space. It has another pattern in e-commerce due to the specific role of technology space.

The nature of technology space is in a way that it is essentially designed to remove constraints and limitations of time and space in e-commerce process. In e-commerce space, customer's behavior is directly dependent on the capabilities and facilities that the technology provides to the customer.

A variable such as sensibility can be defined for technology space that indicates the role and amount of using technology by the customer in conducting the transaction process. The relationship between sensibility variable and customer's behavior is based on equation (7).

$$\text{Sensibility}_{\text{Customer behaviour}} = \left[\sum_{t=\text{Alpha}}^{\text{End Exchange}} \text{Technology}_{\text{use}} \right] \blacksquare \left[\int_{t=\text{Alpha}}^{\text{End Exchange}} \text{Technology}_{\text{Facility}} \right] \overrightarrow{\text{Social_value}} \quad (7)$$

As seen in equation (7), the sensibility variable is dependent on two concepts of the capabilities provided by the technology as well as the use of technology. The relationship between these two variables, regarding the commerce type, can be one of two operators of addition or multiplication. If the relationship between the two variables is strong, the operator will be multiplication, and if it is moderate, the operator will be an addition. Both variables are defined based on $\overrightarrow{\text{Social_value}}$ vector.

The reason is the nature of social values space, especially religious values. If the technology contradicts the nature of social values, customers will not use it. This can be discussed more tangibly, particularly in the field of religious values.

On the other hand, the space of technology capabilities is continuous. The space of using the technology by the customer is discrete. $\overrightarrow{\text{Social_value}}$ consists of a set of elements indicating the values that must be considered in the transaction process so that customer's behavior in the electronic transaction process can be analyzed.

The purpose of articles (Vafaei and Fekete-Farkas, 2017; Rahim et al., 2014) is to analyze factors affecting customer's behavior in online shopping. In this articles, financial risk, product risk, convenience risk, non-delivery risk, return policy and service and infrastructural variables and the impact of domain-specific innovativeness on attitude, subjective norms and perceived behavioral control are proposed as the main factors influencing online shopping behavior.

3.4 Summary

Table I shows the factors affecting the constituent elements of alpha space based on the stated materials in Sections 1.3 to 3.3

As shown in Table I, the factors affecting the three spaces mentioned in equation (4) are stated here. As suggested in equation (4), alpha space is defined based on three spaces of satisfaction, online purchase and online shopping behavior.

Based on equation (2), the elements affecting social values derive from one of the spaces of social value, technology and traditional commerce.

Regarding customer's satisfaction, the criteria of reputation, product and payment derive from the nature of the transaction. In this space, criteria of privacy, system security, cybercrime, site interaction, site information, site ease of use, contact with the site and the technology-based network system, as well as the criterion of perceived value, arise from social values.

In Table I, in customer's satisfaction space, the concept of commerce trust and its governing model can both be due to the nature of the transaction and the values. When the

Independent variables	Nature of commerce parameters	Technology-based parameters	Social value-based parameters
Customer satisfaction	Trust Firm reputation Product/Service Payment	Privacy System Security Cybercrime Site interactivity Site trust Site informativeness Site contact Site ease of use Website characteristic Network system	Perceived value
Online purchase intention	Interpersonal trust Perceived behavioral control Third party assurance Trustors propensity Trustworthiness Firm's reputation Perceived risk	Responsiveness Personalization Perceived usefulness Perceived ease of use Privacy Security Gender Functionality Internet literacy Confirmation Reliability Integrity Competence Benevolence Perceived enjoyment	Attitude Subject norm Perceived norms Religious commitment Social support Customer satisfaction Perceived value
Online shopping behavior	Financial risk Product risk Convenience risk Non-delivery risk Return policy Perceived behavioral control Innovativeness domain specific	Service and infrastructural variables	Attitude Subjective norms

Table I.
Factors affecting the constituent elements of alpha space

concept of trust is considered in e-commerce systems, concepts such as individuals' privacy and system security in the technology space affect it.

Both concepts are themselves the main criteria in the technology domain. In an e-commerce system, the system will be able to meet the customer's satisfaction requirements when it can meet all three groups of concepts that lead to the concept of trust.

Using equation (5), it can be shown that the main criteria of trust in e-commerce are reputation, quality and price. On the other hand, because in e-commerce, and especially in B2C-based models, unlike traditional shopping, the product is not accessible at the time of shopping and is provided in the cyberspace of the internet, winning the trust of customers is of great importance. Designing a firm representative on the internet (whether a website or applications) is recognized as a major criterion in commerce model adaptability to customer's specific characteristics. This concept includes other criteria, such as interaction with the firm representative, information stored and displayed by a firm representative, website or application ease of use, communication with the firm, communication system, privacy and security.

Payment service is an indicator of system security criterion. This criterion is among the criteria that derive from transaction nature, technology and values. In traditional commerce, it is one of the most important parameters to transact goods or services. In e-commerce, payment methods are derived from the concepts of traditional commerce based on social values and especially the religious beliefs of the people in the society.

About the Islamic approach mentioned in Section 4, it can be argued that people who believe in the *Sharia* of Islam should use bank mechanisms that do not include usury to pay electronically through firm's portals (Kadirov, 2014; Shamim, 2010). Although this is beyond the scope of the e-commerce system and has a complete dependence on the payment system if the e-commerce system fails to use payment mechanisms that fit social values and especially religious values, the proposed model in equation (3) will be challenged. Therefore, according to the reviewed frameworks and equation (3) and equation (5), payment method is an indicator of system security, and system security itself is an indicator of trust. On the other hand, cybercrime is a criterion that affects customers' trust in online shopping.

It can be suggested that most of the variables governing e-commerce model adaptability to the customer should be discussed in designing the firm representative. Interacting with the firm representative means how the customer will change the form of receiving services.

Navigation and aesthetics of the firm representative contribute to change customer's attitude toward the firm. Thus, consumers' attitude toward the firm is affected by their perception of interaction with the firm's representative.

The informativeness of firm representative means the ability to inform the customer about various information on purchasing. For example, information on products, their prices, availability, alternative products, as well as information including delivery times, should be involved in the firm representative. The more accurate and complete the information is provided, the more time the customer will spend in the firm representative to shop.

This will ultimately lead to more customer satisfaction. In traditional commerce, reputation is one of the main criteria for commencing or continuing the transaction process; however, using equation (6), it can be stated that in e-commerce, due to the concept of searching for a wide range of service and goods providers, the value reputation notion is less than traditional commerce systems. The matrix in equation (6) is such that the concept of resource discovery causes the concepts of quality, price and most importantly, the concept of AE, in this model of the business to have a higher value than the concept of reputation. According to equation (6), variables such as trust, perceived behavior control, third-party

assurance, trustworthiness, reputation and perceived risk derive from the transaction nature.

Accountability, personalization, gender, performance, internet literacy, certification, perceived profitability, perceived ease of use, reliability, honesty, competence, benevolence, perceived enjoyment, privacy and security arise from technology. Attitudes, subjective norms, religious commitment and social support are derived from social values. Ease of use of a firm representative means the simplicity of the firm representative function by each customer. Communication with a firm representative is one of the most important elements of customer relationship management and allows the customer to ask questions about firm's products and services.

They also receive their responses online or through communication channels such as telephone, email, fax and social networks. On the other hand, the company can examine its customers' satisfaction or dissatisfaction as feedback. The communication system refers to the network infrastructure that runs the firm representative and must be compatible with different network infrastructures. This is because each customer may use a different network structure in each geographic area.

Given examining the criteria form the technology, it can be concluded that these criteria are considered among the important features in designing and developing a cycle of the firm representative and are a subset of the main criteria for designing the firm representative. Perceived value is the essential result of marketing activities and is a first-order element in relationship marketing. Therefore, the perceived value can also be considered as the main indicator of customer satisfaction.

To provide a model that adapts to customer requirements, customer satisfaction variable includes three main criteria of designing a firm representative from technology, the perceived value of customer's religious beliefs and customer's trust, which results from all three aspects of transaction nature, technology and values.

In the case of purchasing space based on equation (6), it can be suggested that one of the most important criteria is perceived behavior control. This criterion examines situations where individuals do not have full control over the situation. Perceived behavioral control affects two criteria of intention and behavior. The criterion of perceived behavioral control is considered as the main indicator for online shopping intention variable and attitudes and mental norms criteria. Third-party assurance convinces the customer that a firm representative is safe when he/she feels that it is unsafe, and this assurance makes the customer feel confident about the sellers' competence and ethical behavior.

The level of perceived risk for e-shopping customers is higher than those who purchase traditionally. The impact of customer's trust on e-shopping intentions depends on perceived risk, especially when it e-commerce activities includes unexperienced customers that examining a variety of websites and do not know them well.

Perceived risk is an indicator of trustworthiness criterion. Internet literacy is the knowledge and ability of a person to use the internet and its tools and technologies. Thus, for e-shopping, the customer must first have internet literacy. Internet literacy is technology-related, and the conditions of ease of use of a firm representative should be taken into account in developing and designing cycle of the firm representative.

Gender is a measure that affects online shopping and changes customer's behavior, depending on whether the customer is a woman or a man. For this reason, some websites, depending on the nature of their business that may be more or less male-dominated or female-dominated, design firms' representative. Gender is considered an indicator for website designing criterion. Performance depends on whether the firm representative provides enough information on products and services.

The performance of a firm representative can be defined as a mechanism for efficient delivering information. Confirmation is one of the criteria of cognitive beliefs that determine customer expectations, including past services provided by a firm representative, and somehow refers to the evaluation process. Therefore, if a firm representative performance is higher than costumers' expectations, they will confirm the website more and re-purchase through the website. Customers expect a firm representative to respond their questions quickly.

A firm representative should provide facilities for quick interaction with the customer because this quick and appropriate response to the customer will make the customer spend more time with the firm representative and purchase. Personalization aims at including content that is designed based on individuals' needs and interests. Personalizing content allows a firm representative to engage potential customers through their attention and participation throughout the process so that they can make decisions more quickly.

Perceived profitability is defined as the degree to which a customer believes the use of a firm representative would improve his/her purchasing performance. Perceived profitability and perceived ease of use are both considered as indicators of designing firm representative. Reliability indicates a firm representative ability to properly accomplish orders, quickly provide information and maintain personal information. This has a direct impact on customer satisfaction and, subsequently, on purchasing.

Enjoyment is defined as "awareness of public feeling when people are completely engaged in certain activities." In physical purchases, customers want to go back to the store because they have an enjoyable purchase. Enjoying e-shopping has a very important impact on customer's purpose and behavior. In pre-purchase stage, the customer is potentially curious about the convenience, security, maintenance, privacy, and ease of action. At the purchasing stage, purchasing pleasure and enjoyment becomes more important because it may affect purchasing decisions. Therefore, the customer of a firm representative may leave the system because of not enjoying the shopping experience.

An enjoyable purchase is directly dependent on a firm representative. Integrity is the expectation that others will behave by accepted social standards, such as honesty, and a set of principles that the society trust it. Providing rational information that is validated by social values, and generally, honesty in the electronic shopping process is one of the most important benchmarks of this criterion. Believing in integrity means the customer believes that the firm representative has a moral behavior during the shopping process.

Reducing social uncertainty, understanding, predicting and controlling others' behavior is a central motivating force for human behavior. When laws and customs are not enough, people will rely on trust as the main mechanism for reducing social uncertainty. The relative lack of laws and customs on the Internet, especially in e-commerce, makes consumer trust very important. However, the lack of interpersonal exchanges and the nature of a once business transaction on the internet make this consumer's trust unique. Because trust relates to others and is reinforced through interactions with them. Therefore, the seller's competence and, in fact, the business competence, is reflected in a firm representative. It directly affects winning or not winning the trust, and in case of winning the trust, it will lead to the electronic shopping process. Benevolence is an incentive to achieve mutual interest.

Benevolence indicates a special relationship between trust and loyalty. In B2C e-commerce, benevolence means the seller, in addition to his or her interest, provides conditions for the customer to benefit from his/her purchase. Thus, it is a factor in winning customer's trust. Therefore, integrity, competence and benevolence are three important indicators in gaining customers' trust in online shopping.

Social support can represent the individual's sense of belonging, popularity, or acceptance. The feeling that they need him/her for himself/herself and for what he/she can do. Another definition of social support emphasizes the level of people's perception of love and support from family, friends and relatives against psychological stresses and events. To be successful, the firm representative must understand consumer's shopping behavior.

Social values inspire norms in the society, and norms also direct individuals' behaviors, and these behaviors can be derived from individuals' attitudes. For this reason, attitudes and mental norms are two main indicators of perceived values. In online shopping behavior variable, the benchmarks of perceived behavioral control and domain-specific innovativeness are derived from the transaction nature, financial risk criteria, product risk, welfare risk, the risk of non-delivery and return policy.

Infrastructure and service variables are based on the type of technology, and attitude and subjective norms criteria derive from values. Some criteria have already been discussed; therefore, they will not be dealt with again.

Perceived risk in e-shopping is due to a failure in technology or human error. Most risks associated with e-shopping include financial risk, product risk, welfare risk and non-delivery risk. The uncertainty level in e-shopping process affects consumers' perceptions of perceived risks. Thus, financial risk, product risk, welfare risk and risk of non-delivery are recognized as perceived risk indicators, and perceived risk criterion is also considered as an indicator of customer's trust. Product return policy refers to the policies of e-commerce where the seller is obligated to obey those policies when the customer returns a product.

This can lead to more trust from online customers. Online shoppers need to learn new technology skills so they can evaluate and retrieve products in newer Internet spaces. Domain-specific innovativeness changes the Web space into a more creative and interesting space for customers and with this change, individuals' relative attitude toward online shopping space will also change and influence winning online customers' trust.

4. Case study, Islamic business-to-consumer models

Considering the materials in Section 3, in this section, we will examine B2C e-commerce models designed for specific Muslim users (Shamim, 2010). In this section, each model will be discussed according to equations (2) to (8). Given in Ribadu and Rahman (2016), Ali *et al.* (2015) and Ribadu and Rahman (2016) and presented framework in Ribadu and Rahman (2016); Ali *et al.* (2014); Richard *et al.* (2016) and Sarofim and Tolba (2015), it can be stated that the frameworks in Ribadu and Rahman (2016) and Muhammad *et al.* (2013) are reference frameworks of Islamic transaction, and other frameworks defined in this domain are considered as frameworks derived from these two frameworks.

4.1 Strategies for e-commerce transactions by Islamic sharia

Muhammad *et al.* (2013) investigates:

- examining the license of conducting e-commerce transactions from the Islamic law perspective, especially in the content of Islamic law in contracts; and
- the analysis of e-commerce transactions to meet the requirements of the Islamic Sharia (Dean, 2014; Sergius Koku and Jusoh, 2014).

Also, to examine the second goal, the Amazon site has been selected as the case study.

The findings of the online transactions analysis show that, in general, Islamic law requirements of a valid contract, except for two specific scenarios, are met in the rest of transaction scenarios. The first scenario is transactions related to non-Halal products such

as alcohol, pork, non-Halal food and beverages, tobacco and tobacco-related products, as well entertainments that are against *Sharia* or music, and the second scenario is payment methods by using conventional credit cards (usury) (Arham, 2010; Jonathan and Liu, 2011; Tieman and Che Ghazali, 2013; Mohd Dali *et al.*, 2015). Figure 1 shows Amazon general transactions process.

As seen in Figure 1, the general process of transactions in Amazon includes the following six main elements:

- (1) customer;
- (2) Amazon site (as seller or dealer);
- (3) product;
- (4) price
- (5) payment facilities; and
- (6) product delivery.

In Muhammad *et al.* (2013), after exploring this process, various items such as contract parties, assurance of transaction and products being Halal or non-Halal within the framework of *Sharia* have been studied. Then, payment methods through credit cards are reviewed on Amazon site, and Islamic credit card is proposed to replace public credit cards, and finally (Mohd Dali *et al.*, 2015), the framework outlined in Figure 2, the status of online transaction validity is provided by Amazon site from Islamic *Sharia* perspective.

As shown in Figure 2, a structure for validating online transactions with an Islamic approach is suggested on Amazon site. This structure consists of four main and important elements of the transaction form, parties, subject and payment in transactions from Islamic *Sharia* perspective. The transaction form must be transparent and by the seller and the buyer's demands (Muhammad *et al.*, 2013).

Mutual satisfaction and legal capacity to conduct the transaction are the most important factors of transaction parties. Transaction subject includes product and its price. In this framework, online transactions will be confirmed on the condition that, in addition to having the features mentioned in this structure, the product should be Halal (its transaction is permitted in the Islamic *Sharia*), transaction payments must be made through Islamic credit cards (to avoid usury) (Mohd Dali *et al.*, 2015). Apart from these two situations, the transaction is not by the Islamic *Sharia* and is invalid.

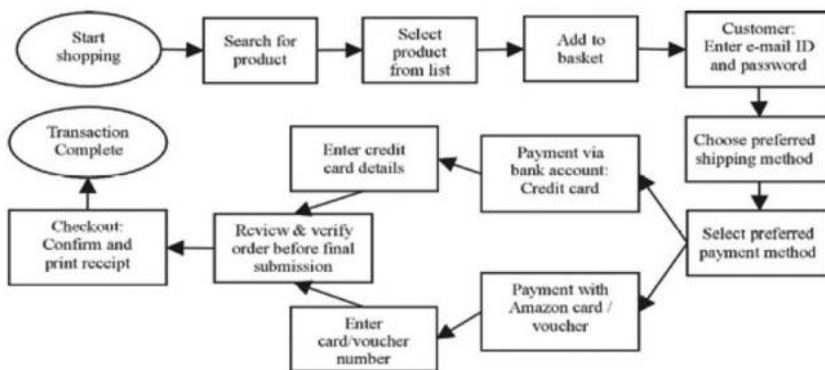


Figure 1. Amazon general transactions process [81]

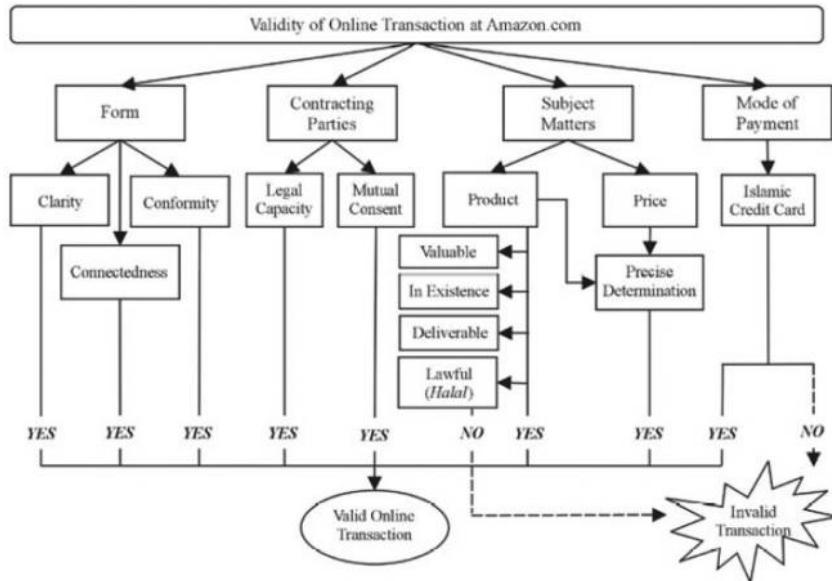


Figure 2.
Online transaction
validity by Amazon
site from Islamic
Sharia perspective

Source: Muhammad *et al.*, 2013

Religious commitment means that religious followers want firms' representative to consider their religious teachings. Customers rely on a firm representative that takes into account their religious beliefs. The use of information and communication technology for e-commerce transactions may raise religious issues. Thus, the possibility of electronic transaction from *Sharia* perspective must be analyzed.

Most of the consumers' concerns, especially Muslims, discussed in this article, are that current e-commerce processes are mixed with non-Islamic elements such as usury, gambling, uncertainty, and Haram items. For this reason, the e-commerce model must ensure that customer's religious values are taken into consideration in the electronic shopping process. Religious commitment derives from religious values and is an indicator of perceived value criterion. Here, social protection also means social acceptance either from the family as a smaller community or the society.

This type of support arises from social values and forms the individual's (consumer) subjective norms in society, and these norms will directly affect customers' online shopping. What indicators need to be investigated to examine the adaptability of this model? It is important to note that the requirements of special Muslim customers are adopted from the religious value of these customers. The laws of Muslims' socio-religious values space are determined based on these primary and secondary resources. Socio-religious values space represents the values and anti-values governing various aspects of life, including transaction-related activities.

These laws define the constraints, limitations, values and unique characteristics of patterns governing Muslims transactions. Primary resources include Qur'an (Muslim scriptures) and Sunna (which reflects the religion, the Words and the beliefs of Prophet Muhammad) (Wilson, 2012). Secondary resources include *ijtihad* (an attempt to deduce subordinate religious laws from Islamic jurisprudence resources), which itself has two components of consensus (the consensus of scholars) and analogy (reasoning through comparison).

In Islamic jurisprudence resources, these two resources create socio-religious value space for particular Muslim customers. It can be stated that in case of special customers of a socio-religious value, there is a set of resources creating a socio-religious value space that should be discussed by e-commerce models so that an adaptation can be made to customers' specific requirements for a socio-religious value space and e-commerce model.

In this framework, the concept of contracting parties and its related concepts, such as mutual consent should be distinguished in two areas of consumer rights and firm rights, and each's rights are independently investigated (Muhammad *et al.*, 2013). On the other hand, information security in online business space is very important (Muhammad *et al.*, 2013).

One of the most important consumer rights is privacy and information protection that has not been considered in the proposed framework. The framework suggests that every e-commerce transaction should be free from any elements of the prohibition, such as usury, uncertainty and gambling, and the elements of fraud, deception or coercion should be added depending on the primary and secondary resources.

The comprehensive study of electronic payment process on Amazon site and an emphasis on payment through Islamic credit cards (Mohd Dali *et al.*, 2015), especially Debit Card, can be suggested as the advantages of this framework.

4.2 The framework for e-commerce requirements based on Islamic sharia

In Ribadu and Rahman (2016), the general framework for e-commerce requirements based on Islamic *Sharia* from B2C model perspective is presented. In this article, the requirements for e-commerce that are compatible with Islamic *Sharia* have been identified. These conditions are classified into two groups of Islamic law contracts and prohibition of Islamic *Sharia* in e-commerce.

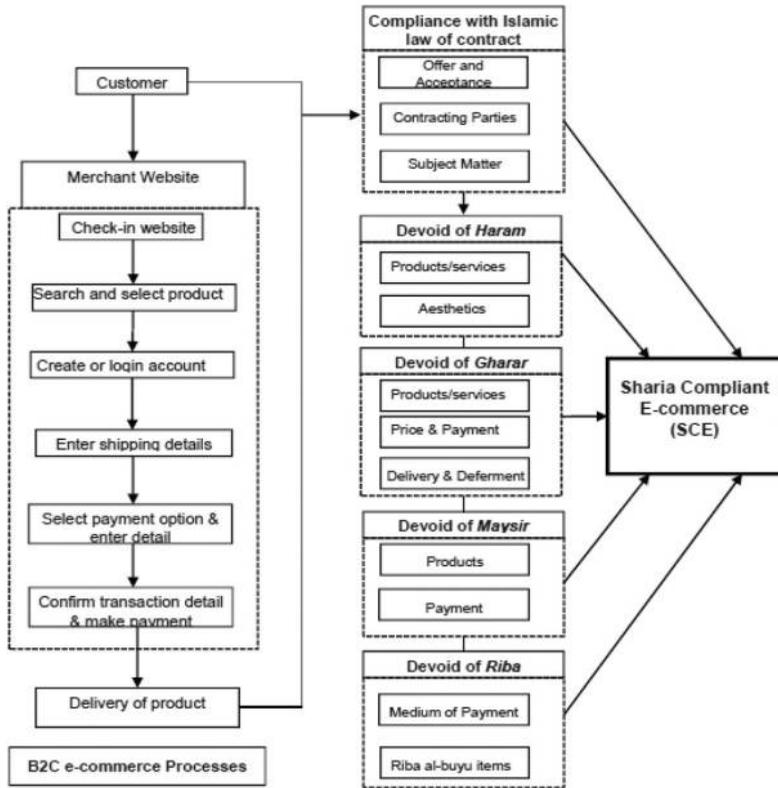
In Ribadu and Rahman (2016), the requisites for contracts based on Islamic law, including contract form (offer and acceptance), contract parties (buyer and seller), as well as contract subject (item and price) are proposed. Also, it refers to requisites for e-commerce prohibition from Islam perspective, that is, usury, uncertainty, gambling and Haram. Figure 3 illustrates this proposed framework.

As shown in Figure 3, the proposed framework illustrates B2C e-commerce process that can be adapted to the Islamic society's value space, That is, from the time the customer logs in and searches for the required products until the products are purchased and delivered. This framework also examines the requirements for product transaction on the internet and based on *Sharia* of Islam, which is the basis of Islamic transactions.

These requirements must be considered during the transaction process so that Islamic *Sharia* can confirm the transaction. These requirements include the Islamic law relating to contracts conclusion and prohibited elements, including avoidance of prohibited products and services, avoidance of uncertainty in products and services, the price and payment, delivery and delay of goods, avoidance of gambling on products and payment and avoidance of usury, and thus, a general framework of B2C model is presented with an Islamic approach.

In comparison to previous frameworks and models, this framework includes more Islamic transaction factors. Various factors such as electronic payments, goods and services, delivery and delay of goods, price and important factors in the contract (offer and acceptance, contract and contract subject) are expressed regarding elements of prohibition in business in Islamic law are suggested in this framework.

In examining examples of e-commerce adaptable to a particular type of social values, called Islamic values, customers should pay based on their beliefs, such as compliance with the laws of Islamic commerce, contract legitimacy from Islamic law perspective, and by



Source: Ribadu and Rahman, 2016

Figure 3. General B2C framework for e-commerce requirements based on Islamic *Sharia*

observing Islamic laws and considering the seller and the buyer’s rights on the basis of Islamic *Sharia* (Ribadu and Rahman, 2016).

The model used in this society should meet the requirements of the firm and the customer based on the Islamic laws. The model governing e-commerce, regardless of its governing pattern, should be able to consider the rules of Islamic *Sharia* that govern the traditional commerce in the model.

5. Discussion

The concept of commerce model adaptability to patterns, behaviors and customer functions is one of the most important challenges in various domains of commerce, including e-commerce. Typically, using the available data and taking into account customer’s function and behavior over different time intervals, traditional commerce systems try to provide models to adapt the commerce model to specific customer characteristics.

Given the human nature of the customer in commerce models, the firm should have some capabilities in the commerce model so that it can extract the factors affecting customer’s society space and adapt the model based on these factors. The human nature of the customer causes the factors affecting customer’s society space to have a high priority for the

customer. If the commerce model cannot be adapted to these features, then the customer will not accept it. This is especially more important in the sub-space of factors affecting transaction in terms of the customer's religion because if the commerce model fails to adapt to the customer's religious characteristics, it will be unacceptable from the customer's perspective, and its implementation may be considered contrary to religious teachings and prohibited by the customer.

In e-commerce systems, due to the formation, technology space and elimination of temporal and spatial constraints governing the commerce, extracting an adaptable model to the characteristics of customer's society space is a more complex situation. The nature of e-commerce is in a way that it changes customer's traditional society space to the internet society space. This makes the e-commerce model pay attention not only to the concepts of the commerce model adaptability to customer's social characteristics but also to parameters that arise from transferring social space to a new internet-based space and the formation of technology space.

In this paper, on the one hand, by examining related works in this area and analyzing B2C-based e-commerce models and modeling the concept of customer in B2C e-commerce, it was found out that the model is adaptable when the elements of spaces affecting the transaction in each three spaces of Technology, Social, and Traditional Commerce adapt to customer's social value space. According to [equations \(1\) and \(3\)](#) in this paper, customer's space transacts under the influence of three spaces of satisfaction, online purchase and online shopping behavior.

If the transaction process does not take into account these three spaces, then the transaction activities will be unacceptable from customer's perspective. On the other hand, based on [equation \(2\)](#), the model is adaptable to social value space when the elements affecting social value space in every three spaces of satisfaction, online purchase and online shopping behavior in technology, social and traditional commerce follow the patterns and models proposed in this article. In [equations \(5\) to \(7\)](#), the model is raised to determine the elements of satisfaction, online purchase, and online shopping behavior by considering the features of technology, social, and traditional commerce that affect the concept of social value space.

The equations above extract a set of elements shown in [Table I](#). These elements are a set of parameters that the e-commerce model should consider them so that the model can match social values, and in particular socio-religious values. The presented model in [equation \(5\) to equation \(7\)](#) is a general pattern for extracting features that affect social values. The factors listed in [Table I](#), are derived from the implementation of [equations \(5\) to \(7\)](#) on e-commerce models listed in Section 4. On the other hand, [equations \(1\) and \(3\)](#) provide a clear view of the concept of customer adaptability in B2C e-commerce models, such as those in Section 4.

[Equation \(2\)](#) also introduces the concept of spaces affecting the adaptability concept. The results of analyzing [Table I](#) represent the coefficient of the influence of Traditional Commerce and Social spaces from technology space. Internet technology in e-commerce systems transfers social space from traditional space into the internet-defined space. This change in space causes the traditional concepts of adaptability to be redefined based on the concepts software engineering. However, the presence of goods and services is proposed as the elements that exist in both traditional commerce and e-commerce in constituent elements of commerce adaptability to social values. By analytical review of [Table I](#), it can be discovered that if the e-commerce system wants to adapt to the needs of social values in the area of customer satisfaction, most of the variables that should be addressed derive from technology space.

This is due to the nature of customer satisfaction and adapting customer satisfaction to social values. In e-commerce, both elements of the customer and the firm operate according to the structure of representative.

Therefore, if the firm representative can adapt itself to the customer's social values, its first consequence will be increased customer satisfaction. However, among the four parameters mentioned for customer adaptability to social values to increase satisfaction in the domain of transaction nature, all four variables have corresponding elements in the technology space. This is also implicitly true for social values space.

Hence, if firm's managers want to adapt to requirements of customer's social values, and thus, increase customer's satisfaction, they can focus on the parameters mentioned in the technology space. On the other hand, most of the parameters mentioned in the technology space have a nature of software engineering and computer graphics. Perhaps, among these parameters, three parameters of privacy, trust and ease of use can be considered as the most ones.

Other parameters mentioned in this section are based on these three parameters. In [Table I](#), there is a different pattern than the customer satisfaction space about the status of online purchase intention space. The orientation of parameters of customer's adaptability to social values is based on the parameters defined in the transaction nature space.

The parameters mentioned in this topic in the technology space are only aspects of implementation and, in some cases; parameters that are common between the two spaces of online purchase intent and customer satisfaction are not the unique parameters of this space. In social values space, the situation is to some extent similar. Parameters of social values space can be deduced from parameters of the transaction nature space. Parameters of this space are in fact social representations of parameters of the transaction nature space. This is due to the transaction definition. Whether in the e-commerce space or traditional commerce space, the transaction has a single concept regarding two basic elements of commerce, the customer and the firm, and it aims at meeting the requirements. Because of this, the general pattern governing the purchase or repurchase intention in any commerce system adapts to the traditional commerce system, and factors that adapt commerce to social values in purchase intention domain are by factors influencing the adaptability of traditional commerce to social values.

In [Table I](#), by analyzing the status of online shopping behavior, it can be concluded that the pattern governing this space is similar to that of the online purchasing intent space. The parameter defined in technology space is the manifestation of implementing the parameters of transaction nature space. As for social values space, it cannot explicitly be suggested that these parameters are derived from the space of transaction nature. However, these parameters will not be achievable if the parameters relating to transaction nature are not followed.

The reason is the human nature of purchase in every commerce system. The human nature of the buyer defines the elements that affect commerce adaptability to social values, in both e-commerce and traditional systems, based on a certain set of parameters. Among the set of parameters that influence the e-commerce adaptability to social values, the concept of risk and purchase behavior control are proposed as two main parameters, and other parameters can be defined based on them.

6. Conclusion

If e-commerce cannot adapt to customer's social values, which are the most important values for the customer in transacting, then the customers will not accept it. The analysis of customer's mathematical model in B2B-based commerce processes as well as the

presentation of mathematical models for the status analysis of the elements affecting commerce adaptability to social values indicates the importance of two spaces of technology and transaction nature. The parameters of these two spaces, especially privacy, trust, and ease of use from technology space, and purchasing constraint and limitation from transaction nature space, are the main parameters that should be considered by firms to adopt the e-commerce model on social values. These parameters allow firms to increase profitability by increasing satisfaction, organizing purchase intention process and controlling and adapting customer's behavior at the time of purchase. The parameters also allow organizing transaction processes and consequently, allocating appropriate resources to customers, which in addition to reducing the firm cost, optimize the transaction processes.

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