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Shareef , M., Dwivedi, Y., Kumar, V., Davies, G., Rana, N. & Baabdullah , A. (in press). Purchase Intention in an Electronic Commerce Environment: A Trade-off between Controlling Measures and Operational Performance.  
*Information Technology & People*  
<http://dx.doi.org/10.1108/ITP-05-2018-0241>

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# **Purchase Intention in an Electronic Commerce Environment: A Trade-off between Controlling Measures and Operational Performance**

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## **Abstract**

**Purpose** –The aim of this study is to understand the integrated impact of the application of protection measures against identity theft on consumers’ synergistic perception of trust, the cost of products/services, and operational performance – all of which in turn is postulated to contribute to purchase intention when shopping online.

**Design/methodology/approach** – In order to accomplish the specified aim, this study first conducted an experiment by involving the students from a university in Bangladesh. Then a survey was conducted to capture their opinion based on the previous experiment.

**Findings** – The study identified that in e-commerce, operational performance and trust have potential impact on pursuing consumers’ purchase intention. Traditionally, price is always an issue in marketing; however, for e-commerce, this issue does not have direct impact on purchase intention.

**Research limitations/implications** – The main limitation of this study is that a less established e-commerce example was utilized to conduct the experiment and survey for validating the model. Also, the study was conducted only in the context of Bangladesh and a student sample was utilized. Future studies can test the model in different contexts (particularly to verify the impact of privacy) by utilizing data from consumers.

**Practical implications** –This study has resolved a controversial issue by generating clear guidelines that the overall conjoint effect of operational performance, trust, and price on purchase intention is neither negative nor neutral. Synergistically, the application of these controlling tools of identity theft can substantially enhance consumers’ trust, which is the single most predictor to pursue consumer purchase intention.

**Originality/value** – This study has provided in-depth insight into the impact of different controlling measures in e-commerce purchase intention. Practitioners have potential learning from this study that if consumers find the application of different controlling mechanisms against cybercrimes, particularly identity theft, enhancing the reliability, authenticity, and security of transactions in this virtual medium, they do not mind paying a higher price. Such insights have not been provided by existing studies on this topic. Developing trust on e-commerce purchase is the driving force, not the price.

**Keywords:** E-commerce, Purchase Intention, Operational Performance, Trust, Price-value, Privacy, Online Consumer Behavior

## **Introduction**

Given the pace of information and communication technologies (ICT) proliferation, particularly mobile technology, electronic commerce (e-commerce) and mobile commerce (m-commerce) based practices are expanding fast (Aïmeur & Schönfeld, 2011). Due to changes in lifestyle, urbanization, and technology habituation, consumers are increasingly interested in and very keen to adopt and use electronic government, e-commerce, m-commerce and social media based applications and sites for facilitating their routine shopping activities and interactions with government (Dwivedi et al. 2017a; Featherman & Pavlou, 2003; Kapoor et al. 2018; Liao et al., 2011; Rana et al. 2017; 2016). The increasing habit of consumers shopping online is gradually creating a new window for marketers to promote and sell their products directly to customers. On the other hand, consistently, there are technology-related security breaches and potential risk (i.e., cybercrime is fast increasing) at an exponential rate (Aïmeur & Schönfeld, 2011; Saleh, 2013). Initial studies on this topic (Saleh, 2013) have revealed that of the many forms of cybercrime, identity theft is one of the most severe issues for managing e-commerce, which is argued to be acting as a barrier to the wider proliferation of such emerging online shopping channels (Featherman et al., 2010). This provides a basis for undertaking further research for understanding issues related to it and formulating associated recommendations that can help e-commerce retailers to minimize the impact from such challenges.

Several existing studies have already contributed to issues related to e-commerce, which includes issues such as risks in e-commerce transactions (Featherman & Pavlou, 2003; Liao et al., 2011; Shareef et al., 2008), consumers' trust disposition attitude in e-commerce purchase (Gefen et al., 2003; Shareef et al., 2013), consumers' buying behavior and adoption criteria of a virtual medium as a marketing channel (Dwivedi et al., 2016; Razmak & Bélanger, 2018), and cybercrimes (Aïmeur & Schönfeld, 2011). These studies have investigated potential threats in this virtual medium, their sources, and loopholes of security. Existing studies (Featherman et al., 2010; Featherman & Pavlou, 2003) have also examined the widespread impact of emerging security threats and have recommended how to manage them and minimize their impact. Studies related to technology behavior, e-commerce, e-government, mobile banking, and mobile health (Anderson et al., 2008; Douglass, 2009; Dwivedi, 2016; Shareef et al., 2011, Shareef et al.,

2014b) have explored and discussed how the proliferation of technology can create sources of identity thefts and cybercrimes. Researchers dealing with marketing aspects and consumer behavior (Pavlou, 2003) have also investigated such issues to explore how they prohibit the spontaneous expansion of a virtual medium such as e-commerce. It is well recognized that expected growth of e-commerce is being severely hampered, slowed, and jeopardized due to many types of risks arising from emerging challenges such as identity theft (Douglass, 2009; Hartmann-Wendels et al., 2009). Hence, it has been argued that cybercrimes (such as identity theft) should be controlled and minimized in order to avoid having negative impact on the growth and diffusion of online/virtual shopping mediums (Anderson et al., 2008).

In line with that, several technological, managerial, administrative, behavioral, and regulating measures have been identified and implemented in ICT-related remote virtual medium like e-commerce (Featherman et al., 2010). However, there are logical underpinnings that these security controlling measures implemented to alleviate risks concerning identity theft can create several constraints in free expansion of e-commerce, as consumers might perceive complexities in terms of flexibility and operational performance (Saleh, 2013). Since, such complexities and constraints act as red flags in many stages of the buying process in the virtual remote environment, consumers psychologically may perceive annoyance and irritation in terms of time consumed to complete the transaction process (Liang, 1998; Shareef & Kumar, 2012).

Consumers' natural expectation of value surplus (i.e., achievement of higher value in exchange of price given) can be analyzed in terms of constraints in e-commerce structure, pattern of interactions, and associated risks. Based on social exchange theory (Lawler, 2011) it can be argued that like any financial exchange, consumers always evaluate a buying effort in terms of investment (for instance, physical labor, financial cost, opportunity cost, time spent, social value, psychological annoyance) against physical and hedonic benefit achieved from that exchange (Thibaut & Kelley, 2008). In essence, they look for higher reward or satisfaction in exchange for kinds of investment to accomplish a desired task (Schloegel et al., 2018). In the light of transaction cost theory (Williamson, 1981) this issue has been well articulated from a purely economic perspective, which suggests that while evaluating a purchase of any product, consumers generally attempt to identify the value of the purchase in terms of the effort they put

in (including monetary amount, time, physical labor, psychological endowment, and social opportunity cost) and the gain they may achieve through a purchase. This suggests that consumers' satisfaction from a purchase depends on value exchange (Malone et al., 1987). In the ICT literature, Liang (1998) suggested that consumers evaluate the transaction value of any purchase based on all the associated complexities and uncertainties. Therefore, it can be argued that application of several managerial and technology measures to control identity theft might have both advantages and disadvantages from the customers' perspectives. Nevertheless, hardly any scholarly study has addressed this issue and investigated the possible impact of all managerial and technological control measures in the context of e-commerce. This is a critical issue for the proliferation and sustainability of e-commerce as a retailing channel.

Therefore, the aim of this study is to examine the impact of different control measures of identity theft on consumers' purchase intention in an e-commerce environment. More specifically, the study attempts to identify and examine the integrated impact of protection measures of identity theft on consumers' synergistic perception of trust, the cost of products/services, and operational performance, all of which in turn are argued to contribute to purchase intention in an e-commerce environment. In this context, Bangladesh, a developing country where digital market economy is growing very fast, was selected as the venue for empirical study. In terms of digitization and online purchase, market of this country is expanding rapidly. On the other hand, as a developing country, cybercrime has potential impact on consumers' behavioral intention. Therefore, a developing country like Bangladesh could be an excellent representation to demonstrate this kind of research objective. In Bangladesh, when economy is growing in a very fast pace, growth of Internet from 2000 to 2010 is 517.3% (Howladar et al., 2012). More than 40 million people are using Internet and substantial portions from them are gradually converted and becoming interested in online shopping (Suhan, 2015).

The remaining sections are organized as follows. The following section proposes an exploratory model and formulates the associated hypotheses based on existing literature on consumer behavior, trust disposition, and technology adoption. The next section (Section 3) elaborates the research design and methodology to accomplish the proposed research aim. Section 4 then presents data analysis and results. Then a discussion of results is presented in Section 5. Finally,

Section 6 first outlines key conclusions and then provides a discussion on theoretical contributions, implications for practice, limitations of this research, and directions for future research on this topic.

### **Theoretical Basis**

This section will first briefly discuss theoretical basis from the existing literature and then present a summary and key points from exploratory qualitative interviews that were conducted to provide support for the hypotheses development.

This study has developed its primary and pragmatic conceptualization of the theoretical base from the prior research on identity theft, cybercrime, application of controlling measures, and its impact on purchase intention in e-commerce environment (Anderson et al., 2008; Douglass, 2009; Featherman et al., 2010; Featherman & Pavlou, 2003; Hartmann-Wendels et al., 2009; Liao et al., 2011; Pavlou, 2003; Saleh, 2013; Shareef & Kumar, 2012). Existing literature on different types of risks in e-commerce operation and its preventing systems has demonstrated that the functional measures to protect/control identity theft tailored to e-commerce are global laws, control of organizations, technical management, managerial policy, publications to develop awareness, risk management tools, data management, and control over employees (Aïmeur & Schönfeld, 2011; Anderson et al., 2008; Liao et al., 2011; Shareef & Kumar, 2012). These studies on e-commerce operation and functionality have also heuristically argued and recommended that the synergistic impact of the application and implementation of the controlling measures on e-commerce is severely vulnerable and should be carefully investigated to draw an effective conclusion (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009; Jiang et al., 2013; Shareef & Kumar, 2012). This current study postulates through interviews of e-commerce managers (see subsection below) that various protection techniques for controlling identity theft might have a severe compounding and guiding effect on the cost of products/services, operational performance, and also on consumers' perception of trust while forming purchase intention in an e-commerce environment. Both researchers and managers concerned with e-commerce feel that the integrated impact of the cost of products/services,

operational performance, and consumers' trust on websites is substantially enrooted in guiding the purchase intention of consumers (Collier et al., 2006; Sebastianelli et al., 2006; Shareef et al. 2014a). Therefore, the aforementioned researchers on cybercrime and its conjoint effect on purchase intention recommended understanding consumers' purchase intention through the simultaneously integrated impact of cost of products/services, operational performance, and consumers trust in e-commerce websites. This present study has commenced its contribution from this point. We conducted an exploratory investigation (as discussed in the remaining part of this section) among managers of e-commerce to support the theoretical model and hypotheses proposed in this research.

To examine the validity of the three potential constructs of perceived trust, perceived price value, and operational performance adopted from the aforementioned literature review and source-prevention model of Shareef and Kumar (2012) of e-commerce and their impact on purchase intention, in this research we first conducted exploratory interviews with operation managers of 20 e-commerce websites in Bangladesh. More than 70 percent of commercial e-commerce firms conduct business related to apparel and boutique, music, and bookselling in Bangladesh. Business-to-consumer (B2C) e-commerce commenced business in Bangladesh from the beginning of this century, and now its momentum is being accelerated with a significant amount of customer base. The business has attracted many customers to purchase online and is gradually expanding with the inclusion of more new customers and new firms. The interviews were conducted by utilizing a semi-structured questionnaire relating to the three predefined constructs of the source-prevention model. Interviewees asserted that after the application of many identity theft controlling tools, now e-commerce websites are facing inhibiting challenges from some issues. The driving force in this account was the development of trust toward e-commerce. Nevertheless, they affirmed that these rigid controlling mechanisms have hiked the price of the products and services due to warranting further expenditure as operational cost, which is around 7-15 percent based on the type of controlling mechanisms. For instance, one manager of a boutique e-commerce stated that "Consumers need trustworthy behavior from the webs. However, many consumers put complain if the system is too much complicated due to complex technological controlling measures". They agreed that operational performance has somehow been affected as many customers are facing challenges in interacting due to complexity and

longer response time in processing their orders; however, its impact is still uncertain. The general manager of a bookselling e-commerce clearly pointed out his frustration with security measures by illustrating, “Nowadays, sometimes consumers do not like to buy books online, because they feel the system is too much time consuming. We need a balance between controlling measures and operational performance”. Another manager from the apparel sector told us, “We do not find any problem after tightening security of our site. It rather helps enhancing prospective customers trust on us”! Since implementation of different controlling tools is a gradual process, the comprehensive impact of these three phenomena on overall purchase intention of consumers from e-commerce is still not well established and identified. Hence, a systematic and thorough empirical investigation should be conducted to estimate this ultimate goal, i.e., the purchase intention of consumers in the e-commerce environment.

Based on the above discussion, this study underpins its accomplishment on the following research question: *What is the impact of operational performance, trust, and price of products/services on consumers’ purchase intention in an e-commerce environment after the application of different managerial and technological measures to control identity theft related risks?* The next section will now proceed to provide a brief overview of the proposed model and discusses the hypotheses formulated to guide empirical aspects of this research.

### **Hypothesis Development**

The following paragraphs explain the rationales of developing the hypotheses depicting the relations of purchase intentions with perceived trust, perceived price value, and operational performance. The theoretical framework also suggests that the perceived trust is determined by three antecedents, namely perceived security, perceived privacy, and perceived anxiety, while operational performance is influenced by perceived time value and perceived effort value (Aïmeur & Schönfeld, 2011; Belanger et al., 2002; Cheng et al., 2017; Saleh, 2013; Shareef & Kumar, 2012). These relationships are individually discussed, and associated hypotheses are proposed in the subsequent part of this section.

*Perceived Trust (to enable protection from identity theft)*

Trust is the overall confidence of the consumers about the credibility and reliability of the vendors in that interacting in the websites will fulfill their value expectation in exchange of financial, physical, and psychological contributions (Belanger et al., 2002; Cheng et al., 2017; Dienlin & Trepte, 2015). Having compatibility with the dynamic characteristics of an online-based channel, consumers have a keen interest to buy products using e-commerce (Featherman et al., 2010; Gefen et al., 2003; Shareef et al., 2013). Nevertheless, many consumers refrain from online buying only due to absence of trust (Balasubramanian et al., 2003; Darley et al., 2010; Shareef et al., 2008; Wolfinbarger & Gilly, 2003). In this context, this study with the support of many scholarly studies (Gefen et al., 2003; Pavlou, 2003; Shareef et al., 2012), argues that the application of controlling tools of identity theft has intensified impact on growing perception of trust, which pursues customers' purchase intention from e-commerce. Shareef et al. (2008) suggested that among e-commerce consumers, site security, operational security, personal attitude, and local environmental security are the main factors for forming a perception of trust. Scholarly studies on e-commerce operation and consumers' attitude (Aïmeur & Schönfeld, 2011; Anderson et al., 2008; Douglass, 2009; Featherman et al., 2010) recognized that perception of trust is highly correlated with consumers' understanding of the reliability and authenticity of the site. For the purpose of this research, based on the review of literature on the conceptual definition of trust (Aïmeur & Schönfeld, 2011; Anderson et al., 2008; Gefen et al., 2003; Pavlou, 2003; Shareef et al., 2012), perceived trust can be defined here as the *degree to which consumers have cognitive, affective, and behavioral confidence in e-vendors due to the application of controlling mechanisms of identity theft that their interactions and transactions in e-commerce are free from all risks that may arise from attacks of hackers*. Considering the above discussion, the following hypothesis is proposed:

**H<sub>1</sub>:** *Due to the application of identity theft controlling measures, perceived trust has a significant positive effect on consumers' purchase intention in an e-commerce environment.*

#### *Perceived Anxiety (due to identity theft)*

The transaction cost approach first recognized that uncertainty in any transaction has a severe subversive effect on consumers' psychological condition. Several researchers of e-commerce (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009) demonstrated that the virtual environment of e-commerce where any transaction is associated with a certain degree of

uncertainty always produces some sort of anxiety in consumers' minds. Consumers psychologically feel nervous and unstable about the transaction in the virtual environment. Any uncertainty can cause the generation of anxiety (Brewer, 1999; Gudykunst et al., 2001). However, the application of controlling measures with regard to identity theft can potentially reduce this psychological instability and can remove mental anxiety (Shareef & Kumar, 2012). After reviewing scholarly studies on trust disposition attitude (Gefen et al., 2003; Pavlou, 2003), it can be argued that identity theft related trust is substantially associated with perception of anxiety (Featherman et al., 2003; Featherman & Pavlou, 2003; Liao et al., 2011; Pavlou, 2003; Shareef et. al., 2009; Shareef et al., 2013). This perception of anxiety can also be influenced by the perception of security and privacy. Hence, this study, streamlining the literature review (Douglass, 2009; Hartmann-Wendels et al., 2009; Liao et al., 2011; Pavlou, 2003; Shareef et. al., 2009), conceptualizes perceived anxiety as *the degree to which consumers psychologically can reduce mental agony and stress that their interactions and transactions in e-commerce are free from any risks that arise from any attacks of hackers due to the application of controlling mechanisms of identity theft*. Based on that, this study proposes the following hypothesis:

**H<sub>1a</sub>:** *Due to the application of identity theft controlling measures, perceived anxiety has an effect on consumers' perception of trust while purchasing in an e-commerce environment.*

#### *Perceived Security (from identity theft)*

Protection from financial (monetary fraudulence) and social risks (fear of losing social status due to an inability to maintain commitment with many social agencies after losing self-identity information to the hackers while purchasing from an e-commerce website) are categorized here as the overall perception of security (Aïmeur & Schönfeld, 2011; Saleh, 2013). On the other hand, perception of psychological risks (anxiety due to severe mental frustration and agony because of the loss of identity-related information and associated sufferings) can create anxiety among consumers while purchasing from an uncertain environment like e-commerce (Anderson et al., 2008; Douglass, 2009; Featherman et al., 2010). So, termination of all the facets of risks associated with the implementation of identity theft controlling measures that can ultimately contribute and enhance customers' trusting attitude for purchase intention from an e-commerce website is broadly classified here as perceived security. For the virtual medium, this

phenomenon is rooted in the interaction of the human–computer interface, which is operated, governed, and accomplished from a remote place (Shareef et al., 2008).

When customers identify that different managerial and technological controlling tools are implemented to protect them from financial, psychological, and social risks, they intend to develop a perception of security on that e-commerce website, which ultimately contributes to their trust in e-commerce (Gefen et al., 2003; Pavlou, 2003; Pavlou & Gefen, 2004). The security features of e-commerce websites and the reputation of the vendors can enhance consumers' perception of their trustworthiness, which streamlines their behavioral intention in favor of online purchasing (Doherty & Tajuddin, 2018; Featherman et al., 2003; Featherman & Pavlou, 2003; Gefen et al., 2003; Janssen et al. 2018; Liao et al., 2011; Pavlou, 2003). Shedding light on the literature review with regard to e-commerce security (Collier & Bienstock, 2006; Liao et al., 2011; Shareef et al., 2008/2013), this study conceptualizes the construct perceived security as *the degree to which consumers feel that their interactions and transactions in e-commerce are free from any financial and social risks that arise from attacks of hackers due to the application of controlling mechanisms of identity theft*. Considering the discussion presented above, we propose the following hypotheses:

**H<sub>1b</sub>:** *Due to the application of identity theft controlling measures, perceived security has a significant positive effect on consumers' perception of trust while purchasing in an e-commerce environment.*

**H<sub>1c</sub>:** *Due to the application of identity theft controlling measures, perceived security has a significant positive effect on consumers' psychological perception of anxiety while purchasing in an e-commerce environment.*

#### *Perceived Privacy (from identity theft)*

Perception of risks can be derived from several facets such as performance, financial, time, psychological, social, and privacy (Featherman & Pavlou, 2003). However, as this research is exploring only that segment of trust that is developed due to the application of controlling measures of identity theft, the current effort is considering the risks associated with the financial, social, psychological, and privacy facets. After the application of many controlling mechanisms of identity theft, customers may feel that hackers will not be able to extract personal information

that is disclosed and shared by them during purchase from websites, and this motivation can increase their perception of privacy, which leads to pursuing trust disposition attitude of the customers toward e-commerce purchase and reduces their perception of anxiety (Featherman et al., 2003; Liao et al., 2011; Aïmeur & Schönfeld, 2011). The perceived privacy construct is conceptualized here based on previous literature on privacy (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009; Shareef et al., 2011; Smith et al., 2011) as *the degree to which consumers feel that their interactions and transactions in e-commerce are free from any risks related to unauthorized sharing, communication, and distribution of personal information that arise from attacks of hackers due to the application of controlling mechanisms of identity theft*. The proposed hypotheses in this context are:

**H<sub>1a</sub>:** *Due to the application of identity theft controlling measures, perceived privacy has a significant positive effect on consumers' perception of trust while purchasing in an e-commerce environment.*

**H<sub>1e</sub>:** *Due to the application of identity theft controlling measures, perceived privacy has a significant positive effect on consumers' psychological perception of anxiety while purchasing in an e-commerce environment.*

### *Perceived Price Value*

There are always significant financial risks while interacting with and providing personal information to e-commerce websites (Aïmeur & Schönfeld, 2011; Saleh, 2013). Several scholarly articles (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009) have acknowledged that consumers are continuously losing money and experiencing potential long-term financial and other identity-related fraudulence due to aggressive attacks of identity theft in e-commerce. Existing studies (Kristy et al., 2005; Kyung-Shick, 2008) have also suggested that the financial, psychological, and social risks due to identity theft can severely deter consumers from pursuing positive intention to purchase via e-commerce. On the other hand, the application of different controlling measures of identity theft can potentially reduce the risk of losing credit card/debit card numbers, and financial fraudulence including financial loss, and, thus, can save money and avoid hassle for the consumers (Shareef & Kumar, 2012). Analyzing many technological and managerial tools implemented to protect from identity theft, however, researchers also asserted that these controlling tools can potentially cause the price hike of

products and services (that is generally borne by consumers) offered through e-commerce (Shareef et al., 2009; Venkatesh et al., 2012). Alford (2002) explained that price-value exchange is a typical evaluation of consumers while expressing willingness to purchase. Based on the explanation from Dodds et al. (1991), UTAUT2 affirmed that consumers' willingness to evaluate the benefits they achieve in exchange for money they spend can guide their purchase intention from ICT-driven channels. This study defines the perceived price value construct from the literature review (Dwivedi et al., 2016; Venkatesh et al., 2012) as *the perception through comparative evaluation of the trade-off between achieved benefits and the monetary cost spent in accomplishing the targeted task*. Hence, the corresponding hypothesis related to this construct is stated as follows:

**H<sub>2</sub>:** *Due to the application of identity theft controlling measures, perceived price value has a significant positive effect on consumers' purchase intention in an e-commerce environment.*

### *Operational Performance*

According to the source-prevention model of e-commerce (Shareef & Kumar, 2012), different administrative measures like employee control, application of tightened rules and regulations, and managerial policies can lead to reducing and minimizing the possibility of identity theft threats. However, at the same time they can severely hamper the flexibility afforded by the interactivity between computer and customer within the boundary of systems, policies, and regulations (Collins, 2003; Newman, 2004). The overarching effects of bureaucratic principles can create many obstacles between the relations of virtual environment and remote customers (Shareef & Kumar, 2012). The complexities they are facing, after the application of several technological controlling measures to prevent identity theft, in respect to prior experience in interacting with these e-commerce websites when there were fewer technologically controlled security measures, are significantly higher, and the time they are spending is longer, which may lead to a negative attitude about purchasing any products from these websites. Unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al. 2003) has measured this operational performance through the combined effect of performance expectancy and effort expectancy (see Al Mansoori et al., 2018). Based on the above discussion, it can be argued that the potential change in degree of operational performance may have a severe compounding effect on consumers' acceptance of e-commerce (Ali et al., 2018). Borrowing the essence of the

perceived operational performance construct from Shareef and Kumar (2012), this research has recognized two dimensions of this construct, namely time value and effort value, and conceptualized the construct as *the degree of perceived time and effort that e-commerce interaction may require from consumers in accomplishing the targeted task*. Hence, the proposed hypothesis is:

**H<sub>3</sub>:** *Due to the application of identity theft controlling measures, operational performance has a significant positive effect on consumers' purchase intention in an e-commerce environment.*

#### *Perceived Time Value*

From the time efficiency construct conceptualized in the transaction cost approach, we can get deep light for consumers perception of value obtained in exchange of time invested in accomplishing the desired goal (Carter & Bélanger, 2005; Dellaert et al., 1998; Shareef et al., 2009). It is a serious concern that has been revealed by many seminal research studies that controlling security threats by applying managerial and technological measures can lead to a longer time consumption in fulfilling desired goals through interaction with an e-commerce website (Carter et al., 2005; Dwivedi et al., 2016; Gefen et al., 2003; Wagner et al., 2003). The mobile-health adoption model (Dwivedi et al., 2016) has also revealed that waiting time, i.e., time value return, is also a dominating concern for consumers to adopt or not adopt any virtual medium governed by ICT. Transaction cost analysis (Williamson, 1981) also reflected consumers' behavioral intention to find evaluative comparison in terms of effort invested and return gained through time efficiency. Consequently, consumption of extra time can create the perception of less operational performance of the website. Based on review of previous literature on the notion of return of time value (Al Mansoori et al., 2018; Dwivedi et al., 2016; Venkatesh et al., 2012), this study defines perceived time value as *the degree to which consumers gain desired cognitive and affective value through interaction in e-commerce in exchange for time spent in accomplishing the targeted task*. In line with that, this study postulates the following relationship:

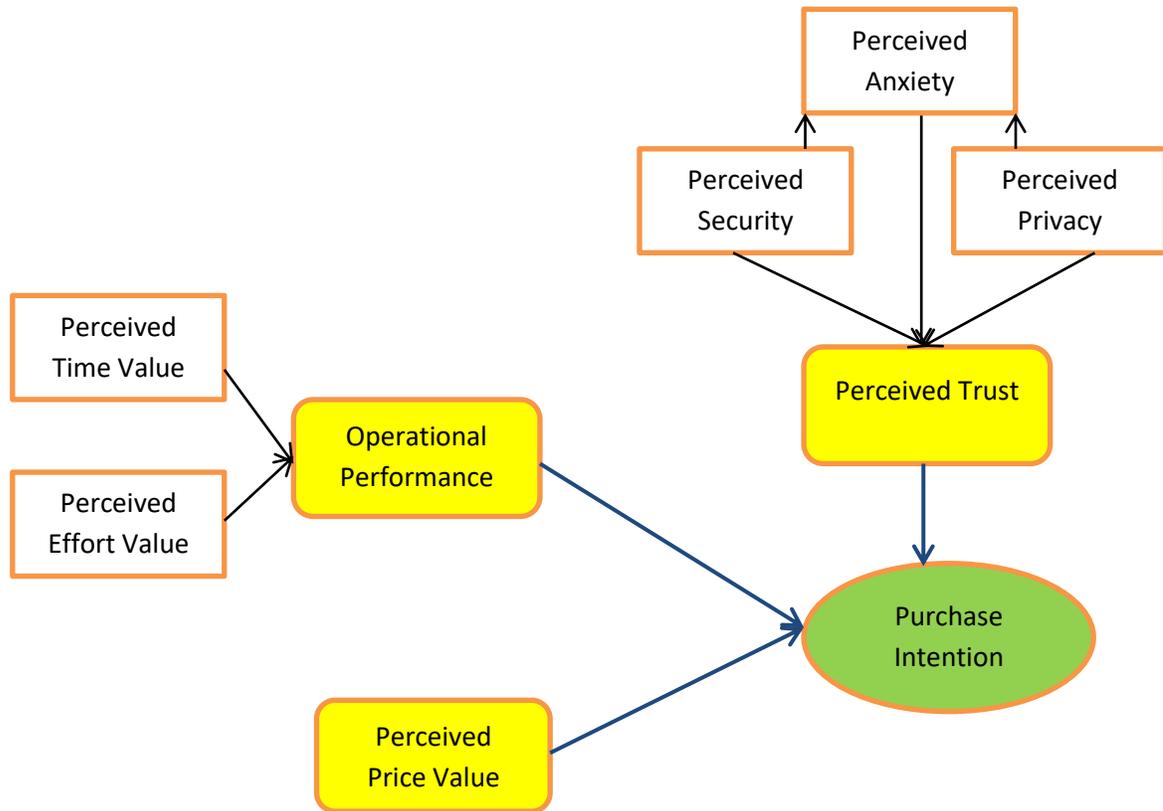
**H<sub>3a</sub>:** *Due to the application of identity theft controlling measures, perceived time value has a significant positive effect on consumers' perception of operational performance while purchasing in an e-commerce environment.*

### *Perceived Effort Value*

According to the diffusion of innovation theory (Rogers, 1995; Kapoor et al. 2014) and the technology adoption model (Davis, 1989), and many seminal works on consumer adoption (Dwivedi et al., 2016; 2017ab; Shareef et al., 2011; 2016), accepting any technology-driven virtual environment substantially correlated with the consumers' perception of how easy the system was to understand and interact with. According to Shareef et al. (2009), consumers' adoption of a virtual medium is rooted in four behavioral aspects, which are desire to use (i.e., attitude and motivation), ability to use, reasoning to use, and satisfaction to use, which together indicate evaluation of the complexity of the system. The complexity according to the diffusion of innovation theory (Rogers, 1995) and perceived ease of use (PEOU) from the technology adoption model (Davis, 1989) can guide the conceptual definition of effort required for consumers to accomplish their desired task and can be defined as *the degree to which consumers gain desired cognitive and affective value through interaction in e-commerce in exchange for effort reflecting difficulties in understanding and use in accomplishing the targeted task*. Hence, the proposed hypothesis is:

**H<sub>3b</sub>:** *Due to the application of identity theft controlling measures, perceived effort value has a significant positive effect on consumers' perception of operational performance while purchasing in an e-commerce environment.*

Based on the aforementioned hypotheses, the proposed research model is illustrated by Figure 1, which postulates that operational performance, perceived value, and perceived trust exert direct influence on purchase intention.



**Figure 1:** The Impact of Controlling Mechanisms of Identity Theft on Online Purchase Intention (IT-OPI Model)

### Research Methodology

An empirical approach is employed to examine the influence of the three contributing constructs on e-commerce purchase intention. To examine this effect from the IT-OPI model (Figure 1), the empirical study designed in this context has been divided into two different phases: Experimental stage and Survey. This first allows the giving of a certain kind of exposure to respondents (experiments) and then capturing their perceptions through a survey-based empirical study (Ryals & Wilson, 2005; Shareef et al., 2018). Such an approach has been employed by previous studies (French, 2017; Rose & Wood, 2005) for gaining insights about consumers' perception based on their collaborative experience.

### *Questionnaire Design*

The measuring items for both independent and dependent constructs were adapted from existing literature keeping the consistency of the original scale, and are listed in Appendix A. A total of 37 items were utilized for measuring the independent constructs and their dimensions, and 4 items were utilized for measuring the dependent constructs. A focus group comprised of two university professors in Bangladesh with marketing-related expertise and two professionals (top managers) having wide experience in operating e-commerce reviewed the questionnaire for its wording, meaning, and significance. Then the questionnaire was examined and tested by 20 managers of e-commerce in Bangladesh (as depicted in a study among managers). This structured questionnaire was designed to measure the independent and dependent variables of the study with a 5-point Likert scale ranging from 1 (strongly disagree/never) to 5 (strongly agree/always). The 5-point Likert scale is used to increase the response rate and response quality along with reducing the respondent's frustration level (Babakus & Mangold, 1992).

### *Purchase through Experimental Approach and Sample Selection*

Through a short interview of 700 MBA students of a well-reputed university in Bangladesh, 296 students informed that they buy online dresses/books/music or videos almost once a month. From these 296 students, this study has randomly selected 200 with equal gender division based on their prior experience in purchasing from e-commerce and frequency of interaction with different e-commerce websites. The age range of respondents was between 25 to 35. Around 10 percent (23 students) of this group had prior experience of being victimized by identity theft in the last year with different magnitudes of security threats, risks, and losses while purchasing from newly opened e-commerce websites in Bangladesh (operated by students) with almost no security features. In the first phase, an experiment was launched among those 200 MBA students to conduct purchases from such websites. This kind of experimental approach can be useful for measuring capability (Frayne & Geringer, 2000; Smith & Fletcher, 2004). For this experiment, three e-commerce websites to be operated locally were opened (one boutique store, one book store, and one music/video store). The rationales for selecting this sample are the following:

1. In Bangladesh, e-commerce as an alternative marketing channel has been growing very fast in the last few years, and customers nowadays are familiar with and getting interested in buying

online due to changing lifestyle in urban areas, which is evident by the widespread adoption of mobile and online technologies.

2. Due to weakness in the enforcement of appropriate rules and regulations, identity theft has been expanding greatly in the last couple of years with severe attack on e-commerce, mobile banking, online money transfer, etc. In Bangladesh, protection of consumers' rights is not sufficiently prominent. So, consumers are experiencing a potential threat due to identity theft, particularly in any kind of online interactions and transactions.

3. Many online companies and banks are implementing several managerial and technological mechanisms to protect or at least minimize identity theft related problems like hacking financial information. So, now consumers are also facing significant troubles in online transactions due to many complexities and time-consuming operation as well as price hiking (as a side effect). Due to extreme traffic jams in Dhaka city, consumers have a keen interest in online purchases. However, due to lack of enough time (average professionals spend around four hours in traffic jams in Dhaka city) and unbearable stress in urban life, they frequently express annoyance over newly imposed complexities and longer response time in online transactions.

4. More than 70 percent of e-commerce websites in Bangladesh deal in boutique, music, and bookselling businesses.

5. Students comprise the leading category who frequently purchase products online in Bangladesh. Growth of Internet users in Bangladesh is much higher than the average growth in all over the world, and from them, most of the students in Bangladesh are very much interested in online shopping (Suhan, 2015). As a result, in Bangladesh, student can be the best representative sample for online shopping (Howladar et al., 2012).

6. Since this study has a total of eight independent constructs including the dimensions, around 100 respondents are good enough to conduct structural equation modeling (SEM) (Chau, 1997; Kline, 2011). However, since this study was attempting to capture consumers' practical experience after purchasing from e-commerce, the targeted sample size should be larger than 100, because all the students might not have prior experience in recent purchasing from e-commerce. Considering information from the brief interviews of the MBA students, it was revealed that around 50 percent of university students have become habituated to purchase from e-commerce recently. Therefore, targeting a sample of 200 is justified to capture perception of e-commerce purchase based on prior experience from at least 100 respondents.

This study, for the purpose of conducting the experiment, launched three e-commerce websites temporarily under the student association of the social club of the university (one boutique, one music, and one bookselling). These three websites implemented all the recommended controlling measures both managerial and technological as depicted in the study of Shareef and Kumar (2012) so that no students of the sample should face any kind of threats of identity theft. However, due to these extensive controlling measures, the average price of products was 10 per cent higher than other typical e-commerce websites in Bangladesh. The sample students were not informed about the formation, purpose, and location of these websites. However, they were advised and instructed to conduct their next two months' purchase from these websites, and for their inspiration, they were gifted a scratch card of average \$ 5 value (it was explained to them that this gift card was given to them from the authors of the experiment, not from the websites). However, this instruction was not something imposed, so they had the freedom not to purchase from these websites. To explore consumers' actual perception, the type of design of the current study is effective as consumers were now heuristically active members in shaping products' attributes (French, 2017; Rose & Wood, 2005). Consumers could personally and potentially interact and collaborate in the experimental phase and subsequently could reflect their experience in the survey phase, which is basically capturing their perception gathered through prior experiment (Maklan et al., 2008; Mishra et al., 2017).

### *Survey and Data Collection*

It is worth noting at this stage that, although consumers' perception based on their recent purchase experience was collected from this experiment and survey only from one institution, the sample of this study is statistically very powerful considering its variability and heterogeneous character, since the students of MBA come from varied educational and cultural backgrounds with significant differences in age. Also, they are studying in one institution for MBA; however, before MBA they graduated from nine different universities having different majors (like engineering, textiles, business administration, public administration, and other social science disciplines). The experiment was started among the students of MBA on the 25<sup>th</sup> of September 2017 (Fall semester students) and completed on the 24<sup>th</sup> of November 2017 (so, a period of two months in total). This followed the distribution of a survey questionnaire to those 200 students in

a class and requested them to answer if they had purchased any products in the last two months from the three websites. Out of 200 students, 137 students informed that during this period, they had made at least one purchase from any one of these websites. So, to find out the validity of our research question, this study collected responses from this sample of 137. Since the survey was conducted within a group of known students, non-response bias is not an issue for our experiment and survey (those who qualify - all of them participated and provided responses). Typically, if non response rate in a random sampling is less than 20 percent, this non-response error does not have potential impact on the findings (Berg, 2005).

Common method bias (CMB) could be a problem for a single-method study, but no consensus exists about the seriousness of such biases (Malhotra et al., 2006). However, the questionnaire was tested by an expert focus group. This pretesting of the scale items helps to reduce misleading items and, thus, method bias (Hoyt, 2000). Since the raters/participants have no direct connection with the outcome, this study claims to reduce CMB as much as possible (Burton-Jones, 2009). The Harman's single factor test was also conducted among the independent constructs with their measuring items to verify the variance extracted for the independent constructs. It was reported to be 27.18 percent for the first factor, which is less than the cut-off value of 50% as suggested by Podsakoff et al. (2003). It justified the claim of this study that no potential CMB is existed.

### **Data Analysis and Results**

Structural equation modeling (SEM), a multivariate technique, is used in this research to estimate the series of inter-related dependence relationships simultaneously through LISREL. Considering the adequacy of goodness-of-fit, we can identify and establish the model and theorize the relations among the variables. The model testing procedure used the correlation matrix. SEM has two parts, the measurement model and the structural model. The measurement model denotes the reflective model presenting the relations between the observed and unobserved variables, which is fundamentally confirmatory factor analysis (CFA). The structural model represents the relations among the latent variables, i.e., the cause-effect relations. Following the suggestion of Anderson and Gerbing's (1988), a two-step approach of complete SEM where the confirmatory measurement model precedes the estimation of the structural model was conducted.

### *Reliability Testing*

The reliability of the constructs indicates the internal consistency of the items to measure the underlying concepts of all the constructs. Reliability is measured by the composite reliability score (Fornell & Larcker, 1981). According to Fornell and Larcker (1981), the score of composite reliability should be greater than the benchmark of 0.7. We have verified the composite reliability for each construct through the calculation of standardized factor loadings and the indicator's measurement error, which is found adequate (shown in Table 1). Values greater than 0.70 in Table 1 reflect good reliability (Hair et al., 2006). The mean of the constructs is also shown in Table 1.

**Table 1: Composite Reliability and Mean Score**

Constructs	Composite Reliability Based on Standardized Items	Mean of the Constructs
PS	0.93	3.68
PTV	0.92	2.4
PEV	0.95	2.25
PP	0.93	3.8
OP	0.95	1.79
PT	0.93	3.71
PA	0.87	3.72
PPV	0.94	3.59
PI	0.95	3.29

### *CFA and Construct Validity*

We conducted this CFA to evaluate the convergent validity and discriminant validity. Following the recommendation of Kline (2005), we removed those items from CFA, which loaded at the respective construct with a loading value less than 0.50. We also verified our dropping items (one at a time) that contain a high degree of residual variance with other items (Gefen et al., 2000). Several items were found having loading value less than 0.50 from our previously selected 37 measurement items of eight independent constructs. We also verified the scale items

of the dependent construct. To support the refinement of measurement items to retain, the correlation matrix of the items with the construct was also verified. The model fit indices were compared with the recommended values for CFA. We revealed that one item from PS, two items from PTV, two items from PEV, one item from PP, two items from OP, one item from PT, two items from PA, and two items from PPV cannot be retained following the aforementioned criteria. So from the initial 37 measuring items of eight independent constructs, we could retain 24 measuring items. After refinement as per recommendation of literature, it is heuristically assumed that the scale items with adequate loading values are appropriately reflective indicators of their underlying constructs. This finding confirmed construct validity (Chau, 1997). In CFA, the average variances extracted (AVE) for each factor and its measures all exceeded 0.50; thus, convergent validity is confirmed (Fornell & Larcker, 1981). Discriminant validity is also an important issue to be confirmed in SEM. From our analysis, it is identified that the largest shared variance between these factors is lower than the least AVE value for each factor and its measures (Chau, 1997). This examination was conducted by the variance-extracted test (Fornell & Larcker, 1981). In this context, the assumption is that discriminant validity is ensured between two constructs if both of their variances are greater than the squared correlations between these two constructs. From example from Table 2, we can examine that the lowest AVE value was 0.88 (for PA and PPV constructs), which is higher than the largest squared correlation between any pair of constructs (0.6194 – between PS and PT). Therefore, discriminant validity among the constructs is confirmed. Maximum shared variance (MSV), the square of the highest correlation coefficient between latent constructs, is 0.6194. Average shared variance (ASV), the mean of the squared correlation coefficients between latent constructs, in this study is 0.2034

**Table 2: Correlation Matrix and AVE**

	PS	PTV	PEV	PP	OP	PT	PA	PPV	PI
PS	<b>.90</b>								
PTV	.2809	<b>.89</b>							
PEV	.1980	.2938	<b>.92</b>						
PP	.433	.0767	.0864	<b>.91</b>					
OP	.25	.2343	.2959	.0734	<b>.90</b>				
PT	.6194	.156	.1552	.3994	.2401	<b>.90</b>			
PA	.3943	.1731	.1018	.2237	.1176	.3446	<b>.88</b>		

PPV	0.1136	.066	.0906	.0566	.1436	.0388	.0396	<b>.88</b>	
PI	.5596	.257	.1918	.257	.3238	.5256	.3481	.0713	<b>.90</b>

Diagonal are square root of AVE and others squared correlation

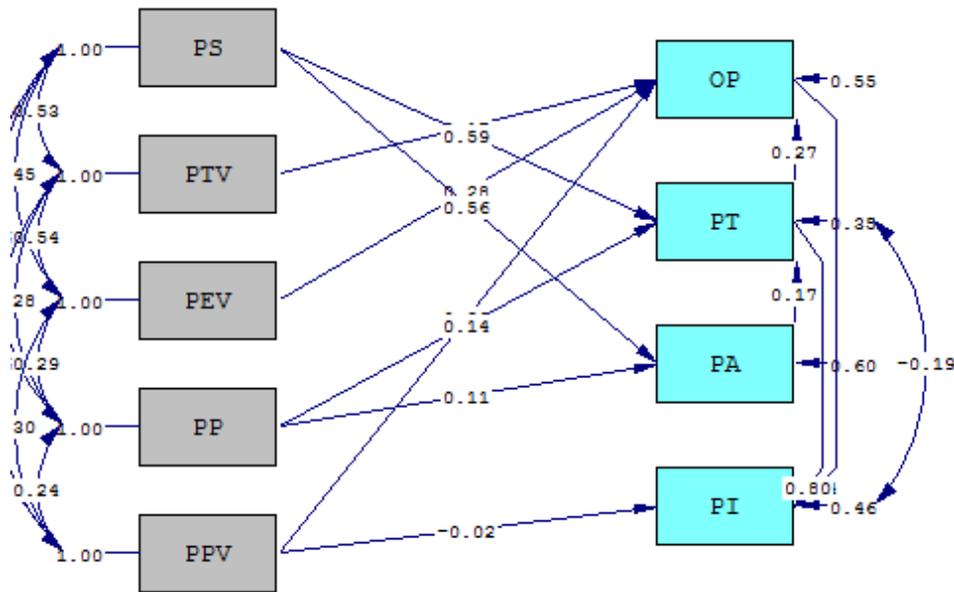
### *Structural Model*

After refinement of the scale items, the structural model was generated. This model verifies the causal relations of the independent latent variables with the dependent variable through the path that is expressed in the hypotheses. However, before proceeding with the hypothesis testing, it is very important to discuss endogeneity. This might have compounding impact on the result to predict the dependent the variable with the conjoint effect of the independent constructs (Antonakis et al., 2014). Since the research was initially designed to collect data through randomized experiment, the possibility of endogeneity is reduced (Rubin, 2008). The causal effect of the exogenous variables on the endogenous variable is predicted and ultimately derived through the support of literature review and theories. Therefore, it can be claimed that endogeneity is not a potential issue for this study (Mulaik, 2009).

The first phase of analysis for the cause and effect relation showed that the model did not fit adequately as the fit indices were not acceptable as per the recommended values of comparative fit index (CFI), goodness of fit index (GFI), root mean square error of approximation (RMSEA), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), and relative fit index (RFI) (Chau, 1997; Kline, 2005). At this phase, Chi-Square statistic is 59.53, df 16, p-value 0.000, and RMSEA 0.141. Based on the modification indices to improve the model fitness, we have added an error covariance between purchase intention (PI) and perceived trust (PT), which is in line with recommendation by existing literature on SEM (Fornell & Larcker, 1981; Kline, 2011). The model improvement suggested additional causal relations from perceived trust (PT) and perceived price value (PPV) to operational performance (OP). We can explore this suggestion as marketing and behavioral literature can provide deep insight on these relations, which are discussed in the next section. After inclusion of these modified relations, the model showed accepted fitness with the data as per the literature. We checked the ‘t’ values for all the constructs. It was found that all the hypothesized relations are significant other than the following two relations. Perceived price value (PPV) does not have significant relation on

purchase intention and perceived privacy (PP) does not have significant effect on perception of anxiety (PA). These two paths do not appear to have significant relations in pursuing purchase intention and anxiety respectively at the 0.05 levels, even non-significant at the 0.10 levels.

The final model, reasonably accepted as per model fitness indices depicted in the literature, is shown in Figure 2 (with loading values). The model fitness indices with the recommended values (Chau, 1997; Kline, 2005) are shown in Table 3. We have also verified the mean of all the latent constructs (see Table 1) for these newly launched e-commerce websites after application of all the measuring techniques to control identity theft. Final results from hypotheses testing with ‘z’ values are shown in Table 4.



**Figure 2: Online Purchase Intention (Loading Value) of the IT-OPI Model**

**Table 3: Model Fitness Indices**

Fit Measures	Recommended	Validated
Chi-square ( $\chi^2$ )	$P \geq 0.05$	15.3 (0.28887)
Degrees of Freedom		13
$\chi^2$ /Degree of Freedom (df)	$\leq 3.00$	1.1769
Comparative Fit Index (CFI)	$\geq 0.90$	0.996
Goodness of Fit Index (GFI)	$\geq 0.90$	0.976
RMSEA	$< 0.06$	0.036
Adjusted Goodness of Fit Index	$\geq 0.80$	0.917

Normed Fit Index (NFI)	$\geq 0.90$	0.977
Incremental Fit Index (IFI)	$\geq 0.90$	0.996
Relative Fit Index (RFI)	$\geq 0.80$	0.935

**Table 4: Hypotheses with ‘z’ Values**

Hypothesis	Status	Path Coefficient	‘z’ Value
H <sub>1</sub> : Due to the application of identity theft controlling measures, perceived trust has a significant positive effect on consumers’ purchase intention in an e-commerce environment.	Accepted	0.805	9.756
H <sub>1a</sub> : Due to the application of identity theft controlling measures, perceived anxiety has an effect on consumers’ perception of trust while purchasing in an e-commerce environment.	Accepted	0.17	2.849
H <sub>1b</sub> : Due to the application of identity theft controlling measures, perceived security has a significant positive effect on consumers’ perception of trust while purchasing in an e-commerce environment.	Accepted	0.59	8.419
H <sub>1c</sub> : Due to the application of identity theft controlling measures, perceived security has a significant positive effect on consumers’ psychological perception of anxiety while purchasing in an e-commerce environment.	Accepted	0.56	6.243
H <sub>1d</sub> : Due to the application of identity theft controlling measures, perceived privacy has a significant positive effect on consumers’ perception of trust while purchasing in an e-commerce environment.	Accepted	0.14	2.271
H <sub>1e</sub> : Due to the application of identity theft controlling measures, perceived privacy has a significant positive effect on consumers’ psychological perception of anxiety while purchasing in an e-commerce environment.	Rejected	0.105	1.178
H <sub>2</sub> : Due to the application of identity theft controlling measures, perceived price value has a significant positive effect on consumers’ purchase intention in an e-commerce environment.	Rejected	0.02	-0.332
H <sub>3</sub> : Due to the application of identity theft controlling measures, operational performance has a significant positive effect on consumers’ purchase intention in an e-commerce environment.	Accepted	0.24	3.758
H <sub>3a</sub> : Due to the application of identity theft controlling measures, perceived time value has a significant positive effect on consumers’ perception of operational performance while purchasing in an e-commerce environment.	Accepted	0.17	2.141
H <sub>3b</sub> : Due to the application of identity theft controlling measures, perceived effort value has a significant positive effect on consumers’ perception of operational performance while purchasing in an e-commerce environment.	Accepted	0.29	3.586
<b>Emergent Hypothesis:</b> Due to the application of identity theft controlling measures, perceived trust has an effect on consumers’ perception of operational performance while purchasing from e-commerce	Accepted	0.27	3.72
<b>Emergent Hypothesis:</b> Due to the application of identity theft controlling measures, perceived price value has an effect on consumers’ perception of operational performance while purchasing from e-commerce	Accepted	0.20	2.822

## Discussion

In the final structural model where the cause–effect relations are revealed through path loadings, the  $\chi^2$  statistic is 15.3 with degree of freedom 13 and p-value 0.28887. So  $\chi^2$ /degree of freedom (df) is quite acceptable, and this result including other parameters indicates that the model is a good fit. RMSEA (0.036) and 90 percent confidence interval for RMSEA (0.00; 0.0957) are also a good fit. The squared multiple correlation coefficient ( $R^2$ ), which explains the amount of variance the independent constructs accounts for in the dependent variable is sufficient as per social science research (Kline, 2005).  $R^2$  for purchase intention is .879. That means 87.9 percent variance of purchase intention (PI) can be explained by operational performance (OP), perceived trust (PT), and perceived price value (PPV). However, the contribution of PPV on PI is negligible and can be removed (shown in Figure 2 and also in Appendix B). Therefore, the assumption of the IT-OPI model, i.e., OP, PT, and PPV can explain consumers' purchase intention in e-commerce, is partially and adequately justified. This value of  $R^2$  is higher than usual for social science. The reasons of this higher value lie on the fact that the three constructs OP, PT, and PPV were designed to measure the dependent construct PI from rigorous experiment and literature review. If a model adequately fits with the constructs, a good  $R^2$  can be achieved (Kline, 2011). The three independent constructs can adequately measure consumers purchase behavior. Additionally, before collecting data, an ecommerce site was artificially designed and a group of MBA students of the same university participated in that experiment. This procedure also enhances the possibility of getting higher  $R^2$ . However, this process of e-commerce website design can provide certain limitations on the study which is now stated under the section “Future Research Guidelines and Limitations”. For the causal relation of perceived trust (PT) with perceived security (PS), perceived anxiety (PA), and perceived privacy (PP), 65.1 percent variance of perception of trust in e-commerce against identity theft or any other cybercrime is explained by these three dimensions. Similarly, on OP, 44.6 percent variance is explained by the two primary hypothesized constructs PEV and PTV and two more relations with the constructs PPV and PT. For PA, 40.1 percent variance is explained by PS and PP, although contribution of PP is not significant. All these relations with loading values and error variances are shown numerically in Appendix B. Error variances denote the amount of variances in each measurement due to error in predicting actual phenomena of the underlying latent construct.

Now comparing this with the extant literature and shedding light on the identified causal relations of OP, PT, and PPV with PI, it is revealed that any change in purchase intention of the consumers of e-commerce in Bangladesh is fundamentally affected by change in perception of trust and operational performance. Change in price in exchange for value received through e-commerce websites does not have potential impact on pushing or resisting purchase behavior. Out of the three hypothesized constructs that shape purchase intention, perception of trust regarding safe interaction and transaction in e-commerce purchase has the highest contribution (0.805). It means a unit change on trust in e-commerce, i.e., change in perception of reliability and authenticity, will cause a 0.805 unit change on consumers' purchase intention when the effect of operational performance and price value remain constant. On the other hand, although perception of trust is assumed to be composed of perception of security, perception of privacy, and perception of anxiety against cybercrime, from Appendix B, it is seen that trust in e-commerce transaction while using personal identity and sensitive financial information is fundamentally dependent on security perception (.594) due to the application of identity theft controlling mechanisms in comparison to higher privacy perception (.137) and perception of less anxiety (.166). Again perception of less anxiety is underpinned by the perception of security.

Marketers have long been sought about the versatile impact of consumers' trust on selecting any brand and marketing channel over others (Shareef et al., 2014a; Sprott, 2008). Reflecting the essence of uncertainty from the transaction cost approach, any interaction in a virtual medium like e-commerce is specifically characterized by uncertain phenomenon as consumers have very few tangible cues while interacting by self-service technology from a remote place (Shareef et al., 2009). These feelings of uncertainty in e-commerce, particularly due to identity theft, might have a severe compounding effect on consumers' minds and can create anxiety (Bauer, 1960). Consumers' perception of anxiety is a common phenomenon while purchasing from any uncertain environment and, thus, can affect consumers' trust disposition attitude (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009). So, compared with the first group of hypotheses (H<sub>1</sub>, H<sub>1a</sub>, H<sub>1b</sub>, H<sub>1c</sub>, H<sub>1d</sub>, and H<sub>1e</sub>), it can be concluded that after application of different control mechanisms against identity theft, primarily consumers are concerned about security, not cognitive privacy and psychological anxiety. And due to enhancement of perception of security,

consumers' perception of the trustworthiness of e-commerce is enhanced, which significantly affect purchase intention.

Referring to the fundamental economic price-value concept from the transactional cost approach, it is argued that consumers always evaluate price savings while confirming transactions from any interaction. In a virtual medium, consumers interact from remote locations, and they ignore many traditional aspects of bricks-and-mortar purchase; however, researchers asserted that price saving is a potential reason for consumers to perceive e-commerce as a useful and effective marketing channel (Carter & Bélanger, 2005; Shareef et al., 2009). Nevertheless, since gradual enhancement of security measures to protect or at least minimize all risks related to identity theft can increase the price of product/service and the amount consumers spend while purchasing from this vulnerable marketing channel (Anderson et al., 2008; Douglass, 2009), during evaluation of price-value return, consumers may have a negative impression about their purchase intention (Burnham et al. 2003; Shareef et al, 2009). However, in e-commerce purchase, any change in price due to the application of many administrative measures and encryption cannot affect consumers' intention to purchase that much. Rather consumers are mostly concerned about reliability, authenticity, and security in transaction. However, consumers are fully concerned about operational performance. Operational performance is rooted in the perception of time and effort to be spent in e-commerce transaction. It is also shaped through the contribution of trust and price value. This is an interesting identification. Although price-value exchange does not have a significant contribution in perusing purchase intention directly (contrasting with our proposed second hypothesis H<sub>2</sub>), it can have an impact on consumers' perception of operational performance, which can be explained through the transaction cost approach (Williamson, 1981). When consumers find the price they are paying in exchange for the value they earned is reasonably satisfactory, they are ready to compromise with lower performance in operation.

Due to the application of many technological measures like encryption, firewall, and anti-spyware in e-commerce, the operation can potentially lead to creating severe complexities in interaction with this virtual medium (Miyazaki, 2008; Sprott, 2008; Wolfinbarger & Gilly, 2003). After the application of different effective technological and managerial tools as described in the source-prevention model and control of e-commerce operation, its operational performance can

lose its flexibility and convenience to a significant degree (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009; Shareef & Kumar, 2012). Consumers may face technological complexities as well as time delay in performing their desired transactions (Featherman & Pavlou, 2003; Shareef & Kumar, 2012). It is recognized and authenticated by many potential researchers of marketing (Jin et al., 2008) and technology-consumer interactive behavior (Gefen et al., 2003) that applications of controlling tools destroy easy-going interactive characteristics of e-commerce to some extent. Consumers also may perceive non-satisfactory return of benefits from e-commerce interaction in terms of time value (Shareef et al., 2-16; Venkatesh et al., 2012). Now, we should look at the composition and actual scenario of operational performance to interpret the performance of the third group of hypotheses ( $H_3$ ,  $H_{3a}$ , and  $H_{3b}$ ). In Bangladesh many e-commerce websites for boutique, music, and apparel are launched by students. These are operated in a casual and nonprofessional manner. From interviews of our sample, as mentioned earlier, around 10 percent (23 students) of this group have prior experience of being victimized by identity theft in the last year with different magnitudes of security threats, risks, and losses while purchasing from newly opened e-commerce websites in Bangladesh (operated by nonprofessional students) with almost no security features. Now, as the experiment, this study examined consumers' perceptual attitude toward e-commerce purchase through these three selected e-commerce websites (one boutique, one music, and one bookselling). Several traditional controlling measures like administrative controls (putting red flags if there is any signal of mismatch of password, unusual purchase pattern, several purchases within a very short time, data management, employee management, etc.) and technical measures like encryption and password (linkage with bank through sending a verification code in a registered mobile phone, etc.) were applied in these three websites. These three online sites represented significant enhancement in security and privacy and reduction of psychological anxiety; however, these applications also significantly enhanced complexities in operational performance through consumption of more time and effort, and they also increased price. This result can be observed from Table 1 reflected in the perception of operational performance (mean of OP is only 1.79 and mean of PEV is 2.25 and of PTV is 2.40). Therefore, after application of these controlling tools, consumers perceive very low operational performance of these websites, which has an adverse impact on purchase intention (average intention is 3.29). This could be much lower; nevertheless, consumers' trust in these e-commerce websites is

ensured (average is 3.71), which is again composed of perception of security (average is 3.68), privacy (3.8), and anxiety (3.72). Consumers also have the impression that price value is quite satisfactory (3.59), although price has been beefed up by around 10 percent. However, ultimately average purchase intention has been increased (it is much higher than 3, i.e., they will continue to purchase) and is quite satisfactory.

It is presumably assumed that the application of several controlling mechanisms of cybercrimes like administrative and technological tools to minimize different types of identity theft can potentially instigate some positive and negative forces on consumers' perception while purchasing from e-commerce. For instance, consumers may find that operational performance has been drastically complicated due to many embargoes arising from security tools. On controlled and secured online sites, it can take a much longer time to complete the desired transaction, and such sites could be more complicated to understand and operate and need more effort to interact with. Consequently these complexities in terms of longer time and effort needed to be spent may negatively affect consumers' interest in buying online. These safety applications can potentially reduce identity theft and thus can reduce the cost of fraudulence; however, many controlling mechanisms can substantially hike the price of the products/service sold through e-commerce, which ultimately can cause an overall price increase. This increase in price can again have a negative impact on consumers' purchase intention from e-commerce. However, on the other hand, several scholarly studies (Anderson et al., 2008; Barker et al., 2008; Carter & Bélanger, 2005; Liao et al., 2011) extensively identified that consumers may be deterred from purchasing online for many reasons, but the principal inhibiting reason is losing trust in online purchasing due to many risks arising from security threats, losing privacy, and psychological anxiety in a virtual environment. Expectedly, the application of identity theft measures that potentially control those risks related to security, privacy, and anxiety can significantly draw back consumers' trust in e-commerce transaction, which ultimately may lead to enhancing consumers' purchase intention (Hartmann-Wendels et al., 2009; Liao et al., 2011). This study has attempted to understand the synergistic effect of these three interrelated but mutually multidirectional issues on e-commerce purchase intention.

The study identified that operational performance and trust play an exhaustive role in pursuing consumers' purchase intention from e-commerce. Price is always an issue; however for e-commerce this issue does not have a direct impact on purchase intention. If consumers find that due to the application of different effective controlling mechanisms against cybercrimes, particularly identity theft, they can perceive higher trust about the security of their transaction, they do not mind spending a little bit more. This study confirmed that consumers' perception of operational performance has been decreased due to the longer time, greater effort, and more complexity involved during transaction for the application of several technological and administrative controlling mechanisms that are not robust and flexible. However, interestingly, although overall operational performance has been decreased after the application of security features, for the same reason, since trustworthiness of consumers increases, it contributes to upholding operational performance to some extent. Arguably, the positive effect of trustworthiness can offset the negative impact of longer time and greater effort consumption leading to operational performance. In addition, a risk-free website can enhance consumers' impression of gaining higher value in exchange for the price they pay to the vendors, which ultimately may cause perception of better operational performance.

Considering the integrated impact of negative operational performance and higher price and positive trustworthiness due to the application of identity theft controlling measures, we conclude that consumers' attitude toward purchase intention will be ultimately positive. Before getting the findings of this research, it was uncertain whether, after the application of many controlling measures, consumers' purchase intention is growing or not. This research confirmed that although the negative impact of slower operational performance and higher price can have an adverse effect on purchase intention, due to the substantial enhancement of trust after the application of controlling measures and assurance of potentially risk-free e-commerce transition, the combined impact of these three plausible predictors of purchase intention is adequately positive and persuasive. So, precisely, if vendors can make their websites risk free for prospective consumers when they buy from these, by implementing administrative and technological tools, consumers will not mind engaging more rigorously with higher effort to tolerate complexities and paying a slightly higher price to purchase from e-commerce, which

provides them many other advantages, not available from traditional bricks-and-mortar retail stores.

### **Conclusions, Contributions, Limitations, and Future Research Directions**

The proposed IT-OPI model is dedicated to understanding an important research question regarding the plausible impact of controlling mechanisms of identity theft on online purchase intention. The answer to this question has significant market value as the application of these tools, both administrative and technological, needs potential time, effort, and money from both sides, consumers and e-commerce vendors. To understand the conjoint effect of those three driving or inhibiting forces on purchase intention, this research has conducted an experiment among consumers in Bangladesh by launching three e-commerce websites with the extensive application of several administrative and technological tools to control identity theft related cybercrimes.

On this occasion, the research postulated a total of 10 hypothesized relations with purchase intention. All the hypotheses are identified as significant other than two. It is identified that perception of price value, i.e., slight hiking of price of purchase from e-commerce websites after the introduction of several administrative restrictions, and data management and technological measures, does not have a significant contribution to e-commerce purchase intention. Therefore, this hypothesis turned out to be insignificant. However, it has a potential positive contribution with regard to consumers' perception of higher operational performance. Consequently, a new cause-effect relation has been introduced in the model depicting contribution of perceived price value in shaping consumers' perception about the operational performance of e-commerce websites. Therefore, consumers' perception of operational performance is generated from the contribution of time and effort perception as well as price-value perception; however, it is also influenced by perception of trust. It means if consumers find higher trustworthiness with regard to e-commerce operation, they find online transaction as having higher operational performance, although in terms of time and effort, it is rather more complicated and worse than before. So, the relation of trust with operational performance has introduced a new path in the cause-effect model. Several researchers working on the trust model and time and effort performance of online

transaction (Dwivedi et al., 2016; 2017b; Featherman & Pavlou, 2003; Shareef et al., 2013; Venkatesh et al., 2012) claimed that trust disposition attitude can cause positive evaluation about the virtual medium. The second hypothesis that turned out to be insignificant is the relation between privacy and perceived anxiety. Anxiety is predominantly governed by the belief of security against hackers. Privacy is not that much important for Bangladeshi consumer to be worriedly concerned of the operation. On top of that, consumers' trust disposition attitude is, although composed of perceptions of security, privacy, and absence of anxiety, substantially governed by perceived security.

Overall, it can be concluded that administrative measures like data management, employee control, and restrictive data access policy and technology measures like encryption, digital signature, and verification should be applied in e-commerce operation to control any kind of cybercrime such as identity theft. Consumers' purchase intention in e-commerce depicted in the IT-OPI model is substantially dependent on the conjoint effect of operational performance, trustworthiness, and price value of products/service. However, the effect of price in exchange for value received does not have a significant impact on pursuing or inhibiting intention to purchase online. While controlling cybercrimes through the application of those measures can enhance trust disposition attitude, it can potentially reduce consumer perception of operational performance. Nevertheless, the impact of perception of trust is so prominent in pursuing purchase intention that the negative impact of operational performance can be significantly compensated for. Therefore, considering the comprehensive impact of those three constructs, after the application of those controlling measures against identity theft, ultimately consumers' intention to continue purchasing from e-commerce is accelerated.

### ***Theoretical Contributions***

Several marketing and ICT researchers (Anderson et al., 2008; Barker et al., 2008; Carter & Bélanger, 2005; Darley et al., 2010; Douglass, 2009; Hartmann-Wendels et al., 2009; Liao et al., 2011) postulated that trustworthiness is the single most important predictor to pursue consumers' positive attitude toward purchase from e-commerce. This current research examined the comprehensive impact of the three constructs and finally revealed through an experiment that if consumers find higher trust, they will continue purchasing from e-commerce. Now looking at the

composition of trust, this research identified that in Bangladesh, the requirement of privacy regarding the issue of sharing of personal information is gradually increasing, and consumers' anxiety due to the uncertainty of a virtual medium as per its characteristics has impact on the development of trust disposition attitude; however, still, for the development of trust in a virtual medium like e-commerce, the perception of security against website hacking and stealing of sensitive financial information is the crucial issue and most contributing parameter. If the online site is secured and risk free against any kind of cybercrime, consumers will feel higher trust in e-commerce and that is the dominating predictor to pursue purchase intention.

These findings can be explained through theoretical aspects. The GAM model (Shareef et al., 2011; Shareef et al., 2014b) encapsulated the importance of consumers' trust in an online medium. The extended unified theory of acceptance and use of technology (Venkatesh et al., 2012) investigated consumers' behavior from a marketing perspective and acknowledged that consumers are always concerned about time and effort value, which might deter adoption of any system. Shedding light on the underlying concept of the transaction cost approach (Williamson, 1981), consumers feel risk in transaction in an uncertain environment; however, the return value of investment depends substantially on consumers' perception of the exchanged value they receive, which is related to trust and operational performance (Dwivedi et al., 2016). Following the essence of social exchange theory (Kelley, 1959; Kelley & Thibaut, 1978), consumers will reinforce their behavior to purchase online if they find it beneficial. Certain negative phenomena like time delay and higher effort in e-commerce operation and slightly higher price of product can inhibit consumers from purchasing online after the application of complex technological and managerial controlling mechanisms in the transaction phase of e-commerce. However, these applications can substantially increase consumers' trust. On the other side, e-commerce has many other conveniences compared with traditional physical store purchase. Therefore, finding higher trust can effectively compensate for those reasons for negative attitude and ultimately develop the impact on positive perception to purchase from e-commerce.

Therefore, from a theoretical perspective, this study has created a new avenue to conduct future research. It clearly provides guidelines to researchers of e-commerce. Consumers' trustworthiness is the governing issue in pursuing intention to purchase from e-commerce. The

cause–effect relation also indicated another important theoretical issue in this context. Perception of operational performance of online websites substantially depends on consumers’ belief in the reliability and authenticity of the website. This is more related to psychological behavior reflecting social exchange theory. This identification reveals another important theoretical aspect: that consumers’ attitude toward e-commerce purchase is also substantially oriented by the affective component of attitude, not only the cognitive component. Traditionally, purchase is potentially dominated by price-value exchange; however for e-commerce, it has an indirect influence that affects purchase intention through controlling perception of operational performance; this is related to the behavioral component of attitude. Therefore, we can conclude that theoretically, marketing researchers should explore all three components of attitude, i.e., cognitive, affective, and conative, to pursue consumers’ purchase intention toward e-commerce.

### ***Implications for Practice and Policy***

This research has potential significance for and a contribution to make to the existing literature of marketing, behavioral, and ICT-related investigation. Shareef and Kumar (2012) delineated that when we implement many rigid controlling mechanisms in e-commerce management, it might have some mixed effects. From one perspective, it can increase consumers’ trust by ensuring safe and risk-free transaction (Anderson et al., 2008; Douglass, 2009); however, many researchers (Hartmann-Wendels et al., 2009; Liao et al., 2011) are afraid that these complicated systems can demotivate many potential customers to interact with e-commerce as these restrictions and many bureaucratic solutions can wipe out the convenience of easy system operation for some consumers, who do not have enough experience, familiarity, and skill in self-service technology. Due to difficulties and time-consuming operation, they might lose their interest in purchasing through e-commerce. In addition to that, researchers anticipated, or were at least confused about, the profound impact of these mechanisms on cost price (Anderson et al., 2008; Barker et al., 2008). So, it was really a dilemma whether inclusion of those controlling measures ultimately have positive or negative impact comprehensively. Understanding this issue and resolving this dilemma has significant value for marketing and ICT researchers as this can reshape future trends of e-commerce operation. This study has resolved this controversial issue by generating clear guidelines that overall the conjoint effect of these three profound variables on

purchase intention is neither negative nor neutral. Synergistically, the application of these controlling tools of identity theft can substantially enhance consumers' trust, which is the single most predictor to pursue consumer purchase intention. This is a potential finding for consumer behavior and e-commerce practitioners.

This research indicated that trust is the governing issue in promoting e-commerce purchase. Yes, it is true that if the system is too technologically rigid, consumers may be deterred from interacting and return their face due to excessive time and effort needed to accomplish their desired marketing; still higher trust is the backbone of consumers' purchase intention, so that they can even ignore the slightly higher price and amount they need to spend to cover the application costs of the vendors in making the operation safe against hackers.

Trust is the most important predictor, and as per the literature (Featherman et al., 2010; Featherman & Pavlou, 2003; Gefen et al., 2003; Shareef et al., 2011), it is composed of privacy, security, and to some extent anxiety due to psychological and behavioral risks associated with e-commerce transaction (Anderson et al., 2008; Douglass, 2009; Hartmann-Wendels et al., 2009; Liao et al., 2011; Pavlou, 2003). However, our exploratory research certified that to ensure trustworthiness, managers of e-commerce should give most priority to security-related issues of the site and transaction; still consumers are not that much concerned about privacy. If security is ensured, consumers' psychological perception of anxiety about uncertainty will automatically be reduced.

Another potential identification of this study is that the price of the product is always a concern for consumers. However, since the application of identity theft measures can potentially reduce the risk of losing financial information and, thus, a future bad experience or occurrence of losing money, this slight price hiking may not directly slow down customers in purchasing from e-commerce.

### **Future Research Guidelines and Limitations**

This is a significant research and has a potential contribution for e-commerce operation. However, the experiment to validate the model and conceptualize the ultimate impact through conceiving consumers' purchase intention was not conducted in any mature e-commerce. The experiment was conducted in three artificial e-commerce websites. It might have some impact on higher  $R^2$  value. Future researchers can conduct the same experiment in fully established e-commerce. It was conducted in Bangladesh and among students. Researchers can test the model in different developed countries (particularly to verify the impact of privacy) and among all kinds of consumers. This study did not consider any moderating effects of demographic variables like income, gender, and age. Future researchers can consider these moderating effects on purchase intention. The product type in e-commerce might have an impact on purchase intention, particularly for experiential products. This issue should be investigated shedding light on the revealed model.

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## Appendix

### Appendix A: Measuring Items for Independent and Dependent Variables

Construct	Items	Source	Standardized Loading Value
Operational Performance (OP)	1. In terms of my time and effort required to accomplish my desired task, operation of this website is useful to me <b>(dropped)</b> 2. In terms of my time and effort required to accomplish my desired task, operation of this website is reasonably paid-off 3. While interacting in this website, I find its process of placing order is reasonable 4. Overall tasks required to place my order in this website is satisfactory <b>(dropped)</b> 5. All interactions in this website to accomplish my desired task are acceptable to me 6. While accomplishing my desired task, I am happy with my time and effort spent	Dwivedi et al., 2016; Shareef et al., 2008/2011; Venkatesh et al. 2012; Authors self-developed	.36
			.53
			.63
			.36
			.60
			.77
Perceived Effort Value (PEV)	7. In terms of my effort required to accomplish my desired task comparing to my return is useful to me <b>(dropped)</b> 8. In terms of my effort to accomplish my desired task, comparing to my return is reasonably paid-off <b>(dropped)</b> 9. While interacting in this website, I find the effort I engaged to place order is reasonable 10. Overall effort required to place my order in this website is satisfactory 11. While accomplishing my desired task, I am happy with my effort invested	Davis, 1989; Gefen et al., 2003; Pavlou, 2003; Rogers, 1995; Shareef et al., 2007; Wolfenbarger & Gilly, 2003	.40
			.40
			.65
			.65
			.74
Perceived Time Value	12. In terms of my time required to accomplish my desired task comparing to my return is useful to me <b>(dropped)</b> 13. In terms of my time to accomplish my desired task, comparing to my return is reasonably paid-off <b>(dropped)</b> 14. While interacting in this website, I find the time I spent to place order is reasonable 15. Overall time required to place my order in this website is satisfactory 16. While accomplishing my desired task, I am happy with my time spent	Dwivedi et al., 2016; 5; Featherman & Pavlou, 2003; Shareef et al., 2009	.26
			.42
			.59
			.76
			.51
Perceived Trust	17. The website is overall reliable to protect me from hackers 18. I find the website is trustworthy to protect me from identity thieves 19. I believe the website has become secured after implementing controlling measures of identity theft 20. The authority takes full responsibility for any type of insecurity during interaction/ transaction at the website. <b>(dropped)</b>	Balasubramanian et al., 2003; Collier & Bienstock, 2006; Kumar et al., 2007; Featherman et al., 2003; Gefen et al., 2003; Liao et al., 2011; Shareef et al., 2009; Wangpipatwong et al., 2005	.59
			.82
			.53
			.47
Perceived Security (PS)	21. The website is safe to interact with for financial purposes 22. The website protects information about my credit/debit card 23. The website can protect from hackers to steal my personal vulnerable financial information 24. The website can protect from hackers to steal my personal vulnerable identity information	Featherman et al., 2003; Featherman & Pavlou, 2003; Gefen et al., 2003; Liao et al., 2011; Pavlou, 2003; Shareef et al., 2008/2011	.45
			.72
			.70
			.50
Perceived Anxiety (PA)	25. I do not feel mental stress to interact in this website 26. I do not feel mental agony to interact in this website 27. I am comfortable to interact in this website <b>(dropped)</b> 28. Psychologically, I do not find any problem to interact in this website <b>(dropped)</b>	Brewer, 1999; Featherman et al., 2003; Featherman & Pavlou, 2003; Gudykunst et al., 2001	.59
			.67
			.41
			.26
Perceived Privacy (PP)	29. I would not hesitate to provide personal information to the website 30. The website protects my disclosed personal information due to	Collier & Bienstock, 2006; Devaraj et al. 2002; Liao et	.57

Construct	Items	Source	Standardized Loading Value
	application of controlling measures of identity theft 31. The website protects from any unauthorized sharing of my personal information with other sites. 32. Nobody can steal my disclosed personal information due to application of controlling measures of identity theft( <b>dropped</b> )	al., 2011; Shareef <i>et al.</i> , 2007; Shareef <i>et al.</i> , 2009; Wolfenbarger&Gilly,2003	.7 .72 .48
Perceived Price Value	33. The price of the product/service I purchase from this website is reasonable( <b>dropped</b> ) 34. The price of the product/service I purchase from this website is satisfactory( <b>dropped</b> ) 35. The price of the product/service I spent to purchase from this website is paid off 36. I am satisfied with the money I spent in compare to the value I gained 37. The tradeoff between the money spent and the value gained is acceptable	Dwivedi <i>et al.</i> , 2016; Shareef <i>et al.</i> , 2008/2009/2012; Venkatesh <i>et al.</i> 2003/2012	.24 .02 .58 .75 .55
Purchase Intention	38. I would like to purchase from this website 39. I am happy with the purchase from this website 40. I am satisfied with the purchase from this website 41. I will continue purchasing from this website in future	Dwivedi <i>et al.</i> , 2016; Pavlou, 2003; Shareef <i>et al.</i> , 2008	.56 .63 .75 .64

## Appendix B

### Structural Equations

$$OP = 0.271*PT + 0.172*PTV + 0.285*PEV + 0.196*PPV, \text{ Errorvar.} = 0.555, R^2 = 0.446$$

Standerr	(0.0729)	(0.0804)	(0.0795)	(0.0693)	(0.0683)
Z-values	3.720	2.141	3.586	2.822	8.124
P-values	0.000	0.032	0.000	0.005	0.000

$$PT = 0.166*PA + 0.594*PS + 0.137*PP, \text{ Errorvar.} = 0.349, R^2 = 0.651$$

Standerr	(0.0584)	(0.0705)	(0.0603)	(0.0429)
Z-values	2.849	8.419	2.271	8.124
P-values	0.004	0.000	0.023	0.000

$$PA = 0.559*PS + 0.105*PP, \text{ Errorvar.} = 0.599, R^2 = 0.401$$

Standerr	(0.0895)	(0.0895)	(0.0738)
Z-values	6.243	1.178	8.124
P-values	0.000	0.239	0.000

$$PI = 0.236*OP + 0.805*PT - 0.0190*PPV, \text{ Errorvar.} = 0.455, R^2 = 0.879$$

Standerr	(0.0629)	(0.0825)	(0.0570)	(0.0634)
Z-values	3.758	9.756	-0.332	7.174
P-values	0.000	0.000	0.740	0.000