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The effects of technology, organisation and environmental factors on small firm entry to electronic marketplace: a developing country perspective

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Abstract: This study attempts to construct a theoretical framework and finally examines the magnitude of the effects of various internal and external factors on Bangladesh's small firm entry to e-marketplace. To attain the research objectives, technology, organisation and environment framework (Tornatzky and Fleischer, 1990) was employed to construct an initial research model which was further fine-tuned through field study. A mixed method research approach (i.e., qualitative field study followed by a quantitative survey) was employed to develop the research model and test hypothesised relationships among the study constructs. A PLS based structural equation modelling was employed with a dataset of 416 SMEs which were collected through a questionnaire survey from different small firms in Bangladesh selected by applying a probability sampling technique. The structural model estimates reveal significant association of *perceived compatibility*, *owner innovativeness*, and *customer readiness* with small firm willingness to participate in electronic marketplace. The study concludes with implications.

Keywords: e-marketplace; small firm; e-marketplace entry; technology; organisation; environment framework.

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1 Introduction

Information and communication technology (ICT) enabled electronic marketplaces (e-marketplace) have brought bunch of opportunities in trade and commerce to the business firms in many ways (Wan and Wang, 2018; Pereira et al., 2011) which drives the organisations around the world to conduct their business operations in online marketplace to reap up the benefits resulted from the development of ICT. Numerous studies revealed that online business platforms help enhance business reach which finally transmitted in increased business growth (Hussain et al., 2020; Shahzad et al., 2020) and support for firm sustainability in the global crisis (Shahzad et al., 2020), for example lockdown situation in COVID-19 pandemic. More clearly, online marketplaces open up a new window to facilitate various firms' offerings worldwide (Wan and Wang, 2018) where firm size and location do not show much effects. As a result, the usefulness, convenience, ease of use and many other benefits of electronic business platforms and growing trend of firm online marketplace participation attract contemporary research initiatives to examine the effects of various technology, organisation, and environment related factors on firms', especially on small firms' online market entry decision.

A wide range of academic literature extensively recognised the significance of small and medium sized enterprises (SMEs) in the sustainable economic development of any country. A World Bank group study shows that formal SMEs contribute up to 60% of total employment and up to 40% of national income (GDP) in emerging economies (World Bank, 2020). The study also reveals that the number of formal micro, small and medium-sized enterprises (MSMEs) in emerging markets would be more than 160 Million which would be in-between 365–445 million if the informal MSMEs are included (World Bank, 2020). Likewise, the number of small firms in Bangladesh is also large which contribute significantly to the country's economic development. According to the

SME Foundation (2021), Bangladeshi small firms include approximately 99.84% of all industrial units, contributing over 82.97% of all industrial employment.

A number of extant literature confirm the significance of ICT in enhanced firm performance (Chege et al., 2020; Šaković Jovanović et al., 2020; Li et al., 2020; Azam, 2015). For example, Azam (2015) portrayed a notable impact of incredible development in ICT on the business operations around the world. Similarly, Chege et al. (2020) demonstrated a positive association between technology innovation usage and firm performance. Pradhan et al. (2018) also revealed a strong relationship between digital infrastructure, more clearly ICT infrastructure and economic growth. Therefore, the trends in technological developments result in various ICT-based applications development which in turn play fundamental roles in facilitating the business operations, aiding productivity and business growth through enhanced firm performance (Chege et al., 2020; Hussain et al., 2020; Azam, 2015). As a result, enterprises around the world are more likely to trade online, especially they prefer to operate business on electronic marketplaces (Hussain et al., 2020).

Following the growing trend of technological advancement and its use in business sector, a good number of research initiatives have been undertaken to address multiple aspects of ICT and other digital technology adoption behaviour of organisations and individuals (Thong, 1995; Hussain et al., 2020; Azam, 2015; Buettner, 2017; Hossain and Azam, 2019; Hossain, 2021; Thomas et al., 2019). For example, Šaković Jovanović et al. (2020) examined the relationship between e-commerce and firm performance under the mediating effects of commercial websites and electronic marketplaces showing a positive association between the electronic marketplace participation and firm performance. Besides, Timmers (1998) outlined various business models for electronic marketplace. Timmers (1999) also portrayed the benefits arisen from e-commerce adoption which could be enjoyed by the firms whoever adopt it. There are, therefore, more similar studies focusing on various impact of e-commerce and e-marketplace adoption on firms' overall operation and performance (Gërguri-Rashiti et al., 2017; Octavia et al., 2020).

However, the empirical evidence show a paucity in addressing the effects of various technology, organisation and environment (TOE) related factors on small firms' entry to online marketplace in emerging economies. Most of the past studies are focused on the developed country perspective (Šaković Jovanović et al., 2020; Thong et al., 1995; Ching and Ellis, 2004). More particularly, the previous studies provide a narrow look to firm's online marketplace participation. For example, Upadhyaya et al. (2017) investigated factors affecting B2B e-marketplace adoption by Indian SMEs whereas Dholakia and Kshetri (2004) examined the effects of country level factors on electronic commerce diffusion. Beckinsale et al. (2006) assessed whether there is any impact of government initiatives on technology adoption strategies in SMEs, while Sila (2013) examined the effect of organisational factors on firm level electronic commerce adoption phenomena. Hence, a logical question might be arisen on the impacts of those factors if they are analysed under a comprehensive study framework.

To address the aforementioned question, this study, therefore, is one among the initial attempts of examining the effects of various technology, organisation, and environment related factors on small firms' online marketplace entry decision employing the combination of DOI and TOE framework. Another contribution of this study lies in analysing the e-marketplace adoption phenomena in a developing country perspective, more specifically in Bangladesh perspective.

The paper is structured as follows: the following section outlines the research background focusing on reviews of relevant literature on digital technology adoption by firms, prospects and opportunities of online marketplace, and the technology-organisation-environment framework. Based on the technology-organisation-environment framework, research hypotheses are developed in Section 3. Section 4 presents the research methodology, data analysis and results, while Section 5 outlines the discussion on research findings, and research implications and conclusions are stated in Section 6.

2 Research background and theoretical grounding of the research model

Following the tide of global advancement in information communication technology, the internet service in Bangladesh was introduced in the 90s initially. The then internet service in Bangladesh was only the limited access to e-mail via bulletin board systems (Azam, 2007). However, an incredible progress in the growth of internet usage and sophistication of the technology has been observed in the recent years. For example, the number of internet users in Bangladesh is 111.875 million on December 2020 (BTRC, 2021) which was only 100,000 in 2000 (Azam and Quaddus, 2009). Bangladesh is now providing nationwide internet service to its citizenry in different modes, such as, broadband, fibre optic cable network, and also through mobile-based 4G data services with a maximum speed up to 50 mbps. It is important to note that, a user can buy 1 GB mobile internet data pack only at BDT 27 (USD 0.32) which represent the convenience of getting internet service at a nominal price.[1]

The Government of Bangladesh (GOB) is giving the highest priority to develop a 'Digital Bangladesh' by 2021 which is defined as the utilisation of digital technology to establish a happy, prosperous, and educated society which will also combat the poverty and corruption. There are some promising developments going on around the country which indicates that 54.7% of Bangladeshi farmers having their own cell phones and 37% of them use internet (GOB, 2015). According to the BTRC (2021), the total mobile phone user in Bangladesh is 170.137 million as of December 2020.

It is also encouraging that a range of information services are now available at the periphery and rural areas of the country. For example, 102 types of information services are available in the villages and 211 million e-services have been provided to the citizens of Bangladesh from the 5,275 digital centres established all over the country (GOB, 2016). The government is dedicated to expand the capacity of providing IT services to its citizenry regardless of their geographical location, thus, initiates establishing a hi-tech Park in two regions (Jessore, and Kaliakoir of Gazipur). A specialised digital university is also planned to be established which would help develop a number of experts in the ICT sector.

With the development of good IT infrastructure and the facilities to promote a digital-based society the GOB wishes to utilise the technology in its various business sectors to ensure economic development. Although the government has very positive initiatives and a rapid progress towards utilising the ICT in administration, business and economic development, there remain a paucity of research initiative to look at the Bangladeshi small firms'[2] willingness to conduct business in online marketplace. Therefore, this paper addresses and examines the impacts of various technological,

organisational, and environmental factors on small firms' electronic marketplace entry behaviour.

2.1 Electronic marketplaces: empirical evidence

Electronic marketplace is an online platform which facilitates meeting of buyers and sellers to exchange products, services, or information (Deng et al., 2020; Duan et al., 2012; Timmers, 1998). In other way, Bakos (1991) refers electronic marketplace as an inter-organisational information systems (ISs) which facilitates exchanging information about prices and product offerings among the participating buyer and sellers. Online marketplaces open up a new window to facilitate various firms' offerings worldwide (Wan and Wang, 2018) which may enhance firm performance. Based on survey data of 267 sellers from China, Wan and Wang (2018) documented that entrepreneurial self-efficacy and remote work self-efficacy significantly affect the firm performance by developing sellers' operational creativity. The study may be criticised as it was limited to a specific online marketplace whilst other marketplaces were not evaluated. Further, the study measured the change in firm performance on the basis of operational creativity while there might have many other factors which might have significant effects on the firm performance.

The significance of firms' electronic marketplace operation is widely recognised in the literature (Octavia et al., 2020; Stockdale and Standing, 2004) which led scholars to examine organisational e-marketplace entry behaviour (Deng et al., 2020; Duan, 2020. For instance, Deng et al. (2020) investigated the critical determinants for SMEs' e-market adoption from Australian settings. Their empirical findings suggest that perceived benefits, perceived trust, top management support, and external pressure have notable impact on the e-market adoption decision of Australian SMEs. Using 279 survey responses, the study administered structural equation modelling (SEM) to validate the research propositions and confirmed various technology, organisation, and environment related determinants which affect the e-market adoption decision of SMEs. However, one of the major limitations of the study is ignoring the impact of organisational technology compatibility and owners' innovativeness on SMEs' e-market adoption decision which in fact, do not provide an inclusive insight on studying SMEs' e-marketplace entry phenomena.

To explain the importance of common network, Renna (2013) proposed a decision model to facilitate SMEs' online platform participation decision behaviour. The study estimated the proposed model effectiveness based on two performance benchmark models, viz., complete information sharing and non-cooperative environment. The findings of the study reveals that the dynamic network of the partners are beneficiary under complete cooperation of the partners (Renna, 2013). Similarly, Battaglia et al. (2017) demonstrated that strong partnership among the participants, enhanced resource sharing, in-depth exchange relation among the partners, and sound governance of the network stimulate the effectiveness of small business strategic networks from the printing and metal-mechanics industry perspective.

The early stage e-marketplace studies are largely developed country specific. For example, MacGregor and Vrazalic (2005) administered a mixed-method study approach to identify the entry barriers to the SMEs in Australia and Sweden. They conducted their survey in urban regional areas of Australia and Sweden where the existence of functioning government initiated Chamber of Commerce, structured and organised small

business community, sound educational facilities, and diversified business cross-section were required. Confirming the aforementioned criteria, they administered their survey and documented two major groups of e-commerce entry barriers, viz.: e-commerce is either 'too difficult' or 'unsuitable' to the SMEs of Australia and Sweden. Therefore, the study represents the e-commerce entry barriers to the SMEs which are conducting their operations in a sophisticated business environment that leaves space for further investigations from a poor market infrastructure condition. Additionally, the study also provides opportunities to investigate the facilitators to the e-commerce adoption by SMEs.

Another seminal study (Stockdale and Standing, 2004) addressed the nature of electronic marketplace and investigated the benefits and barriers of SMEs' e-marketplace participation. Based on the extensive literature review, Stockdale and Standing (2004) first demonstrated the structures of electronic marketplaces focusing on the ownership models, transaction models, and income models. Further, they explored number of benefits and barriers to the e-marketplace participation by the SMEs which would help develop policies and strategies to resolve the barriers and to open up the way to enjoy the benefits thereafter. Again, the study is concentrated to the developed economy perspective which might not, in general be applicable for all form of economic settings.

In summary, online marketplaces offer enormous opportunities for the individual, organisation and business firms to search customers, perform a business transaction, and maintain an interactive and profitable relationship with the customers. Thus the benefits of online marketplace participation induces the firms of all size to participate in the online marketplaces which motivates the researchers to look into the effects of technology, organisation, and environment related factors on e-marketplace adoption in the competitive globalised marketplace.

2.2 TOE framework

The TOE framework was developed by Tornatzky and Fleischer (1990) to posit the magnitudes of organisational context which are responsible for the acceptance and usage of innovations. According to them, adoption of technologies by any firm is influenced by organisational-technological-environmental issues. Relevant internal and external technologies of a firm are considered as technological issues. The adoption is highly dependent on the perceived relative advantages, the organisational and technological compatibility, the complexity of the application as well as on experimentation and visibility of the application (Deng et al., 2020; Oliveira et al., 2014; Jeyaraj et al., 2006; Azam and Quaddus, 2012; Tornatzky and Fleischer, 1990; Sabherwal et al., 2006).

Organisational issues refer to firm size, business scope, level of centralisation, level of formalisation, organisational culture, characteristics of managerial structure, human resources quality, decision making and communication mechanisms and extent of slack resources (Awa et al., 2017; Jeyaraj et al., 2006).

On the other hand, Tornatzky and Fleischer (1990) proposes that the external environment is assembled with facilitating and inhibiting factors of the firms' operation area which includes customers, suppliers, competitors, the community, the government, the size and structure of the industry, trading partner's readiness, and the macro-economic context (Awa et al., 2017; Al-Qirim, 2006; Scupola, 2009; Azam and Quaddus, 2012). The TOE framework also refers that the actors of external environment

define the organisational requirements for innovation, resources needed for pursuing the innovation, and the capacity for adopting and using the innovation.

To examine the innovation adoption behaviour of firms, the TOE framework has been applied in different field of studies across the countries. Therefore, the justification of applying TOE framework in evaluating organisational technology adoption behaviour has been evidenced by prior studies. For instance, Effenedi et al. (2020) employed TOE framework to investigate the social media adoption phenomena of the SMEs during COVID-19 outbreak. Using TOE framework they administered covariance-based SEM and showed strong impact of technological, organisational, environmental, and social media awareness on SMEs' social media adoption intention. In another seminal work, Deng et al. (2020) also applied the TOE framework along with the technology acceptance model (TAM) and the commitment trust theory (CTT) to explore the critical determinants of SMEs' electronic marketplace adoption intention. The empirical findings of the study reveal that the comprehensive TOE framework is suitable to explain the e-marketplace adoption behaviour of SMEs. Similarly, Kuan and Chau (2001) empirically showed the applicability of technology-organisation-environment framework in IS innovation adoption. Srivastava and Teo (2010) also applied the TOE framework to examine ICT adoption phenomena. Similarly, in a study, Lian et al. (2014) employed the model (TOE framework) developed by Tornatzky and Fleischer (1990) for the assessment of factors affecting the cloud computing adoption decision phenomena in hospitals.

Thus, many other prior studies (Deng et al., 2020; Awa et al., 2017; Ifinedo, 2011; Oliveira and Martins, 2010; Zhu et al. 2010; Thong, 1999) have applied TOE framework to understand the innovation adoption behaviour of firms across the countries around the world. Therefore, evidence from the empirical studies justify the appropriateness of applying the TOE framework in investigating firms' e-marketplace entry behaviour.

3 Research model and hypotheses

The current study applies a mixed-method research approach to develop and finalise the conceptual framework of the study, and to empirically estimate small firm electronic marketplace entry decision. Based on the extensive literature review and qualitative field study, this study develops a comprehensive research model and study hypotheses. A detail outline of the qualitative field study is presented in the methodology section.

3.1 Technological aspect

Technological aspect consists of components like computer hardware, software, communication and networking technologies which are mandatory to operate business in digital environment (Putra and Santoso, 2020; Aboelmaged, 2014; Bhattacherjee and Hikmet, 2008). According to Tornatzky and Fleischer (1990), the technology infrastructure plays vital role in innovation adoption process which acts like an internal competitive resource.

3.1.1 Relative advantage

Previous studies (Putra and Santoso, 2020; Stockdale and Standing, 2004; Bakos, 1998) show that firms perceiving more relative advantages of using digital technology are more

likely to do business online. Perceived relative advantage of online marketplace participation is the extent of benefits provided by the online marketplaces to the participating organisations (Deng et al., 2020; Putra and Santoso, 2020; Thong, 1999; Rogers, 1995; Kuan and Chau, 2001). More clearly, perceived relative advantage of online marketplace participation posits possible additional benefits which the participating organisations might enjoy compared to the non-participating traditional business firms. The significance of expected benefits in adoption behaviour has been identified in many prior studies (Rogers, 1995). Past studies also reveal that users' positive perception toward the benefits of new technologies develops their likelihood of innovation adoption (Kannabiran, 2012; Chau and Tam, 1997). Usage of technologies, e-marketplace participation, for example, enhances firm competitiveness (Deng et al., 2020; Bayo-Moriones and Lera-López, 2007), reduces operating cost (Al-Qirim, 2007), develops firm efficiency (Ongori and Migiro, 2010) and improves process innovation (Raymond and Bergron, 2008) which leads the organisations to participate electronic marketplaces. In another study, Ramdani et al. (2009) shows that firms perceiving technology usage relatively advantageous are more likely to adopt new innovations. Therefore, following the notion of the evidences, it is hypothesised that,

Hypotheses 1 Perceived relative advantage positively affect small firm online marketplace entry decision.

3.1.2 Compatibility

An innovation is said to be compatible only if it seems to be consistent with the existing workflows, practices, values, and past experiences of prospective adopter (Rogers, 1983; Putra and Santoso, 2020). Thong (1999) believed that firms are likely to adopt technologies if the innovation seems to be compatible with their current operating system. In a study, Ching and Ellis (2004) found strong positive relation between firms' perceived compatibility with IS and e-commerce adoption.

Tornatzky and Klein (1982) found significant relationship between the adoption of a particular technology and the perceived characteristics (relative advantage, compatibility, and complexity) of the technology. Based on this proposition, we assume that compatibility of online marketplace participation have impact on firms' e-marketplace entry decision. It is also believed that there is a positive relationship between firm online operation compatibility and their e-marketplace entry decision. Therefore, it is hypothesised that,

Hypotheses 2 Digital technology usage compatibility positively affects firms' e-marketplace entry decision.

3.1.3 Complexity

Firms' online market participation complexity is the degree of difficulties in operating business activities in a digital platform. Rogers (1983) defines the perceived complexity of an innovation is the degree to which it is supposed to be difficult to use. It is assumed that perceived complexity of an innovation negatively affect the technology adoption decision (Putra and Santoso, 2020). Therefore, the complexity characteristic of IT adoption stated by Tornatzky and Klein (1982) may be negatively related to online marketplace participation decision. Therefore, we propose that,

Hypotheses 3 Perceived e-marketplace participation complexity negatively affects firms' e-marketplace entry decision.

3.2 Organisational aspect

Organisational aspect indicates the internal resources that are available to use (Wymer and Regan, 2005). Past studies revealed capital, expertise, human resources, efficiency (Effendi et al., 2020; Huang et al., 2004; Al-Qirim, 2007), firm size (Al-Qirim, 2007) as organisational factors.

3.2.1 Firm size

Firm size has been considered as a great predictor of innovation adoption phenomena in the existing literatures (Gono et al., 2016; Duan et al., 2012). Many of the empirical evidences posit that large firms are more likely to adopt new technologies since they have the experience, skills, resources, and moreover, the ability to cope up with the failures resulting from innovation than the small firms (Gono et al., 2016; Ramdani et al., 2009; Janvrin et al., 2008). Many of the prior IS studies have also evidenced firm size as a strong indicator in estimating innovation adoption behaviour (Thong, 1999; Bala and Venkatesh, 2007; Low et al., 2011). Therefore, it is proposed that,

Hypothesis 4 Firm size has a positive impact on small firms' likelihood of online marketplace participation.

3.2.2 Owner's innovativeness

In a study, Ching and Ellis (2004) found that people of young age, who are well educated and have diversified outlook are more likely to accept new technologies than older people. Past studies (Putra and Santoso, 2020; Palvia et al., 1994; Brancheau and Wetherbe, 1990) also propose that education level makes difference in the learning process of the adopters. Several studies for example, Kimberly and Evanisko (1981) also show that owners having risk taking attitude tend to adopt digital technology more quickly than others.

Considering the above mentioned empirical evidences, the following hypothesis is developed,

Hypothesis 5 Owner's innovativeness positively influence small firm online marketplace entry behaviour.

3.2.3 Firm age

Pickernell et al. (2013) suggest that *year of operation* of a firm affects SMEs' electronic commerce activities. They state that newly established firms are more likely to do business online than that of older firms. Firms operating for long years are hardly found interested to enter into the virtual markets since most of the older firms suffers from internal inertia which prohibits enterprises' innovation adoption decision (Pickernell et al., 2013; Zhu et al., 2006).

Moreover it is easy to decide for the newly established firms to enter into e-marketplaces. The concept is supported by the following quotation "[…] since our

business is a new venture, we did not face any organizational system related difficulties what older organizations do, it (e-marketplace participation) requires technological competency which we, the new generation can handle easily", [Firm D] which is supportive to the findings of various previous studies (Pickernell et al., 2013; Chuang et al., 2007). Therefore, it is proposed that,

Hypothesis 6 Firm age has a positive impact on small firms' online marketplace entry decision.

3.2 Environmental aspect

3.2.1 Industry support

According to Tornatzky and Fleischer (1990), adoption of technologies by any firm is influenced by organisational-technological-environmental issues. In this case, external environment is assembled with facilitating and inhibiting factors of the firms' operation area which includes the size and structure of the industry, competitive pressure, trading partner's readiness, government encouragement and the macro-economic context (Abed, 2020; Putra and Santoso, 2020; Effendi et al., 2020; Al-Qirim, 2006; Scupola, 2009; Azam and Quaddus, 2012; Awa et al., 2017). For the purpose of this study, therefore, it is hypothesised that,

Hypothesis 7 Industry support positively affects small firms' online participation.

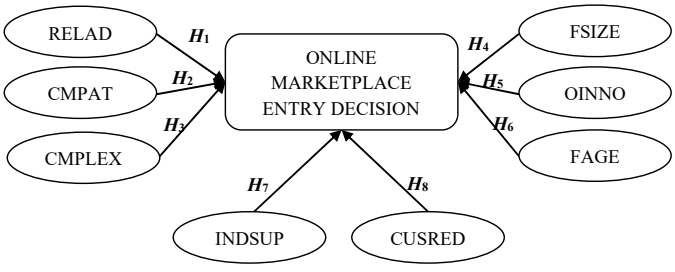
3.2.2 Customer readiness

To do business in a digital environment customers' readiness to take part in the digital market has a significant impact on firms' online entry decision (Abed, 2020; Premkumar and Roberts, 1999). Customers' online participation was found as a significant factor affecting firms online market participation decision (Abed, 2020; Ching and Ellis, 2004; Thong and Yap, 1995). For example, Abed (2020) found that customers' presence in the online marketplace creates immense pressure on the firms end to make sure their participation online. In an early stage study of innovation adoption by Kimberly and Evanisko (1981), it was also found that customers' education has a notable contribution in firms online market entry decision. In our field study we found age of customers and their technology usage trend have a great impact on small firms digital market entry decision. For example, Firm B said, "[…] there are around 4 to 5 crore internet users in Bangladesh, and this is your market size". On the other hand, Firm D said, "[…] our target customers are the young generation who are profound to use internet, especially the Facebook". Based on the literature support and field study, it is therefore, hypothesised that,

Hypothesis 8 Customer readiness positively affects small firms' online market entry decision.

Figure 1 presents the proposed research model developed on the basis of the aforementioned groundings. Following the notion of the TOE framework developed by Tornatzky and Fleischer (1990), the proposed model demonstrates research hypotheses through eight paths to estimate the impact of technology, organisation, and environment related factors on small firms' e-marketplace entry decision.

Figure 1 Research model and hypotheses



Notes: RELAD = relative advantages, CMPAT = compatibility, CMPLEX = complexity, FSIZE = firm size, OINNO = owners innovativeness, FAGE = firm age, INDSUP = industry support, CUSRED = customer readiness.

4 Methodology and findings

The study employs a mixed method research approach by combining a qualitative field study and quantitative survey. The aim of the qualitative study was to explore the study constructs and to fine tune and finalise the conceptual framework of the study which was primarily developed from the literature review. Based on the conceptual framework developed from the literature review and qualitative field study, survey instruments were developed for quantitative estimation.

4.1 Qualitative study

In the qualitative phase of this current study, an in-depth interview approach was applied. The study administered 12 in-depth interviews applying convenience and purposive sampling technique. It is important to note that use of convenience and purposive sampling technique in business research is very common (Zikmund, 2000). The authors stopped interviewing after 12th interview observing data saturation and information redundancy (Lincoln and Guba, 1985; Lincoln and Denzin, 2003). To select the respondents, we considered firms' involvement in e-business, the convenience and availability to reach the key informants, and their willingness to participate in the study.

This study administered 12 in-depth interviews applying a semi-structured interview technique. The main focus of these interviews were to draw insights on the small firms' e-marketplace entry barriers and facilitators from the technological, organisational, and environmental contexts. We scheduled all the interview sessions based on the convenience and availability of the respondents. We also considered a less rush working schedule to ensure uninterrupted insights and observations of the respondents. Each of the interviews lasts around one hour. With the consent of the respondents, we recorded the entire interview sessions. To ensure appropriate explanation of the body language and other cues of the respondents, we transcribed the interviews on the following day of the interviews.

Focusing on the multiple dimensions of the interview transcripts, we applied content analysis technique to analyse the transcripts. Following the studies of Hossain et al. (2021) and Quaddus and Xu (2005), the content analysis was carried out manually. Both inductive and deductive approaches were followed to categorise the factors and variables

derived from the in-depth interviews. The qualitative field study, in support with the literature comprised eight study constructs. The field study also resulted in six new items incorporated in the quantitative survey instruments. However, due to the main focus of this study, the respondent demography, nodes and quotes for the study factors and variables, and the key findings of the qualitative field study are presented in the Appendices.[3]

4.2 Quantitative study

To empirically test the research hypotheses developed upon literature review and qualitative field study, a survey questionnaire was designed for data collection. More clearly, to validate the research hypotheses, measurement items in the survey questionnaire was developed on the basis of detailed literature review and in-depth field study. A pilot test was conducted for further validation of the questionnaire. Finally, the fine-tuned survey questionnaire was sent to the owners or managers or their delegated representatives who are the decision makers of the particular firm to collect the desired data. A group of expert surveyors were employed to collect data and 416 usable data were collected. SEM by employing Smart partial least square (PLS) was used for data analysis.

4.3 Sampling procedure

Owners or owner managers or managers (decision makers) of small firms located at Dhaka City (the capital city of Bangladesh), Rajshahi City (one of the major divisional cities in Bangladesh), and some other corners of Bangladesh are the target population of this study. However, most of our respondents are from the Dhaka City. Dhaka has been prioritised as the sampling area considering the fact that high industry concentration is evident at or nearby Dhaka. The high speed internet usage trend is also high at Dhaka. The sample size was 416 small firms located in various geographical locations in Bangladesh those were selected by using a probability sampling technique.

4.4 Firm profile and respondent demographics

Table 1 and Table 2 show the firm profile and demographic profile of the survey respondents respectively. The study reports that the respondents firms are selected from manufacturing industry (4.81%), service industry (55.29%) and trading houses (39.90%). 71.15 respondent firms have online participation through their own general websites, 25% have their interactive web pages while 44.71% firms participated in online marketplaces among them 61.11% participated through Daraz and 38.89% firm participated in online marketplace through Bikroy.com.[4] Interestingly, respondent firms concentrate their online business in B2C type of operation. 55% of the firms are located at Dhaka city while 45% operates their businesses from other areas in Bangladesh.

The study also reports that the majority of respondents are owners. Among 416 respondents 45% are owners, 20.7% are managers, 19.7% are officers, and 14.7% of total respondents are staffs which indicates a higher possibility of getting firms' core observations regarding decision making process. It should be mentioned that 283 respondents (68% of total respondents) have at least a graduation degree which may affect in getting quality thoughts and responses regarding firms' technology adoption

decision. Table 2 also shows the income and age group of the respondents. 304 respondents belong to the below 40 thousand income group and 352 respondents belong to 20–40 years age group. It is very interesting to note that almost 85% of the respondents belong to a very young age group which is representative to our primary assumption. Finally the table shows the gender group which represents 95.2% of the respondents are male and the rest are female.

Table 1 Firm profile

Demographics	*Frequency*	*%*
Industry category		
Manufacturing	20	4.81
Service	230	55.29
Trading house	166	39.90
Online participation		
Having own general website	296	71.15
Having own interactive website	104	25.00
E-market participants	186	44.71
Bikroy.com*	132	61.11
Daraz*	84	38.89
Location		
Dhaka city	229	55
Other area	187	45

Note: *Bikroy.com and Daraz are two popular e-marketplace conducting B2C type business services in Bangladesh.

Table 2 Respondents demographics

Demographics	*Frequency*	*%*
Position		
Owner	187	45.0
Manager	86	20.7
Officer	82	19.7
Staff	61	14.7
Education		
Post-graduation	127	30.5
Graduation	156	37.5
Higher secondary	93	22.4
Secondary	28	6.7
Primary	9	2.2
Other	3	.7

Table 2 Respondents demographics (continued)

Demographics	*Frequency*	*%*
Income		
Below 20 k	165	39.7
20–40 k	139	33.4
40–60 k	56	13.5
60–80 k	26	6.3
80–100 k	16	3.8
Above 100 k	14	3.4
Age		
Below 20 y	9	2.2
20–30 y	239	57.5
30–40 y	113	27.2
40–50 y	43	10.3
50–60 y	12	2.9
Gender		
Male	396	95.2
Female	20	4.8

4.5 Hypotheses testing

4.5.1 Data analysis and result

The SEM is considered to be the best fit for data analysis for the purpose of this study. A large number of scholars and researchers around the world have adopted SEM for multivariate data analysis where the networks of constructs are complex in nature (Azam and Quaddus, 2013). The study nature and its practical implications, therefore, led us to employ the PLS-based SEM for the data analysis (Barclay et al., 1995).

4.5.2 Measurement model

To assess the measurement model, a confirmatory factor analysis was conducted through Smart PLS (Version 3.2.6). For this purpose, the Fornell-Larcker criteria (Fornell and Larcker, 1981) was examined to evaluate the reliability, convergent validity, and discriminant validity of the constructs. Composite reliability (CR) was considered to assess the construct reliability of the measurement model where the CR for each of the factors in the model were above 0.80 which is, therefore, met the acceptable threshold as proposed by Nunnally and Bernstein (1994).

Following the past evidence (Anderson and Gerbing, 1988), factor loadings within the constructs and the correlation between the constructs were examined to meet the construct validity. The analysis projects a highly satisfactory level of factor loadings (ranged between 0.554 and 0.885) with an acceptable critical ratio and significance level. Therefore, the factor loading range of each construct satisfies the item convergence on the projected constructs (see Table 3).

Following the suggestions of Barclay et al. (1995) and Igbaria et al. (1995), the square root of the average variance extracted (AVE) and cross loading matrix have been used in this study to assess the discriminant validity. According to Barclay et al. (1995), the constructs of a model are said to be discriminant if the square-root of the AVE of a particular construct is higher than its correlation with other constructs. The square roots of the AVEs and the correlations among the latent variables are shown in Table 3. The main diagonal of the table represents the square roots of the AVEs and the correlations among the latent variables are shown in the off diagonal of the table. Results shown in Table 3 projects the evidence for discriminant validity of the constructs.

Table 3 Convergent validity and reliability

Constructs	*No. of items*	*Standard loading range**	*Cronbach's alpha*	*Composite reliability*	*AVE*
RELAD	3	0.733–0.86	0.846	0.855	0.664
CMPAT	6	0.711–0.807	0.703	0.887	0.567
CMPLEX	3	0.694–0.839	0.792	0.831	0.623
OINNO	8	0.554–0.833	0.765	0.88	0.483
INDSUP	3	0.767–0.885	0.846	0.855	0.664
CUSRED	4	0.645–0.848	0.752	0.865	0.619
INTENT	5	0.656–0.811	0.802	0.862	0.558

Note: *all standardised loadings are significant at $p < 0.01$ level.

Following the suggestion of Barclay et al. (1995), cross loading matrix was also produced to cross-check the discriminant validity shown in Table 3. The cross-loading analysis projects that the loading of the items on a particular constructs was higher than the loading of the items on other constructs, therefore, met the criteria as suggested by Barclay et al. (1995). Due to the shortage of space, we did not show cross loading matrix in this paper.

Table 4 Discriminant validity

Factor	*Items*	*CMPAT*	*CMPLEX*	*CUSRED*	*INDSUP*	*OINNO*	*RELAD*	*INTENT*
Compatibility	6	*0.753*						
Complexity	3	0.52	*0.789*					
Customer readiness	4	0.509	0.416	*0.787*				
Indus support	3	0.179	0.169	0.09	*0.815*			
Owner innovativeness	8	0.557	0.49	0.455	0.149	*0.695*		
Relative advantage	3	0.493	0.302	0.447	0.13	0.492	*0.815*	
Willingness	5	0.462	0.33	0.418	0.093	0.482	0.296	*0.747*

Notes: CMPAT = compatibility, CMPLEX = complexity, CUSRED = customer readiness, INDSUP = industry support, OINNO = owners' innovativeness, RELAD = relative advantage, INTENT = intention/online marketplace entry decision.

4.5.3 Structural model

The hypothesised relationships were tested through structural model. An application of bootstrap method with Smart PLS was employed to examine those relationships. Table 5 presents the results of path coefficients and t-statistics.

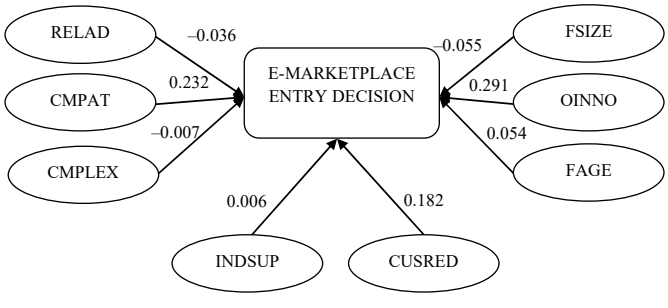
Table 5 Structural model

	Hypotheses	*Beta*	*t-statistics*	*Comments*
Relative advantage → willingness	H1	–0.036	0.598	Rejected
Compatibility → willingness	*H2*	*0.232*	*3.769***	*Accepted*
Complexity → willingness	H3	–0.007	0.123	Rejected
Firm SIZE → willingness	H4	–0.055	1.275	Rejected
Owner innovativeness → willingness	*H5*	*0.291*	*4.146***	*Accepted*
Firm age → willingness	H6	0.054	1.177	Rejected
Indus support → willingness	H7	0.006	0.141	Rejected
Customer readiness → willingness	*H8*	*0.182*	*2.977***	*Accepted*

Notes: **p < 0.01; $R^2 = 0.318$

The structural model projects that hypotheses H_2, H_5, and H_8 among all the primary hypotheses are accepted (significant *t*-values). The results indicate that firms' internal compatibility, owner innovativeness, and customer readiness are very much influential in small firms' online marketplace entry decision. On the other hand, the structural model also presents that hypotheses H_1, H_3, H_4, H_6, and H_7 are rejected (insignificant *t*-values). This study result shows that perceived relative advantage, complexity, firm size, firm age, and industry support are not that much significant in influencing small firms' online marketplace entry decision. The research model explains 31.8% of small firms' online marketplace entry decision in a developing country setting.

Figure 2 The comprehensive model estimates



Notes: RELAD = relative advantages, CMPAT = compatibility, CMPLEX= complexity, FSIZE = firm size, OINNO = owners innovativeness, FAGE = firm age, INDSUP = industry support, CUSRED = customer readiness.

5 Discussion

The study illustrates the magnitude of the effects of various technology-organisation-environment related factors on small firms' e-marketplace entry decision in Bangladesh. The test result shows that *compatibility* (technological variable), *owner innovativeness* (organisational variable), and *customer readiness* (environmental variable) have significant impact on small firms' e-marketplace entry decision. Therefore, the model parameter estimates show an acceptance of hypotheses H_2, H_5, and H_8, and a rejection of hypotheses H_1, H_3, H_4, H_6, and H_7. *Relative advantage* was hypothesised as having positive impact on firms' intention to enter to electronic marketplace. It was assumed that firms perceiving e-marketplace participation advantageous were supposed to be more likely to have a positive attitude towards online marketplace participation. However, the study did not produce any significant relationship between perceived relative advantage and small firms' e-marketplace entry decision which is contrary to the previous results (Bakos, 1998; Chandra and Kumar, 2018). This result might be the reflection of the sample firms since all the sample firms were already in online marketplace and thus they did not differentiate benefits of online market participation from not participating there.

The test result shows *compatibility,* another technology related variable has significant relationship with small firms' e-marketplace entry decision which is supported by the previous studies (Wymer and Regan, 2005; Chandra and Kumar, 2018). This infers the fact that the firms having more compatibility with online market operation are more likely to participate online. The study measures the firm compatibility with the online business operations considering the cost of new system installation, consistency with the existing workflows, appropriateness of firms' internal IT infrastructure, consistency with the traditional business operations. Based on the notion of the TOE (Tornatzky and Fleischer, 1990) framework, it was hypothesised that *compatibility* has a significant impact on small firms' e-marketplace entry decision. However, the test result accepted the hypothesis which has some implications for existing and potential entrants in online marketplace as well as for policy makers. The participants, both existing and potential, may focus on their internal IT infrastructure development to comply with their existing workflows. On the other hand, the policy makers may emphasise on way outing for making the firms compatible with the technology usage.

Complexity was also identified as another technology related variable having strong impact on small firms' e-marketplace entry decision. Thus it was hypothesised that firms perceiving complexity in participating and operating their business online are unlikely to enter into the electronic marketplace. However, the study result rejected the hypothesis with an insignificant *t*-value (–0.007) which contradicts with prior studies (Bakos, 1998; Stockdale and Standing, 2006). The possible explanation for the insignificant test result for *complexity* regarding the small firms' e-marketplace entry decision could be the sample firms who were the users of technology and the participants of electronic marketplaces might not face any problem in participating and conducting their business in electronic marketplaces, and thus did not show any importance on that aspect.

Based on the previous studies (Thong, 1999; Matta et al., 2012) it was hypothesised that *firm size* has a strong positive relation with firms' e-marketplace participation. The study could not find any significant relationship between the *firm size* and firm online market entry decision, thus rejected the hypothesis H_4 which is contrary to the findings of Thong (1999). On the other hand, this result is supported by some other previous studies (Chandra and Kumar, 2018). The possible explanation of this result is that all the sample

firms were of same size, i.e., small in nature. As a result, the estimation did not produce any significant result to show a strong relationship between *firm size* and firms' e-marketplace entry decision.

This study revealed a strong significant positive effect of owner innovativeness on small firms' electronic marketplace entry behaviour (Hypothesis H_5 was accepted) which confirms previous studies (Thong and Yap, 1995; Thong, 1999). The study shows that the more the owners are innovative, the more the likelihood of the firms' online market entry. The measurement items consider whether the owners of the firms have risk taking ability or not as well as how much educated they are were also considered. The owners' age and knowledge about technological advancement and development were importantly considered to assess the owners' innovativeness. The result of this study shows that if the owners are of young age, and are well educated, then there is more chance to participate online. The study also represents that owners' risk taking ability and knowledge and interest on the technological advancement around the world largely affects the small firms' online market entry decision.

The hypothesis related to firm age (H_6) was rejected by the estimation since it did not produce any significant relationship between the firm age and the firms' online market entry decision which contrasts the findings of Chandra and Kumar (2018).

Two factors related to environment were identified in this study and therefore, two hypotheses were developed to test their significance on small firms' e-marketplace entry decision. *Industry support* is one of the environment related factors and the study result shows insignificant relationship between *industry support* and small firms' online market entry decision which is contrary to the prior results (Howarth, 2001; Stockdale and Standing, 2004; Azam and Quaddus, 2012).

Based on the TOE framework as developed by Tornatzky and Fleischer (1990), it was hypothesised (H_8) that *customer readiness* positively affects small firms' online market entry decision. As hypothesised, the study shows a strong positive effect of *customer readiness* ($\gamma = 0.182$) on small firms' e-marketplace entry decision in Bangladesh which is complementary to other prior studies (Ching and Ellis, 2004; Azam, 2014, Chandra and Kumar, 2018). The measurement items focused on customers' internet usage propensity, technology usage trend, online transaction capability, and the total number of internet users in Bangladesh. The study finds a composition of all these items in a higher customer readiness which largely influence small firms to participate online for market expansion by reaching diverse and vast market.

6 Research implications and conclusions

6.1 Theoretical and practical implications

The current study contributes to the extant electronic marketplace research in many ways. First, the study provides an empirically validated theoretical framework to examine the effects of various technology-organisation-environment related determinants of electronic marketplace entry decision of small firms from a developing country settings. This study helps extend the electronic marketplace research from developed economy perspective to developing or transitioning economy perspective. For example, the key difference between a developed country and a developing country setting is the difference in country governance, business environment, and IT infrastructure. This could be

witnessed from the study of MacGregor and Vrazalic (2005) which was administered in urban regional areas of Australia and Sweden where structured and organised business environment was a prevailing condition whereas, this study provides empirical evidence from a relatively poor business and IT infrastructure environment perspective. It is important to mention that our study has administered the survey countrywide which covers both the urban and rural region of the country. Thus, this study has developed and empirically validated a conceptual framework to investigate the small firms' e-marketplace entry behaviour in Bangladesh. The conceptual model developed and validated in this study, therefore, can be used as a basis for studying electronic marketplace adoption behaviour of small firms in similar transitioning or developing economies.

On the other hand, our study, to some extent provides similar insight about the factors affecting firms' online marketplace participation and performance over the online marketplace. For example, Wan and Wang (2018) show that owners' creativity is important to perform well online which is also depicted in our study. However, the main difference between the contexts of these two studies is the coverage of e-commerce platforms where the prior study has focused on the firms performing on a single e-commerce platform while our study has covered firms participating in all the leading e-commerce platforms in Bangladesh. Therefore, the current study posits a more inclusive and extensive evidence than the prior one. More clearly, it is observed that our study context and empirical results are quite unique and expand the knowledge of the critical factors of e-marketplace participation by small firms in Bangladesh and in similar developing countries.

Small firms are considered as heart of the national economy. The economic growth of a country largely depends on the development of small enterprises. By taking part in electronic marketplace, small firms in a developing country may obtain enormous business potentials by market expansion across the countries around the world. Therefore, the small firms in developing countries need to understand the ample benefits of e-marketplaces and the increasing demand for the electronic marketplace participation to ensure the competitive advantages. Moreover, to increase the pace of small firms' electronic marketplace participation, the small firms and the online marketplace operators have to understand critical factors affecting the e-marketplace participation decision. Entrepreneurs, e-marketplace administrators, and the government need to consider the existing workflows, values, business practices, and past experience of the adopters while developing an electronic marketplace model to ensure massive participation of small firms operating in the developing countries. Thus, the current study demonstrates exclusive findings in respect to the development of e-marketplace and small firms' participation into it. Therefore, with the findings of the study, small firms can successfully manage their business operations through optimum utilisation of their resources whereas the e-market developers can develop a compatible online market model for the effective use of the marketplaces.

The study also shows that owners innovativeness significantly affect small firms' e-marketplace participation. Such findings shed lights on the importance of the e-marketplace awareness development among the owners or the top management of the small firms. Therefore, the finding of the study stimulates the government and the e-marketplace administrators to promote the education, knowledge sharing systems, and intrapersonal skill development which will result in innovative human resources, who will in turn, be more likely to participate in the e-marketplaces.

Further, the finding of the current study reveals that customers' choice, education, age, and their technology usage trend largely affect the e-marketplace entry decision of small firms. Therefore, to ensure a sustainable electronic marketplace, the e-market operators have to attract both the customers and business firms. Additionally, the government or the policy makers have to formulate favourable policies that will protect the customers' rights so that the customers get the electronic marketplace usage trend up which will accelerate the pace of small firms' entry to e-marketplace.

Technology driven business activities largely rely on the government's initiatives to ensure quality education, technical support centres, developed IT infrastructure, availability of digital devices like computer or smart phones and financial supports for the small firms for doing business online, and also to motivate small firm owners and various stakeholders to overcome the challenges prevail in the traditional markets. Hence, the study provides small firm owners and their top management, e-marketplace operators, and the government with meaningful information for the development of increased electronic marketplace participation by small firms in developing countries.

6.2 Conclusions

The present study examines various technology, organisation, and environment related factors which affect small firms' e-marketplace entry decision from a developing country settings. Based on extensive literature review a comprehensive research model is developed which is validated through a quantitative survey. A PLS-based SEM is employed to validate the conceptual model. The empirical findings of the study reveal that firm technology compatibility, owners' innovativeness, and customers' readiness are crucial determinants of small firms' e-marketplace entry decision in developing country like Bangladesh. However, perceived relative advantage, perceived complexity, industry support, firm size, and firm age do not show any significant impact on small firms' e-marketplace entry decision. The findings of the study is believed to be of significant importance in modelling and profiling small firms' behaviour to participate in the online marketplaces in the developing countries perspective. Additionally, the significant contribution of the study on the factors affecting small firms' e-marketplace entry decision may also motivate researchers to look at the broader perspective of small enterprises' electronic marketplace entry phenomena in examining the impact of e-market operations on the firm performance.

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Notes

1 Information about the speed of internet services in Bangladesh has been collected from the official record of Teletalk Bangladesh Ltd., a government owned mobile telephony and Internet service provider in Bangladesh.

2 For the interest of this study we define small firms which have less than 100 employees (National Industrial Policy 2016 of Bangladesh).

3 Please see demographic information of the interviewee in Appendix 1, factors and variables, and their sources in Appendix 2, and nodes and quotes for the exploration of variables from field study in Appendix 3.

4 Bikroy.com and Daraz are two popular e-marketplace conducting B2C type business services in Bangladesh.

Appendix 1

Demographic information of the interviewee

Variables	*Respondents*											
	R-1	*R-2*	*R-3*	*R-4*	*R-5*	*R-6*	*R-7*	*R-8*	*R-9*	*R-10*	*R-11*	*R-12*
Nature of business	Retailer	Vendor	Manufacturer and retailer	Retailer	Wholesaler	Service provider	Retailer	Retailer	Retailer	Supplier	Retailer	Supplier
Size (no. of staff)	8	25	4	3	4	2	2	6	2	7	3	12
Position	Assistant manager	Managing director	Owner	Owner	Owner	Managing director	Owner	Owner (partner)	Owner	Owner (partner)	Owner	Owner (partner)
Education	MBA	BSc (Engg.)	BBA	BBA	Graduate	LLB	BBA	BBA	BBA	BBA	BBA	BBA
IT knowledge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of establishment	2012	2009	2011	2012	2015	2015	2018	2018	2017	2019	2016	2016
E-marketplace usage proportion	100%	100%	60%	50%	20%	25%	100%	100%	100%	50%	100%	40%

Appendix 2

Factors and variables, and their sources

Factors	*Variables*	*Respondents*												*Literature*
		R-1	*R-2*	*R-3*	*R-4*	*R-5*	*R-6*	*R-7*	*R-8*	*R-9*	*R-10*	*R-11*	*R-12*	
Relative advantages	Lower transaction cost	√	√	√				√	√	√			√	Stockdale and Standing (2004), Timmers (1999), Tumolo (2001), Bakos (1998), Clemons et al. (1993), Modahl (1999) and MacGregor and Vrazalic (2004)
	Access to a wider market (domestic and international)	√	√	√	√	√	√	√	√	√	√	√	√	Loane (2005), Tumolo (2001), MacGregor and Vrazalic (2005) and Stockdale and Standing (2006)
	Greater potential for partnership		√						√		√			Hurwitz (2000) and Tumolo (2001)
	Better customer dealing	√	√			√		√	√	√				Bakos (1998), Tumolo (2001), Lawson et al. (2003) and Stockdale and Standing (2006)
	Prompt transaction	√		√				√	√					Field study
	Hassle free shopping	√	√	√	√			√	√	√	√			Field study
	24*7 business dealing	√				√	√	√	√	√	√	√		Deeter-Schmelz et al. (2001), Hurwitz (2000) and Lin and Hsieh (2000)
Compatibility	Operating cost of adoption		√	√			√	√	√	√			√	Poon (2000), Thulani et al. (2010), Van Akkeren and Cavaye (1999), MacGregor and Vrazalic (2005) and Wymer and Regan (2005)
	Investment for technology and new system installation						√	√	√	√		√		Field study
	Processing time for adoption					√		√	√	√		√		Van Akkeren and Cavaye (1999) and Stockdale and Standing (2006)
	Compatible with existing workflow						√	√	√				√	O'Callaghan et al. (1992)
	Internal IT infrastructure			√	√		√	√	√			√		Ashrafi and Murtaza (2008)

Factors and variables, and their sources (continued)

Factors	*Variables*	*Respondents*												*Literature*
		R-1	*R-2*	*R-3*	*R-4*	*R-5*	*R-6*	*R-7*	*R-8*	*R-9*	*R-10*	*R-11*	*R-12*	
Complexity	Payment mode	√		√	√			√	√		√			Bakos (1998), Clemons et al. (1993), Malone et al. (1987), Modahl (19990) and Tumolo (2001)
	Payment security	√	√		√			√	√			√	√	Field study
	Limited expert		√			√							√	Van Akkeren and Cavaye (1999) and Stockdale and Standing (2006)
	Requires technology competency			√				√	√					Field study
Firm size	Firm size	√		√	√			√	√	√				Walczuch et al. (2000), Premkumar and Roberts (1999) and Thong (1999)
Owners' innovativeness	Owners knowledge on technology	√	√	√		√	√	√	√	√				Field study
	Owners' education	√	√	√	√	√	√	√	√	√	√	√	√	Field study
	Owner's age		√			√	√	√	√			√		Thong (1999)
Industry support	Lack of support form market makers							√				√		Stockdale and Standing (2003, 2004) and Korchak and Rodman (2001)
	Supplier readiness	√				√	√	√		√				Field study
Customer readiness	Customers online participation	√	√	√	√			√	√	√	√	√		Ching and Ellis (2004), Thong and Yap (1995) and Premkumar and Roberts (1999)
	Age of customers	√	√	√				√	√	√			√	Field study
	Technology usage trend	√	√	√	√			√	√	√	√	√	√	Field study
	Education	√	√	√	√	√	√	√	√	√	√	√	√	Brancheau and Wetherbe (1990), Kimberly and Evanisko (1981) and Palvia et al. (1994)
	Customer buying culture	√		√	√			√	√	√	√	√	√	Field study

Appendix 3

Nodes and quotes for the exploration of variables from field study

Nodes/themes	*Quotes*	*Comments*
Prompt transaction	Respondent 1 (R-1) said, "[…] since we deal online, people can get idea seeing our product detail online and can order online or just by making a phone call to us. This process saves our time and enable us to make transactions faster." Respondent 3 (R-3) said, "[aaa], actually we provide all the details of our products online, people can make their choice sitting at home, and can order online by mentioning the product code and quantity which is not that easy to do in traditional shops, because, […] you need to move around, walk around, ask the sellers, visit multiple shops or markets, […] and all that need hours of time."	*Prompt transaction* is considered as an influential variable to address firms' intention to adopt online business.
Hassle free shopping	Respondent 1 (R-1) mentions that "[…] people of Dhaka city (the capital of Bangladesh) can enjoy a hassle free shopping sitting at home since there is a great problem of traffic jam in the city […]."Respondent 2 (R-2), 3 (R-3), and 4 (R-4) also opine similarly. Additionally, a service provider (Respondent 6) states, "[…] at Rajshahi (a divisional city in Bangladesh) we prefer personal interaction in dealing with customers, […] since it is not a big city, people knows about the service providers and can easily contact personally to get services. […] But in a crowded mega city like Dhaka, people may feel comfort to search and compare services sitting at home using the Internet […]".	*Hassle free shopping* is an influential factor affecting small firms' e-marketplace entry decision.
Investment for technology and new system installation	Respondent 4 said, "[…] I did not feel any problem to start my business online because I had a personal computer at home already, and I use smartphones having Internet connections in both, […] and just created a free facebook page to market my products, […]." Respondent 6 said, "[…] for us, it seems unnecessary to bear the cost of website design and its' maintenance."	*Investment for technology and new system installation* is logically explored as an antecedents of online business.
Payment security	Respondent 2 opinioned that "[…] basically we have two basic mode of payment for our products and services, viz., cash payment, and payment through mobile banking. We don't find any problem with cash payment, however, sometimes, our customers hesitate to pay through mobile banking in advance."	*Payment security* is found as an influential factor that may affect small firms' online market entry decision.
Technology competency	Respondent 3 said, "[…] of course, it (dealing online) requires a minimum technology competency. […] person without having any knowledge on IT cannot run a business online. […] I had knowledge on basic computer operations, […] which helped me a lot in taking the decision of starting business online sitting at home."	*Technology competency* has been explored as an important variable influencing firms' move towards online business.

Nodes and quotes for the exploration of variables from field study (continued)

Nodes/themes	*Quotes*	*Comments*
Owners' knowledge on technology	Respondent 2 said, "I have completed my graduation in telecommunication engineering, […] you would find most of the entrepreneur in this field are from engineering background." Respondent 6 said, "I had a training on IT and it helps me in operating my things online." Respondent 5 said, "without having any ABC (fundamental knowledge) on technology use, one cannot deal online."	*Owners' knowledge on technology* has a significant impact on firms' e-marketplace entry decision.
Owners' education	Respondent 1 said, "[…] yes, of course, […] the owners of this firm are well educated, […] they (owners) are from IT background."	*Owners' education* has significant impact on technology adoption process.
Supplier readiness	Respondent 1 said, "[…] look, we deal in fish. We collect it from the fishermen directly, then […], and you know, none of our fishermen use internet. We can connect them through voice calls using mobile phone only."	The study explores *supplier readiness* negatively related to the firms' electronic marketplace entry decision. We may interpret it as an inhibitor of firms' online market entry decision.
Customers' age and technology usage trend	Respondent 1 said, "most of our target customers are of young age, […] they stay busy with their office in day time, […] generally (they) don't get time to shop, […] almost everybody use a smartphone with Internet connection, […] they like to shop online sitting at home. […] especially our Bhaabi community (indicating women community) now a day like to shop their necessary things online." Respondent 2 said, "[…] the internet users in Bangladesh is around 80 million, […] and this is your market size." Respondent 3 said, "the young generation of our country is our target customer. […] using smartphone with internet connection is a general trend here now, and they like to shop online very much. […] such trend gives us huge opportunity to do business online."	*Customer age* and *technology usage trend* affect small firms' electronic marketplace entry decision.
Customer buying culture	Respondent 3 said, "customers of our country like to visit and compare multiple shops and then decide to buy a thing. […] they like to bargain with seller face to face […]." Respondent 11, a retailer and supplier of seasonal fruits, specially the Mango across the country and outside the country. They states that, "[…], people of this region relies more on face to face dealing than remote one. […]. However, by providing quality fruits, we need to develop their trust on our service."	