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Why do citizens use e-tax system? Extending the technology continuance theory

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ABSTRACT

Among the various online services provided by the government, e-tax system is one of the commonly used e-government platforms, which offers significant benefits to government and citizens by reducing costs, eliminate human errors, and reduce the turnaround time for processing income tax returns. Despite these plausible benefits, some reservations have been articulated regarding the continuance usage intention of e-tax system. Thus, we investigate the most critical factors of e-tax continuance usage in this paper. We developed an integrated theoretical model based on the technology continuance theory (TCT) extended with social influence and perceived risk. The proposed conceptual model was empirically validated with data collected from a sample of 345 e-tax service users in Bangladesh. Partial least squares structural equation modeling (PLS-SEM) was employed to analyze the collected data. The study findings suggest that user satisfaction, perceived usefulness, and attitude have a direct impact on continuance usage intention where confirmation, ease of use and social influence have indirect influence on continuance usage intention of e-tax system. This paper discusses some contributions to theory and practice based on our findings.

Introduction

The advancement of e-technologies has led to numerous changes in the lives of citizens and the ways governments deliver their services to citizens. Today, governments have recognized the necessity of e-technologies and overwhelmingly incorporated these technologies for improving public services. In this line, many e-government initiatives have been set up to provide quality services to citizens, distribute knowledge, develop solidarity among citizens, create employment opportunities, and ensure a competitive environment for government bodies and private organizations (Hesson & Al‐Ameed, 2007). Like the developed countries, the use of ICTs in developing countries has helped to improve internal efficacy as well as to improve service delivery (Bhatnagar, 2009; Santhanamery & Ramayah, 2015). Among the various online services provided by the governments, e-tax service is one of the most commonly used e-government platforms (Veeramootoo et al., 2018).

Electronic filing of personal income tax, commonly known as e-tax is a vital online application that automates income tax related processes to increase efficiency in assessing and collecting income tax related information. The e-tax service has been recognized as a potential tool for tax service innovation as well as costs savings for both taxpayers and government tax collecting agencies (Fu et al., 2006). It also combines tax preparation, submission of online tax returns and online tax payment facilities under a single platform (Ambali, 2009). The e-tax system is especially valuable for tax collecting agencies since the system facilitates to avoid many mistakes while dealing with the manual filings and help to detect tax evasion through data matching. The data collected through the electronic tax information assists tax authority to examine the tax declaration more efficiently and accurately. Besides, such data enables policymakers to develop a fair and comprehensive tax policy (Manly et al., 2005). On the other hand, the e-tax service method reliably

ensures access to and provides government data and services to citizens, organizations, employees, and other entities (Akram, Malik, Shareef, & Awais Shakir Goraya, 2019; Bélanger & Carter, 2008; Dwivedi, 2016).

Despite these revealed benefits of e-tax service, government incentives and media campaigns to motivate citizens to go online for government services, the majority of citizens in developing countries do not use e-tax services (Bhuasiri et al., 2016; Harfouche, 2010; Veeramootoo et al., 2018). However, the success of e-government initiatives like e-tax service depends on whether governments can persuade citizens to accept and use of this service continuously. If citizens do not use the e-tax service, then the e-government projects will fail and the public money will be wasted (Lallmahomed et al., 2017). Therefore, to reap up the full benefits from government investments in digitalization, it is needed to encourage people to shift from offline to the online platform. As the number of new users of the e-tax system is rapidly growing and citizens who have already taken the e-tax services in use, the tax authorities need to keep them in track to facilitate their continuance usage intention. Therefore, research on the factors affecting continuous usage intention of e-tax service is a worthy initiative and a vital research agenda. The findings of these studies can be essential to augment the continuance usage intention of e-tax service to the benefits of tax payers as well as governments (Veeramootoo et al., 2018). However, existing studies in this domain have been criticized for not considering theories and models that investigate post-adoption behavior.

The adoption and continuation are two separate theoretical notions, which are influenced by different sets of factors (Islam et al., 2016). Santhanamery and Ramayah (2018) and Islam (2012) argued that users' behavior concerning an IS changes after their initial adoption based on their perceived expectation with the system, which may ultimately strengthen rise or decline their future usage intention. However, most of the prior studies have borrowed theories from the adoption literature to investigate the continuance usage intention of e-tax system (Ambali, 2009; Santhanamery & Ramayah, 2018). To this end, numerous theories such as the Technology Acceptance Model (TAM), the unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) were used in this domain (Nabavi, 2016; Ortiz de Guinea, 2009). Scholars argue that many of these theories may be useful for explaining initial IS adoption, by may not be inherently appropriate for researching continuance usage behavior (Islam et al., 2015; Talukder, Chiong, Corbitt, et al., 2019). Bhattacherjee and Barfar (2011) confirmed after a comprehensive review of the literature that theories originally developed to explain customer acceptance of an IS were incorrectly used to predict continuing behavior. Therefore, scholars need to follow more suitable models to grasp continuance behavior instead depend on adoption models (Islam, 2016; Nabavi, 2016).

To overcome the gaps mentioned above, this study proposes an integrated research model in the context of e-tax system continuance usage intention based on the technology continuance theory (TCT) by Liao et al. (2009). The main benefit of using the TCT is that satisfaction and attitude are combined into a single model while retaining variables such as ease of use and usefulness as the first level of antecedents (Liao et al., 2009; Weng et al., 2017). The proposed model was further extended with additional context-specific predictors (i.e., social influence and perceived risk) that were found significant in prior literature to investigate post-adoption behavior (Veeramootoo et al., 2018; Weng et al., 2017).

Data were collected from 345 Bangladesh e-tax system users and analyzed using SEM to investigate the critical factors influencing the continued usage intention of e-tax service. The study findings indicate that satisfaction, perceived usefulness, attitude, and social influence have a significant impact on continuance usage behavior, while the perceived risk's effect has not been supported. This study offers a significant contribution to the existing literature in the e-government domain by validating the TCT model as well as expanding it with social influence and perceived risk.

The structure of our paper is as follows. First, we review extant research on e-tax system and then discuss the need to extend existing theory to the continuance intention of e-tax system. Second, based on TCT, we develop our theoretical model and hypotheses. Third, we provide a detailed description of our research methodology, followed by the presentation of the results. Finally, we discuss the major findings, implications, limitations, and conclusion of this study.

Literature review

Theoretical and Conceptual Background

After a through literature review, we found only a few studies have been conducted on users' continuance usage intention of e-tax system (see the details in Table 1) (Santhanamery and Ramayah, 2018; Veeramootoo et al. 2018). It implies that, while the existing studies have tended to investigate individuals' decisions to initially adopt an IT, there is less attention paid to the post-adoption environment where individuals decide between continuing and discontinuing usage of an IT (Thong et al., 2006). But the benefits of e-tax services are linked to its adoption and continuance usage (Asianzu & Maiga, 2012). Bhattacherjee (2001) argued that although initial acceptance is important in recognizing the success of an information system but continued usage is even more significant in ensuring the long-term viability of technology innovations. If citizens do not adopt and continuously take advantage of e-government services, then e-government projects may fail, and taxpayers' money may be wasted (Lallmahomed et al., 2017). Further, Bhattacherjee (2001) argued that the ultimate viability of an IT is dependent on individuals' continued usage of the IT If the enthusiasm over the initial adoption of an IT diminishes after individuals gain experience from using it, then the IT will suffer from decreased usage and may even fall into disuse subsequently. When this happens, organizations that developed the IT or built their services around the IT would need to write-off their significant investments in developing and implementing the IT (Thong et al.,

2006). For many business-to-consumer e-commerce organizations, the continued usage decision or user retention is essential for guaranteeing the long-term profitability of these organizations (Bhattacherjee, 2001; Parthasarathy & Bhattacherjee, 1998; Reichheld & Schefter, 2000). The potential benefits from increasing user retention rate can include a substantial reduction in operating costs and possibly a dramatic increase in profits (Crego & Schiffrin, 1995; Reichheld & Sasser, 1990). Owing to the significant influence of continued usage on the long-term viability of an IT, it is important to research the factors that influence individuals' post-adoption behavior (Thong et al., 2006). As the number of people using e-filing rises, tax authorities need to devise measures to ensure that users continue using the system. Nonetheless, most e-government research skewed towards factors affecting citizens' adoption intention (Carter et al., 2016; Rana et al., 2015; Shareef et al., 2011) and continuance intention toward e-government services, in general, yet e-tax filing is still in infancy (Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018).

Furthermore, adoption and continuance behavior are two theoretically distinct concepts and are affected by different sets of factors. Users' behavior with respect to an information system (IS) after initial adoption changes based on their experiences with the system, which may ultimately increase or decrease future usage (Santhanamery & Ramayah, 2018; Venkatesh et al., 2011). However, the majority of studies have borrowed constructs from the adoption literature to study e-filing continuance usage intention (Ambali, 2009; Santhanamery & Ramayah, 2018). To this end, various theories such as the technology acceptance model (TAM), the unified theory of acceptance, the use of technology (UTAUT), the IS success model, the theory of planned behavior (TPB), and the social cognitive theory (SCT) have been used to study continuance intention behavior (Nabavi et al., 2016). Researchers posit that many of these theories, although valuable to understand initial adoption of an IS, are not necessarily suitable to study continuance usage behavior (De Guinea & Markus, 2009; Nabavi et al., 2016). Following an exhaustive review of the literature, Bhattacherjee and Barfar (2011) concluded that theories originally developed to explain consumer acceptance of an IS have been applied inappropriately to predict continuance usage behavior. There is therefore, a need for researchers to adopt more appropriate models and constructs to understand continuance behavior instead relying on traditional models (Nabavi et al., 2016).

To address the above identified research gap, this study validates technology continuance theory (TCT) in the context of e-tax continuance intention. The TCT was recommended as an improved model for the IS continuance that is appropriate for the total life cycle of acceptance (Santhanamery & Ramayah, 2018; Weng et al., 2017). We also extend the model by including perceived risks (Fu, 2006; Veeramootoo et al., 2018) and social influence (Carter et al., 2011) given their importance in influencing continuance usage behavior of an IS.

Table 1: Literature review summary

Authors (year)	Main Theory	Method	Sample	Country	Significant predictor
Hu et al. (2009)	Extended TAM	Survey	518	China	Security, Convenience, Usefulness Ease of use, Service quality
Santhanamery & Ramayah, (2012)	No specific theory	Survey	1000	Malaysia	Usefulness, Ease of use, Optimism bias
Santhanamery and Ramayah (2014)	No specific theory	Survey	116	Malaysia	Confirmation, Perceived usefulness, Satisfaction
Santhanamery & Ramayah, (2015)	ECT	Survey	40	Malaysia	Ethnicity, Extraversion, Conscientiousness Neurotism, Agreeableness, Openness
Santhanamery, (2016)	Extended TPB	Survey	236	Malaysia	Correctness, Response time, Security, Attitude, Perceived risk
Santhanamery & Ramayah, (2018)	TCT	Survey	435	Malaysia	Confirmation, Perceived usefulness, Perceived ease of use, Attitude Satisfaction
Akram, Malik, Shareef, & Awais Shakir Goraya, (2019)	IS Success model	Survey	582	Pakistan	Perceived functional benefits, Confirmation Satisfaction, Perceived risk
Veeramootoo et al., (2018)	ECT & IS success model	Survey	660	Mauritania	Information quality, System quality Service quality, User satisfaction Confirmation, Habit, Perceived risk

Source: Authors

Empirical Studies and Hypothesis Development

Confirmation

Confirmation is the congruence between the expectation and actual performance of the service (Bhattacherjee, 2001). Users' confirmation of expectations advocates that users develop their expectations from using a technology, and confirm their expectations after their actual use. If users obtain expected benefits through their usage experiences with an IS, this leads to a positive effect on users' satisfaction (Bhattacherjee, 2001; Thong et al., 2006). Prior studies on continuous usage behavior have confirmed that the level of user satisfaction with the system is positively influenced by the level of confirmation (Bhattacherjee, 2001; Nascimento et al., 2018; Veeramootoo et al., 2018). Following this, we suggest that users' decision for e-tax usage is influenced by their initial expectations from e-tax system and their actual post usage experience. After visiting online tax system, the extent to which users'

expectations are met, ultimately affects satisfaction levels with the system. Likewise, based on the level of confirmation, the perception of perceived usefulness is also changed. Confirmed users would perceive that the system would bring benefits for them whereas, disconfirmation may reverse the perception of usefulness. In fact, past studies also found a strong positive association between confirmation and expected usefulness (Bhattacherjee, 2001; Nascimento et al., 2018; Weng et al., 2017). Therefore, we propose the following hypotheses:

H1. Confirmation positively influences user satisfaction.

H2. Confirmation positively influences perceived usefulness.

Perceived Usefulness

Perceived usefulness is the individuals' perceptions of a particular system that will assist them in accomplishing their job better (Davis, 1989). An individual who perceives a particular type of system as useful, is more likely to be satisfied with that system than one who perceives else. Perceived usefulness has a direct impact on attitudes towards using a service and attitude in turn affects behavioral intentions (Davis, 1989; Taylor & Todd, 1995). A number of prior studies have shown that perceived usefulness has a significant positive effect on attitude, and on satisfaction (Bhattacherjee, 2001; Iranmanesh et al., 2017).

Further, once users realize that using a particular system can enrich their efficiency, they may want to continue to use that system. In this respect, Bhattacherjee (2001) claimed that users will always want to keep using a particular system that can help them improve productivity. Past studies on information systems have also shown that perceived usefulness has a significant positive impact on users' continuance usage intention (Bhattacherjee, 2001; Islam, 2015; Weng et al., 2017). In our study context, users need to see the e-tax service system will help them to file their taxes more easily and efficiently compared with the traditional paper-based tax system. The more useful users feel from the e-tax system, and the more satisfied they are and the more likely they will continue to use the service. Therefore, we develop the following hypotheses:

H3. Perceived Usefulness positively influences attitude.

H4. Perceived Usefulness positively influences continuance usage intention.

H5. Perceived Usefulness positively influences satisfaction.

Perceived ease of use

In the context of government digital services, citizens must perceive that electronic systems in the public sector are easy to use. A system that is too complex will reduce its benefits (Carter et al., 2011). Many past studies have found a strong positive association between perceived ease of use and perceive usefulness (Islam & Mäntymäki, 2011; Shiau & Chau, 2016; Weng et al., 2017). Similarly, e-Tax system is generally recognized as more useful when the users find that it is easy to use. On the other hand, users of e-tax service need to realize that the e-tax system is a friendly tool for accomplishing income tax-related works, receive information more easily and quickly with minimum efforts. Besides, users need to feel that the e-tax system is relatively easy to learn. In our case, e-tax system must be easy to use to encourage users to use it. The better the impression of system ease of use, the better the perception of system effectiveness will result. Therefore, we posit the following hypotheses.

H6. Perceived ease of use positively influences perceived usefulness.

H7. Perceived ease of use positively influences attitude.

Satisfaction

Satisfaction is the individuals' psychological state arising from the unconfirmed perceptions or emotions of the environment, combined with the past feelings of the consumers regarding their consumption experiences (Oliver, 1981). Individuals' continuance intention, which is their commitment to post-adoption, is contingent on their satisfaction (Liao et al., 2009). In the government digital services context, previous experience with government online channels plays an important role in forming their satisfaction levels. Pleasant experience tends to use government e-services and assures the success of public services. Prior researches have validated a significant positive influence of users' satisfaction on their continuance intention for e-government (Akram, Malik, Shareef, & Awais Shakir Goraya, 2019; Hong, 2017). In the context of the e-tax service, the users' satisfaction with the system may derive their continuance intention to use.

Though some past studies regard to attitude and satisfaction as synonymous with each other, many scholars assert that these two constructs are different from a conceptual viewpoint (Iranmanesh et al., 2017). Attitude is more enduring and goes beyond prior experiences, while satisfaction appears to be considered as a transient and experience-related factor (Liao et al., 2009). Satisfaction has been found to play a critical role in predicting consumers' attitudes and continuous behaviors (Sayyah Gilani et al., 2017; Weng et al., 2017). Notwithstanding satisfaction and attitude are viewed as two distinct constructs, their effects on user behavior can possibly be combined. For that reason, the following hypotheses have been developed:

H8. User satisfaction positively influences continuance usage intention.

H9. User satisfaction positively influences attitude.

Attitude

Attitude refers to the degree to which an individual has a favorable or unfavorable opinion or perception of the behavior in question (Ajzen, 1991). If taxpayers have an optimistic view to a new system and technology, they are more eager to take benefit from it (Lee, 2010). The literature suggests that the attitude impacts the use and adoption of IS significantly (Lee, 2010; Liao et al., 2009). Thus, it is believed that when users have positive attitudes towards the e-tax system, they will most likely use it. Based on this, we propose the following hypothesis:

H10. The attitude positively influences continuance usage intention.

Social Influence

Social influence refers to the pressure from society, friends, relatives and other influential to perform or not to perform a certain behavior (Lee, 2010). Specifically, social influence is linked with the views about the expectation from others. Weng et al. (2017) evidenced that social influence has a significant effect on the intentions and attitudes of individuals concerning certain types of behavior. It is believed that many users would decide to make use of an e-tax system if it is also used by their friends and surrounding people. Therefore, in the current study, we hypothesize the following:

H11. Social influence positively influences attitude toward continuance usage intention.

Perceived risk

In IS use context, perceived risks are the uncertainties linked with the exposure and loss of individual information while performing online transactions (Veeramootoo et al., 2018). Concerning the e-tax service, perceived risk is the amount of uncertainty or anxiety that a taxpayer experiences while using the e-tax system (Azmi & Kamarulzaman, 2010). Online tax filing systems are more prone to cyber-attacks. Such factors have stimulated users' risk perception of the system, which ultimately adversely impacts their attitudes (Schaupp & Carter, 2010). In this line, Hung et al. (2006) investigated the impact of perceived risk on attitude in Taiwan's e-tax system and found that perceived risk has a negative impact on attitude. Users' risk perception is relevant while examining their continuance usage intention toward e-tax system. When the users think that the third party may mishandle their personal information, then they will stop to continue e-tax service use. Carter et al. (2011) concluded that perceived risk greatly affects the decision of a person to use the e-tax system due to the various inconsistencies affiliated with the Internet. However, Veeramootoo et al. (2018) did not find any relationship between perceived risk and continuance intention of e-tax service. In consideration of these uncertainties that surround online-based transactions, we hypothesize the following:

H12. Perceived risk negatively influences attitude towards continuance intention.

H13. Perceived risk negatively influences continuance usage intention.

Research Model

In our study, we used TCT to predict the continuance usage intention of the e-tax system among taxpayers. The TCT was proposed as an enhanced model for the IS continuance by combining ECM and TAM (Liao et al., 2009). The main strength of the TCT model is that it incorporates satisfaction and attitude into a single continuance paradigm while retaining the other variables of perceived ease of use and perceived usefulness as the first layer predictors (Liao et al., 2009). Compared to the ECM and TAM, the TCT has been used in this study because of its explanatory power (Liao et al., 2009; Weng et al., 2017). Many prior study findings have recommended that the social influence and perceived risk are important for investigating continuance usage intention (Weng et al., 2017). In this respect, the present study has adopted social influence and perceived risk into the original TCT, aiming to better predict the attitude and continuance intention. More justification regarding the inclusion of social influence and perceived risk are given in the next section. The modified TCT model is shown in Figure 1.
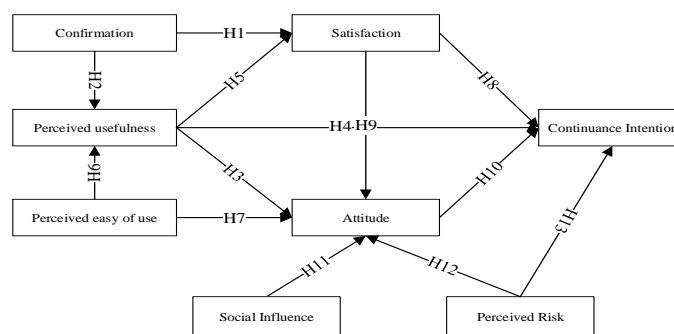

Figure 1: Research Model

Research and methodology

Study context

This study has been conducted in Bangladesh. The government of Bangladesh has been leveraging the advantages of e-government through several applications. Among the e-government services in Bangladesh, the most popular one is the e-tax service, also known as 'e-filing'. The e-tax service was introduced by the National Board of Revenue (NBR), Bangladesh in November 2016. In the first two years, there has been a great enthusiasm among the taxpayers about e-tax. Among the taxpayers, about 44,000 taxpayers have submitted online tax returns in 2017, which is about 3 percent of the total tax returns filed in the fiscal year 2016-17 and the number of online filers in 2017-18 was about 1,28,000[1]. But e-tax use dropped off in the following years. The tax authority received just 2,700 and 6,000 returns online the following fiscal year 2018-19 and 2019-20, respectively[1]. The above data shows the importance of investigating the reasons for low acceptance and drop out of e-tax system. The full benefits of e-tax cannot be achieved if it is not accepted and continuously used by citizens (Veeramootoo et al., 2018). Therefore, studies on the salient factors influencing continuance use intention of e-filing is a laudable initiative and a vital component of a future research agenda.

Measurement Instruments

To enhance the content validity, all measuring instruments with minor context-specific changes were adopted from existing literature. Two researchers with expertise in technology adoption research initially pre-tested the questionnaire instruments to improve clarity, accuracy, and comprehensibility. The questionnaire has two sections: section (A) contains demographic information about the age, gender, and knowledge of e-tax systems, while section (B) includes questions indicating the research model constructs. All constructs were measured using a five-point Likert scale, ranging from 1 'strongly disagree' to 5 'strongly agree'. The measuring instruments and the source of the items are set out in Appendix A.

Sample selection and survey method

The target population of this study comprised of only those Bangladeshi individuals who had experience in using e-tax system. In the absence of an appropriate sampling frame, a convenience sampling method was employed to select the target respondents. This approach of data collection is easy to use, flexible, low-cost and time-saving (Ruhl, 2004; Sekaran, 2006). It allows the researcher to obtain basic data and to achieve the required sample size in a relatively fast and inexpensive way (Kothari, 2004). The convenience sample can support researchers to collect suitable data and information that is not possible using other sampling techniques, which need more formal access to lists of populations (Bujang et al., 2012). Moreover, convenience sampling is common in studies assessing continuance usage of e-government services including e-tax (Almaiah et al., 2020; Talukder, Chiong, Corbitt, et al., 2019; Veeramootoo et al., 2018; Wang et al., 2020).

Data collection was conducted at important and suitable locations such as universities, playgrounds, parks, supermarkets, and community services situated in different parts of Bangladesh. At these locations, respondents were approached, and then we clarified the research context to those who agreed to participate in the survey. We informed that the received information would be handled with total confidentiality. The questionnaire included a filter question that asked the respondents if they had used the NBR e-tax system beforehand. Only those who had used the system at least once were asked to complete the survey. While the majority of the respondents completed the questionnaire on the spot, others requested that the survey instrument is sent to them via email. In such cases, the researchers took note of the email addresses and the questionnaire was sent to them. Four hundred fifty hard copies and 109 e-copies were distributed to respondents. In total, 400 respondents completed the survey, resulting in a response rate of 72%. In order to avoid statistical biases due to missing data, following (Hair et al., 2006), we eliminated 55 questionnaires that contained >10% missing responses across any of the scale items, resulting in a final usable sample of 345. The summary of the respondent details is given in Appendix B.

Statistical analyses

SPSS 23.0 and SmartPLS 3.2.8 version software were used for data analysis. Covariance-based SEM was used in order to overcome the constraints of component-based SEM with regard to properties of distribution, sample size, measurement model, model complexity, identification and factor indeterminacy. Covariance-based SEM is usually applied with an objective of the model test and validation and requires a large sample (Tenenhaus et al., 2004). If the objective of the study is theory testing, covariance-based SEM (AMOS, LISREL, etc.) is justifiable, whereas variance-based SEM (SmartPLS, PLS Graph, etc.) is more justifiable for developing theory and identifying the associations (Hew et al., 2017). PLS is the prediction-oriented SEM approach and can deal with model complexity; therefore, in the current study, we have used PLS method for the analysis.

Multivariate Assumptions

The assumptions of Multivariate Analysis were tested before utilizing SEM for data analysis.

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[1] http://nbr.gov.bd/publications/income-tax/eng

Linearity

All the possible types of relationships between the variables such as linear, quadratic, cubic, logarithmic, exponential, compound, growth, inverse, and logistics were tested using Curve-estimation. The p-values of linearity for all the proposed relationships came out to be less than 0.05 (Hair et al., 2006). Hence, the relationships were concluded to be reasonably linear for SEM to be applied as an analysis technique.

Normality

The data were tested for skewness and kurtosis in SPSS to ensure normality. All the computed values were observed to lie within -1 to +1, hence, concluding the data to be normally distributed (Azzalini et al., 2016).

Multi-collinearity

The values for VIF (Variance Inflation Factor) were computed 3-4 times by putting a different variable as a dependent variable each time to ensure that there are no major variations in the values. All the values came out to be less than 3, which is a widely accepted threshold for VIF (Kock, 2015). Hence, it was concluded that there is no issue of multi-collinearity with the data.

Homoscedasticity

The scatter plots were generated to ensure that the assumption of Homoscedasticity is satisfied. The random disturbances between the relationship of each independent variable and the dependent variable, continuance usage intention were equidistant from the regression line across all values of the independent variables (Ooi et al., 2018). The scores obtained did not follow any systematic pattern rather were distributed in a rectangular shape. Hence, it was concluded that the assumption of Homoscedasticity is fulfilled.

Common method bias

Common method bias (CMB) is implicit in behavioral research, which uses cross-sectional data from surveys as all the data were self-reported, we looked at CMB, which may be a potential concern to the study outcome. We applied Harman's single factor test (Harman, 1976). Our test results showed that a single construct accounted for 39.64% of the total variance, far below the recommended 50% (Podsakoff et al., 2003). We re-validated CMB using other approaches because of growing disagreement with the merits of Harman's single-factor test (Harman, 1976). Following Bagozzi (1991), we checked the construct correlation matrix (Table 3) in the measurement tool and found no correlation above 0.90. Therefore, CMB is not a major problem for this study.

Reliability and Validity Measurement

We assessed the internal reliability, consistency, convergent and discriminant validity. In Table 2, the items loadings, composite reliability, Cronbach's alpha and Average Variance Extraction (AVE) for each latent construct are presented. The values of Cronbach alpha (α), composite reliability, rho_A and AVE were acceptable range (Hair et al., 2013). The square roots of AVEs, which are shown as diagonal element in Table 3, were greater than the off-diagonal element, which confirmed the discriminant validity for each construct (Henseler et al., 2009).

Table 2: Measurement Model

Constructs	Items	Loadings	Cronbach's Alpha	rho_A	CR	AVE
Attitude	AT1	0.899	0.865	0.866	0.918	0.788
	AT2	0.879				
	AT3	0.885				
Confirmation	CON1	0.865	0.83	0.832	0.898	0.746
	CON2	0.851				
	CON3	0.875				
Continuous usage intention	CUI1	0.9	0.868	0.87	0.919	0.792
	CUI2	0.907				
	CUI3	0.863				
Ease of Use	PEU1	0.866	0.841	0.85	0.904	0.759
	PEU2	0.905				
	PEU3	0.841				
Perceived usefulness	PEU1	0.834	0.863	0.867	0.907	0.709
	PEU2	0.862				
	PEU3	0.863				
	PEU4	0.808				
Perceived Risk	PR1	0.843	0.864	0.867	0.907	0.71
	PR2	0.829				

Table 2 Cont'd

	PR3	0.84				
	PR4	0.857				
Satisfaction	SAT1	0.883	0.859	0.861	0.905	0.703
	SAT2	0.85				
	SAT3	0.817				
	SAT4	0.803				
Social Influence	SI1	0.808	0.844	0.847	0.895	0.681
	SI2	0.827				
	SI3	0.829				

Note: CR = Composite Reliability; AVE = Average Variance Extracted

Table 3: Correlation Matrix and the square root of the AVE

	ATT	CON	CUI	PEU	PU	PR	SAT	SI
ATT	**0.888**							
CON	0.564	**0.864**						
CUI	0.660	0.660	**0.890**					
PEU	0.355	0.306	0.249	**0.871**				
PU	0.578	0.614	0.752	0.320	**0.842**			
PR	0.417	0.529	0.445	0.354	0.597	**0.842**		
SAT	0.665	0.710	0.755	0.331	0.729	0.542	**0.839**	
SI	0.608	0.576	0.697	0.371	0.549	0.677	0.560	**0.825**

Structural Measurement and Hypothesis Testing

SmartPLS 3.2.8, a widely accepted statistical software, was utilized to inspect the structural path coefficients and the R-square values of endogenous constructs. Furthermore, the bootstrapping method at 5% significant level was also applied for testing the hypotheses. These values were extracted by running with 5000 samples and no sign changes in the bootstrapping technique. Among the thirteen examined relationships, ten had been statistically significant (Figure 2). The proposed model explained 60.7% for attitude, 42.9% for satisfaction, 22.9% for perceived usefulness, and 71.7% of the variance of continuance usage intention of e-tax system.
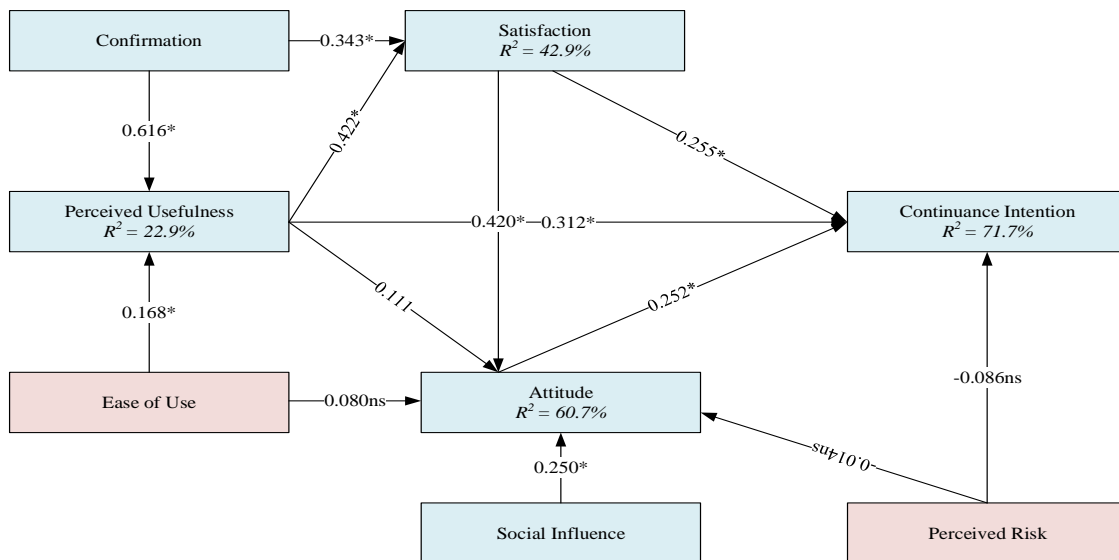

Figure 2: PLS results of the structural model

Note: * = Significant at P < 0.05; ns = not significant; the numbers along the arrows refer to the coefficient values.

Discussions

The main objective of this study was to identify factors affecting continuance usage intention of e-tax system. Our framework, rooted within the TCT model by Liao et al. (2009), with two additional predictors, namely perceived risk and social influence, comprehend

the factors that influence users' continuance usage intention of e-tax system. The finding of the study shows that, except for three hypotheses, all the hypotheses in the proposed model were supported.

Specifically, the results indicate that confirmation and perceived ease of use were significant antecedents of perceived usefulness. The positive effects of the confirmation ($\beta = 0.616$, $p < 0.001$) and perceived ease of use ($\beta = 0.168$, $p < 0.001$) on perceived usefulness are in line with the results of Chen et al. (2014) and Weng et al. (2017). Our findings imply that confirmation of the users' expectations after actual use has an important effect on forming their perceived usefulness of e-tax service. Besides, ease of use plays a role in shaping perceived usefulness during the post-adoption stage. From this perspective, the service providers should develop user-friendly services and increase their effort to meet the expectations of their users.

Furthermore, perceived usefulness ($\beta = 0.111$, $p < 0.001$), social influence ($\beta = 0.250$, $p < 0.01$), and satisfaction ($\beta = 0.420$, $p < 0.01$) had significant effects on attitude, which are consistent with other studies (Kimathi et al., 2019; Weng et al., 2017). These results imply that users will have positive attitudes towards using a service when they perceive that using the system will help them to submit their tax return in an easier and faster way, they perceive social pressure to use the system for filing return, and they are satisfied with the system. The significant effect of the social influence on the users' attitudes indicates that users are expected to refer to the opinions of their friends, family members, and colleagues and may favor these sources over mass media reports and expert opinions (Talukder, Chiong, Corbitt, et al., 2019).

However, the effect of the perceived ease of use ($\beta = 0.080$, $p > 0.001$) and the perceived risk ($\beta = 0.014$, $p > 0.05$) on attitude were not supported. These findings are consistent with previous studies (Bhuasiri et al., 2016; Thominathan & Ramayah, 2015). The explanation is that as citizens broaden their expertise and become experienced with the e-tax system, it becomes a routine for them. Therefore, perceived ease of use did not influence attitude. On the other hand, if e-tax users are satisfied with the system and their families and friends think positively about the use of the service, this could be a safe way to get services, and thereby the risk they perceive will not be of concern (Talukder et al., 2019).

The results also confirm the impacts of the perceived usefulness ($\beta = 0.312$, $p > 0.001$), satisfaction ($\beta = 0.255$, $p > 0.001$) and attitude ($\beta = 0.252$, $p > 0.001$) on the continuance intention to use the e-tax service. These findings are consistent with Liao et al. (2009) and Venkatesh and Davis (1996). The study indicates that perceived usefulness is the strongest predictor of continuance usage intention. Upon finding the e-tax service useful, users will intend to continue using the system to submit their taxes online. Users who are not satisfied with the services may, however, stop using the services, although they have a positive perception of its usefulness. It is therefore recommended that the service providers establish a user-friendly system and expand their efforts to meet their users' expectations (Veeramootoo et al., 2018).

Finally, the effect of the perceived risk ($\beta = 0.086$, $p > 0.001$) on continuance usage intention was not supported. Although this result was unexpected at the same time is consistent with few existing studies (Bhuasiri et al., 2016; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018). For instance, Bhuasiri et al. (2016) argued that perceived risks lose their importance when citizens display positive attitudes toward the service provider. The sensible reason may be that with the increase in the use of smartphones and the Internet, the Bangladeshi residents are becoming more knowledgeable about information technology (Hossain Md et al., 2020). Due to the collectivist culture and customs, Bangladeshi people are not much concerned regarding their privacy and financial risks (Hoque et al., 2016; Talukder et al., 2020). Consequently, the result might be the true reflection of the present socio-economic and cultural conditions of Bangladesh.

Implications

Theoretical implications

This study has some theoretical contributions to the current information systems literature, particularly in the e-tax service domain. Online tax service is mostly assessed from acceptance and adoption perspective and ignored continuance usage intention (Akram, Malik, Shareef, & Goraya, 2019; Santhanamery & Ramayah, 2018; Veeramootoo et al., 2018). This study is one of the first attempts to explore the determinants of the e-tax users' continuance intention by employing the TCT model. Previous research employed the TCT to explore the post-adoption behavior in different domains, such as e-health, online games, mobile taxi booking, and e-learning (Hsu et al., 2014; Sayyah Gilani et al., 2017; Weng et al., 2017). Therefore, the current study confirms the generalizability and explanatory power of the TCT in e-tax context. This study is one of the first attempts to explore the determinants of the e-tax users' continuance intention by employing the TCT model. Previous research employed the TCT to explore the post-adoption behavior in different domains, such as e-health, online games, mobile taxi booking, and e-learning (Hsu et al., 2014; Sayyah Gilani et al., 2017; Weng et al., 2017). Therefore, the current study confirms the generalizability and explanatory power of the TCT in e-tax context.

This study also includes two additional context-specific variables namely- perceived privacy risk and habit to understand the continuance usage behavior of e-tax service. So far there is no of literatures on citizens' adoption and continuance usage intention of e-tax service in Bangladesh since its inception. To understand intention to use public sector online services especially e-tax service in Bangladesh, the study combines prominent IS continuance theories and contextual factors. It would provide a theoretical foundation for researching e-Government services adoption and continuance usage intention in the future. Finally, due to a generic approach, the findings of this study could be easily modified to assist other developing countries in planning and up-taking e-tax

services. Practically, the study provides valuable guidelines to policy makers, technology vendors and service providers in successfully implementing e-services like e-tax in developing nation. Finally, the outcomes of this study will be helpful to develop and implement suitable policies to influence more users to adopt and continuously use of e-government services like e-tax service.

Practical implications

This study also offers policy initiatives for providers of e-tax services, such as the National Board of Revenue (NBR), Bangladesh, aside from its theoretical implications. The conclusions of the analysis would be beneficial to decision-makers, service providers, who will refine their policies to strengthen e-tax systems, leading to an increased citizen's continuous usage. The findings indicate that satisfaction, attitude, perceived usefulness, and social influence are critical to the continuance usage of the e-tax service. Therefore, the tax authority may need to provide special attention to these significant predictors. Specifically, in order to prevent network failures, the service providers need to consider spending additional money to strengthen the operational architecture of the e-tax framework. Increased systems efficiency and stability, more robust system structures and maximum safety and protection should be underlined. They should propose intervening taxpayers to develop the website's functionality and to provide correct and up-to-date details. Promoting technology-enabled assistance, such as the smart portal, to provide citizens with enhanced and efficient online services, may need to be ensured. This may include tools such as virtual voice assistants, click to call, or online messaging services to help taxpayers immediately.

Confirmation was found to predict customer satisfaction significantly. The service provider should investigate ways to improve positive confirmation. The tax authority ought to be more attentive to customer requirements (Thong et al. 2006). Compliance with the tax return can be made more straightforward and problem-free for taxpayers. The tax authority should concentrate on opportunities for the use of the programs and constantly demonstrate to taxpayers the value of e-tax system. In addition, continuous use will also be improved by training individuals about how to successfully use the system. Finally, the substantial social influence indicates that the tax authority can proactively handle social effects on people by arranging gatherings to discuss best-use strategies, promoting champions who are keen to disseminate awareness and the value of the program and can generate meaningful terms, and preparing against steps to counter critical feedback (Talukder, Chiong, Corbitt, et al., 2019).

Conclusions

The objective of this work was to identify the factors that affect the continued use of e-tax services in Bangladesh. This study contributed by distinguishing between initial IS acceptance and continuous use. Many recent works on e-tax service have taken theories from the adoption research to analyze the continuous use behavior. The paper argued that current IS theories for initial adoption are not appropriate for the continuous use of e-taxes. According to this assertion, the TCT was found to be an ideal fit for the purpose of continued use. On the basis of this theory, the analysis confirmed the e-tax model of continued use. In addition, two additional determinants of e-tax continuance usage were introduced to respond to researchers' call for the expansion of established theory by the introduction of new constructs specific to particular contexts of e-government service use. Although result indicates positive influence of user satisfaction, perceived usefulness, and attitude on continuance usage intention while the influence of perceived risk was not statistically significant. It means that risk perception is not create much barrier in for the citizens of developing countries like Bangladesh. The strong predictive capacity of the structural model suggests that TCT provides successful theoretical grounds for the continued use of e-government systems, such as e-tax. Therefore, researchers may use our model to investigate the continuous use of other e-government contexts. Nonetheless, given that each e-government service has its own distinctive characteristics, researchers need to augment their model by including context-specific constructs (M. S. Talukder et al., 2019).

While this study has certain key implications for researchers and practitioners, it has some limitations that could contribute to further studies. Our research omits a variety of essential variables that might potentially explain consumer behavior. Potential research may concentrate on extending the study by adding constructs such as trust, self-efficacy and the habit of increasing the explanatory capacity of the conceptual framework. Second, this study was conducted employing cross-sectional data through convenience sampling from Bangladesh. Future research can be conducted using longitudinal data through a more reliable sampling method (i.e., random sampling). Although the convenience sampling method offers significant benefits to researchers, it may not deliver a representative result (Kothari, 2004). Third, the findings may be limited to continuance usage of e-tax only. The extent to which the results and conclusions of the study can be extended to other e-government system remain to be verified. Therefore, it is important for future studies to test the model in other e-government contexts to validate the results. Finally, the present study only focused on data from the citizen of Bangladesh, so the research findings are context-specific and cannot be generalized to other countries. Future studies should collect data from other countries and compare their results with this study to see if there are any differences.

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