

Determinants of E-government Technology Adoption for Government Employees in China: Based on the UTAUT3 Model

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[https://doi.org/10.4335/21.4.1043-1066\(2023\)](https://doi.org/10.4335/21.4.1043-1066(2023))
ISSN 1581-5374 Print/1855-363X Online © 2023 Lex localis
Available online at <http://journal.lex-localis.press>.

Abstract E-government technology (EGT) is the cornerstone of efficient government offices, which can streamline their work to enhance service quality for government employees. Thus, it is essential to examine the determinants of EGT implementation by government employees. Guided by the Unified Theory of Acceptance and Use of Technology 3 model, this research explores critical determinants that affect EGT adoption. Results from questionnaires completed by 207 Chinese government employees indicated that EGT adoption intention is positively affected by facilitating conditions (FC), habit (HB) and personal innovativeness (PI). Moreover, it partially mediates the relationship between HB and EGT adoption behavior, as well as PI and EGT adoption behavior. EGT adoption behavior is significantly affected by HB and PI. Surprisingly, research found other factors not significant for EGT adoption intention. This research contributes to the theory in the area of e-government and provides valuable insights for government agencies, with theoretical and practical significance.

Keywords: • UTAUT3 model • e-government • government employees • technology adoption • PLS-SEM

1 Introduction

E-government was considered by Sisman et al. (2009) as a pattern of agencies that utilizes information and communication technology (ICT) to elevate the efficiency of information exchange and services between public organizations and business organizations or citizens. Jongcheul (2004) argued that e-government is a public administration activity utilizing ICT that provides efficient public services and supports the development of democratic institutions through organizational change and improved policies. Brown and Brudney (2001) defined e-government as the utilization of web technologies to improve the ability of the public to obtain government information and services while providing them with efficient services. According to the above descriptions, it is obvious that e-government represents just one approach to implementing government affairs that combines government agencies with modern information technology (IT). Technology is just one method of achieving e-government, which changes the means of implementation of government to conduct business with those they serve (Yildiz, 2007). Therefore, the current research considers e-government technology (EGT) as the technology that applies IT to government management, services and decision-making to promote the efficiency and quality of government services.

The rapid growth of the Internet promotes the advancement of e-government, leading to a transformation of government from the industrial era to the information era. Adopting EGT within government agencies can fully share information and services, enhance public supervision, improve efficiency and promote open government (Al-Refaie & Ramadna, 2017). For e-government to be successfully implemented, there is a need for government employees at all levels to have excellent IT knowledge and certain information processing skills (Panda & Sahu, 2013). However, there are still many government employees who cannot adapt to the requirements of office automation and new developments in IT, making the application of EGT lag behind the pace of development (Gholami et al., 2021). Accordingly, it is meaningful to seriously examine the determinants that affect EGT adoption for government employees. This will help government agencies to improve their efficiency further and thus provide comprehensive and convenient services to society.

Scholars proposed several models to analyze technology adoption. The leading model for anticipating users' adoption of technology is widely acknowledged as the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This model has been further developed and extended by scholars to form the latest Unified Theory of Acceptance and Use of Technology 3 (UTAUT3) model. In the domain of e-government, most studies concerning technology adoption are citizen-centered. However, the number of studies conducted from the perspective of government employees is relatively limited. Additionally, existing studies on

technology adoption for testing the UTAUT3 model mainly concentrated on e-health (Mengesha et al., 2016), e-payment (Saha & Kiran, 2022), and higher education (Gunasinghe et al., 2019; Gunasinghe et al., 2020; Gupta et al., 2022; Tiwari et al., 2022). Despite the popularity of the UTAUT3 model, its applicability in the domain of e-government remains under-explored.

Farooq et al. (2017) suggested testing the suitability of the UTAUT3 model in a novel research environment. In response, the current research systematically examines a new research population (government employees) in a new context (e-government) and a new cultural environment (China) using the UTAUT3 model to fill the gaps in existing studies. This research aims to explore critical determinants of EGT adoption for Chinese government employees based on the UTAUT3 model. Explicitly, research is designed to address two basic questions: (1) What determinants are potentially decisive in affecting the adoption of EGT for government employees in China? (2) How do these determinants affect the adoption of EGT for government employees respectively? The empirical results of the structural equation modeling analysis reveal that external environmental factors (facilitating conditions) and individual intrinsic factors (habit and personal innovativeness) greatly influence the decision of government employees to adopt EGT. By fully exploring the determinants of EGT adoption among government employees using the UTAUT3 model, this research facilitates in-depth research and development of theories related to technology adoption and e-government. At the same time, it provides theoretical support for creating a favorable environment for technology adoption in government agencies. Lastly, corresponding countermeasures and suggestions are proposed for government agencies, policymakers and technology developers to encourage government employees to adopt EGT.

2 Literature overview

In research on IT adoption, the Theory of Planned Behavior (TPB), UTAUT and Technology Acceptance Model (TAM) have been widely used and tested (Rehouma & Hofmann, 2018). Among them, the most extensively applied traditional model is the UTAUT model. Venkatesh et al. (2003) consolidated the crucial determinants that drive ICT adoption by employees within organizational settings and constructed this model. Venkatesh et al. (2012) enhanced the UTAUT model by incorporating three new independent variables, known as the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). The additions included hedonic motivation (HM), perceived value (PV) and habit (HB). Then, Farooq et al. (2017) proposed the UTAUT3 model, which builds upon the UTAUT2 model by adding the independent variable “personal innovativeness” (PI).

So far, several scholars have tested the UTAUT3 model to some extent. Research concluded that PI, EE (effort expectancy), FC (facilitating conditions), HB and HM significantly affect the adoption of virtual learning environments and e-learning for users. Conversely, PI and SI (social influence) have no significant effects (Gunasinghe et al., 2019; Gunasinghe et al., 2020). Gupta et al. (2022) explored the determinants affecting the adoption of virtual communication technology (VCT) for leaders in higher education. Results confirmed that EE, FC, PI, PE (performance expectancy) and SI are important determinants of VCT adoption. Tiwari et al. (2022) concluded that EE, PV, PI, PE and SI are found to affect teachers' adoption of new technology. It follows that the predictive power and testing effectiveness of the same model framework vary somewhat depending on the field of study. Thus, there is a need to examine the extent to which users adopt technology in different contexts. At present, the UTAUT3 model with strong explanatory power chosen for this research has not been extensively examined in the domain of G2E (Government to Employee, G2E). Hence, the current research tests and verifies the applicability of this model, contributing to the domain of e-government and IT adoption.

3 Hypotheses development

According to Venkatesh et al. (2012), PV represents an individual's perception of the balance between the benefits they perceive from utilizing the system and the expenses associated with its use. Against the background of consumers' adoption of technology, the decisions made by consumers are significantly impacted by the price. This is because price determines the cost of equipment and technology services that consumers need to purchase and thus influences whether consumers make adoption decisions (Brown & Venkatesh, 2005; Coulter & Coulter, 2007). However, the workplace environment in this research is different from the consumer environment. Employees in government agencies have free access to systems and technologies without paying associated costs. Therefore, the current research considers that there is no effect of PV on the adoption of EGT for government employees.

PE refers to the extent to which an individual has a belief that utilizing a specific technology will elevate their work performance and achieve higher benefits (Venkatesh et al., 2003). In this research, PE represents the government employees' assessments of the support that adopting EGT provides in boosting their work performance. PE is related to the usefulness of technology, which reflects the extent of confidence individuals have in the adoption of technology. When individuals determine whether to adopt new technology, they first consider if the technology will be conducive to increased efficiency. If they deem new technology to be practical, they will have strong adoption intention (Williams et al., 2015). The reason behind this is their assurance that new technology can efficiently assist them in completing work tasks. For government employees, adopting EGT can greatly

simplify associated workflow and increase productivity. Once they perceive the usefulness of technology, there is a high probability that they will consider adopting it for job-related benefits. Therefore, one hypothesis is as follows:

H1. PE positively affects behavioral intention to adopt EGT for government employees.

EE represents an individual's perception of the ease of utilizing a technology or system (Venkatesh et al., 2003). Ease of use and complexity are two constructs that reflect EE (Venkatesh et al., 2003). In this research, EE denotes the government employees' perceptions of the usability of EGT and its level of ease. It is measured by assessing easiness to learn and use EGT. Davis (1989) suggested that users must learn and remember accordingly in order to master new technology. However, when the learning and memorization process is complex, users make selective cognitive trade-offs. Generally, people have a clear preference for things that save them a tremendous amount of effort and time (Venkatesh et al., 2003). When it takes minimal time and effort to master the usage of EGT, government employees will perceive it as easier to utilize new technology. Then they will expect a higher degree of performance from new technology, which will increase their adoption intentions. Accordingly, one hypothesis is as follows:

H2. EE positively affects behavioral intention to adopt EGT for government employees.

SI is interpreted as the extent to which an individual feels that those around him/her think he/she needs to adopt technology (Venkatesh et al., 2003). The concept of SI in the current research is defined as the influence of others' behaviors or environmental factors on an individual's adoption behavior of new technology. These influences stem from the pressure exerted by institutional policies or peers and the opinions of leaders or peer friends. They can affect individuals' intention and ability to adopt new technology by altering their cognition, emotions and behavior (Venkatesh et al., 2003). SI affects individuals' behavior through three mechanisms: conformity, identification and internalization (Venkatesh & Davis, 2000; Warshaw, 1980). The mechanism of conformity plays a key role in coercive use settings. It leads individuals to change their behavioral intentions to deal with societal pressure. Group normativity makes a direct connection between SI and behavioral intention.

In voluntary use settings, SI arises through two mechanisms: identification and internalization (Venkatesh & Davis, 2000). On the one hand, identification acts as a mechanism when individuals perceive that performing a behavior is beneficial in maintaining or shaping their positive image in the group (Kelman, 1958). Individuals tend to adopt the advice of others to enhance their own image, which

leads to changes in their behavioral intentions. Government employees who are advised to adopt EGT may be willing to change their behavioral intentions to maintain a good image and increase social acceptance. On the other hand, when individuals are in the process of internalization, they believe that the induced behavior is consistent with their own values through the persuasion or behavioral influence of others (Hwang, 2011). In the current research, government employees working in the same office have opportunities to interact frequently with their colleagues and to observe each other's behavior. If they tend to agree with others, the internalization process occurs. In this case, individuals may be influenced by others. Thus, one hypothesis is as follows:

H3. SI positively affects behavioral intention to adopt EGT for government employees.

HM is depicted as the pleasure or satisfaction that an individual experiences from utilizing one technology or system (Venkatesh et al., 2012). This research defines HM as fun, enjoyment and pleasure that government employees get from adopting EGT at work. Basically, HM presents its intrinsic utility (e.g., fun, enjoyment, recreation, pleasure) as well as extrinsic utility (e.g., usefulness, efficiency) (Venkatesh et al., 2012). Alalwan et al. (2015) argued that these utilities not only increase people's confidence in adopting a particular IT but also can stimulate individuals' hedonic feelings, leading to a greater willingness to adopt it. EGT adoption can help government employees to improve productivity. In this process, government employees may develop a certain sense of pleasure and experience the usefulness of technology. Thereby, one hypothesis is as follows:

H4. HM positively affects behavioral intention to adopt EGT for government employees.

FC is identified as the extent to which an individual deems that existing organizational and technological infrastructure is capable of sustaining system use (Venkatesh et al., 2003). In the workplace, FC refers more to professional technical training, technical support services and timely guidance (Jaganathan et al., 2014). Therefore, the current research interprets FC as the infrastructure, technology and agency policies that support government employees in adopting EGT, and the extent to which leaders support employees and provide them with necessary training. FC consists of two components: resource-related elements (e.g., time and financial needs) and technology-related factors which may limit the use of the system (e.g., compatibility issues) (Venkatesh et al., 2003). FC affects individuals' assessments of the ease of completing a task, reflecting their beliefs in the organization and technology that supports the adoption of the system (Subawa et al., 2020). The presence of FC will increase the level of confidence of employees in technology

adoption. When employees are confident they are supported, they tend to consider adopting it.

Bhattacharjee (2000) argued that FC is an external constraint. When the infrastructure and conditions to sustain technology adoption are available, users have certainty and confidence in adopting technology and thus are more inclined to embrace it (Mtebe & Raisamo, 2014). Lack of timely assistance and support, inadequate information and restricted resources hinder individuals from embracing web-based technologies (Talor & Todd, 1995). This implies that easy access to support provided by organizations is the basis for individuals to adopt new technology (Iftakhar, 2016). Lack of such support will affect adoption behavior. Hence, the hypotheses are as follows:

H5a. FC positively affects behavioral intention to adopt EGT for government employees.

H5b. FC positively affects adoption behavior of EGT for government employees.

Limayem et al. (2007) interpreted HB as the extent to which an individual carries out a behavior automatically due to previous learning. In the current research, HB means that the act of EGT adoption has become an action that can be automatically performed at work. Habits are repetitive, unconscious and automatic behaviors of individuals that can shape human decision-making processes (Chuang, 2011; Liao et al., 2011). The formation of habits suggests the correlation between repeated behavioral norms in memory and the characteristics of the environment in which they are embedded (Verplanken & Aarts, 1999; Verplanken & Wood, 2006). The more frequently government employees adopt EGT at work, the more likely this behavior will become a habit. Once they are in the work environment, the habitual behavior of adopting EGT and the work environment will automatically create some kind of connection. At this time, government employees subconsciously believe that they should adopt EGT.

When one behavior is repeatedly reinforced and performed enough times, the habitual behavior is created. At this point, the emergence of habitual behavior does not require any behavior-related input to cause people to respond in a certain way directly (Verplanken & Aarts, 1999; Verplanken & Wood, 2006). Consequently, the hypotheses are as follows:

H6a. HB positively affects behavioral intention to adopt EGT for government employees.

H6b. HB positively affects adoption behavior of EGT for government employees.

PI is considered to be the extent to which individuals adapt to innovations more quickly than others (Rogers, 1983). From a broader perspective, PI is seen as a capacity driven by a person's personality (innovativeness), which includes being receptive to new thoughts, thinking independently, discovering creative ideas and uniquely making innovative decisions (Midgley & Dowling, 1978). In the current research, PI refers to the characteristic that a particular government employee can adopt EGT more quickly than others. Research demonstrated that PI is a crucial indicator of technology adoption, indirectly affecting individuals' behavioral intentions through social influence, sense of personal control and innovation characteristics (Jackson et al., 2013). The individual innovativeness of government employees directly affects their perception of new technology adoption. Highly innovative government employees are more inclined to recognize and perceive the usefulness of EGT through channels such as mass media and interpersonal communication. This population is more likely to trust EGT's capability to help them achieve their desired outcomes.

Moreover, innovation is associated with impulsiveness and risk-taking (Venkatraman & Price, 1990). An individual's adoption beliefs regarding new technology are positively correlated with their level of innovation (Lewis et al., 2003). For individuals who are innovative, they are more probably to be able to withstand risks associated with technological change and are most willing to embrace the adoption of new technology. Accordingly, the hypotheses are as follows:

H7a. PI positively affects behavioral intention to adopt EGT for government employees.

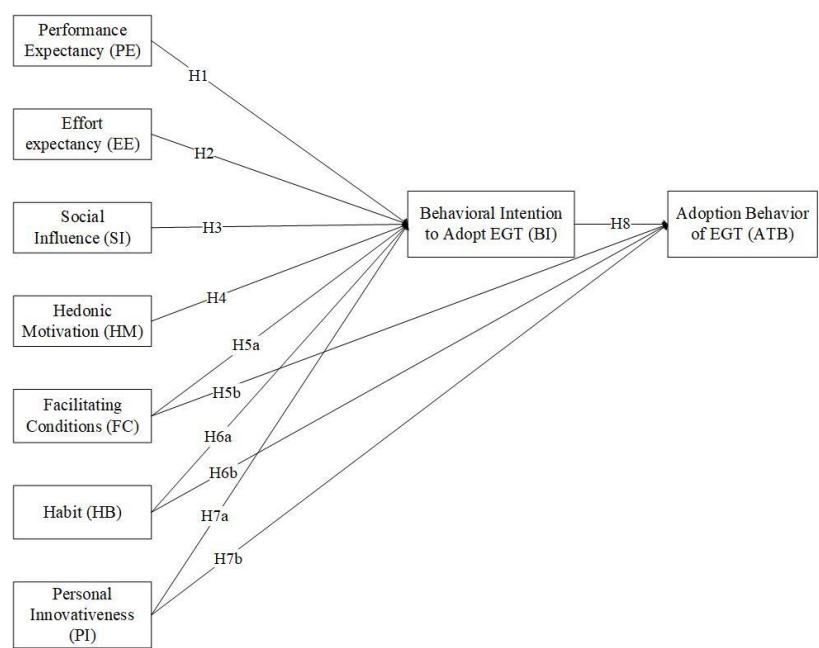
H7b. PI positively affects adoption behavior of EGT for government employees.

Behavioral intention can be described as the conscious desire or motivation of an individual to perform one specific behavior, which is a state of readiness before an individual carries out an action (Davis, 1989). As noted by Awwad and Al-Majali (2015), adoption behavior can be interpreted as the intensity with which users adopt technology. Behavioral intention indicates desire or purpose, which can be a predictor of desired behavior or actual adoption of technology (Venkatesh et al., 2003). Accordingly, before determining whether government employees will adopt EGT, it is essential to first identify their adoption intentions. Thus, one hypothesis is as follows:

H8. There is a strong relationship between behavioral intention to adopt EGT (BI) and adoption behavior of EGT (ATB) for government employees.

The research model proposed in this research is shown in Figure 1.

Figure 1: Research model



4 Methodology

4.1 Instrument

The questionnaire’s scales used were derived from scales validated in existing research, with some adaptations to the background of this research. The scales were professionally translated from the previous English into Chinese to ensure semantic consistency. This questionnaire was pretested by one expert and twelve government employees prior to its formal distribution. In response to the comments from participants, the questionnaire was further amended and optimized. Subsequently, it was officially distributed.

The questionnaire comprised two sections, the first of which gathered data on the demographic characteristics of survey participants. For example, education, gender, work experience and age. The second section concerned basic constructs of the UTAUT3 model, comprising a total of 34 question items. The participants in the survey were requested to evaluate each question on a seven-point scale. They were allowed to answer on a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The detailed version of the questionnaire utilized in this research can be accessed in Appendix A.

4.2 Sample

The data were collected from Credamo (<https://www.credamo.com>), a currently popular and widely used online survey website in China, which is a professional research platform with a large number of survey respondents. The questionnaire was distributed to the screened respondents (government employees) using the user screening function of this platform. Respondents' participation in this survey was entirely voluntary. They were first questioned with screening questions (e.g., whether they are government employees; whether they have adopted EGT to some extent) to determine their eligibility to continue participating in the survey. Respondents who answered in full received a bonus at the end of the questionnaire. After removing invalid questionnaires that did not pass the screening questions, highly consistent response values throughout the questionnaire and unreasonable response times, 207 valid questionnaires were finally adopted. Table 1 displayed data about the demographics of the respondents.

5 Data analysis and results

The research model was examined by the partial least squares structural equation model (PLS-SEM). There were two reasons why this method was chosen. Firstly, the research model had many potential variables and indicators, making it a relatively intricate model (Hair et al., 2019). Secondly, PLS-SEM can examine the theoretical framework based on a predictive perspective (Hair et al., 2019). This is consistent with the purpose of this research to test the UTAUT3 model and to determine the most crucial determinants affecting government employees' adoption of EGT. The measurement software utilized was SmartPLS 3.2.9.

5.1 Analysis of measurement model

The current research first verified the reliability and validity of each construct. In this process, factors such as indicator reliability, internal consistency reliability, convergent validity and discriminant validity should be taken into consideration (Hair et al., 2019). The external loadings of indicators were employed to assess the indicator reliability, with a value recommended to be above 0.7. As illustrated in Table 2, all values of the external loadings exceeded 0.7, indicating that the indicator reliability was acceptable. Internal consistency reliability could be assessed by referring to composite reliability (CR) and Cronbach's alpha (CA). According to Table 2, all potential variables had CR and CA values above a recommended value of 0.7. This denoted that the research model was valid and credible. Evaluation of the convergent validity employed the average variance

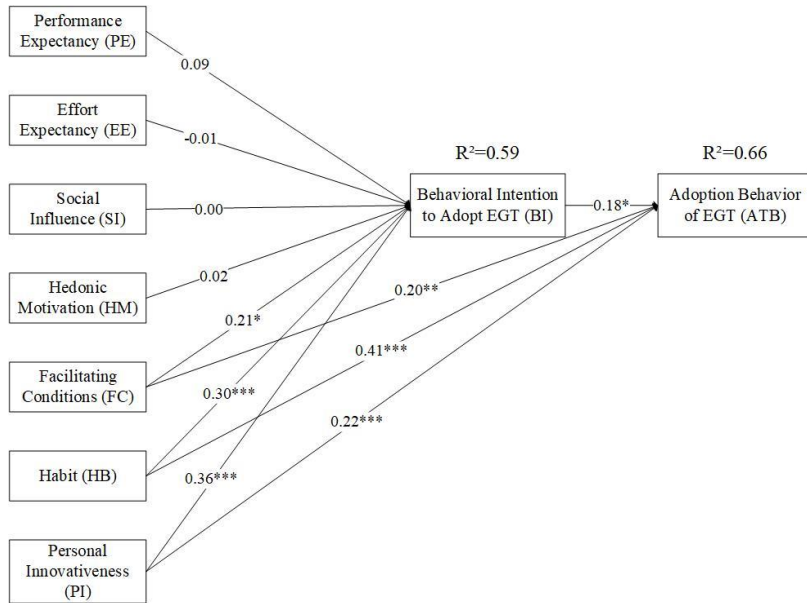
extracted (AVE) index, which should have a value higher than 0.5. The results in Table 2 indicated that the research model had a relatively good convergent validity. Discriminant validity is a statistical concept that evaluates the discrepancy between each construct. One of its evaluation criteria is the Fornell-Larcker criterion. This criterion stipulates that the discriminant validity of a construct can be determined if the square root of its AVE value exceeds the correlation coefficient between the construct and other constructs in the model. Detailed data were displayed in Table 3.

5.2 Analysis of structural model

The structural model was evaluated by assessing the significance and relevance of path coefficients, as well as the coefficient of determination (R^2). The evaluation was improved in terms of accuracy by executing a bootstrap algorithm with 5000 resampling iterations. Figure 2 displayed the standardized path coefficients (β) and explained the variance of endogenous variables.

Subsequently, a series of hypotheses proposed earlier were tested. The path coefficients illustrate the relationships between potential variables that were hypothesized. Table 4 revealed that FC ($\beta = 0.21$; $p < 0.05$), HB ($\beta = 0.30$; $p < 0.001$), and PI ($\beta = 0.36$; $p < 0.001$) exerted significant and positive effects upon BI. Thus, H5a, H6a and H7a were supported. However, PE, EE, SI and HM were not significant in predicting BI. H1, H2, H3 and H4 were found to be unsupported. Further relationships were also validated, with the observation that FC ($\beta = 0.20$; $p < 0.05$), HB ($\beta = 0.41$; $p < 0.01$), PI ($\beta = 0.22$; $p < 0.001$) and BI ($\beta = 0.18$; $p < 0.05$) were significant and influential in ATB. Thus, H5b, H6b, H7b and H8 were supported. Table 4 represented the results of all hypotheses established among constructs.

Figure 2: Estimated relationships of the structural model



The R^2 value was used to reflect the variance explained in each endogenous variable and to measure the effectiveness of structural models in predicting outcomes. Hair et al. (2011) stated that the level of predictive power can be considered weak when the R^2 value is at 0.25, moderate at 0.50 and substantial at 0.75. As illustrated in Figure 2, the research model was shown to explain 59% of the variance in BI ($R^2 = 0.59$) and 66% of the variance in ATB ($R^2 = 0.66$). This indicated that the theoretical model used in the current research had moderate explanatory power regarding government employees' adoption of EGT.

Ultimately, the examination of the mediating effect of behavioral intention was conducted. The direct effect of FC on ATB was revealed to be significant in Table 4. However, Table 5 illustrated that the indirect effect was not significant. Thus, BI has no mediating effect on the connection between FC and ATB. HB can significantly affect ATB directly (see Table 4) and indirectly through BI (see Table 5). Therefore, BI partially mediated the connection between HB and ATB. Similarly, BI partially mediated the effect of PI on ATB.

6 Discussion

Based on the UTAUT3 model, the current research explores the effects of different determinants on the adoption of EGT for government employees. The findings obtained from this research contribute to government agencies' better understanding of employees' adoption of new technology.

The empirical outcomes reveal that PI is the most powerful predictor of BI and ATB. The result is in accordance with existing research (Farooq et al., 2017; Suo et al., 2022; Tiwari et al., 2022). This finding emphasizes that individuals' own idiosyncratic factors should be considered when determining the intention to adopt EGT.

Similarly, HB significantly affects BI and ATB (Gunasinghe et al., 2019; Musa et al., 2022; Suo et al., 2022). It demonstrates that when government employees adopt EGT with high frequency and form a habit, the habit acts as a powerful force to increase their intentions to adopt new technology. Other than that, as the level of government employees' habitual adoption of EGT increases, they develop a solidified perception of the technology and have a certain dependence on EGT. At this point, government employees do not overthink before adopting EGT for their work but directly use the technology.

In addition, the adoption of EGT is significantly affected by FC (Farooq et al., 2017; Gunasinghe et al., 2019; Gupta et al., 2022; Meet et al., 2022; Tseng et al., 2022). It reveals that when adopting new technology, government employees consider the resources and information they practically have access to adopt the technology and whether they can obtain assistance and support from others.

The results also suggest a significant correlation between BI and ATB. As substantiated by existing literature (Farooq et al., 2017; Gunasinghe et al., 2019; Gupta et al., 2022; Musa et al., 2022; Tiwari et al., 2022), the stronger the adoption intention, the greater the probability of actual adoption. The high intention to adopt EGT implies that government employees hold an agreeable attitude about the technology. Once this technology needs to be adopted, they will be the first to act to adopt it.

However, PE is not a significant determinant of BI (Dhiman et al., 2020; Gupta et al., 2018; Tseng et al., 2022). This may be due to the fact that some functions of new technology are complex, time-consuming and tedious. Government employees do not perceive the usefulness and value of EGT, so PE is insufficient to reinforce their adoption intentions.

In this research, EE serves as a weak predictor of BI (Ain et al., 2016; Lewis et al., 2013; Suo et al., 2022). EE does not have a noticeable effect on users with more experience (Venkatesh et al., 2003). One possible explanation is that the respondents involved in this research had already adopted EGT. Most of them had higher education and had received computer-related learning. In essence, they have acquired certain technical skills and are adept at handling work tasks with the help of EGT. Therefore, the perceived effort of adopting EGT for work is not enough to motivate them to adopt EGT.

SI is considered to be an insignificant determinant (Gunasinghe et al., 2019; Gunasinghe et al., 2020; Meet et al., 2022). This research prefers the voluntary adoption of EGT for government employees. Users are less affected by the role of SI in voluntary adoption settings than in mandatory technology adoption settings (Koh et al., 2010). This may be one of the reasons why SI is not significant in BI. Another reason may be that most government employees are very individualistic. They have their own ideas and can make their own decisions. Thus, they are not easily influenced by the groups around them.

The current research also finds no significant correlation between HM and BI (Dhiman et al., 2020; Gupta et al., 2022; Suo et al., 2022; Tamilmani et al., 2019; Tiwari et al., 2022; Tseng et al., 2022). Government employees tend to derive a sense of pleasure when initially adopting new technology. Nevertheless, as the experience of adopting it increases, they reduce the novelty of EGT. EGT loses its original attraction and government employees adopt it for more practical purposes.

7 Conclusions

Based on the UTAUT3 model, the current research explores the determinants that affect government employees' adoption of EGT. It is found that FC, HB and PI are significant determinants affecting BI and ATB. In addition, BI plays a partially mediating role between HB and ATB as well as PI and ATB. However, no significant effects of EE, SI, PE and HM on BI are found. In conclusion, the results gained from the current research demonstrate that EGT adoption for Chinese government employees is influenced by both environmental factors (facilitating conditions) and personal factors (habit and personal innovativeness).

7.1 Theoretical implications

The following aspects outline the theoretical implications of this research. To begin with, the current research proposes an EGT adoption model based on basic constructs of the UTAUT3 model, which enriches technology adoption theory by extending knowledge in the domain of G2E. In the second place, the current research validates the UTAUT3 model in the background of e-government by

testing its ability to predict EGT adoption. Through this examination, this research not only confirms the applicability of the UTAUT3 model in this specific background but also extends its application environment to other areas. Third, the current research explored the determinants influencing the adoption of EGT for Chinese government employees, providing some theoretical basis for government agencies to encourage employees to adopt new technology.

7.2 Practical implications

The findings can assist government agencies in understanding the extent to which employees adopt EGT, with practical implications for managers, technology developers and policymakers.

Managers should invest more in infrastructure to provide employees with hardware, software and other equipment facilities. Furthermore, experts and professionals should be arranged to conduct technology training for employees to enhance their skills in adopting EGT. Government agencies can provide efficient and timely technology access support to employees, especially for new or inexperienced employees. For example, providing video materials for employees to study and reference, setting up e-books and other online resources, as well as conducting regular simulated operation training. Technology developers in government agencies are expected to pay close attention to and cater to users' technology adoption habits by designing user-friendly technology usage interfaces and systems, as well as good page and navigation practices. Policymakers should consider stimulating innovation among government employees when developing rules and policies related to technology adoption. For example, provide financial rewards such as bonuses and paid or extended leave opportunities for employees who are the first to adopt technology to stimulate innovative behaviors. In addition, policymakers can consider incorporating innovation-related criteria into the promotion and career development process within government agencies, thereby incentivizing employees to pursue innovation and technology adoption. By implementing these measures, policymakers can foster a culture of innovation among employees to enhance the probability of new technology adoption.

7.3 Limitations and future research

The followings are the limitations identified in this research. First, the current research does not conduct cross-cultural comparisons of respondents, which also does not cover multi-group analyses. Moreover, owing to a limitation of available resources, the current research only involves respondents originating from China (a developing country). Future research can be carried out by comparatively analyzing survey participants from developed and developing countries for an in-depth study to discuss intercultural influences. Ultimately, the current research only conducts a

cross-sectional analysis of government employees' behavior in adopting EGT caused by time restrictions and lacks a vertical comparison based on a timeline. Longitudinal studies may yield better research results to analyze the evolving behavioral dynamics of government employees' adoption of EGT during an extended duration. Hence, it is illustrated that future research could employ a longitudinal design to obtain a more in-depth comprehension of the phenomenon under examination.

Acknowledgment:

This work was supported by Shandong Provincial Natural Science Foundation (grant number ZR2022QG016), and the Taishan Scholars Program (grant number NO. tscy20221110).

References:

- Ain, N., Kaur, K. & Waheed, M. (2016) The influence of learning value on learning management system use: An extension of UTAUT2, *Information Development*, 32(5), pp. 1306-1321, <https://doi.org/10.1177/0266666915597546>.
- Al-Refaie, A. & Ramadna, A. M. (2017) Barriers to E-Government Adoption in Jordanian Organizations from Users' and Employees' Perspectives, *International Journal of Electronic Government Research*, 13(1), pp. 33-51, <https://doi.org/10.4018/ijegr.2017010103>.
- Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., Lal, B. & Williams, M. D. (2015) Consumer adoption of Internet banking in Jordan: Examining the role of hedonic motivation, habit, self-efficacy and trust, *Journal of Financial Services Marketing*, 20(2), pp. 145-157.
- Awwad, M. S. & Al-Majali, S. M. (2015) Electronic library services acceptance and use An empirical validation of unified theory of acceptance and use of technology, *Electronic Library*, 33(6), pp. 1100-1120, <https://doi.org/10.1108/el-03-2014-0057>.
- Bhattacharjee, A. (2000) Acceptance of e-commerce services: The case of electronic brokerages, *IEEE Transactions on Systems Man and Cybernetics Part a-Systems and Humans*, 30(4), pp. 411-420, <https://doi.org/10.1109/3468.852435>.
- Brown, M. M. & Brudney, J. L. (2001) Achieving advanced electronic government services: An examination of obstacles and implications from an international perspective, *National Public Management Research Conference, Bloomington*, 2, pp. 143-49.
- Brown, S. A. & Venkatesh, V. (2005) Model of adoption of technology in households: A baseline model test and extension incorporating household life cycle, *MIS Quarterly*, 29(3), pp. 399-426.
- Chuang, Y. F. (2011) Pull-and-suck effects in Taiwan mobile phone subscribers switching intentions, *Telecommunications Policy*, 35(2), pp. 128-140, <https://doi.org/10.1016/j.telpol.2010.12.003>.
- Coulter, K. S. & Coulter, R. A. (2007). Distortion of price discount perceptions: The right digit effect, *Journal of Consumer Research*, 34(2), pp. 162-173, <https://doi.org/10.1086/518526>.
- Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, 13(3), pp. 319-340.

- Dhiman, N., Arora, N., Dogra, N. & Gupta, A. (2020) Consumer adoption of smartphone fitness apps: an extended UTAUT2 perspective, *Journal of Indian Business Research*, 12(3), pp. 363-388, <https://doi.org/10.1108/jibr-05-2018-0158>.
- Farooq, M. S., Salam, M., Jaafar, N., Fayolle, A., Ayupp, K., Radovic-Markovic, M. & Sajid, A. (2017) Acceptance and use of lecture capture system (LCS) in executive business studies Extending UTAUT2, *Interactive Technology and Smart Education*, 14(4), pp. 329-348, <https://doi.org/10.1108/itse-06-2016-0015>.
- Gholami, R., Singh, N., Agrawal, P., Espinosa, K. & Bamufleh, D. (2021) Information Technology/Systems Adoption in the Public Sector: Evidence From the Illinois Department of Transportation, *Journal of Global Information Management*, 29(4), pp. 172-194, <https://doi.org/10.4018/JGIM.20210701.0a8>.
- Gunasinghe, A., Abd Hamid, J., Khatibi, A. & Azam, S. M. F. (2019) The adequacy of UTAUT-3 in interpreting academicians' adoption to e-Learning in higher education environments, *Interactive Technology and Smart Education*, 17(1), pp. 86-106, <https://doi.org/10.1108/itse-05-2019-0020>.
- Gunasinghe, A., Abd Hamid, J., Khatibi, A. & Azam, S. M. F. (2020) The viability of UTAUT-3 in understanding the lecturer's acceptance and use of virtual learning environments, *International Journal of Technology Enhanced Learning*, 12(4), pp. 458-481, <https://doi.org/10.1504/ijtel.2020.110056>.
- Gupta, A., Dogra, N. & George, B. (2018) What determines tourist adoption of smartphone apps?: An analysis based on the UTAUT-2 framework, *Journal of Hospitality and Tourism Technology*, 9(1), pp. 48-62, <https://doi.org/10.1108/jhtt-02-2017-0013>.
- Gupta, S., Mathur, N. & Narang, D. (2022) E-leadership and virtual communication adoption by educators: an UTAUT3 model perspective, *Global Knowledge Memory and Communication*, <https://doi.org/10.1108/gkmc-01-2022-0001>.
- Hair, J. F., Ringle, C. M. & Sarstedt, M. (2011) PLS-SEM: Indeed a silver bullet, *Journal of Marketing theory and Practice*, 19(2), pp. 139-152.
- Hair, J. F., Risher, J. J., Sarstedt, M. & Ringle, C. M. (2019) When to use and how to report the results of PLS-SEM, *European Business Review*, 31(1), pp. 2-24, <https://doi.org/10.1108/ebv-11-2018-0203>.
- Hwang, Y. (2011) Predicting Attitudes Toward Knowledge Sharing by E-Mail: An Empirical Study, *International Journal of Human-Computer Interaction*, 27(12), pp. 1161-1176, <https://doi.org/10.1080/10447318.2011.565706>.
- Iftakhar, S. (2016) Google classroom: what works and how, *Journal of Education and Social Sciences*, 3(1), pp. 12-18.
- Jackson, J. D., Yi, M. Y. & Park, J. S. (2013) An empirical test of three mediation models for the relationship between personal innovativeness and user acceptance of technology, *Information & Management*, 50(4), pp. 154-161, <https://doi.org/10.1016/j.im.2013.02.006>.
- Jaganathan, M., Mustapa, A. N., Hasan, W. A. W., Mat, N. K. N. & Alekam, J. M. E. (2014) Does dependency make a difference? The role of convenience, social influence, facilitating condition and self-efficacy on student's purchase behaviour of smartphone, *AIP Conference Proceedings*, 1635(1), (American Institute of Physics), pp. 332-339.
- Jongcheul, P. (2004) *Designing system architecture for cadastral information dissemination using Internet* (The Netherlands: International Institute for Geo-Information Science and Earth Observation Enschede), available at: https://webapps.itc.utwente.nl/librarywww/papers_2004/msc/gim/park_jongcheul.pdf (October 6, 2023).
- Kelman, H. C. (1958) Compliance, identification, and internalization three processes of

- attitude change, *Journal of conflict resolution*, 2(1), pp. 51-60.
- Koh, C. E., Prybutok, V. R., Ryan, S. D. & Wu, Y. A. (2010) A Model for Mandatory Use of Software Technologies: An Integrative Approach by Applying Multiple Levels of Abstraction of Informing Science, *Informing Science: the International Journal of an Emerging Transdiscipline*, 13, pp. 177-203, <https://doi.org/10.28945/1326>.
- Lewis, C. C., Fretwell, C. E., Jim, R. & Parham, J. B. (2013) Faculty Use of Established and Emerging Technologies in Higher Education: A Unified Theory of Acceptance and Use of Technology Perspective, *International Journal of Higher Education*, 2(2), <https://doi.org/10.5430/ijhe.v2n2p22>.
- Lewis, W., Agarwal, R. & Sambamurthy, V. (2003) Sources of influence on beliefs about information technology use: An empirical study of knowledge workers, *MIS Quarterly*, 27(4), pp. 657-678.
- Liao, C. C., To, P. L., Liu, C. C., Kuo, P. Y. & Chuang, S. H. (2011) Factors influencing the intended use of web portals, *Online Information Review*, 35(2), pp. 237-254, <https://doi.org/10.1108/14684521111128023>.
- Limayem, M., Hirt, S. G. & Cheung, C. M. K. (2007) How habit limits the predictive power of intention: The case of information systems continuance, *Mis Quarterly*, 31(4), pp. 705-737, <https://doi.org/10.2307/25148817>.
- Meet, R. K., Kala, D. & Al-Adwan, A. S. (2022) Exploring factors affecting the adoption of MOOC in Generation Z using extended UTAUT2 model, *Education and Information Technologies*, 27(7), pp. 10261-10283, <https://doi.org/10.1007/s10639-022-11052-1>.
- Mengesha, G. H., Garfield, M. J. & Assoc Informat, S. (2016) A Contextualized IT adoption and Use Model for e-health: The Case of Telemedicine at Black Lion Teaching Hospital, Ethiopia, *Paper presented at the 22nd Americas Conference on Information Systems (AMCIS)* (San Diego, CA).
- Midgley, D. F. & Dowling, G. R. (1978) Innovativeness: The Concept and Its Measurement, *Journal of Consumer Research*, 4(4), pp. 229-242, <https://doi.org/10.1086/208701>.
- Mtebe, J. S. & Raisamo, R. (2014) A Model for Assessing Learning Management System Success in Higher Education in Sub-Saharan Countries, *Electronic Journal of Information Systems in Developing Countries*, 61(1), pp. 1-17.
- Musa, M., Ismail, M. N., Tahir, S., Fudzee, M. F. M. & Jofri, M. H. (2022) Student Acceptance Towards Online Learning Management System based on UTAUT2 Model, *International Journal of Advanced Computer Science and Applications*, 13(11), pp. 139-147.
- Panda, P. & Sahu, G. (2013) Critical Success Factors for e-Gov Project: A Unified Model, *IUP Journal of Supply Chain Management*, 10(2), pp. 19-32.
- Rehouma, M. B. & Hofmann, S. (2018) Government employees' adoption of information technology: a literature review, *Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age*, pp. 1-10.
- Rogers, E. M. (1983) *Diffusion of innovations* (New York: The Free Press).
- Saha, P. & Kiran, K. B. (2022) An Exploration of Trust as an Antecedent of Unified Payment Interface Usage: A SEM-Neural Network Approach, *International Journal of Electronic Government Research*, 18(1), <https://doi.org/10.4018/ijegr.298627>.
- Sisman, A., Sesli, F. A. & Alkis, Z. (2009) E-government concept and e-government applications in Turkey, *African Journal of Business Management*, 3(11), pp. 644-653.
- Subawa, N. S., Widhiasthini, N. W. & Mimaki, C. A. (2020) An empirical study of E-marketplace acceptance in MSMEs under the constructs of effort expectancy, social influence and facilitating condition factors, *Proceedings of the 2020 The 6th International*

Conference on E-Business and Applications, pp. 116-120.

- Suo, W. J., Goi, C. L., Goi, M. T. & Sim, A. K. S. (2022) Factors Influencing Behavioural Intention to Adopt the QR-Code Payment: Extending UTAUT2 Model, *International Journal of Asian Business and Information Management*, 13(2), <https://doi.org/10.4018/IJABIM.20220701.oa8>.
- Tamilmani, K., Rana, N. P., Prakasam, N. & Dwivedi, Y. K. (2019) The battle of Brain vs. Heart: A literature review and meta-analysis of "hedonic motivation" use in UTAUT2, *International Journal of Information Management*, 46, pp. 222-235, <https://doi.org/10.1016/j.ijinfomgt.2019.01.008>.
- Taylor, S. & Todd, P. A. (1995) Understanding information technology usage: A test of competing models, *Information Systems Research*, 6(2), pp. 144-176, <https://doi.org/10.1287/isre.6.2.144>.
- Tiwari, M., Gupta, Y., Khan, F. M. & Adlakha, A. (2022) UTAUT3 model viability among teachers due to technological dynamism during COVID-19, *Information Discovery and Delivery*, 50(3), pp. 245-259, <https://doi.org/10.1108/idd-02-2021-0018>.
- Tseng, T. H., Lin, S. J., Wang, Y. S. & Liu, H. X. (2022) Investigating teachers' adoption of MOOCs: the perspective of UTAUT2, *Interactive Learning Environments*, 30(4), pp. 635-650, <https://doi.org/10.1080/10494820.2019.1674888>.
- Venkatesh, V. & Davis, F. D. (2000) A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies, *Management Science*, 46(2), pp. 186-204, <https://doi.org/10.1287/mnsc.46.2.186.11926>.
- Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003) User acceptance of information technology: Toward a unified view, *MIS Quarterly*, 27(3), pp. 425-478, <https://doi.org/10.2307/30036540>.
- Venkatesh, V., Thong, J. Y. L. & Xu, X. (2012) Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology, *MIS Quarterly*, 36(1), pp. 157-178.
- Venkatraman, M. P. & Price, L. L. (1990) Differentiating between cognitive and sensory innovativeness: Concepts, measurement, and implications, *Journal of Business Research*, 20(4), pp. 293-315, [https://doi.org/10.1016/0148-2963\(90\)90008-2](https://doi.org/10.1016/0148-2963(90)90008-2).
- Verplanken, B. & Aarts, H. (1999) Habit, Attitude, and Planned Behaviour: Is Habit an Empty Construct or an Interesting Case of Goal-directed Automaticity?, *European Review of Social Psychology*, 10(1), pp. 101-134.
- Verplanken, B. & Wood, W. (2006) Interventions to break and create consumer habits, *Journal of Public Policy & Marketing*, 25(1), pp. 90-103, <https://doi.org/10.1509/jppm.25.1.90>.
- Warshaw, P. R. (1980) A new model for predicting behavioral intentions: An alternative to Fishbein, *Journal of Marketing Research*, 17(2), pp. 153-172.
- Williams, M. D., Rana, N. P. & Dwivedi, Y. K. (2015) The unified theory of acceptance and use of technology (UTAUT): a literature review, *Journal of Enterprise Information Management*, 28(3), pp. 443-488, <https://doi.org/10.1108/jeim-09-2014-0088>.
- Yildiz, M. (2007) E-government research: Reviewing the literature, limitations, and ways forward, *Government Information Quarterly*, 24(3), pp. 646-665, <https://doi.org/10.1016/j.giq.2007.01.002>.

Appendix:

Appendix A: Measurement items of the instrument.

Performance Expectancy (Farooq et al., 2017; Venkatesh et al., 2012)

- PE1 I find e-government technology (EGT) very helpful in my work.
- PE2 Using EGT allows me to get things done faster.
- PE3 The use of EGT helps to improve my work efficiency.
- PE4 The use of EGT helps to improve my work ability.

Effort Expectancy (Farooq et al., 2017; Venkatesh et al., 2012)

- EE1 It doesn't take much effort for me to become familiar with and use EGT.
- EE2 It was easy for me to master and use EGT.
- EE3 I find EGT easy to use.

Social Influence (Farooq et al., 2017; Venkatesh et al., 2012)

- SI1 People who are important to me think I should use EGT in my work.
- SI2 People who are important to my behavior think I should use EGT in my work.
- SI3 People whose opinions I value have suggested that I use EGT in my work.
- SI4 My colleagues think I should use EGT in my work.
- SI5 Leaders in the organization encouraged me to use EGT.

Facilitating Conditions (Farooq et al., 2017; Venkatesh et al., 2012)

- FC1 At work, I have the necessary resources to use EGT.
- FC2 At work, I have the necessary knowledge to use EGT.
- FC3 When I have trouble using EGT at work, I can get help from others.
- FC4 EGT is compatible with the work equipment I use, so I can work with it properly.

Habit (Farooq et al., 2017; Venkatesh et al., 2012)

- HB1 At work, using EGT has become my habit.
- HB2 At work, I often use EGT.
- HB3 At work, I have to use EGT.

Hedonic Motivation (Farooq et al., 2017; Venkatesh et al., 2012)

- HM1 At work, it is very interesting for me to use EGT.
- HM2 Working with EGT is a pleasant way for me to work.
- HM3 Using EGT allows me to work in a pleasant and comfortable way.

Personal Innovation (Farooq et al., 2017; Venkatesh et al., 2012)

- PI1 I like to experiment with new information technology in my work.
- PI2 I can't wait to try out the features of the new technology.
- PI3 When I hear about new information technology, I study it.

PI4 Among my colleagues, I’m usually the first to try out new technologies.

Behavioral Intention to adopt EGT (Farooq et al., 2017; Gupta et al., 2022; Venkatesh et al., 2012)

BI1 I have a positive view of EGT.

BI2 I plan to use EGT in my future work.

BI3 I predict I would use EGT for work in the future.

BI4 I would advise others to use EGT for their work.

Adoption Behavior of EGT (Farooq et al., 2017; Gupta et al., 2022; Venkatesh et al., 2012)

ATB1 EGT has become an important part of my work.

ATB2 I really enjoy using EGT in my work.

ATB3 I often use EGT to get my work done.

ATB4 The adoption and regular use of EGT helps me achieve my goals.

Tables:

Table 1: Data about the demographics of the respondents

Variable	Category	Number (N=207)	Percentage(%)
Gender	Female	101	48.79
	Male	106	51.21
Education	Master degree or above	38	18.36
	Bachelor degree	158	76.33
	College degree	10	4.83
	High school/technical secondary school	1	0.48
Age	≤25 years	31	14.98
	26-35 years	128	61.83
	36-45 years	30	14.49
	≥46 years	18	8.70
Work Experience	<1 year	15	7.25
	1-3 years	47	22.70
	3-5 years	48	23.20
	5-8 years	37	17.87
	8-10 years	24	11.59
	>10 years	36	17.39

Table 2: Attribute of scale

Constructs	Item	External Loadings	CR	CA	AVE
BI (Behavior Intention to Adopt EGT)	BI1	0.77	0.83	0.73	0.55
	BI2	0.71			
	BI3	0.75			
	BI4	0.73			
EE (Effort Expectancy)	EE1	0.81	0.91	0.86	0.77
	EE2	0.94			
	EE3	0.88			
FC (Facilitating Conditions)	FC1	0.80	0.83	0.73	0.55
	FC2	0.70			
	FC3	0.73			
	FC4	0.73			
HB (Habit)	HB1	0.83	0.85	0.73	0.65
	HB2	0.86			
	HB3	0.72			
HM (Hedonic Motivation)	HM1	0.88	0.93	0.89	0.82
	HM2	0.91			
	HM3	0.92			
PE (Performance Expectancy)	PE1	0.78	0.87	0.80	0.63
	PE2	0.81			
	PE3	0.82			
	PE4	0.76			
PI (Personal Innovativeness)	PI1	0.84	0.88	0.82	0.65
	PI2	0.83			
	PI3	0.80			
	PI4	0.76			
SI (Social Influence)	SI1	0.80	0.91	0.87	0.66
	SI2	0.80			
	SI3	0.84			
	SI4	0.78			
	SI5	0.82			
ATB (Adoption Behavior of EGT)	ATB1	0.74	0.84	0.75	0.57
	ATB2	0.71			
	ATB3	0.74			
	ATB4	0.83			

Note: CR=composite reliability; CA=Cronbach's alpha; AVE=average variance extracted.

Table 3: Fornell-Larcker test

Construct	BI	EE	FC	HB	HM	PE	PI	SI	ATB
BI	0.74								
EE	0.25	0.88							
FC	0.61	0.44	0.74						
HB	0.58	0.21	0.51	0.81					
HM	0.51	0.22	0.50	0.32	0.90				
PE	0.56	0.13	0.53	0.50	0.62	0.79			
PI	0.64	0.26	0.56	0.36	0.64	0.55	0.81		
SI	0.52	0.19	0.54	0.54	0.48	0.57	0.53	0.81	
ATB	0.68	0.29	0.64	0.69	0.51	0.67	0.59	0.69	0.76

Note: Italic diagonal values are square root of AVE.

Table 4: The results of hypotheses

Hypothesis	Path	β	p value	T value	Result
H1	PE $\rightarrow$ BI	0.09	0.25	1.16	No
H2	EE $\rightarrow$ BI	-0.01	0.86	0.18	No
H3	SI $\rightarrow$ BI	0.00	0.99	0.01	No
H4	HM $\rightarrow$ BI	0.02	0.79	0.26	No
H5a	FC $\rightarrow$ BI	0.21*	0.02	2.32	Yes
H5b	FC $\rightarrow$ ATB	0.20**	0.01	2.79	Yes
H6a	HB $\rightarrow$ BI	0.30***	0.00	4.09	Yes
H6b	HB $\rightarrow$ ATB	0.41***	0.00	5.29	Yes
H7a	PI $\rightarrow$ BI	0.36***	0.00	4.50	Yes
H7b	PI $\rightarrow$ ATB	0.22***	0.00	3.27	Yes
H8	BI $\rightarrow$ ATB	0.18*	0.03	2.23	Yes

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 5: Mediation test

Mediation path	β	T value	p value	Conclusion
FC $\rightarrow$ BI $\rightarrow$ ATB	0.04	1.59	0.11	Rejected
HB $\rightarrow$ BI $\rightarrow$ ATB	0.05	2.23	0.03	Supported
PI $\rightarrow$ BI $\rightarrow$ ATB	0.07	2.26	0.02	Supported