FACTORS INFLUENCING THE INTENTION TO USE DIGITAL WALLET

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Abstract: With technology rapidly evolving, society is embracing digital wallets, enabling electronic money transfers across various platforms. Despite growing literature on digital wallets, there's a research gap in understanding users' intentions, particularly in developing countries like Mongolia. This study aims to explore factors influencing digital wallet adoption in Mongolia, drawing from behavioral finance principles. Using the Technology Readiness Index and the Technology Acceptance Model, data was collected from 390 users in Mongolia. Findings from Partial Least Squares Structural Equation Modeling reveal that optimism and innovativeness positively impact the intention to use digital wallet, while discomfort and insecurity have a negative effect.

Keywords: E-wallet, Technology Readiness Index, Technology Acceptance Model

ЦАХИМ ХЭТЭВЧ ХЭРЭГЛЭХ ХАНДЛАГАД НӨЛӨӨЛӨХ ХҮЧИН ЗҮЙЛС

Хураангуй: Технологийн хурдацтай хөгжлийг дагаад шинэлэг санхүүгийн хэрэгсэл, платформууд бий болсоор байгаагийн нэг жишээ нь цахим хэтэвч бөгөөд дижитал түрийвч хэрэглэгчдийн хандлагад нөлөөлөх хүчин зүйлсийн талаарх судалгаа олон улсад улам бүр нэмэгдэж байгаа хэдий ч Монгол Улс шиг хөгжиж буй орны хувьд энэ төрлийн судалгаа хомс байна. Иймээс энэхүү судалгаа нь Монгол Улсын цахим хэтэвч хэрэглэгчдийн хэрэглэх хандлагад нөлөөлж буй хүчин зүйлсийг зан төлөвийн санхүүгийн үүднээс судлахыг зорьсон. Технологийн Бэлэн байдлын Индекс болон Технологийг хүлээн авах онолыг ашиглан Монгол Улсын 390 хэрэглэгчдээс өгөгдлийг цуглуулсан болно. Хэсэгчилсэн хамгийн бага квадратын бүтцийн тэгшитгэлийн загварчлалын үр дүнд өөдрөг үзэл болон шинэлэг байдал нь дижитал түрийвч ашиглах хандлагад эерэг нөлөө үзүүлдэг бол эсрэгээр, ашиглахад таагүй байдал болон найдваргүй байдал нь сөрөг нөлөө үзүүлдэг гэсэн гол үр дүн гарсан.

Түлхүүр үгс: Цахим түрийвч, Технологийн Бэлэн байдлын Индекс, Технологийг хүлээн авах загвар

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Introduction

As technology is rapidly growing, people need to use, adopt and accept the technology. This fast-growing technology has created a new product named digital wallet, also known as e-wallet, which is a financial tool for transferring money electronically through online devices, smart phones, financial applications, and software programs. Nowadays, payment apps like, Alipay, Paypal, Google pay are commonly used in daily life, and that allow people financial transactions more easily no matter where they are. Eliminating the need to carry cash or physical currency is one of the advantages that attract customers to use the digital wallet.

Currently, digital wallets are based on the technologies of Near field communication (NFC), magnetic secure transmission (MST) and QR codes. NFC is a method of contactless communication between devices like smartphones or tablets (Near field communication). NFC technology is widespread in Europe and Asia, and is quickly spreading throughout the United States. Using MST, card readers read cards and store information in the digital wallet, and connect to the payment process. QR codes is a trending tool that is used in daily transactions and payments using the device's camera and wallet scanning system.

Among the developed countries of the world, China is the leader in the use of e-wallets. WeChat and Alipay's QR code-enabled e-wallets are being used across the region. According to the Global payment report by 2022, 49 percent of all payments will be made with the digital wallet, and this percentage is predicted to increase by 5 percent in 2026. As of 2022, mobile e-wallets accounted for 54 percent of all transactions in China, while cash accounts for 16 percent of all transactions (Global payment report, 2022). However, cash is expected to account for less than 8 percent of total transaction value by 2025. Most Southeast Asian countries are using e-wallets in preference to cards. As WeChat and Alipay only charge 0.1% transaction fees, e-wallets continue to grow at a rapid pace.

In Mongolia, the National Settlement Council was established in 2008 and its mid-term strategy towards digital payment was proved in 2009. The purpose of this strategy was to increase the use of cashless payment methods and provide financial services to citizens. The share of cashless payments had been lower than the share of payments in cash until 2017. In 2016, the share of cashless payments (44%) was lower than the share of payments in cash (56%). Since 2017, cashless payments have been becoming more useful in financial transactions. Through the past 5 years, the main three methods of cashless payments have been implemented in Mongolia: internet banking, mobile banking, and telephone banking. Internet banking refers to doing transactions online in multiple ways, such as computer, tablet, and laptop, whereas mobile banking is only accomplished via mobile phones.

Telephone banking is a service in which customers who do not have access to the internet do transactions over the telephone. In Mongolia, those customers mainly live in the countryside where internet access is not available. By the end of 2023, 3.5 million customers have been using internet banking, which is a 45.8 percent increase from 2 years ago. For the same time, 1.9 million customers have been using mobile banking, which is a 46.1 percent growth. The number of telephone bank users has reached 0.7 million, an increase of 75 percent compared to the number of customers in 2020 (Online banking report, 2023).

Moreover, by the second quarter of 2022 with regard to the implementation of cashless payment channels in Mongolia, new cashless payment methods started to apply, such as QR codes, digital wallets, and electronic payment applications. About 90 percent of payments are made in non-cash forms using cards, banking applications, digital wallets, and QR codes, and the remaining 10 percent are done in cash (Online banking report, 2023). The escalating prevalence of cashless payment methods has sparked heightened research interest, underscoring the importance of comprehending user adoption of digital wallets. This comprehension is particularly crucial for policymakers, industry stakeholders, and researchers committed to promoting the widespread utilization of cashless payment systems. The scarcity of research in Mongolia about e-wallet usage further accentuates the need for this study. The existing gap in understanding the dynamics of cashless payment adoption by Mongolian customers necessitates investigation, and the formulation of a promising conceptual model to address this gap is crucial for advancing scholarly understanding in this context. Therefore, this study aims to investigate the determinants influencing individuals' intention to adopt digital wallets in Mongolian context, drawing insights from the field of behavioral finance.

Literature review

The Technology Acceptance Model (TAM), initially formulated by Venkatesh and Davis, delineates perceived usefulness and usage intentions within the realms of social influence and cognitive instruments (Venkatesh & Davis, 2000). According to Venkatesh and Davis, numerous empirical TAM studies have highlighted the significance of perceived usefulness in determining usage intentions. Understanding the factors influencing perceived usefulness is crucial as it underpins usage intentions and shapes how these factors evolve over time, particularly with increased system usage.

While the original TAM primarily focused on determinants of perceived ease of use, exploring determinants of perceived usefulness has empowered organizations to devise interventions aimed at enhancing user acceptance and system adoption

(Venkatesh & Davis, 1996). Consequently, Venkatesh and Davis conducted a study in 2000 to extend TAM's scope, investigating how perceived usefulness and usage intention constructs evolve with sustained information system (IS) usage.

The TAM has emerged as a widely utilized model for anticipating user acceptance and adoption of novel technologies.

The Technology Readiness Index (TRI) was developed by Parasuraman and Colby to evaluate the readiness of technology for North American consumers (Parasuraman, 2000; Parasuraman & Colby, 2001). It examines how individuals' personalities and demographics influence their readiness to embrace technology, which in turn affects their acceptance or rejection of new technologies (Parasuraman, 2000). Consequently, the TRI model categorizes technology readiness into drivers and inhibitors, encompassing factors such as optimism, innovativeness, discomfort, and insecurity.

In line with the TAM model's approach to studying the adoption of digital wallets, the TRI model's constructs—perceived optimism, innovativeness, insecurity, and discomfort—were considered. There are researches that has incorporated technology readiness and technology adoption model to explain users' readiness and perceptions toward financial technology (Walczuch et al., 2007; Nugroho & Fajar, 2017; Rahman et al., 2017). Hypotheses were formulated and tested to evaluate the impact of these TRI factors on the intention of continued use, the primary dependent variable within TAM.

Optimism

Optimism, characterized by a positive outlook toward technology, plays a significant role in technology adoption. Individuals with an optimistic disposition are more inclined to embrace new technologies, integrating them into their daily routines. Moreover, optimists are predisposed to accepting the present circumstances. Specifically, individuals with high levels of optimism perceive technology usage as uncomplicated and are less likely to dwell on negative occurrences (Walczuch et al., 2007).

Consequently, optimism exerts a substantial and favorable influence on the intention to continue using digital wallets (Hypothesis I).

Innovativeness

Innovators are individuals inclined to embrace new technologies, and the digital wallet represents a high-value innovation within this domain. Innovativeness refers to the personal propensity to adopt innovative technologies (Mcdougall, 2014).

In the context of the present study, it is hypothesized that innovativeness has a significant and positive impact on the intention to continue using digital wallets (Hypothesis II).

Insecurity

Security within the context of online transactions pertains to ensuring the safety of financial transactions conducted through digital platforms (Cheskin, 1999). It is widely recognized as a crucial element in fostering trust in various online transactions (Nasri, 2011). Particularly in the realm of mobile banking platforms, security concerns loom large, significantly impacting users' willingness to adopt such systems (Bhatt, 2016; Svilar & Zupančič, 2016).

According to Roca et al. (2009), security encompasses threats that could potentially lead to economic hardships, including data destruction, disclosure, modification, denial of service, as well as fraudulent activities. Users exhibit considerable apprehension regarding the security of their personal information, especially concerning sensitive data such as credit card details (Fawzy & Abdel, 2015; Farid, 2012).

Insecurity with regards to technology refers to the uncertainties surrounding security and privacy, often manifesting as a lack of trust in the technology itself (Parasuraman & Colby, 2015).

Therefore, our hypothesis is that the insecurity has a negative impact on the intention of continued use of digital wallet (Hypothesis III).

Discomfort

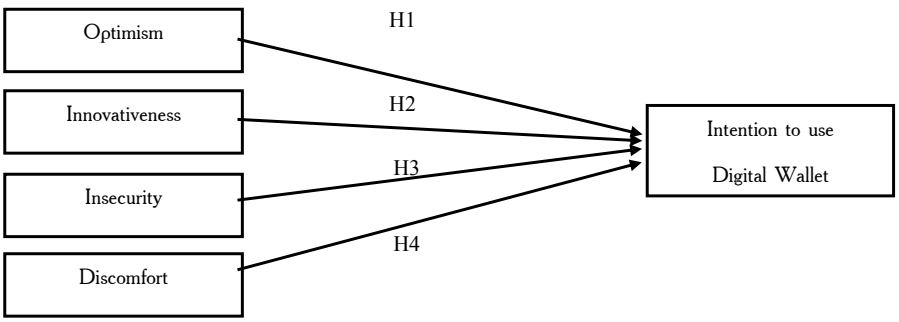
Discomfort is related to an individual's lack of control or discomfort over technology (Parasuraman, 2000). Discomfort relates to an individual's sense of unease or lack of control when interacting with technology.

So, our hypothesis is that discomfort has a negative impact on the intention of continued use of digital wallet (Hypothesis IV).

Conceptual Framework

Our dependent variable is the intention of continued use of digital wallet through TAM, and independent variables are optimism, innovativeness, insecurity and discomfort by TRI model.

Figure 1. Conceptual framework



RESEARCH METHODS

In order to analyze the digital wallet adoption, we used the partial least square structural equation modeling (PLS-SEM) method that is mainly used among researchers on this topic. PLS-SEM stands as a comprehensive modeling methodology that provides researchers with the tools to explore the intricate relationships among variables and evaluate the credibility and consistency of any research framework (Hair, 1998).

For data collection, we have prepared survey questions relating to our dependent and independent variables. It is important to mention that all our questionnaires have reached digital wallet users and 390 respondents participated.

The basic assumption of sampling is to assume that the original population is normally distributed, and the sample size is selected by simple random sampling that the formula is shown in equation 1.

$$n_1 = \frac{t^2 \times w \times (1-w) \times N}{N \times \Delta_p^2 + t^2 \times w \times (1-w)} \quad (1)$$

Where, t = Student t distribution's critical value; w = the probability of a sample answering a certain question, or the percentage of the target population in the original population. A constant value of 0.5 is used if this parameter is not known before the survey; N = population size; Δ= The margin of error, or the resulting sample mean, is the assumption that the results will be the same if the sample size is increased or decreased by Δ percent.

Following the sampling procedure, the calculation for an optimal sample size of online banking users determined it to be 385. Hence, the acquisition of 390 valid responses for this study is deemed adequate for subsequent in-depth analysis. The data is analyzed by SmartPLS software.

In the measurement process, a Likert-type five-point scale was employed, offering respondents a range from 1, indicating "strongly disagree," to 5, representing "strongly agree." This scale facilitates participants in expressing their level of agreement or disagreement effectively. Its significance lies in its capacity to standardize responses, thereby reducing the impact of extreme answers, a crucial consideration in behavioral finance research.

Participants were tasked with recording their responses within this scale, where '1' corresponded to 'strongly disagree' and '5' indicated 'strongly agree.' This structured approach provided participants with a clear and systematic method to articulate their attitudes and opinions, ensuring a comprehensive and accurate data collection process.

RESEARCH FINDINGS AND DISCUSSION

51% of participants were male and 49% of respondents were female. In case of age group, the largest percentage goes to the age group between 19-24, followed by the age group of 25-30 and 31-35 respectively. Most of the respondents work in private companies and are students. Most of the respondents earn less than 400.000MNT, followed by 700.000-1.500.000MNT of monthly income.

Table 1. Demographic profile

		Percent
Gender	Male	51
	Female	49
Age Group	Up to 18	12
	19-24	36
	25-30	19
	31-35	12
	36-40	10
	41-50	9
	More than 51	2
Occupation	Government organization	12
	Private	33
	Self-employed	12
	Student	36

	Other	7
Income	Up to 400.000 MNT	33
	401.000-700.000 MNT	8
	701.000-1.00.000 MNT	12
	1.000.000-1.500.000 MNT	12
	1.500.001-2.000.000 MNT	15
	2.000.000-2.500.000 MNT	6
	More than 2.500.001 MNT	14

Model assessment

For model assessment, the convergent validity of items loading (Loading), average variance extracted (AVE), and composite reliability (CR) were tested. Our result shows that indicator loading was more than 0.5 meaning that they meet the criteria except 5 items (Inse1, Inse2, Disc2, Disc3, Inno1). Therefore, those items were removed because of the lower threshold of 0.5. Then all items met the AVE threshold of 0.5, and CR threshold of 0.7 (Table 2).

Table 2. Model assessment result

Constructs	Items	Loadings	AVE	CR
Optimism (Opti)	Opti1	0.772	0.616	0.865
	Opti2	0.801		
	Opti3	0.814		
	Opti4	0.752		
Innovativeness (Inno)	Inno1	*	0.601	0.819
	Inno2	0.797		
	Inno3	0.779		
	Inno4	0.749		
Insecurity (Inse)	Inse1	*	0.671	0.803
	Inse2	*		
	Inse3	0.824		
	Inse4	0.814		
Discomfort (Disc)	Disc1	0.911	0.612	0.749
	Disc2	*		
	Disc3	*		
Intention to use (BI)	BI1	0.806	0.624	0.832
	BI2	0.828		
	BI3	0.732		

- All items' loadings > 0.5 indicates Indicator Reliability (Hulland, 1999, ρ.198)
- All average Variance Extracted (AVE) > 0.5 as indicates Convergent Reliability (Bagozzi & Yi, 1998; Fornell & Larcker, 1981)
- All Composite Reliability (CR) >0.7 indicates Internal Consistency (Gefen, et al, 2000)

*-removed because of lower threshold of loading

Then we have tested discriminant validity using the Fornell & Larcker (1981). The square root of AVE from each construct was higher than the correlations between construct and other constructs, meaning that there is a discriminant validity (Table 3).

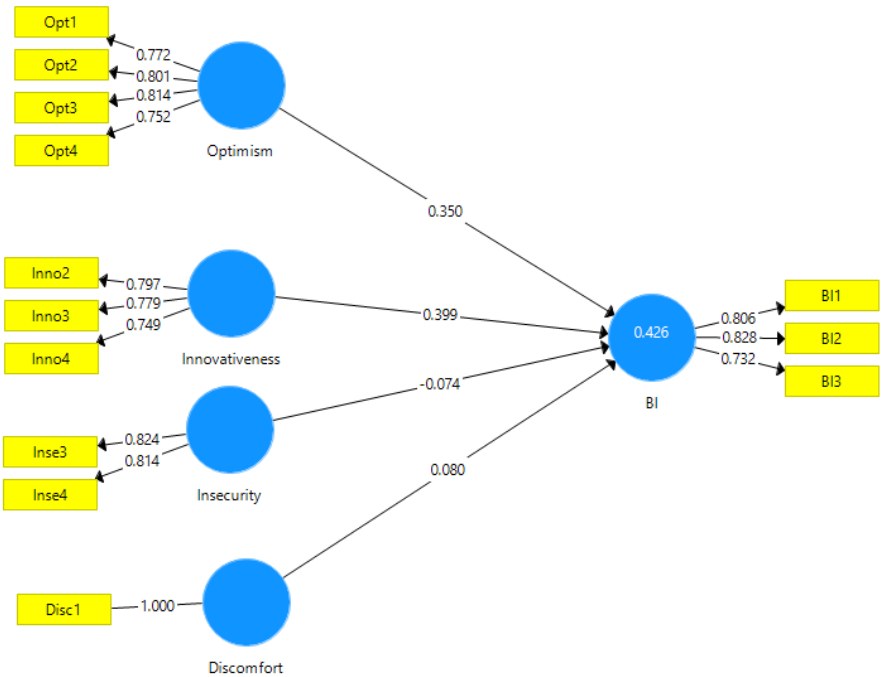
Table 3. Discriminant validity of the constructs

	Intention to use	Discomfort	Innovativeness	Insecurity	Optimism
Intention to use	0.790				
Discomfort	0.113	0.911			
Innovativeness	0.563	0.062	0.775		
Insecurity	-0.089	0.294	-0.089	0.819	
Optimism	0.531	0.084	0.435	-0.010	0.785

The diagonals are the square root of the AVE of the latent variables and indicate the highest in any column or row. It indicates that there is discriminant validity. In summary, the measurement model demonstrates adequate reliability, convergent validity and discriminant validity.

Then R^2 was used for goodness of model fit, and in our model R^2 was 0.426. That means the 42.6% variance of intention to use digital wallet can be explained by the independent variables of discomfort, innovativeness, insecurity and optimism.

Figure 2. Bootstrapping analysis result by SmartPLS software



Finally, bootstrapping analysis with resampling 500 was managed to determine the significance of coefficients. The result showed that optimism and innovativeness have a significant positive relationship with the intention of continued use of digital wallet, and insecurity and discomfort have a significant negative impact on the intention to use digital wallet. All four hypotheses are supported (Table 4).

Table 4. Path coefficient and their significance

Hypotheses	Relationship	Beta	SD	T-Statistic	P-Values
H1	Optimism → BI	0.352***	0.047	3.202	0.000
H2	Innovativeness → BI	0.399***	0.047	8.511	0.000
H3	Insecurity → BI	-0.076*	0.042	1.740	0.082
H4	Discomfort → BI	-0.080*	0.041	1.960	0.051

Note: ****, **, * represent 1%, 5%, 10% significantly level, respectively.*

The innovativeness has the most significant positive influence on the intention to use digital wallet among Mongolian customers.

Conclusion

This study investigated the intention of continued use of digital wallet in Mongolia using PLS-SEM analysis. According to the TAM and TRI model, this study investigated the influence of technology readiness indexes of optimism, innovativeness, insecurity and discomfort on the intention to use digital wallet.

As a result of partial least square structural equation modeling analysis, the intention of continued use of digital wallet is positively influenced by optimism and innovativeness. This result is similar to the previous researches. The research by Acheampong et al. (2017) demonstrated a positive relationship between individual innovation and optimism and the adoption of financial technology, specifically e-payments. Similarly, other studies exploring the connection between optimism, innovation, and the intention to use mobile payments, with perceived ease of use and perceived usefulness as moderating variables, also found a positive effect. These findings confirm the significance of optimism and innovation as key determinants of technology adoption readiness (Martens et al., 2017). Our result implies that Mongolians hold a favorable view of the digital wallet, indicating a propensity to integrate it into their daily lives due to its convenience, flexibility, and efficiency. Therefore, this result can be attributed to several factors.

Firstly, Mongolia's rapidly evolving technological landscape has created a culture where early adopters and innovators are highly regarded. Individuals who exhibit innovativeness may be more inclined to explore and adopt new technologies like digital wallets as a means of staying ahead and embracing modernization. Secondly, the convenience and efficiency offered by digital wallets align well with the increasingly fast-paced lifestyles of Mongolian consumers. Innovativeness often correlates with a desire for convenience and efficiency, making digital wallets an attractive option for those who value seamless and quick payment methods. Additionally, the social influence and peer pressure within Mongolian society may play a role. As digital wallet usage becomes more prevalent among certain social circles or demographic groups, individuals with a higher level of innovativeness may feel compelled to adopt these technologies to stay connected and relevant within their communities. Furthermore, the marketing and promotional efforts of digital wallet providers may target innovative and tech-savvy consumers, thereby resonating more strongly with individuals who possess traits of innovativeness. Overall, the combination of technological advancement, convenience, social influence, and targeted marketing likely contributes to innovativeness being the most significant positive influence on the intention to use digital wallets among Mongolian customers.

On the other hand, insecurity and discomfort have a significant negative impact on e-wallet usage. In the context of diminished control over technology, a lack of

trust, and heightened uncertainty regarding security, there is a discernible tendency for the intention to use digital wallets to decrease. This result is consistent with the previous researches. The previous research depicted that perceived risk has a negative effect on continuance usage intention (Liu et. al., 2018). In Mongolia, insecurity regarding the safety and security of digital transactions may stem from concerns about potential cyber threats, data breaches, or unauthorized access to personal financial information. Mongolia, like many developing countries, may face challenges in ensuring robust cybersecurity measures and building trust in digital payment systems among consumers. Additionally, discomfort with using e-wallets may arise from factors such as unfamiliarity with technology, lack of confidence in navigating digital platforms, or skepticism towards non-traditional payment methods. Mongolia's diverse demographic landscape, including individuals with varying levels of digital literacy and technological proficiency, may contribute to feelings of discomfort among certain segments of the population. Furthermore, cultural and social norms regarding financial practices and preferences may influence perceptions of insecurity and discomfort. Traditional reliance on cash-based transactions and established banking systems may lead to apprehension or resistance towards adopting e-wallets as an alternative payment method. Moreover, issues related to infrastructure and accessibility could exacerbate feelings of insecurity and discomfort. In remote or underserved areas where internet connectivity is limited or unreliable, individuals may perceive e-wallets as impractical or inaccessible, further deterring adoption. Lastly, negative experiences or perceptions of e-wallet usage, such as instances of fraud or technical glitches, can reinforce feelings of insecurity and discomfort, creating barriers to widespread acceptance and usage.

In Mongolian context, based on the outcomes of this study, it is important to invest in robust cybersecurity measures to address concerns related to data security and privacy. Also, it is very essential to design digital wallet interfaces that prioritize simplicity, intuitiveness, and ease of navigation, and provide clear instructions, visual cues, and user-friendly features to minimize feelings of discomfort among users, especially those who may be less tech-savvy.

This study plays a vital role in understanding customer intention to use digital wallet in Mongolia. This study also makes a great contribution to the knowledge and literature in this field, which has not been well evaluated in the Mongolian context.

Furthermore, this study is valuable for banks, digital wallet providers, regulators, policy makers and government organizations in Mongolia to understand customer perception toward the intention to use digital wallet.

LIMITATIONS

Even though this study represents a fruitful attempt to investigate the intention to use digital wallet in Mongolia, it is restricted by the number of limitations. The method in this paper was only a survey questionnaire, so sequential research can continue with other research methods of interview, case studies and experimental research. Also, the data was obtained by digital wallet users in only Ulaanbaatar, the capital city of Mongolia. Therefore, this study covers only Mongolian internal digital wallet. It is crucial to compare and test other countries in order to confirm whether those hypotheses are effective or not.

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