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Understanding Consumer Acceptance of Fintech Service : An Extension of the TAM Model to Understand Bitcoin

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Abstract:*Bitcoin has emerged as one of the most promising Fintech applications over the last years. Although prior researches have focused on the factors to explain technology adoption in Fintech area, there is limited empirical work. Thus, this research is to increase our understanding of the factors that influence Bitcoin acceptance. In order to achieve the goal, we aim to propose a model on Bitcoin by developing an extended model based on the technology acceptance model (TAM). The model was tested with an online survey sample by using the PLS method. The results indicated that the behavioral intention to use Bitcoin is affected mainly by perceived usefulness and perceived security. However, perceived ease of use is not significant and only indirectly gives influence to the intention.*

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I. Introduction

New technology adoption and employment in the financial service section is a key concern of financial marketing research. For instance, Fintech is an economic industry composed of companies that use new technology to provide more efficient financial services[1]. It uses mobile centered information technology to raise the efficiency of the financial system[2].

Among the recent Fintech services, Bitcoin proposes a rapid paradigm shift from the traditional systems. Bitcoin is a cryptocurrency created in 2008 and is the most notable one. The design of Bitcoin was first reported in a paper by Nakamoto[3].Since its first issue of genesis block, Bitcoin has gained strong popularity and is in the center of interest. It relies on blockchain technology to execute its financial transactions, and it is highly secure providing new possibilities as a Fintech platform[4].

However, Bitcoin is relatively new technology of Fintech and its market is still growing and unstable. Some critics have suspicions about the potential of Bitcoin[4], and very little about the user attitude toward the Bitcoin is known until today.

The goal of this research is to increase our understanding of the factors that influence Bitcoin service acceptance. In order to achieve the goal of this research, this research aims to propose a model of Bitcoin service by developing an extended model based on the TAM (technology acceptance model).

II. Literature Review and Hypothesis

Existing information research has tried to explain why people accept innovative services based on new information technologies. In order to effectively achieve these research objectives, various research models have been proposed and developed. These studies have produced empirical models using a variety of exogenous variables, and these exogenous variables have been used as predictors of consumer attitudes and intentions.

TAM is one of the models, and Davis created this model to discuss the effect of external variables on an individual user's internal belief and attitudes[5]. The theoretical backgrounding of the model is Fishbein and Ajzen's TRA (theory of reasoned action)[6]. According to their theory, belief influence attitudes, which lead to behavioral intentions[6].

TAM adapts this causal relationship to its model. In the original TAM, a user's behavioral intention to use a certain technology is determined by two main antecedents: perceived ease of use and perceived usefulness[5,7]. Perceived usefulness is the extent to which a user believes that using the technology will enhance his job performance and is a significant factor affecting acceptance of an information system. Perceived ease of use is defined as the degree to which a user believes that using a particular system would be free of effort[5]. Hence a technology perceived to be easier to use than another is more likely to be accepted[8]. Perceived ease of use also gives influence to perceived usefulness because the easier the technology is to use the more useful it can be[7,8]. Thereby, this research proposes that:

H1. Perceived ease of use will give positive influence to intention to use Bitcoin.

H2. Perceived usefulness will give positive influence to intention to use Bitcoin.

H3. Perceived ease of use will give positive influence to perceived usefulness

Given the pace of technological development, continuous changes in the research model seem inevitable. The first TAM was a very simple model[5] (Davis 1989). However, the existing TAM was not free from the criticism that it did not consider the unique characteristics of Fintech services. The importance of security to the acceptance of Fintech services has been noted in many studies[8,9]. Security were found to be a significant issue to the adoption of Fintech service[10].

One major aspect of Fintech that can help make financial service more secure is blockchain technology. The technology is very secure more than ever before, so it is ideal for financial transaction and gives positive influence to the behavioral intention of users[4]. Thereby, this research proposes that:

H4. Perceived security will give positive influence to intention to use Bitcoin.

III. Research Procedure and Result

In this study, primary data have been collected from the actual Bitcoin users in Korea. These respondents belong to a Bitcoin online community, and the questionnaires are collected from online survey site and 224 respondents complete the survey. Likert five-pointscale ranging from "strongly disagree" and "strongly agree" were used, and all questions were measured through self-reporting. The demographic details of the respondents are as follows. Their average age of respondents is 26.4 years and 73% are male and 27% are female.

Measurement items used in the study are developed based on a series of empirical stages. In the first step, every item in the model is borrowed from the related studies to get initial face validity.

Table no 1:Measurement Item

Construct	Item	Source
Perceived usefulness	1. Using the Bitcoin improves my performance. 2. Using the Bitcoin increases my productivity. 3. I find the Bitcoin to be useful.	Venkatesh and Davis[7]
Perceived ease of use	1. I find the Bitcoin to be easy to use. 2. I find it easy to get the Bitcoin to do what I want it to do. 3. My interaction with the Bitcoin is clear and understandable.	Venkatesh and Davis[7]
Perceived security	1. I find the Bitcoin to be reliable enough to do a transaction. 2. I find the Bitcoin to be secure enough to do a transaction. 3. I believe the Bitcoin is doing its best to enhance security.	Han[11,12]
Intention to use	1. I intend to continue using Bitcoin in the future. 2. I will always try to use Bitcoin in my daily life. 3. I plan to continue to use Bitcoin.	Venkatesh et al.[11,12]

In the second step, it is required to test the validity and reliability of the constructs to perform the PLS test. Reliability of measures is tested by calculating Cronbach's alpha, composite reliability and the AVE (average variance extracted). These scores are found to be satisfactory enough.

Table no 2: Reliability Test

	Cronbach'salpha	Composite reliability	AVE
Perceive usefulness	0.848	0.908	0.767
Perceived ease of use	0.825	0.895	0.739
Perceived security	0.731	0.837	0.635
Behavioral intention	0.944	0.964	0.899

In the third step, to test the validity of measures, factor analysis is executed with the VARIMAX rotation option by using PCA (principal component analysis) method. In the test, four factors explaining 77.776% of total variance are extracted as expected.

Additional Fornall-Larcker test is performed to check discriminant validity[13]. They suggested that the square root of AVE can be used to test discriminant validity, when the calculated value is larger than other correlation value among the latent variables. The test result also shows that discriminant validity is established.

Table no 3: Factor Analysis

	1	2	3	4
Behavioral intention 2	0.922	0.164	0.108	0.114
Behavioral intention 3	0.907	0.219	0.137	0.052
Behavioral intention 1	0.901	0.257	0.060	0.103
Perceive usefulness 2	0.117	0.882	0.199	0.020
Perceive usefulness 3	0.285	0.796	0.217	0.061
Perceive usefulness 1	0.330	0.738	0.194	0.003
Perceived ease of use 2	0.026	0.236	0.872	0.034
Perceived ease of use 1	0.213	0.120	0.846	0.025

Perceived ease of use 3	0.063	0.525	0.677	0.000
Perceived security 2	0.128	0.080	-0.052	0.824
Perceived security 3	-0.044	0.068	-0.045	0.794
Perceived security 1	0.152	-0.097	0.178	0.787
Eigen value	2.780	2.462	2.129	1.962
Variance %	23.169	20.514	17.739	16.353
Total variance	77.776			

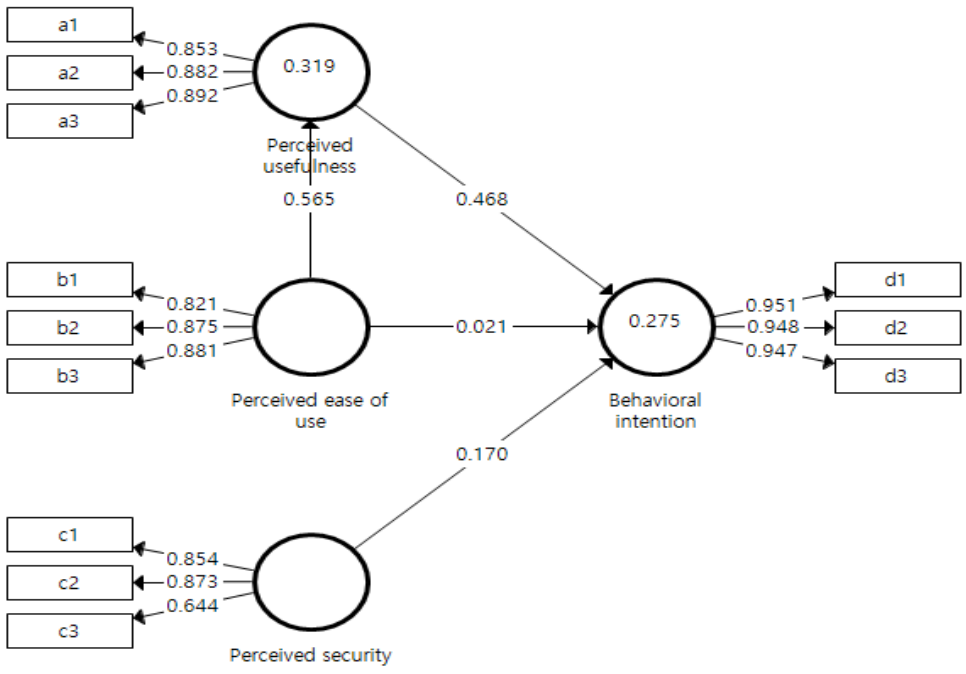
Table no 4: Fornell-Larcker Test

	Behavioral intention	Perceived ease of use	Perceive usefulness	Perceived security
Behavioral intention	0.948			
Perceived ease of use	0.299	0.860		
Perceive usefulness	0.496	0.565	0.876	
Perceived security	0.217	0.081	0.096	0.797

To test the hypothesized relationships between constructs, PLS(partial least square) modeling is used. PLS is a multivariate analysis technique that can test causal research model[14]. PLS is considered to be a suitable method because of lack of previous studies on Bitcoin. According to the bootstrapping test results, an examination of R^2 value (perceived usefulness=0.319, behavioral intention=0.275) demonstrates that the proposed model shows a substantial amount of the variance. According to the test result, every hypothesis except H3 is accepted. Perceived usefulness and perceived security give influence to the behavioral intention directly. However, the direct relationship between perceived ease of use and behavioral intention is not supported.

Table no 5: Test Result

Hypothesis	Estimate	S.D	T value	P (<*0. 05)
H1. Perceived usefulness →Behavioral intention	0.468	0.067	6.967	0.000
H2. Perceived ease of use →Perceived usefulness	0.565	0.051	11.142	0.000
H3. Perceived ease of use →Behavioral intention	0.021	0.070	0.298	0.766
H4. Perceived security →Behavioral intention	0.170	0.052	3.292	0.001



IV. Conclusion

According to the results, the results present contributions to the existing literature in a number of ways. First, this paper makes a contribution to the Fintech literature by providing an understandingof the factors that affect Bitcoin acceptance. Considering the relatively recent development of Bitcoin and the lack of relevant studies, this study provides value as an early study.

Second, the result hint that usefulness factor is a critical factor influencing the Bitcoin acceptance. On the contrary, security is found to have a relatively weak relationship with the user acceptance. This is in contrary to other Fintech related studies[9]. It can be seen that users prefer usefulness value rather than security value when accepting Bitcoin.

Third, this research finds that convenience factor's direct influence to intention is not significant but only influence indirectly. According to the results, the attitude of the user to the convenient Bitcoin is not clear. They may think that convenience is a potential threat to their financial assets.

However, this research has some limitations to be improved. First, the sample size for the analysis is a little bit small. The small sample size of this research can cause the difficulty in generalizing of the research result. Second, further demographic information of respondents such as respondents' education experience, technology readiness is needed for the explication of Bitcoin consumer behavior.

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