

Applying the TAM to understand the factors affecting use Of online banking in the Pescadores

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ABSTRACT

This research was developed based on the technology acceptance model (TAM), and the model empirically examines the factors influencing the online banking adoption behavior of 210 clients in the Pescadores. A total of 210 Penghu (Pescadores) residents were surveyed using a standard questionnaire. We received a total of 150 responses. Since 60 questionnaires were incomplete, the response rate was 71.4%. The questionnaire included three parts. The first part asked our respondents what kinds of online banking services they had used. The second part had questions measuring the constructs in the research model. The third part had demographic questions about the participants.

The implications of the findings are discussed and suggestions made for future research. This study can provide basic information for those who are interested in online banking behavior in the Pescadores.

Keywords: *Online banking, Technology acceptance model (TAM), Theory of planned behavior (TPB), Pescadores*

1. INTRODUCTION

1.1 The background of Penghu (Pescadores)

Penghu (Pescadores) Island archipelago is situated in the southwest of Taiwan. It has a total area of 141 square kilometers, with 90 islands of varying sizes. Of these, 20 are inhabited. The country's administration includes 5 townships and 97 villages, with a population of 97,000. Because it is surrounded by the sea, most of the inhabitants have made their living by fishing. In recent years, the government has made efforts to develop tourism in the economy. The employed population is mainly in agricultural fishery and tourism or military men, government employees, teachers and businessmen. In financial services there is an undeveloped area. Now, there are Land Bank, Bank of

Taiwan, First Bank, Taiwan Cooperative Bank and E. Sun Bank in Penghu (Pescadores).

1.2 What is online banking?

E-Banking provides a variety of financial services of banks though the internet. Through personal computers and browsers, users can get connected to bank websites and operate a variety of banking functions. Internet banking is fast, easy and secure and available 24 hours a day without time limits. It is a borderless virtual entity permitting banking anytime, anywhere. There are six main functions: account information, payment transfers, investment services, customer service, contact centers and information centers. (<http://www.worldjute.com/ebank.html>)

Table 1: Traditional VS E-banking (Comparison between traditional banking and E-banking.)

	Traditional banking	E-banking
Advantages	<ul style="list-style-type: none"> ● Can deal directly with human tellers and other staff to answer questions immediately ● Can submit bills immediately. ● High privacy 	<ul style="list-style-type: none"> ● No time and place limits, convenient and fast ● Can integrate your financial plans ● Low transaction fees ● 24 hour service
Disadvantages	<ul style="list-style-type: none"> ● Has time and place limits ● Spend more time waiting ● Robbery 	<ul style="list-style-type: none"> ● Can't immediately have questions answered ● Difficult to operate for beginners. ● Sometimes the website will be interrupted because of unstable networks ● Security

2. RESEARCH MOTIVATION

Taiwan officially joined the World Trade Organization (WTO) in 2002, causing domestic industries to be confronted with many tests and more competition. E-banking also needs to face this inevitable challenge. The innovation of technology changes peoples' lifestyle. Online banking service development also gradually changes traditional transaction methods. This technology replaces human resources. Online banking is very convenient. People don't have to go to a bank, but rather can just use their E-banking website. It can be used anytime and anywhere. E-banking also needs to help residents to accept the inevitable challenges of changing the traditional model for the residents of Penghu (Pescadores). This study, through literature and questionnaires, analyzes the internet banking behavior and views of Penghu (Pescadores) residents.

3. PURPOSES OF THIS STUDY

- To understand the financial situation of Penghu (Pescadores) residents.
- To understand Penghu (Pescadores) residents' frequency of using online banking services.
- Is using an online banking service helpful for Penghu (Pescadores) residents' financial plans?
- Are online banking services easy to use for Penghu (Pescadores) residents?

Can online banking services help and encourage Penghu (Pescadores) residents' financial management?

4. LITERATURE REVIEW

4.1 Definition of E-banking

Online banking is also called Network Banking or Virtual Banking. It means a computer client can connect through the internet to a Bank's computer. Customers do not go directly to the counter, but can get financial services provided by the Bank, such as account information, transfers, payments, applications and e-mail notification

services. Banking through an internet platform provides customers with immediate, convenient electronic financial services. (Jiang Yihui, 2000)

4.1.2 Electronic Banking in other Countries

4.1.3 E-Banking in Estonia

In 1996, Estonia first developed its internet banking. In the past few years, E-banking has been very significantly promoted in Estonia. In this area, there are many people who have personal computers and internet access, with 45 percent (ages 15-74) being internet users. (Ozdemir, 2009) Deutsche Bank Research shows that more than 70-80% of the internet users in Estonia use internet banking. (Dmitri Sokolov, 2007)

4.1.4 Electronic Banking in China

China Merchants Bank first launched the internet payment system in China in 1997. After that, online banking spread rapidly in China. They believe online banking has more benefits than traditional banks. Therefore, they want to implement new technologies and services to gain competitive market advantage. (Seth, 2004)

4.2 Theoretical Background

4.2.1 TAM Model (Technology Acceptance Model)

TAM (Technology Acceptance Model) according to Davis (1986) is based on the theory of TRA (Theory of Reasoned Action) (Fishbein and Ajzen, 1975; Ajzen, 1988). Its main purpose for us is to provide a basis to discuss how online banking service will affect users' beliefs, attitudes and intentions. We hope this model can effectively explain or predict the behavior of online banking users. In this model, Davis (1989) suggests attitude will be affected by various psychological factors. He proposed two major factors, including Perceived Usefulness and Perceived Ease of Use. He concluded that TAM is the most simple and effective model.

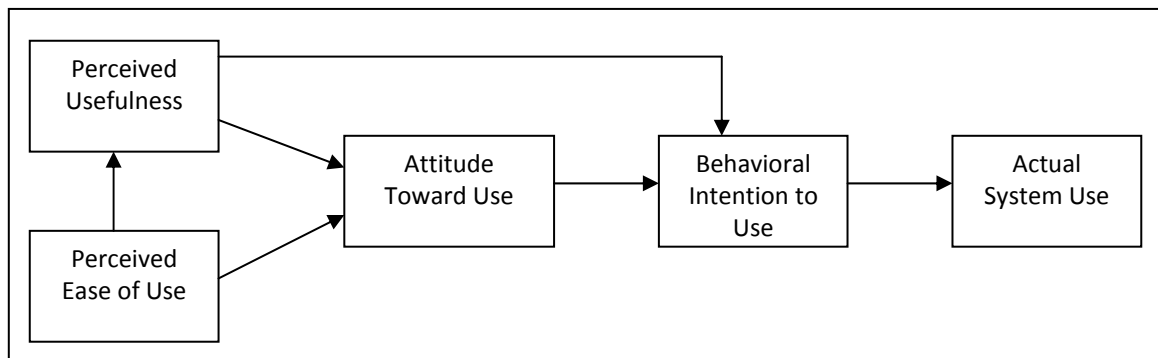


Fig 1: Technology Acceptance Model (Davis et al., 1989)

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Davis (1989) has supported that the cognitive dimension includes Perceived Usefulness and Perceived Ease of Use and they are the most important factors influencing attitudes. Perceived Usefulness and Perceived Ease of Use affect a user's attitude about the use of a new technology. These two factors will further influence Behavioral Intention to Use. The Behavioral Intention to Use further influences actual use.

5. RESEARCH MODEL

We surveyed the opinions of Penghu (Pescadores) residents to explore how they use online banking services and their behavioral intention to use them. We use the Technology acceptance model (TAM) as a theoretical basis and analyzed five factors that influence behavior: Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, Behavioral Intention to Use and System Usage.

6. RESEARCH HYPOTHESES

Several hypotheses were constructed for testing as summarized in Table 2 and the sources from which they have been derived.

7. RESEARCH METHODOLOGY

7.1 Design

A total of 210 Penghu (Pescadores) residents were surveyed using a standard questionnaire. We received a total of 150 responses. Since 60 questionnaires were incomplete, the response rate was 71.4%. The questionnaire included three parts. The first part asked our respondents what kinds of online banking services they had used. The second part had questions measuring the constructs in the research model. The third part had demographic questions about the participants.

7.2 Participant

The participants of this research are residents of Penghu (Pescadores). A sample of 210 people was randomly chosen from Penghu (Pescadores) residents. These people have different ages and education. All the participants were bank customers selected randomly. One hundred fifty usable responses were collected. Table 3 summarizes the demographic characteristics of the respondents.

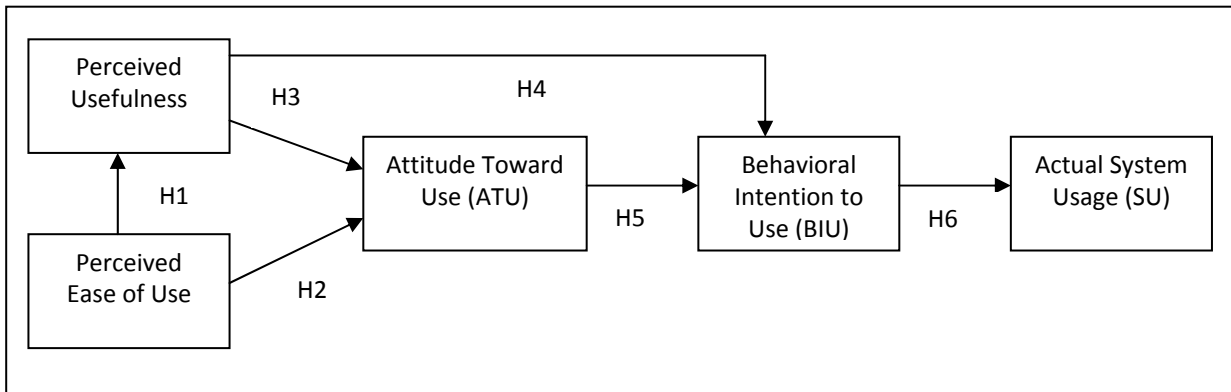


Fig 2: Proposed research model the extended TAM. (Davis et al., 1989)

Table 2: Research hypotheses

Hypotheses	Source
H1: PE→ PU There is a positive relationship between perceived ease of use and perceived usefulness of online banking.	<ul style="list-style-type: none"> ● Davis (1986) ● Davis (1989) ● Cheng et al. (2006) ● Davis et al. (1989)
H2: PE→ ATU There is a positive relationship between perceived ease of use and attitude towards using online banking.	<ul style="list-style-type: none"> ● Agarwal and Karahanna (2000)
H3: PU→ ATU There is a positive relationship between perceived usefulness and attitude towards using online banking.	<ul style="list-style-type: none"> ● Lederer et al. (2000) ● Venkatesh and Davis (2000)
H4: PU→ BIU There is a positive relationship between perceived usefulness and behavioral intention to use online banking.	<ul style="list-style-type: none"> ● Moon and Kim (2001)
H5: ATU→ BIU There is a positive relationship between attitude towards using online banking and behavioral intention to use it.	<ul style="list-style-type: none"> ● Lai and Li (2005)
H6: BIU→ SU There is a positive relationship between behavioral intention to use and actual system usage.	<ul style="list-style-type: none"> ● Fishbein and Ajzen (1975)

Table 3: Profile of survey sample

Respondents characteristics	Number of respondents who answer (n=150)	Percentage (%)
<i>Gender</i>		
Male	87	58
Female	63	42
<i>Age</i>		
18-25	6	4
26-30	18	12
31-35	48	32
36-40	45	30
41-45	6	4
45-50	18	12
50-60	9	6
More than 60	0	0
Respondents characteristics	Number of respondents who answer (n=150)	Percentage (%)
<i>Education</i>		
Junior high school	0	0
High school	27	18
Junior college	27	18
College	75	50
Graduate school	21	14
<i>Income (NTD/Mon)</i>		
Less than 10,000	0	0
10,000-50,000	99	66
60,000-100,000	39	26

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100,000-200,000	9	6
More than 200,000	3	2
Internet use frequency		
Every day	60	40
Almost everyday	48	32
Twice a week	21	14
Twice a month	15	10
One every three-month	6	4
Semi-annual	0	0
Never	0	0
E-banking knowledge		
Quite clear	84	56
Clear	57	38
Ever used	9	6
Never used	0	0

8. MEASUREMENT DEVELOPMENT

All our factors used a five-point Likert scale, ranging from “strongly disagree”1 to “strongly agree”5.

There are several characteristics of features that define a Likert scale:

- The scale contains several items.
- Response levels are arranged horizontally.
- There usually is an odd number of response levels. Typically the number is 5, though sometimes 7, 9, 11 levels are used.

(Uebersax, 2006)

<http://www.john-uebersax.com/stat/likert.htm>

9. DATA ANALYSIS

We used the statistical software package SPSS for Windows (version 12.0), to carry out a regression analysis of the TAM model on our surveys. Regression analysis is a kind of structural equation modeling. Regression analysis is useful because it works well on small samples and can usually be solved quickly, even when there are many factors and variables.

Table 4: Summary of measurement scales

Constructs	Measures	
Perceived Usefulness (PU)	PU1	Using an online banking service is useful for me.
	PU2	Using an online banking service is useful for my personal future plans.
	PU3	Using an online banking service is helpful for my financial plans.
	PU4	Using an online banking service saves me time.
	PU5	Using an online banking service would improve my financial management efficiency.
Perceived Ease of Use (PEOU)	PEOU1	Online banking tools are easy to use.
	PEOU2	Learning to access an online banking service would be easy for me.
	PEOU3	If I use an online banking service, I think it would be clear and easy to operate.
	PEOU4	I would find an online banking service easy to operate in different functions, and I wouldn't need much time to learn.

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	PEOU5	Overall, I find online banking services are easy for me.
Attitude Toward Use (ATU)	ATU1	I enjoy using online banking services.
	ATU2	I prefer to use online banking services.
	ATU3	Online banking services are appealing to use.
	ATU4	I actively use online banking services.
Constructs	Measures	
Behavioral Intention to Use (BIU)	BIU1	I intend to use online banking services.
	BIU2	I am willing to introduce online banking services to friends, relatives or others.
	BIU3	I am planning to use online banking services in the future.
	BIU4	I have positive attitudes toward using online banking services.
Actual System Usage (SU)	SU1	I often use online banking services.
	SU2	I usually use online banking services for my personal financial plans.
	SU3	I frequently use online banking services for financial transaction activities.
	SU4	I always use online banking services to pay my living expenses.

10. MEASUREMENT SCALES

The data show that the 150 people included 87 males, for 58 percent and 63 female, for 42 percent. Half of the people have graduated from university. Age tended towards 31-40 years old, amounting to 62%. Conversely, no one was more than 60 years old. Average incomes were mostly around 10, 000-50,000NT, for 66%. 56 percent of people were very clear on how to operate online banking and use the Internet every day.

11. RESULTS

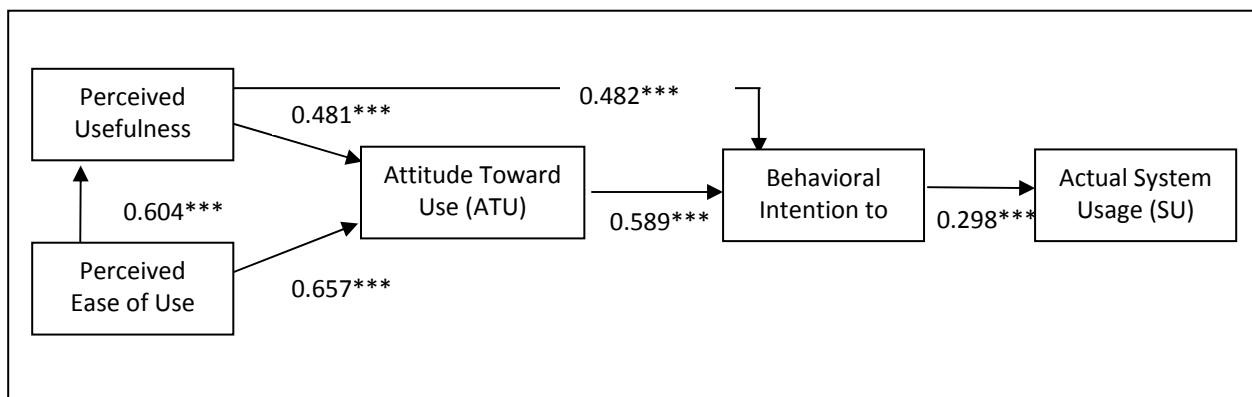


Fig 3: The result of research model. (Path analysis)

12. CONCLUSION

From the results of this research, we can see that Penghu (Pescadores) residents use online banking services less, but they have a very good sense of online banking services' ease and usefulness. This research measures attitude towards the various advantages of online banking through positive factors named perceived usefulness and perceived ease of use. Perceived benefit and perceived usefulness have positive influences on the intention to use online banking services. Still there is a positive correlation between these factors and attitudes and use.

REFERENCES

- [1] Agarwal, R. and Karahanna, E. (2000) Time flies when you're having fun: cognitive absorption and beliefs about information technology usage, *MIS Quarterly*, 24,4, 665-694
- [2] Ajzen (1988) *I. Attitudes, Personality, and Behaviour*. Dorsey Press, Chicago.
- [3] Cheng TCE, Lam DYC, Yeung ACL. Adoption of internet banking: an empirical study 921 in Hong Kong. *Decis Support Syst* 2006; 42(3):1558–72.
- [4] Davis, F.D., "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, Vol. 13 No. 3, 1989, pp. 319-340.
- [5] Davis, F.D., R.P. Bagozzi and P.R. Warshaw,. 1989.. User acceptance of computer technology a comparison of two theoretical models. *Management Science*, 35(8). 982 -1003.
- [6] Davis, F.D.,(1986).A technology acceptance model for empirically testing new end-user information system: theory and results, Ph.D. dissertation, MIT Sloan School of management, Cambridge, MA.
- [7] Fishbein, M. & Ajzen, I. (1975) *Belief, attitude, intention, and behavior: An introduction to theory and research*. Massachusetts, Reading, MA.
- [8] Lai VS, Li H. Technology acceptance model for internet banking: an invariance analysis. *Inform Manage* 2005; 42(2):373–86.
- [9] Lederer, A. L., Maupin, D. J., Sens, M. P., and Zhuang, Y. (2000) the technology acceptance model and the World Wide Web. *Decision Support Systems*, 29, 269-282.
- [10] Moon, J. W. and Kim, Y. G. (2001) Extending the TAM for a World-Wide-Web context, *Information & Management*, 38,4, 217-230.
- [11] Ozdemir, S. and P. Trott, 2009. Exploring the adoption of a service innovation: A study of Internet banking adopters and non-adopters, *J. Financial Services Marketing*, 13(4): 284-299.
- [12] Sokolov, D., 2007. *E-Banking: Risk Management Practices of the Estonian Banks*. Institute of Economics at Tallinn University of Technology.
- [13] Seth, N., S.G. Deshmukh and P. Vrat, 2004. Service quality models: A review, *International J. Quality and Reliability Manage.*, 22(9): 36-51.
- [14] Uebersax, J.S., Likert scales: Dispelling the Confusion. *Statistical Methods for Rater Agreement website*. 2006. Available at: <http://john-uebersax.com/stat/likert.htm>.
- [15] Venkatesh V, Davis FD. A Theoretical extension of the technology acceptance model: four longitudinal field studies. *Manag Sci* 2000;45(2):186-204
- [16] Yihui,J and Eva C, 2000. "Internet banking user's behavior points Analysis ", *Industrial Finance*, No. 107. <http://www.worldjute.com/ebank.html>