Exploring Consumers' Intention to Use Mobile Payment APPs Based on Technology Acceptance Models - Taking Line Pay as an Example

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Abstract

According to the statistics of the Financial Supervisory Commission, as of the end of March 2021, the cumulative transaction amount of the latest five mobile payments has reached 503.2 billion， LINE, a communication software that is inseparable from our lives, has launched a service - "LINE Pay", which has become the most commonly used mobile payment by Taiwanese consumers. This research mainly takes people who have installed LINE PAY as the research object, and uses three factors that may affect consumers' consumption patterns, such as " Brand Association ", " Consciousness Risk " and "social impact".) to explore consumers' usage intentions for mobile payment apps, hoping to gain a deeper understanding of their usage intentions.

Keywords: action payments, technology acceptance models, brand association, consciousness risk, social influence

1. Introduction

Since the launch of the three major international payment platforms in 2017, the advance in mobile technology and the development of the Internet have led to considerable innovation in consumer services. The impact of mobile payments on consumers is significant, in terms of not only increasing the productivity of the financial system or related industries but also enhancing convenience for both merchants and consumers.

It is found in the consumer survey concerning mobile payment conducted by the Institute for Information Industry (III) that consumer preference for mobile payments has increased significantly, from 37% to 50% in 2020 [1]. In the last two years, the impact of COVID-19 has changed consumers' payment habits and spending behavior, with people beginning to accept contactless payment. According to the Financial Supervisory Commission (FSC) [2], as of the end of March 2021, the cumulative value of the five largest mobile payment transactions has reached NT$503.2 billion. The survey conducted by 1111 Job Bank also shows that as many as 90% of the respondents have used mobile and electronic payment tools [3]. LINE Pay (65.5%) is the most frequently used, followed by EasyCard (54.0%), Apple Pay (25.6%), Jiekou Pay (22.9%) and Taiwan Pay (18.0%). LINE, a communication software inseparable from our lives, has launched its service LINE Pay, which is the most popular mobile payment service used by consumers in Taiwan.

In addition, among the various theories of innovative technology acceptance models, the most widely used model framework is the Technology Acceptance Model (TAM) proposed by Davis in 1989. In this study, we focus on people who have installed LINE PAY, and use the Technology Acceptance Model (TAM) to explore consumers' usage intent mobile payment apps through three factors that may influence consumers' consumption patterns, namely 'brand association,'

'consciousness risk' and 'social impact.' We hope to gain a better understanding of behavioral intention to use.

2. Literature Review

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was first proposed by Davis in 1986. Based on Fishbein and Ajzen's Theory of Reasoned Action (TRA), he developed a model to explain and predict how users would behave in an information acceptance system. Davis (1989) [4] pointed out in his research that among the variables affecting system use, the two most important determinants were perceived usefulness and perceived ease of use. Therefore, the model focused on the perceived usefulness and perceived ease of use of IT to analyze users' behavioral intention to use IT. And in his research, it was also pointed out that perceived ease of use would affect users' perceived usefulness of new technologies, and the two were in a positive relationship. In other words, when users subjectively perceive that the use of a new technology will improve their work performance or results, then the operation or ease of use of the technology will affect the user's attitude and intention to use the technology. The technology acceptance model proposed by Davis is shown in Figure 1.

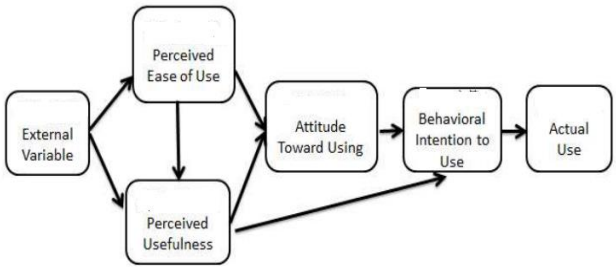

Figure 1.Technology Acceptance Model, TAM

2.2 Definition of Mobile Payments

In *Innovations in Retail Payments* published by the Bank for International Settlements in 2012 [5], 'mobile payment' is defined that 'as long as the payment is initiated over a mobile network, whether by voice, SMS or near-field communication, it can be called a mobile payment.'

2.3 Brand Association

"Brand Association" means that when consumers know a brand of a party, they can trigger relevant evaluations and ideas about the brand from all his memory impressions. Aaker (1996) advocated that brand equity can be viewed from two aspects of product and market, and proposed eleven indicators to measure brand equity [6].

2.4 Consciousness Risk

'Consciousness risk' is the risk of unsatisfactory consumption when consumers recognize the unpredictable sense of uncertainty. Therefore, the phenomenon of consumer behavior can be explored through the concept of consciousness risk. According to the literature review on consciousness risk, it is found that consumers' consciousness risk is a multi-faceted structure (Jacoby, J., & Kaplan, 1972) [7].

2.5 Social Impact

Social impact is the change in an individual's opinion or behavior as a result of the opinion or behavior of others or groups. Deutsh & Gerard (1955) [8] defined social impact as an individual's acceptance of information provided by others as a factual reference. Rogers (1995) believed that whether an individual adopts a new technology, in addition to personal decision-making patterns and technological characteristics, social impact plays an important role [9].

3. Research Methods

3.1 Modified Delphi method

The basic framework of this study is the technology acceptance model proposed by Davis in 1989, and the external factors that may influence consumers' intention to use mobile payments were compiled by referring to the relevant literature on mobile payment usage intent. The three external factors are referred to 'brand association' in Aaker's (1996) measure of brand equity. The 'social impact' proposed by Deutsh & Gerard in 1995 and the 'consciousness risk' proposed by Stone & Gronhaug in 1993 are used to analyze the current domestic mobile payment usage status and future development trends, so as to understand the factors that hinder consumers from adopting mobile payments. Consumers' intention to use mobile payment will be affected by not only their attitude towards using but also consciousness risk and social impact, as shown in Figure 2.

3.2 Operational Definitions and Measurement Questions of the Study Variables

3.2.1 Questionnaire design

This study focuses on the factors that influence the use of mobile payment by Taiwanese consumers. The

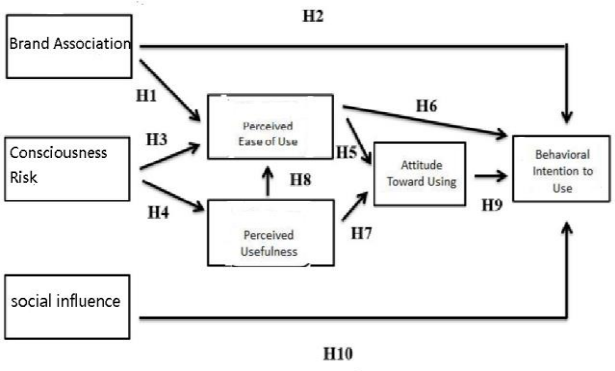

Figure 2 Research Architectur

questionnaire questions were adapted from the scales proposed by Ram (1987) [10], Thong, J. Y., & Xu, X (2012) [11] and others.

3.2.2 *Questionnaire content*

This questionnaire is divided into two parts. In the first part, the questionnaires were developed in accordance with the research framework. The second part is the demographic variables. Each question was quantified using the five-point Likert scale, which was divided into 'strongly agree,' 'agree,' 'undecided,' 'disagree,' and 'strongly disagree,' and was assigned a score of 5,4,3,2,1 in order to facilitate subsequent statistical analysis.

4. Research Results

4.1 Descriptive Statistical Analysis

Regarding the socioeconomic background of the 323 respondents, the statistical results are shown in the table. Among the respondents, the majority of them were female, with 35.9% being male and 64.1% being female. In terms of age, the majority of respondents were 31-40 years old, accounting for 25% of the respondents, followed by 41-50 years old (23%) and 21-30 years old (21%). In terms of education level, the college and university level have the highest proportion (44%), followed by the (vocational) high school level (21.0%) and the junior college level (18%). The most common payment system used by respondents is "Line Pay," with 96 respondents, accounting for 30% of the total valid sample, followed by "Apple Pay." Respondents' experience in using mobile payment is mostly '1-2 years' and '2-3 years,' accounting for 36% and 26% of the overall valid samples respectively. as shown in table 1.

Table 1. Demographics of the respondents

Overall socioeconomic background information	**Category**	**Number of samples**	**Percentage**
Gender	Male	116	35.9
	Female	207	64.1
Age	Under 20	13	4
	21-30	69	21
	31-40	81	25
	41-50	76	23
	51-60	64	20
	61+	20	6
Education level	Below elementary school	6	1
	Junior high school	8	2
	Senior high school and vocational high school	68	21
	Junior college	59	18
	University	142	44
	Graduate school and above	40	12
Personal annual income	Below 200,000 (inclusive)	18	5
	200,000-400,000 (inclusive)	72	22
	400,000-600,000 (inclusive)	103	32
	600,000-800,000 (inclusive)	64	20
	800,000-1,000,000 (inclusive)	38	12
	More than 1 million	28	9
The most-often-used payment system	Apple pay	82	25
	Google pay	64	20
	Samsung pay	53	16
	Line pay	96	30
	Taiwan Pay	28	9
Mobile payment experience	Less than one year	44	14
	1-2 years	85	26
	2-3 years	115	36
	3-4 years	52	16
	4-5 years	27	8

4.2 Regression Analysis

Regression analysis was conducted to understand the relationship between the study variables and to test the hypotheses proposed in this study, as shown in table 2.

5. Conclusion

This research framework is based on technology

acceptance patterns; three variables are used to examine the intent of consumers to use mobile payments through the narrative statistical analysis and regression analysis of dimensions. The recommendations are as follows.

(1) There is a significant positive correlation among 'perceived ease of use,' 'perceived usefulness' and 'attitude towards using.' When consumers feel that mobile payment is easy to use and can quickly solve their payment needs, their attitudes towards using mobile payment will also be affected.

(2) On the consciousness risk dimension, consumers may be exposed to potential risks when using mobile payment transactions, as examined by regression analysis. The hypothesis that consciousness risk has no effect on perceived usefulness and usage intent is not valid when examined by regression analysis. This phenomenon may be due to the fact that consumers are less sensitive to risk perception, and when the loss occurs, the existence of the risk will be realized. Consciousness risk for usage intention may be that the reward generated by mobile payment far exceeds the risk that one can bear.

(3) In terms of social impact, if the user is affected by important events or celebrity endorsements, it will affect their intention to use mobile payment. In a regression analysis, there is also a significant positive impact, representing important festivals or the influence of others will increase the intention to use mobile payment.

Hypothesis	Regression Analysis	R^2	F Value	T Value	Accepted or rejected
H1	Brand Association → Perceived Usefulness	.145	.146	.381	Rejected
H3	Consciousness Risk → Perceived Usefulness	.051	12.388**	3.521**	Accepted
H8	Perceived Ease of Use → Perceived Usefulness	.198	55.939**	7.478**	Accepted
H4	Consciousness Risk → Perceived Ease Of Use	.078	19.467**	4.413**	Accepted
H6	Perceived Usefulness → Usage Intent	.126	32.620**	5.712**	Accepted
H9	Attitude towards Using → Usage Intent	.225	65.652**	8.102**	Accepted
H2	Brand association → Usage Intent	.058	6.993**	-0.171	Rejected
H10	Social Impact → Usage Intent			3.744**	Accepted
H5	Perceived Usefulness → Attitude towards Using	.318	52.972	7.823**	Accepted
H7	Perceived Ease of Use → Attitude towards Using			2.523*	Accepted

(4) To increase consumers' behavioral intention to use mobile payments, how to introduce more practical points (or cash) rewards with low risk and how to allow consumers to use mobile payments with peace of mind and get rewards are the issues that the practitioners must consider.

Table 2. Regression Analysis

Note: * denotes P value < 0.05; ** denotes P value < 0.01 at significant level.

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Authors Introduction

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