

Analysis of WeChat Pay Based on Technology Acceptance Model

Xin Ni Jiang

Dalian NO. 24 Middle School

**Corresponding author. Email: Sydney_Jiang@163.com*

ABSTRACT

The technology acceptance model (TAM) has been widely adopted for the understanding, analysis and prediction of technology adoption, and it can be extended to many different scenarios. WeChat Pay is the second largest mobile payment service in China, despite that it was originally considered as social networking and messaging app, with perceived values different from payment and financial service app. This paper studies the process of cognitive repositioning of WeChat when it launched WeChat Pay and used an enhanced version of TAM to investigate the cognitive factors that influenced the repositioning of WeChat's perceived values. Through using the online questionnaire, the study conducts a survey with 144 samples collected, and finds the perceived availability and perceived affinity of the new value positioning have positive impact on intended behavior. Furthermore, the strength of original positioning is observed to have a negative impact on intended behavior.

Keywords: *Behavior Finance, Mobile payments, Cognitive Repositioning, Availability Bias*

1. INTRODUCTION

Over the last decade or two, smart phones and mobile apps changed many people's daily life. For example, WeChat is one of the dominating apps to enable billions of users in China to connect with each other. Since its first introduction as a messaging app in 2011, it only took WeChat 3 years to introduce the mobile payment service in 2014. While technology innovation played a role, this study will focus the psychological & cognitive factors during the repositioning.

The similar studies in the past have focused on the acceptance of mobile payment and the process of building trust of using mobile payment. Those studies were mostly conducted by applying the technology acceptance model (TAM) to investigate the building of trust and did not focus on the shifting of trust from established perceived values of apps. This study tries to enrich the previous studies by analyzing the impact of behavior finance during the cognitive repositioning. Cognitive repositioning is the influencing factor of value

repositioning and it later leads to behavior intention. To the author's best knowledge, no previous study has investigated the role of behavior finance within this context. Through analysis, this study will extend those existing studies in the investigation of adoption of mobile payment. The TAM is applied to support this study and additional factors are proposed, such as Perceived Availability, Perceived Affinity and Strength of Original Positioning. The findings of this study introduce new insights for other mobile apps to consider when they plan to introduce mobile payment service in addition to existing capabilities.

2. THE DEVELOPMENT OF WECHAT

WeChat was first launched in 2011 as a messaging app. By 2012, number of registered users of WeChat reached 100 million [1]. By 2016, WeChat has accumulated over 800 million monthly active users (MAU) [1]. As of 2021, WeChat's MAU has been over 1.2 billion [1] (as shown in Figure 1).

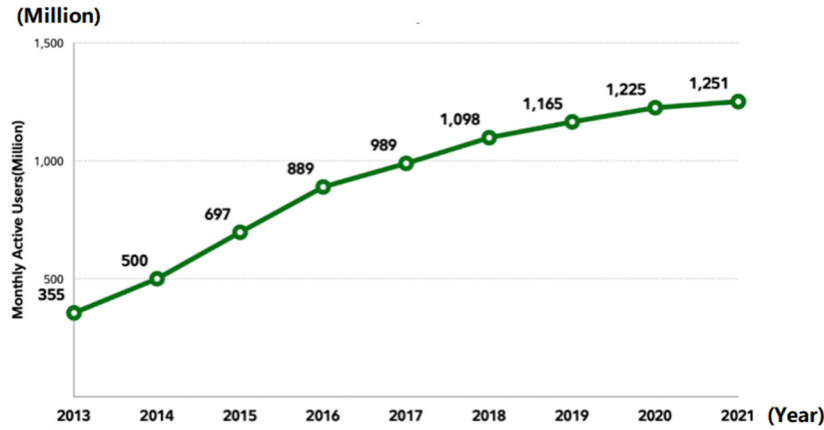


Figure 1. WeChat’s Monthly Active Users

2.1. The Launch of WeChat Pay

One of the key developments for WeChat was the launch of WeChat Pay in 2013. With WeChat Pay, users could link their personal bank accounts to their WeChat accounts, and use the app for bill payment, online shopping, money transfer between WeChat accounts and offline payments in participating stores, restaurants, and vendors. The booster of adoption of WeChat Pay was the WeChat Red Envelope launched in 2014 [2]. During the year of 2016, 3.2 billion WeChat Red Envelope were sent by WeChat users, and over 400,000 during the midnight of Chinese New Year [3].

The idea of Red Envelope is originated from Chinese tradition of “hongbao”, where friends and family members exchange as a gift [4]. The WeChat Red Envelope was launched in January 2014 and it quickly gained popularity among users. WeChat Red Envelope

enables users to give money as gift to other WeChat contacts. The senders need to associate their WeChat accounts with their bank accounts, deposit money, then send WeChat Red Envelope from their WeChat accounts. Money will be deposited into the receiver’s WeChat account, which can be later used for purchase, transfer, or withdrawal.

What could make the launch of WeChat Pay more complex was another mobile payment service, Alipay. Alipay was launched in 2003 by Alibaba group [5]. In 2013, Alipay became largest mobile payment service provider in the global markets [6]. In 2013, Alipay reported user base reached 300 million, and processed over 12.5 billion transactions throughout the year [6, 7]. WeChat pay was not comparable to Alipay at the beginning, but its market share started to grow significantly as show in Figure 2.

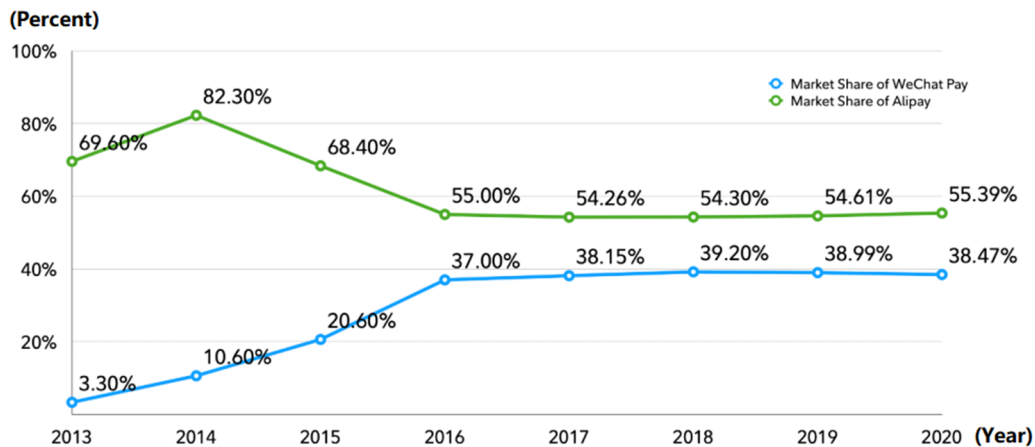


Figure 2. Market Share of Mobile Payment (by Transaction): WeChat Pay vs. Alipay

2.2. The Cognitive Bias: Factors affecting the launch of WeChat Pay

In 2013, WeChat was a popular messaging app with leading features such as Moments, Voice Messaging and

Group Chatting. It has a strong brand, reputation, and user base as a successful social media app. However, those reputations and perceived values might hinder the repositioning of WeChat being a reliable mobile payment service due to a few cognitive biases on information

processing [8]. Because mobile payment, a critical part of online financial service, carries a few important perceived values includes reliability, trustworthy and highly regulation. Those perceived values are different from values from WeChat as a successful messaging app. For WeChat, being a successful messaging app might not help or could even potentially hinder the repositioning of WeChat to be a reliable payment service provider. Therefore, cognitive and psychological reposition were important considerations during the shift of using WeChat for messaging to using WeChat for payment.

Cognitive positioning refers to the attempt by an organization to set the beliefs of potential users about the key attributes of its product offering, especially when the users are generally unfamiliar or underestimate its quality. Cognitive re-positioning, instead of setting the beliefs, refers to the attempt of altering the cognitive bias of potential users. The cognitive biases discussed below would become dragging factors of repositioning of WeChat from a popular messaging app to a mobile payment app.

(1). Availability Bias

This cognitive bias refers to the tendency to make decisions based on "availability" in memory, which can be influenced by how recent the memories are or how familiar are those options are to the decision maker [9]. In 2013, the dominating mobile payment service was Alipay, which is the mostly likely available option for users of mobile payment service.

(2). Affinity Bias

This refers to the tendency for the decision makers to favorably influenced by the people most like themselves [9]. When WeChat Pay was newly launched, limited adoptions by the surrounding family and friends would discourage the adoption.

(3). Status Quo Bias

This refers to the tendency to stay in the current option instead of shifting to an alternative one, to avoid the risk of regret [9]. In 2013, as most of users would consider WeChat to be a messaging app (status quo), this bias would hinder the adoption of WeChat Pay.

3. RESEARCH MODEL AND DATA COLLECTION

3.1. Technology Acceptance Model

The classic Technology Acceptance Model (TAM) is the most widely applied model to analyze and measure the influencing factors that impacts the adoption of a specific technology tool or capability. This model was built based on the theory of reasoned action. The TAM model assumes that when a user has an intention to perform such action, they will be free to act. With the

context of technology adoption, TAM model suggests that the user's decision to adopt a specific technology is determined by two factors: Perceived Ease of Use (PEU) and Perceived Usefulness (PU) [10]. The PEU measures the degree to which a particular user finds or believes that using a specific technology tool or capability would be easy and free of effort. The PU measures the degree to which a particular user finds or believes that using a specific technology tool or system will enhance the user's job performance. PEU and PU will influence the Attitude Towards Using (ATU) and Behavior Intention (BI) of use the specific technology tool and capability [11].

3.2. Ease of Cognitive Repositioning

While the TAM model was useful in discussing the application of information technology, it does not discuss the influence of cognitive basis when the application of the technology involves repositioning of established perceived values. This provides an opportunity of investigating additional category of influencing factors. This study names another category of influencing factors as "Ease of Cognitive Repositioning" and it mainly includes the following influencing factors.

(1). Perceived Availability (PA)

The more mentally available the alternative positioning is, the easier the shift of positioning. The perceived availability could be established by launching marketing campaigns to intensify the availability in memory of decision maker. The hypothesis is the perceived availability will have a positive impact on the adoption of WeChat Pay.

(2). Perceived Affinity (PAF)

Decision makers are likely to be influenced by people like them, and those adoptions could create "network externality" effect for more adoptions. The hypothesis is the perceived affinity will have a positive influence on the adoption of WeChat Pay.

(3). Strength of Original Positioning (SOP)

This refers to the relative strength of the original value proposition in the decision-making process. This hypothesis is the Strength of original positioning will have a negative influence on the adoption of WeChat Pay.

Based on influencing factors mentioned above, this study makes the following hypothesis:

H1: Perceived Availability is positively related to perceived intention of use.

H2: Perceived Affinity is positively related to perceived intention of use.

H3: Strength of Original Positioning is negatively related to perceived intention of use.

3.3. An Enhanced Technology Acceptance Model

With those additional influencing factors under the category of Perceived Ease of Cognitive Repositioning, an enhanced technology acceptance model is proposed as Figure 3.

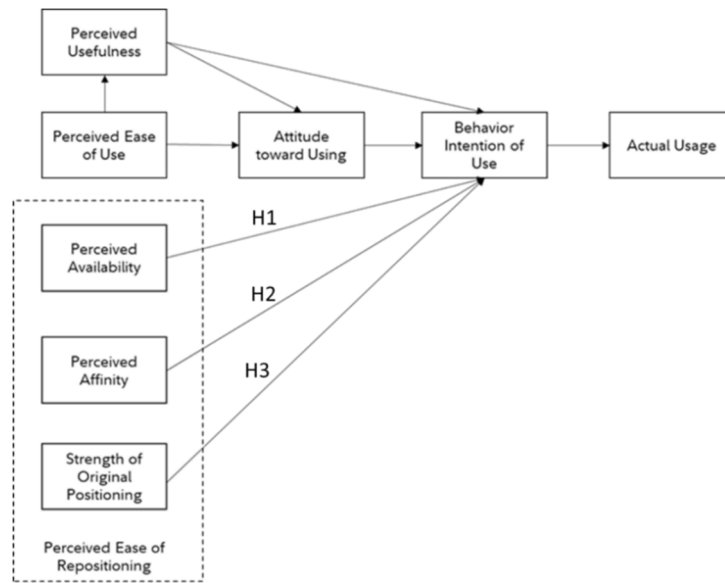


Figure 3. An Enhanced Technology Acceptance Model

3.4. Data Collection

A survey with online questionnaire was designed to collect data from users who used WeChat pay in addition to its messaging features.

29 questions were asked in the online survey with responses scale from 1 to 5 (1 being the most disagreeable and 5 being most agreeable). The questionnaire has two sections. The first section (4 questions) was to collect the demographic information of respondent. The second section (24 questions) was to collect response to measure the influencing factors and intended behavior of the enhanced TAM model. Those influencing factors include Perceived Availability (PA),

Perceived Affinity (PAF), Strength of Original Positioning (SOP), Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude towards Using (ATU) and Behavior Intention (BI). The measurement items were referenced from previous studies and modified for this study [12, 13, 14, 15, 16].

The total data collection period was 4 weeks, and 144 valid and effective data points were collected. The demographic data of respondents was shown in Table 1. Most of the respondents were at the aged of 18 – 45, well-educated and with mid-level monthly earning. The characteristics of the sample are consistent with typical mobile app users. Therefore, the sample is representative.

Table 1. Demographic of Respondents

Demographic Characteristics		Number	%
Gender	Male	78	54.2%
	Female	66	45.8%
Age	<18	2	1.4%
	18 - 30	86	59.7%
	30 - 45	43	29.9%
	45 - 60	12	8.3%
	> 60	1	0.7%
Education	Junior High School and Elementary School	3	2.1%
	High School	12	8.3%
	Bachelor's degree	86	59.7%
	Master's degree and above	43	29.9%

Monthly Income in RMB	4,999 and below	18	12.5%
	5,000 – 9,999	66	45.8%
	10,000 – 14,999	42	29.2%
	15,000 – 24,999	6	4.2%
	25,000 and above	12	8.3%

4. RESULTS

To validate the structure of the model and influencing factors, both exploratory and confirmatory tests have been conducted for validation [17]. A validated

confirmatory factor test will validate and ensure the model is suitable to analyze the data collected, and also the load of factors are validated as well [18]. The results of the factor leading and cross loading is shown in Table 2.

Table 2. Loading and Cross loading of the measurement items

Construct	Item	PA	PAF	SOP	PU	PEU	ATU	BI
Perceived Availability (PA)	PA1	0.881						
	PA2	0.782						
	PA3	0.792						
	PA4	0.536						
Perceived Affinity (PAF)	PAF1		0.844					
	PAF2		0.717					
	PAF3		0.695					
	PAF4		0.651					
Strength of Original Positioning (SOP)	SOP1			0.943				
	SOP2			0.729				
	SOP3			0.823				
	SOP4			0.831				
Perceived Usefulness (PU)	PU1				0.897			
	PU2				0.662			
	PU3				0.819			
	PU4				0.784			
Perceived Ease of Use (PEU)	PEU1					0.692		
	PEU2					0.765		
	PEU3					0.702		
Attitude toward Using (ATU)	ATU1						0.883	
	ATU2						0.871	
	ATU3						0.717	
Behavior Intention of Use (BI)	BI1							0.684
	BI2							0.704
	BI3							0.736

Cronbach's alpha and composite reliability (CR) were tested and validated to ensure the reliability of model. The model is believed to be reliable when both Cronbach's alpha and CR are greater than 0.7 [18]. The average variance extracted (AVE) and factor loading

were used to test the validity of the model. The model is believed to be validated when the factor loading is greater than 0.7 and the AVE is greater than 0.5 [19]. The test results of model reliability and validity is shown in Table 3. This result shows that the value of Cronbach's alpha

was greater than 0.7, the value of CR was greater than 0.7 and the value of AVE is greater than 0.5. This result

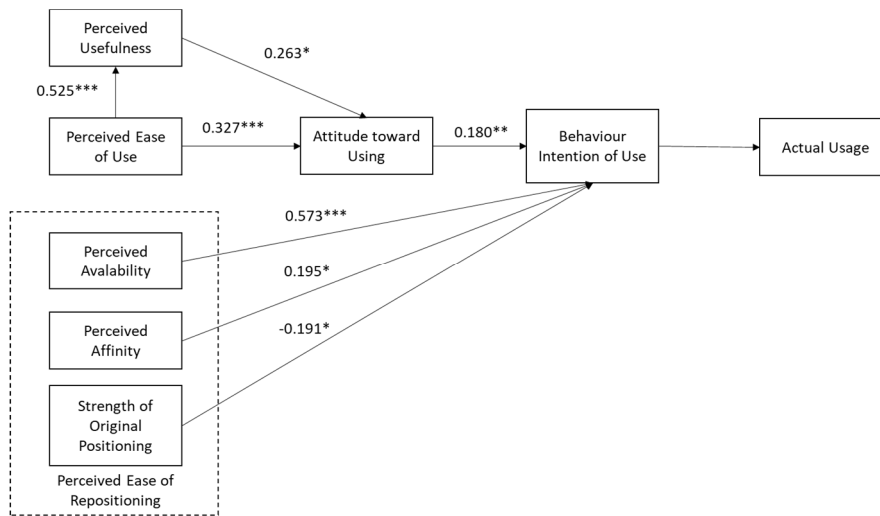
suggests that the reliability and validity of the model and data input are validated [18, 19].

Table 3. Reliability and Validity Analysis

Indicator	PA	PAF	SOP	PU	PEU	ATU	BI
Cronbach's Alpha	0.732	0.809	0.861	0.868	0.852	0.862	0.832
Composite Reliability (CR)	0.84	0.819	0.902	0.872	0.764	0.866	0.751
Average Variance Extracted (AVE)	0.575	0.533	0.697	0.632	0.519	0.684	0.502

5. FINDINGS AND DISCUSSION

A path verification test was conducted to test the relationship between the factors. The results are shown in Figure 4.



Notes: MPLUS was applied to develop Structural Equation Modeling (SEM). *p<.05 **p<.01 ***p<.001

Figure 4. Path Verification

The results suggested that the “Perceived Availability” has a positive influence of the intended behavior. This means when WeChat leverages marketing campaign to build and raise public’s awareness of its payment capability in addition to its messaging capability, users tend to adopt WeChat Pay. WeChat’s Red Envelope campaign in 2014 triggered tremendous discussions in society and made WeChat Pay a highly available option in user’s memory and many users started to use WeChat Pay. In addition, the “Perceived Affinity” has a positive influence of the intended behavior. This means if a user was surrounded by users who adopted WeChat Pay, this user tends to adopt WeChat Pay.

“Strength of Original Position” has a negative influence of intended behavior. This indicates that the stronger positioning of WeChat’s being a messaging App, the less likely the user will adopt WeChat Pay. WeChat’s payment capability demonstrated by Red Envelope campaign weakened its original positioning of being messaging app, therefore contributed to the adoption of WeChat Pay.

Successful mobile apps like WeChat have perceived values of the service they provide [20]. However, when they expand to other business areas, users need to be guided through cognitive and psychosocial repositioning process. This study examined the process and found perceived availability was the most significant factor that positively influenced the adoption. Therefore, for companies that want to reposition of their products and services, they should put more emphasis to raise the awareness and the mental availability of the new positioning.

6. CONCLUSION

This study is to understand the factors that influenced the cognitive repositioning of WeChat in launching WeChat Pay. The result indicates that Perceived Availability and Perceived Affinity have positive effects in adoption. Strength of Original Positioning has a negative effect in adoption. To motivate WeChat users to adopt WeChat Pay, the focus should be raising the awareness of the payment service and weakening the

original positioning of messaging app. This study highlights the importance of understanding and mitigating the cognitive bias and motivate users to adopt WeChat Pay. For example, the “Red Envelope” campaign mitigates the impact of those biases for a successful repositioning. With the massive participation of Red Envelope, WeChat Pay is viewed as the popular payment service and establishes its position of default option of mobile payment. And with massive adoption of WeChat Pay, the affinity bias is acting favorably for WeChat.

While this study discovers the influence of cognitive bias in WeChat Pay’s adoption, there are some limitations. Firstly, the data collection is through online survey and this sampling process might limit the diversity of data collected. In future studies, additional data collection methods should be considered to make sampling date more diversified. Secondly, this study only considers the effects of cognitive bias. Therefore, future study should further investigate the effect of social factors such as culture, religion, social class, buying habits, and how those factors influence the repositioning and adoption process. Finally, this study does not consider the impact of Alipay in the process of repositioning. In reality, many WeChat Pay users are also Alipay users, so future study could further investigate the effect of a competing product during the repositioning process.

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