

# **An Empirical Study on Influencing Factors of NFC (Near Field Communication)-Payment Adoption in China**

**Dongfang Ran**

**International Business Corporative Program  
Dongguk Univ. Gyeongju Campus**

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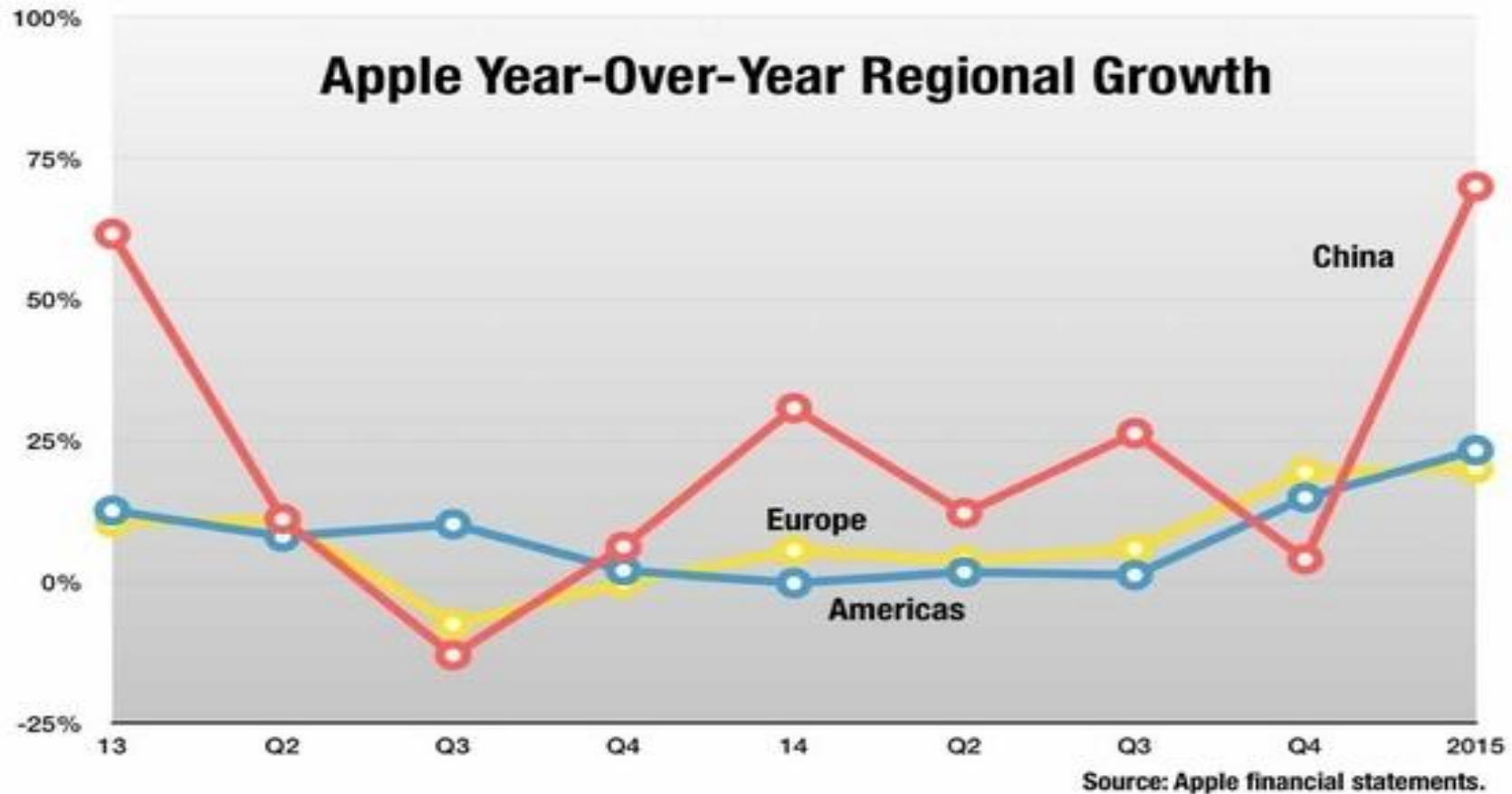
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# Introduction

- Research background
- The rapid evolution of mobile technologies and the increasing diffusion of smartphones have given significant opportunities for innovative companies to create new payment solutions and offer value-added services to their customers.
- Near Field Communication (NFC) mobile payment has been emerging as a noticeable phenomenon that can enable consumers to turn their smartphones into digital wallets.
- China has cash-centric payment cultures, although more and more Chinese try to use NFC mobile payment, but still they cannot compete with the traditional payment services.
- Research questions:
  - what factors influencing user's use intention.
  - understand the reasons why users would accept or not use NFC-payment technology.

# Introduction

The growth of iPhone adoption in China makes it the largest and fastest growing market in the world.



Tech Updates: AMAT's Earnings Slipped, Apple Pay Goes to China PART 4 OF 4

## Apple Pay Launched in China

By Adam Rogers | Feb 24, 2016 2:58 pm EDT



**China could be Apple's largest mobile payments market**

On February 18, 2016, Apple ([AAPL](#)) launched Apple Pay, its mobile payments service, in China ([FXI](#)). Apple Pay was launched with a current and planned support of 19 of the country's largest lenders. "We think China could be our largest Apple Pay market," said Jennifer Bailey, Apple's vice president of Apple Pay.

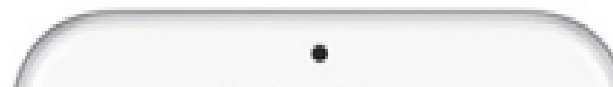
## Apple Pay a hit in China with 3 million cards added in 2 days



By [AppleInsider Staff](#)

Thursday, March 03, 2016, 06:36 am PT (09:36 am ET)

Chinese consumers have flocked to Apple's contactless payment solution in the weeks since its debut, with one bank reporting that more than 3 million cards were activated on Apple Pay in the first 2 days of availability.



# Introduction

According to local reports, by 5 p.m., 38 million bank cards had been linked to Apple Pay. The *Beijing Morning News* said on its Weibo account that within an hour of the service going live at 5 a.m., 10 million people had already linked their bank cards to their accounts.

Apple Pay allows users to pay at stores by waving their phones (or Apple Watches) at contactless terminals at checkout. The service has been hotly anticipated in China since Apple confirmed in December that China would be its fifth country to get it.



An Apple Pay sticker on a glass door of KFC on February 18, 2016 in Beijing, China.

The data were come from a Appleinsider staff's aticle and Beijing morning New's report.

# Introduction

- NFC(near field communication) is “a wireless communication technology that enables transfer of data over distances of up to 10 cm by combining technologies from RFID (Madlmayr,2008)
- Apple pay:
- The service based on NFC and it was announced at Apple's iPhone 6 event on September 9, 2014.
- On December 17, 2015, Apple announced that it will launch Apple Pay with 15 major banks in China,and Chinese users can use Apple Pay since February 18, 2016.
- Apple Pay is a mobile payment and digital wallet service by Apple Inc. that lets users make payments using the iPhone 6, 6 Plus, iPhone SE, iphone 7 and so on.

# Research objective

- Explore why users adopt NFC-payment.
- Examining the influence of PU(perceived usefulness) and PEOU(perceived ease of use) on NFC-payment adoption intention.
- Examining the influence of External variables on PU (perceived usefulness) and PEOU (perceived ease of use).
- Examining the moderator personal innovativeness(PIIT) effect of adoption intention.

# Literature review

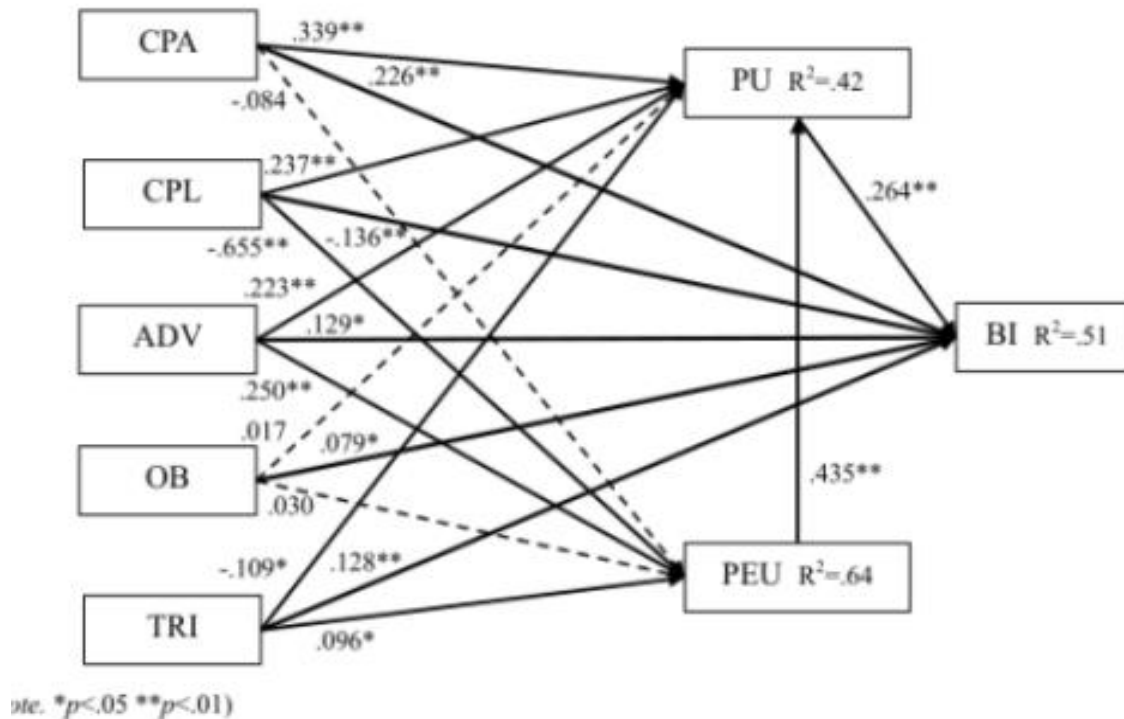
## IDT (Innovation Diffusion Theory):

- An innovation is “an idea, practice, or object that is perceived as new by an individual or another unit of adoption” (Rogers, 1995). Diffusion, on the other hand, is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995). Therefore, the IDT theory argues that “potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation” (Agarwal, 2000).
- IDT( Innovation Diffusion Theory) includes five significant innovation characteristics: relative advantage, compatibility, complexity, and trialability and observability. (Rogers, 1995).

## Relative advantage:

- Relative advantage is defined as the degree to which an innovation is considered as being better than the idea it replaced. Relative advantage refers to the extent to which innovative technology is perceived to be superior to ideas it replaces(Rogers, 1995).
- If a current user sees relative advantage of using innovative product over existing one, he will perceive its usefulness. (Shivers-Blackwell and Charles, 2006; Ramayah and Lo, 2007; Hong et al., 2008).

# Literature review



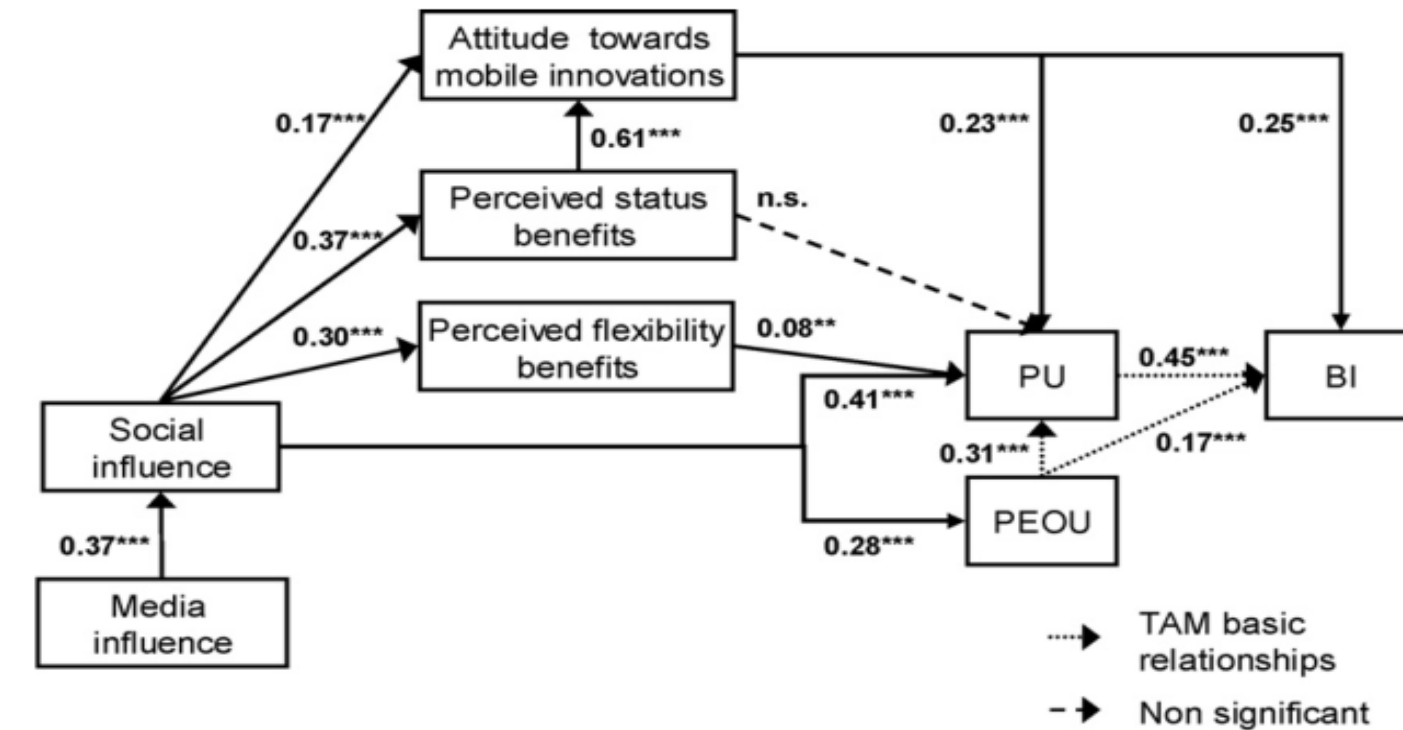
Yi-Hsuan Lee , Yi-Chuan Hsieh and Chia-Ning Hsu . (2011) Technology & Society.

- Relative advantage significantly influence perceived usefulness and perceived ease of use.

## Social influence :

- SI defined as the degree to which an individual perceives that how important others believe he or she should use the new system (Venkatesh et al., 2003).
- Davis et al. (1989) also noted that sometimes other people's commands scored over the user's feelings and beliefs.
- Explanations of how others may affect an individual's IS adoption and use largely draw on Kelman's social influence theory (Malhotra and Galletta 2005).
- TRA recognizes the importance of social norms in influencing individual behavior in general. Such behavior can come from susceptibility to interpersonal influence either to comply with group norms or to enhance one's image within the group (Bearden et al., 1989).

# Literature review



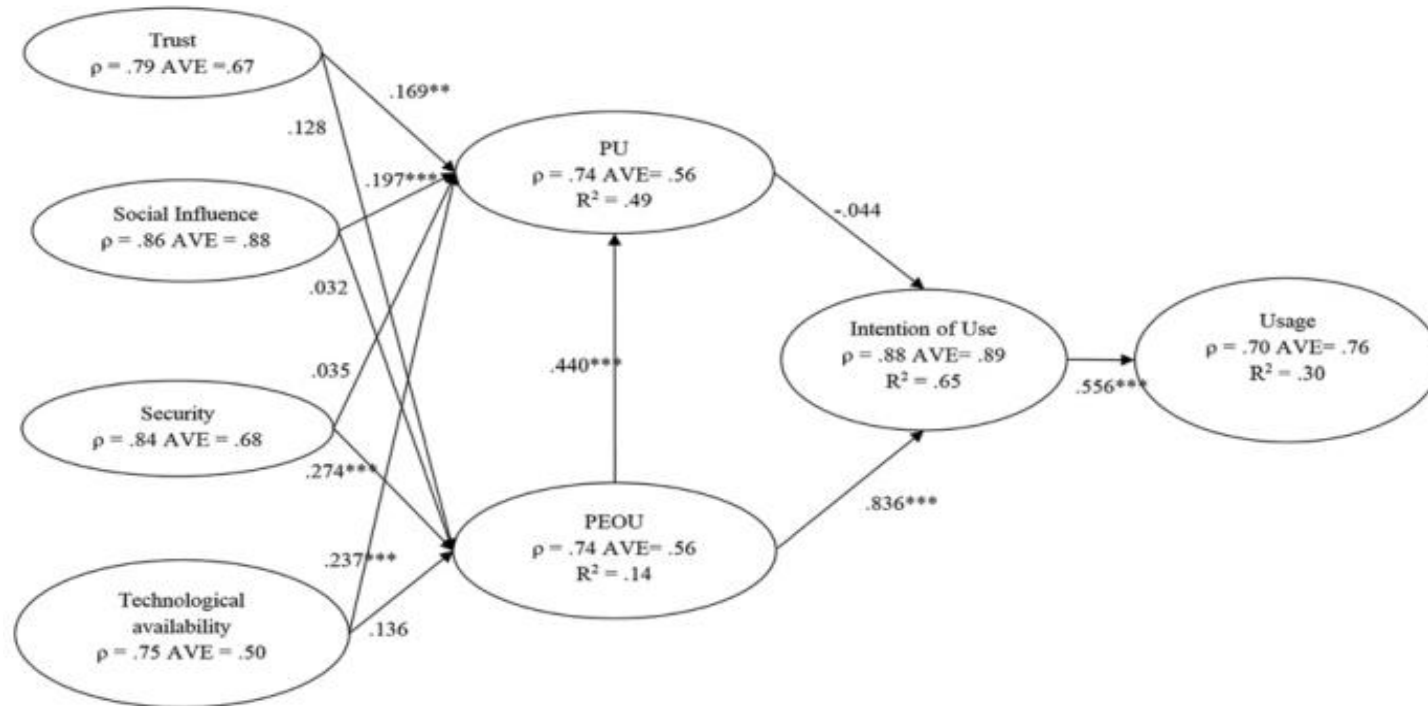
C. Lo ´pez-Nicola ´s et al./Information & Management 45 (2008).

- Social influence significant effect perceived usefulness and perceived ease of use.

# Literature review

- Technology availability
- Technology availability as the degree to which “an individual believes that technical infrastructure exists to support the use of the system” .Rupanjali et al. (2013)
- As Md Noret al. (2011)suggested, the more the technological infrastructures become easily and readily available,the more accessible and usable will be Internet commerce applications.

# Literature review



Vincent Dutot .Journal of High Technology Management Research .(2015)

- Technological availability effect on perceived usefulness and perceived ease of use.

# Literature review

## TAM model (Technology acceptance model)

- developed by Davis(1989), is one of the most influential research models for studying information technology acceptance or intention to use (Tan, Sim, Ooi, & Phusavat, 2012).
- The model presents two determinants, namely perceived ease of use and perceived usefulness, of intention to use a technology.
- Perceived usefulness: is the degree to which an individual believes that using a particular information technology will enhance his own performance.
- Perceived ease of use: is the degree to which a person believes that using a specific information technology will be free of effort .

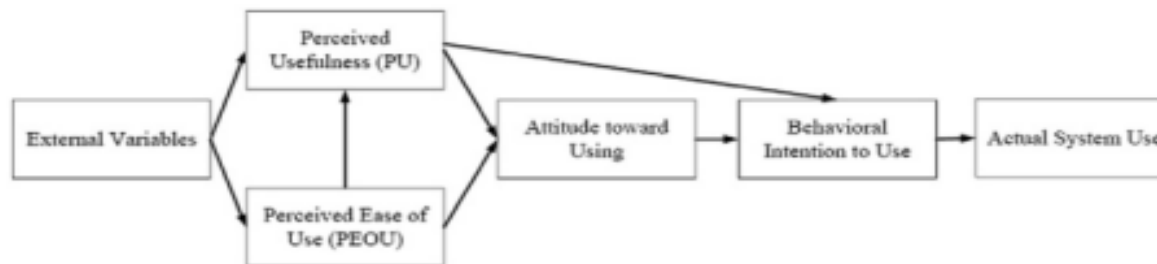


Fig2. Technology Acceptance Model(TAM) Davis,1989

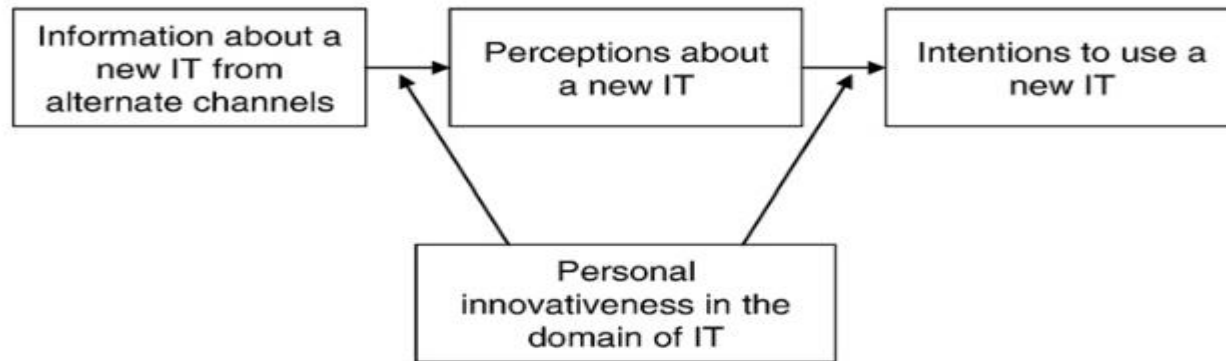
# Literature review

## PIIT (Personal Innovativeness in information technology)

- PIIT is defined as “the willingness of an individual to try out any new information technology” (Agarwal & Prasad, 1998).
- Agarwal and Prasad(1998) have proposed a new construct that illuminates the relationships in technology acceptance models, i.e., personal innovativeness in the domain of information technology (PIIT).
- Rogers'(1995) innovation diffusion theory (IDT) lends additional support by suggesting that users' personality differences can potentially influence how users form their intentions to perform behaviors.

# Literature review

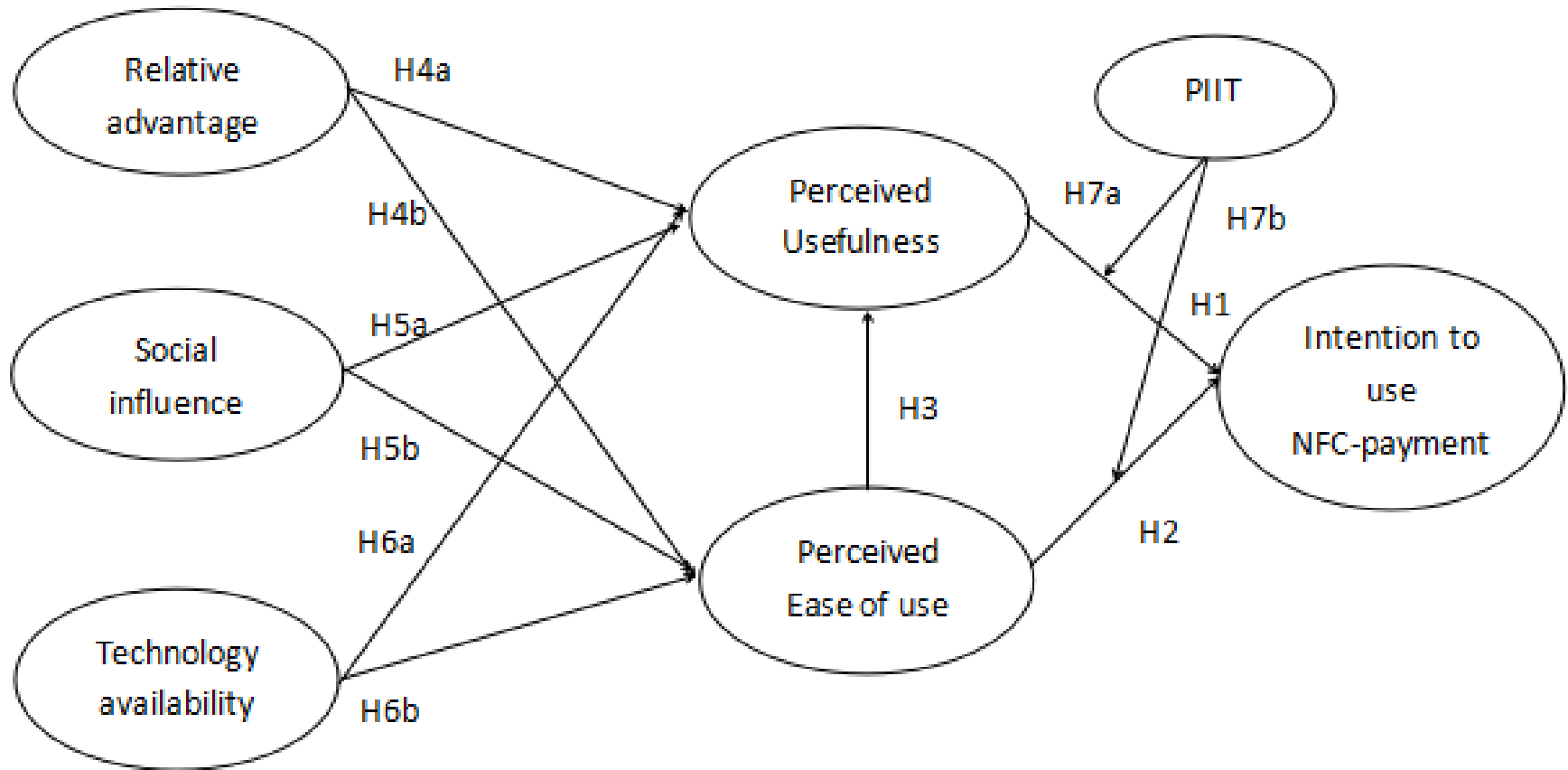
- Agarwal and Prasad have defined PI in the domain of information technology (PIIT) as “the willingness of an individual to try out any new information technology.” Following from the definition of PIIT, they suggest that PIIT serves as a key moderator in technology acceptance behavior.



Relationship between PIIT and other technology acceptance constructs. Agarwal and Prasad (1998)

- As a moderator of the antecedent of perceptions, PIIT moderates the development of perceptions; a person with higher levels of PIIT is expected to develop more positive perceptions about new IT.

# Research model



Research Model

# Hypotheses

- H1. Perceived usefulness has a positive effect on intention to use NFC-payment.
- H2. Perceived ease of use has a positive effect on intention to use NFC-payment.
- H3. Perceived ease of use has a positive effect on Perceived usefulness of NFC-payment.
- H4a: The relative advantages had a positive effect on PU of the NFC-payment.
- H4b: The relative advantages had a positive effect on PEU of the NFC-payment.
- H5a: Social influence has a positive effect on PU of the NFC-payment.
- H5b: Social influence has a positive effect on PEOU of the NFC-payment.
- H6a: Technological availability has a positive effect on perceived usefulness of NFC-payment.
- H6b. Technological availability has a positive effect on perceived ease of use of NFC-payment.
- H7a: Personal innovativeness moderate the relationship between Perceived usefulness and intention to use.
- H7b: Personal innovativeness moderate the relationship between Perceived ease of use and intention to use.

# Research design

- The sample of this paper will choose individual who has the experience using or have used NFC-payment in China .
- About 300 questionnaires will send out to NFC-payment users in Chinese.

# Measurement item

Variables	Operational Definition	Author
perceived usefulness	The degree to which a person believes that using NFC-payment would enhance his or her job performance	Davis, (1989)
perceived ease of use	The degree to which a person believes that using a system would be free of effort.	Davis, (1989)
Relative advantage	Relative advantage : is the degree to which an innovation is perceived as being better than its antecedent	Rogers, (1995)
social influence	Degree to which an individual perceives that how important others believe he or she should use the new system.	Venkatesh, (2003)
Technology availability	An individual believes that technical infrastructure exists to support the use of the system.	Rupanjali et al. (2013)
Personal Innovativeness	Personal innovativeness is the willingness to adopt an innovative technology. In other words, it is the degree of interest in trying a new thing, new concept, or an innovative product or service.	Rogers, (1995)
Intention to use (IU)	A person's subjective probability that he or she will perform some m-services.	Davis, (1989)

# Measurement item

Variable	Measurements	References
Perceived usefulness	Using NFC technology can make one productive	Vincent Dutot. (2015)
	Using NFC technology can make thing easier	
	I consider that NFC technology will allow new features for electronic devices	
	I know some future applications of NFC technology	
Perceived ease of use	Learning to use NFC technology is easy	Vincent Dutot. (2015)
	Using NFC technology is clear and understandable	
	I consider that NFC technology is too technical to be use everyday	
	it is easy to become skillful at using NFC technology	
	Overall, NFC technology is easy to use	
Relative advantage	Using a NFC-payment enables me to accomplish tasks more quickly.	Moore and Benbasat (1991) Rogers (2005) and Agarwal and Prasad (1998)
	More advantages, benefits, usefulness than similar existing products	
	Overall, I find using a NFC-payment to be advantageous in my task.	
Social influence	People who influence my behavior would think that I should use NFC technology	Vincent Dutot. (2015)
	People who are important to me would think that I should use NFC payment	
	I will use NFC payment if the service is widely used by people inmy community	

# Measurement item

Technology availability	I consider that actual mobile phone are not equipped with NFC technology	Rupanjali et al. (2013)
	I consider that few shops or stores are equipped with NFC technology	
	I consider that they are not enough opportunities for NFC technology	
	I consider that the use of NFC technology is mainly based on the availability of the technology everywhere	
Personal Innovativeness	I like to experiment with new ways of doing things	Lai-Ying Leong a , Teck-Soon Hew b , Garry Wei-Han Tan a , Keng-Boon Ooi c, (2013)
	I like to take a chance	
	I like to experiment with new ways of doing things	
Intention to use (IU)	I am likely to use NFC payment in the near future	Lai-Ying Leonga , Teck-Soon Hew b , Garry Wei-Han Tan a , Keng-Boon Ooi c, (2013)
	I am willing to use NFC payment in the near future	
	I will think about using a NFC payment	

Thanks for your  
attention!