



The effects of product-related, personal-related factors and attractiveness of alternatives on consumer adoption of NFC-based mobile payments



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ABSTRACT

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. Although there has been a lot of coverage on consumer acceptance of mobile payments, there are only few researches providing guideline to interpret NFC-based mobile payments adoption.

Taking into consideration of theoretical backgrounds of innovation diffusion and specific characteristics of NFC mobile payments, this study proposes a research framework to provide a profound understanding of factors facilitating or impeding the adoption of NFC-based mobile payments among Taiwanese consumers. The results revealed that intention to adopt NFC mobile payments is affected by most of product-related factors, personal-related factors and attractiveness of alternatives.

This paper is able to advance literature on innovation adoption and facilitate technology marketers in NFC mobile payments. It provides a useful guideline to help researchers investigate issues related to NFC mobile payments. It also brings some managerial implications by assisting relevant parties in NFC mobile payments ecosystem such as mobile network operators, card issuers, payment processing institutions, bank decision makers and merchants when devising their business strategies and marketing campaigns to facilitate NFC mobile payments.

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1. Introduction

1.1. Motivation

Advances in wireless technology have increased the number of people using mobile devices and facilitated the rapid development of mobile commerce. Mobile commerce has emerged as the most important trend reshaping the retail landscape, and some retailers are even taking one step further to make a payment via a smartphone. In other words, as mobile phone technology becomes more sophisticated, new forms of payment have since appeared within the mobile payment theme. Near Field Communication (NFC) mobile payment has been emerging as a noticeable phenomenon that

can enable consumers to turn their smartphones into digital wallets. In the past, shopping in store has often been associated with either cash or card payments. Instead of using such traditional payment methods, a consumer can make a payment for transport fares and for in-store purchases by using their cell phone with the aid of the NFC technology. With the advancement of mobile devices and the emergence of NFC technology, payment today is a mere wave-of-the-phone.

Traditionally, the mobile telecommunication and financial industries are completely separated, each with their own distinct and defined sectors and markets [1]. However, nowadays, there are some collaboration between Mobile Operators and Banks to offer new kind of payment services. The recent development of NFC technology has enabled the emergence of payment services using mobile phones. Furthermore, this technological innovation initiated an ongoing evolution concerning payment transactions. Mobile devices were predicted to gradually substitute for the prevalent

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function of credit cards [1,2].

According to Phneah [3], mobile payment is the fastest-growing application of NFC within the Asia region, aroused by factors such as high mobile device adoption and business maturity. There are different types of NFC applications today, which comprise identification, proximity payments, smart posters and e-tickets. Mobile payments, hence, are considered as “killer applications” for the region. Taiwan has been known as one of the four booming economies called “Asian Tigers”, the advantages of convenient and secure contactless payment solutions have been taking in this island. In wake of that, six companies in which Chunghwa Telecom plays a main role have formed a joint venture to launch a mobile wallet product in Taiwan. Particularly, MasterCard collaborated with Chunghwa Telecom, Cathay United Bank, China Trust Commercial Bank, Taishin International Bank and E-Sun bank to issue over-the-air to customers’ NFC-enabled SIMs [4].

Since NFC-based mobile payment is still in its infancy [5], it will require enthusiastic consumer adoption before it can truly take off. NFC-based mobile payment renders numerous benefits including quick purchasing of products, transferring of secure information by just touching devices. Such a payment method has allowed consumers to eliminate the use of cash while providing the added values of user-friendliness and fast transaction speed. Even though NFC-based mobile payments are invested by collaboration between mobile network operators (MNOs) and banks; there is still a poor understanding of consumer motivation for using NFC-based mobile payment. In addition, the adoption of NFC mobile payment is still not widespread despite its potential as documented, as indicated by Tan et al. [6].

The customers still hesitate to employ NFC mobile payment method to make a purchase while the companies would like to understand and get more details about the opportunity for new way of doing business stemming from such an NFC-based mobile payment [6,7]. In wake of that, although NFC mobile payment is emerging as a new stream of doing business and is forming a new trend of mobile payment as well, very little attention has been given to understand how to encourage and diffuse the new wave of NFC mobile payment.

Although there has been a lot of coverage on consumer acceptance of mobile payments, there are only few researches providing guideline to interpret NFC-based mobile payments adoption [6]. However, much effort has been conducted to analyze security aspects [8,9]. There is also lack of recommendations for enhancing prospective acceptance towards NFC-based mobile payments. In wake of that, it becomes very important to understand how to encourage the adoption of NFC-based mobile payments while there are a humble number of previous works discussing about this issue. It is necessary to understand factors facilitating or impeding the intention to adopt NFC-based mobile payments. In wake of that, we would like to investigate the antecedents of Consumer Adoption of NFC-based Mobile Payments.

1.2. Research objective and questions

As mentioned earlier, the literature reflects remarkably little effort to develop a framework for understanding the feasibility of NFC-based mobile payments from customers’ perspectives. The research objective is mentioned as following:

- Providing a deeper understanding of factors facilitating or impeding the intention to adopt NFC-based Mobile payments.

In order to achieve the research objective, there are some research questions which should be dealt with as following:

- What are the main factors affecting the intention to adopt NFC-based mobile payments? And how do these factors influence the intention?
- What are the main obstacles that need to be overcome in order to speed up NFC mobile payment adoption?

The remainder of this paper is organized as follows. The first section reviews the literature of innovation adoption theory and briefly describes the proposed research model. The following section presents the methodology used to test and verify the proposed hypotheses. The results are then analyzed using SPSS Statistics 19.0 and AMOS 19.0. Finally, the specific contributions and managerial implications of the paper are discussed.

2. Background of the research and proposed research framework

A variety of theoretical perspectives have been advanced to provide an understanding of the determinants of usage. In other words, the consumers’ intention to use new technology can be explained from various frameworks. Among those, widely accepted frameworks which have been developed include the Theory of Reason Action, TRA (Fishbein and Ajzen [10]), Technology Acceptance Model, TAM (Davis [11]), Theory of Planned Behavior, TPB (Ajzen [12]), Diffusion of Innovations, DOI (Rogers [13]), and the Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh et al. [14]). After reviewing existing literature in terms of new technology adoption, we found that Diffusion of Innovations (DOI) and Technology Acceptance Model (TAM), respectively proposed by Rogers [13] and Davis [11] have been widely used as the primary theoretical frameworks for understanding and explaining individuals adoption behavior of new technology.

Davis’s [11] Technology Acceptance Model (TAM) was designed to measure how consumers come to accept and use a technology, but accounted for how perceived usefulness and perceived ease of use affect attitudes. As TAM was originally built to ease managing information system activities in the workplace by measuring the quality of delivered systems (Davis [11]), the primary stress of the TAM-related research perspectives remained confined to interpret adoption process within organizational settings, according to Yang et al. [15]. Although TAM is purportedly used to explicate the technology adoption within organization, the constructs of the model are actually meant to be general and universal, according to Phan & Daim [16]. The authors utilized TAM and integrated the identified factors to formulate their proposed model and then they re-emphasized that perceived ease of use and perceived usefulness are top two factors that affect the adoption of mobile services. In order to give more useful recommendations, Phan & Daim [16] and Benbasat & Barki [17] suggested that more attractive factors should be added to reach more comprehensive understanding of what influences adoption of information systems (IS) in general and mobile services in particular.

The Diffusion of Innovations theory (DOI) which is one of the most influential theories in IS has been widely used to investigate factors that influence an individual’s decision to adopt an innovation or a new technology. The DOI model suggests that individuals will only choose to adopt an innovation if it presents five characteristics, namely relative advantage, compatibility, complexity, observability, and trialability. In wake of that, DOI highlights the importance of technology characteristics in IT adoption and diffusion. Lai et al. [18] stated that the strength of DOI stems from its comprehensive, cumulative experience of innovation characteristic evaluation. DOI is considered as a better model than TAM in predicting the intention to adopt a new technology since it complements TAM in enriching its perceived usefulness and perceived

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