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Consumer acceptance of Mobile Payments in Restaurants

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Consumer Acceptance of Mobile Payments in Restaurants

by

Anna Shatskikh

A thesis submitted in partial fulfillment
of the requirements for the degree of
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Abstract

Despite all the advantages of mobile payments (MPs), they are not being used by a sizable customer base. This paper examines the core drivers of using MPs in the restaurant industry from the consumer's perspective. Based on the Technology Acceptance Model (TAM), we developed a six-factor model to reveal the determinants of consumers' intention to use MPs in restaurants. Security, the subjective norm, compatibility with consumers' lifestyles, and previous experience with MPs were added to the traditional two-factor TAM model (usefulness and ease of use). 300 respondents were recruited from an online survey agency and 258 valid responses were included in the data analysis. The regression results suggested that consumers' intention to use MPs in restaurants is influenced by compatibility with their lifestyle, usefulness, the subjective norm, security, and previous experience with MPs. Lifestyle compatibility was found as the strongest determinant of consumers' acceptance of MPs in restaurants. However, ease of use was not a significant predictor of usage of MPs in restaurants.

Based on the findings, the study shows several implications for the restaurant industry. Five factors (compatibility with lifestyle, usefulness, the subjective norm, security, and previous experience with MPs) can serve as guidelines to encourage consumers' adoption of MPs in the restaurant industry. Industry practitioners can develop advertisements catered to a trendy, innovative, tech-friendly generation who desire the flexibility that MPs give and are willing to do everything with one device. MPs should be developed to provide an added value to the user. It is also important to

increase the source credibility of social information to improve communication campaigns. Finally, restaurant staff could be trained in guiding and assisting consumers in their first experiences with MPs.

I. Introduction

Research investigating the willingness of customers to use Mobile Payments (MPs), in other words “payments over a mobile device” (Zmijewska et al., 2004), in the restaurant industry is motivated by the desire to understand the core factors that lead people to use MPs. Despite the common motivation for investigation, research on MPs in the restaurant industry remains under-examined.

The development of goods and services has played a significant role in changing customers’ payment habits. Commercial institutions, merchants and other service providers are promoting more efficient ways of making payments (Dahlberg & Oorni, 2006). At the same time, growth in the number of mobile phones and mobile technology has significantly accelerated in recent years. Last year, i.e. in 2012, the number of smartphone users in the United States was 101.3 million (Graziano, 2012). Initially, mobile phones were used primarily for making calls and sending text messages. However, mobile phones now provide for a wider variety of services, including taking pictures, booking tickets, unlocking doors and starting cars. If a mobile phone could work as a camera, TV, or a key, why can’t it be used as a credit or debit card? (Tavilla, 2012).

Numerous industry analysts forecast tremendous growth in the MP business. According to recent reports, worldwide MP transaction values were expected to exceed \$171.5 billion in 2012, which is a 61.9 percent increase year on year (Gartner, 2012). Another report stresses that global mobile transactions will grow from \$241 billion in 2011 to more than \$1 trillion by 2015 (Yankee Group, 2011). Moreover, a

Juniper Research study predicts numbers to double or triple in growth in all mobile payment segments over the next five years (Jupiter Research, 2008). According to the same report, North America is going to be among the top three regions for MPs (Jupiter Research, 2008).

Specialists list ubiquity (ease of access at any place and at any time), capability of processing small amounts of payments, eschewal of cash and faster effecting of payments among the most significant advantages of MPs over other payment methods (Poustttchi & Wiedemann, 2005). Additionally, MPs provide flexibility, the convenience of not carrying multiple plastic cards, and shorter transaction time — from 15 to 30 seconds faster than it usually takes for swiping a card, entering a PIN and signing a receipt (Hayashi, 2012).

Together with the evolution of technology, smartphone usage is also growing, particularly for near field communication-enabled (NFC) devices (NFC is a “short-range, standards-based wireless connectivity technology”) (Smart Card Alliance, 2007; Tavilla, 2012). The convenience associated with using smartphones could be a string motivator for using new technology (Pope, et al., 2011). The results of recent surveys show that there is a clear tendency of awareness and interest in mobile contactless payments among smartphone users (Tavilla, 2012). Generation Y (Millennials), which constitutes about 25-30% of the whole population of the United States, has tech-savvy habits and could become the target market for adopting mobile payment systems (Pope, et al., 2011). Another group of consumers that could also easily adopt a new payment system is the group that actively uses mobile banking; this group would be more willing to use mobile phones for other types of payment services (Tavilla, 2012). However, it is clear that young consumers lead the trend and are interested in and willing to use MPs as a new method of payment (Hayashi, 2012).

Consumers in the 16 to 34 age group constitute the largest group of those who are willing to use their smartphones as wallets. However, consumers in the 34-plus age group are much more hesitant regarding this technology (Collins & Larson, 2011).

Despite the convenience of using mobile commerce, companies with MP offerings have not taken off as fast as predicted in most markets, and they suffer from a lack of user acceptance (Garther Group, 2009; Zmijewska et al.,2007). This fact points to the gap between the prospect and reality of mobile commerce (Zmijewska at al., 2004). People are hesitant and doubtful when they hear about MP applications (Schierz et al., 2010). Although market characteristics in the United States provide fertile grounds for quickly adopting MPs, they are moving very slowly(Shin, 2010; Pope, et al., 2011).

The United States already has a widely-accepted, secure, stable and well-developed payment system, which is why it is difficult for any new payment method to enter the market. Therefore, MPs in the United States have a lot of competitors in cash, checks, and debit, credit and prepaid cards (Tavilla, 2012). Previous trials introducing MPs did not have enough support (Gartner, 2012; Yankee Group, 2011). People are not looking for an alternative way of making payments, considering that cards are mostly used to complete transactions (Hayashi, 2012). It appears that for now no one is interested in MPs in the United States. Major financial companies such as Visa, MasterCard, American Express, and First Data are not willing to give space to new MP systems. Also, consumers already have efficient and safe payment solutions. And, finally, merchants do not want to invest in new technology that is not yet widely adopted (Gartner, 2012). Nevertheless, MPs have all the potential to become more secure than traditional payment instruments if there is a remote way to

swipe, delete, lock, and disable a lost or stolen phone and if phones have antivirus software and multiple layers of security (Tavilla, 2012).

It is notable that the Consumer Mobile Financial Services survey, which was conducted by the Federal Reserve Board (2012), showed that, despite the hesitations, over half of respondents are sure that MPs will become a major payment method in the next five years (Tavilla, 2012). In addition, Kasavana (2006) considers payments via mobile devices one of the main future payment methods. As the key favorable characteristics of MPs from the consumer's side, he highlights "speed, convenience, efficiency, security and networking" (Kasavana, 2011). Finally, he claims that there is a chance for MPs to become a widely used payment method, replacing debit and credit cards and checks (Kasavana, 2011).

MP and the hospitality industry

Taking into consideration the infrastructure growth forecasts as well as the anticipated growth in revenue for the industry, it could be assumed that the hospitality industry will also face growth in MP systems and technologies (Kasavana, 2011).

The rapid evolution of mobile technologies, as well as the wide network of mobile phone users, gives MP systems a place in the electronic commerce industry (Au & Kauffman, 2008). Technology developers do their best to create reliable MP applications and to provide an environment for safe, easy and effective transactions. Safety and efficiency are especially important for the restaurant industry, where the majority of POS (Point-Of-Sale) security fraud incidents occur. The restaurant industry has become attractive to hackers due to its traditionally low computer and network security (Cobanoglu & DeMicco, 2007). According to statistics, 80 percent of security threats in restaurants come from POS systems (Clark, 2007). Moreover, 39 percent of restaurant owners say that "common sense" is enough to keep customer

information safe. However, the history of credit card security breaches shows that common sense does not protect restaurants from hackers' attacks (Volpe, 2009).

In most cases, businesses are unaware of the vulnerability of their network security until they face a breach that comes with fines, penalties and forensic costs (Life Cycle of a Data Security Breach, n.d.). But the biggest cost relates to damage to reputation and customer loyalty, which could result in huge losses and put a restaurant out of business (Kalkan et al., 2008). Moreover, information security breaches have a negative impact on restaurant guest satisfaction, revisit intention and word of mouth promotion regardless of whether or not a guest's information was compromised (Berezina et al., 2010).

MPs could reduce fraudulent POS transactions since customers would no longer need to give their personal credit card information to waiters (Hayashi, 2012).

A recent survey by the Federal Reserve Bank of Boston on payment fraud (2012) found that "for most payment types, investments in fraud prevention exceed actual losses with two exceptions: 1) debit signature; 2) MPs." The researchers found that almost "80% of respondents indicated the need for alternatives to magnetic stripe authentication technology to secure card payments and reduce payment fraud, which may be indicative of the growing interest among financial information institutions and other payment stakeholders in migrating to EMV (Europay, MasterCard and VISA) chip technology for cards (and possibly MPs in the future)." In other words, MP implementation could reduce data fraud, as NFC-enabled devices have more secure transactions (Federal Reserve Bank of Boston, 2012).

Kasavana (2006) explores the use of contactless payment options in quick service restaurants (QSR). This sector of the hospitality industry remains in the forefront for adopting cashless payment technologies. Michael Kasavana claims that it

benefits all parts of the payment process: the consumer feels that the transaction is more secure and expedient, food service operators gain customer satisfaction, and banks develop stronger relationships with cardholders (Kasavana, 2006).

However, there is still a need for further research with respect to customer behavior regarding MPs in the hospitality sector, as prior research has provided limited information for understanding the core drivers in consumer acceptance of MPs in the hospitality and particularly in the restaurant industry.

Purpose of the Study

The number of companies that will eventually offer MP technologies is growing rapidly (Schierz et al., 2010). Hence, it is extremely important to identify the reasons behind the MP paradox, since the participants and operators of MP services could greatly benefit from understanding the viewpoint of mobile users (Mallat, 2007). The question of why customers resist using MP technologies remains unanswered. What are the reasons behind the consumer hesitancy to adopt MP technologies, and what could mobile operators do in order to improve the appeal for using these payment services? Consequently, there is a solid foundation and an urgent market need to understand the factors affecting MP adoption from the consumer side.

With the intention of effectively promoting the adoption of MPs in the restaurant industry, this paper will empirically examine the main factors that motivate consumers to use MPs within the restaurant industry and consumer acceptance of such technology. The study consists of two parts, which will contribute to understanding the MP phenomenon: 1) research exploring the Technology Acceptance Model (TAM) by adding important factors that are relevant in the MP context, using a proposed research model that combines several theories examining the relevant factors in consumer motivation for using MPs in restaurants; and 2) research

exclusive to the hospitality industry, particularly to the restaurant industry, where there is a lack of research identifying the core factors for consumer use of MPs.

Research Questions

This research investigates the following main questions:

- a. What are the main factors for consumer acceptance of MPs in restaurants?
- b. What is the level of importance (ranking) of each of the factors for consumers?

Significance, Objectives

The significance of this research for the restaurant industry is far reaching. A poor understanding of consumer motivation for using MPs leads to the loss of opportunities in making customers' lives more convenient and saving their time. In addition, MPs have better security characteristics, thus reducing the risk of fraud, which is important for merchants, as restaurants are responsible for customers' lost information and any financial damage incurred by such losses. MPs could benefit all three stakeholders in the payment process: banks, consumers, and merchants.

Study Outline

This paper consists of five parts, including this one (Introduction). Part II (Theoretical Framework) defines key concepts (MPs and consumer acceptance, types of MPs); introduces the TAM, as well as key factors that have been examined in the context of MPs; and presents hypotheses and elaborates on the theoretical model. Part III (Methodology) describes the method and sample, explains the measurement scale, and outlines the pilot-testing instrument. Part IV (Results) presents the statistical analysis of the collected data. Part V (Discussion, Implications, Study limitations, and

Future Research Suggestions) covers implications and recommendations for improving MP technologies in the restaurant industry.

II. Theoretical Framework

Mobile Payment

Mobile technology has become an integral part of life (Becker, 2007; Schierz at al., 2010). MP technology further tracks and widens opportunities for customers; it combines existing payment methods with mobile technology and increases the effectiveness of payments by lowering transaction costs compared to traditional payment methods. For an MP, the only thing consumers need is a mobile device with an Internet connection. The main difference between MPs and other forms of payment is that MPs use mobile devices as a crucial part of the process (Shin, 2010; Henkel, 2002).

The first key term that should be explained is MP. There is no universal definition of an MP. The most generalizable and widely used definition for an MP is a separate way of electronically processing payments (Schierz at al., 2010) or “payments over a mobile device” (Zmijewska at al., 2004, p.270; Shin, 2010), in which this mobile device is the core differentiating characteristic of MPs compared to other types of payment. Some studies on the subject focus on mobile phones (Zmijewska & Lawrence, 2006); other studies include various mobile communication devices (Henkel, 2002). MPs are the next step in the development of electronic payment transactions (Mallat, 2007) and could be utilized for various types of payments; for instance, commuter trains, flight tickets, hotel rooms, and restaurants (Kim at al., 2010). Dahlberg at al. (2008) includes the usage of wireless and other

communication technologies in the definition of MPs. Another definition of MPs states that an MP is “any payment where a mobile device is used in order to initiate, activate, and/or confirm a payment” (Karnouskos & Focus, 2004, p.44).

We consider MPs to be a type of payment transaction that occurs through an electronic procedure, during which the consumer uses mobile communication techniques together with mobile devices for initiation, authorization, or realization of a payment (Pousttchi, 2003).

For the purpose of this study, the term “MPs” mainly refers to proximity payments made via mobile devices at the POS (Point-Of-Sale).

As this study examines the adoption of MPs from the perspective of the consumer, MPs should also be categorized from a consumer-centric position. The first type of MPs occurs when a person sends money to another person via a mobile device. The second type occurs when a person pays for goods and services purchased over the Internet via mobile phone. The last type occurs when a person pays for something via a mobile phone at the POS.

According to the Federal Reserve Bank of Boston, there are two kinds of MPs (Becker, 2007): remote MPs and proximity MPs. The first two types of MPs mentioned in the previous paragraph are examples of remote MPs; the third type is an example of a proximity MP. This paper will focus on the implementation of “proximity MPs using NFC-enabled mobile devices and the contactless financial payment infrastructure,” which is the most suitable for the restaurant industry (Smart Card Alliance, 2007; Hayashi, 2012).

Remote MPs are extremely convenient for person-to-person payments and payments to merchants who do not have a traditional POS system; for example, flea market vendors. Remote MPs also include paying for purchases from a web merchant

via a mobile phone. Remote MPs may be implemented using the existing financial payment infrastructure (Smart Card Alliance, 2007).

Proximity MPs are valid for POS and vending machines; they widely use RFID (Radio Frequency Identification) or NFC technology. In such cases, instead of using a traditional payment method like cash or a credit or debit card, a consumer makes a mobile payment, which relies on a proximity exchange of financial information through a transportable platform involving NFC. From the consumer's side, the transaction appears to be a contactless credit or debit card transaction, without actually giving their card to the merchant. The whole process of an MP happens in front of the customer (Card Technology Today, 2009). Contactless payment means that the payment device never leaves the customer's hands (Kasavana, 2006). This type of payment is extremely convenient, as it takes very little time to complete and removes the inconvenience of using a physical card (Ding & Unnithan, 2005).

MPs are performed by using either a mobile device or a scan of a barcode within a few inches of a contactless payment-capable POS system at the terminal for payment of the purchase. By tapping the mobile phone the customer makes a contactless payment using NFC technology. "The application and payment account information are encrypted and loaded into a secure area in the phone. The phone uses the built-in NFC technology to communicate with the merchant's contactless payment-capable POS system, similar to the contactless payment cards and devices in use today" (Smart Card Alliance, 2007). The barcode option has a few more steps: first, the consumer downloads a merchant-provided cell phone application; next, after downloading the application and registering as a user, the consumer logs in to his or her personal account. The barcode with the customer's prepaid account information is

shown on the screen; this barcode can be scanned at a POS, thereby making a payment. After scanning, the application updates the account information and balance (Tavilla, 2012). The MP option available at Starbucks is an example of a barcode payment.

A contactless chip (RFID) is located on or in the mobile device. (Karnouskos & Fokus, 2004). The POS for RFID technology payments is usually stationary; RFID technology has a longer transmission range than NFC. This is the main reason why RFID is considered to be a less secure payment option.

Unlike RFID, near field communication (NFC) technology has stationary tags and mobile readers. It is a “short-range wireless technology (functioning at about a 3-inch range), which is optimized for intuitive, easy, and secure communication between various devices without user configuration.” In order for the devices to communicate, the customer just needs to put them within the appropriate range of each other (Karnouskos & Focus, 2004).

NFC is already compatible with “many installed contactless payment readers,” which are used in different POS terminals (Kasavana, 2011).

A proximity payment procedure includes several elements:

1. Contactless Reader – the POS device, which interacts with mobile phones.
2. Payment Gateway – a communication channel for “connecting a contactless payment reader to a transaction processor.”
3. Portable Device – a wireless portable device, which has NFC equipment; in this case it is a mobile phone with a chip set for secure information exchange between a contactless reader and a portable device.
4. Wireless Network – a necessary element for a mobile transaction.

5. E-Wallet App – “electronic wallet software, which lets a mobile phone manage a set of accounts and related transactions” (Kasavana, 2011).

When comparing proximity and remote MPs, the difference appears to be in speed, convenience, and the fact that NFC payments use the existing financial payment processing infrastructure. There is no need to set up payment processes or accounts with a third party, and the proximity MP data is linked directly to a payment card issued to the consumer by a trusted financial institution.

A major benefit of NFC technology is that it is compatible with existing contactless payment standards. Proximity payments are based on EMV global financial standards, which ensure a higher level of security. This technology makes mobile phones act like electronic wallets, eliminating the need to carry credit or debit cards (Kasavana, 2011). Proximity payments could be very useful in case of very limited time or if encountering difficulties or high risk using plastic cards (Ding & Unnithan, 2005).

Consumer Acceptance of New Technology

The second key aspect of this study is consumer adoption (consumer acceptance) of MPs. It is the key element, as users ultimately decide whether or not to use a new system. That is why factors that affect consumer adoption behavior need to be carefully identified and examined (Amberg et al., 2003).

Consumer acceptance could be considered a “relatively enduring cognitive and affective perceptual orientation of an individual” (Schierz et al., 2010, p. 210).

It is important to understand what factors may influence a user’s perception of MP technologies and acceptance thereof.

Previous studies in the area of consumer acceptance of MPs have focused on compatibility (Dahlberg & Oorni, 2006; Lu et al., 2011; Mallat, 2007; Schierz et al.,

2010;); individual mobility (Schierz et al., 2010; Zmijewska et al., 2004); subjective/social norms (Dahlberg & Oorni, 2006; Shin, 2010; Schierz et al., 2010); convenience (Dahlberg & Oorni, 2006; Hayashi, 2012; Kim et al., 2010; Pousttchi, 2003; Xu & Gutierrez, 2006); perceived benefits/relative advantage (Shin, 2010; Lu et al., 2011); perceived risk (Shin, 2010; Lu et al., 2011; Mallat, 2007); security (Hayashi, 2012; Dahlberg et al., 2003; Kim et al., 2010; Pousttchi, 2003; Zmijewska et al., 2004); trust (Gahlberg et al., 2003; Dahlberg & Oorni, 2006; Shin, 2010; Kim et al., 2010; Mallat, 2007; Zmijewska et al., 2004); cost (Hayashi, 2012; Lu et al., 2011; Mallat, 2007; Pousttchi, 2003; Zmijewska et al., 2004); and perceived ease of use and usefulness (Dahlberg et al., 2003; Dahlberg & Oorni, 2006; Kim et al., 2010; Schierz et al., 2010; Zmijewska et al., 2004). Among the least explored factors are context, expressiveness, observability, privacy, speed of transaction, and technology anxiety (Dahlberg et al., 2008). According to the literature, the factors which seem to be the most important for MP acceptance are ease of use, trust, security, usefulness, cost, and compatibility.

The findings of most of these researchers could be summarized as follows: MPs could have a relatively high consumer acceptance rate if the technology that will be offered will be secure, convenient, and easy to use, and will cost the consumer very little or nothing (Shin, 2010). In spite of the industry forecasts about the great potential of MPs, it is necessary to understand what keeps consumers from adopting this technology for everyday use in the restaurant industry. Due to the sophistication and dynamics of MP expansion, the topic should be analyzed from multiple perspectives, examining system characteristics, individual differences, and the behavioral intentions of consumers.

Technology Acceptance Model (TAM)

There are different research models which explain technology usage behavior. As the basis for this research we use the widely accepted model for customer acceptance of various information systems, described and tested by Davis (1989). The model is called the “*Technology Acceptance Model*” (the TAM), which interprets customers’ attitudes towards different technological innovations (Davis, 1989) and will help us to look at the MP adoption from consumers’ viewpoint. This model is predicated on the assumption that factors influencing a customer’s decision with regard to acceptance or refusal to accept a technical innovation can be determined and quantified (Davis, 1989). The model offers two fundamental determinants of new technology acceptance — perceived usefulness and perceived ease of use. According to this model, perceived usefulness is affected by perceived ease of use, as it stipulates that with all other conditions the same, the ease of using the system increases its usefulness (Davis, 1989). The TAM is considered to be a well-established and powerful tool for predicting consumer behavior (Zhang et al., 2007, Wang et al., 2011). It operates with solid measurement and empirical analysis; the advantages of the TAM are that it is comprised of reliable instruments with precise measurement attributes, and its conciseness and empirical solidity (Pavlou, 2003). Nevertheless, the TAM is incomplete in one core aspect – it does not take into account social influence, which affects intentions to use mobile devices, as people use them in a public context, where they observe others’ activities and where they have to adapt to others’ reactions (Nysveen et al., 2005).



Figure 1: TAM

Model Development

As stated by Kim et al., (2008), despite the increasing use of technology in the restaurant industry, few studies have been conducted to examine the acceptance behavior of technology in hospitality organizations (e.g., Ham, 2008; Lam et al., 2007; Lee et al., 2006; Schrier et al., 2010; Wang & Wualls, 2007; Wober & Gretzel, 2000). However, to the best of our knowledge, the above mentioned factors (security, compatibility, the subjective norm, and previous experience in MPs) as incorporated into the TAM have not yet been examined. Therefore, in this study, we are interested in investigating the perceived effect of usefulness, ease of use, the subjective norm, compatibility, and security towards customers' acceptance of MPs in the restaurant industry.

The current study identifies and investigates three additional factors including subjective norms, compatibility, and security. Using the research of Venkatesh & Davis (2000), we develop our hypotheses on the main TAM, incorporating an additional social construct, adapted from the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). Along with technology-related factors, individual use characteristics also have to be taken into account. The conceptual model proposed in this study is based on the thorough review of relevant literature about technology adoption and MPs. We offer to expand the TAM to the behavioral intention level and also to add the compatibility construct.

Usefulness.

One of the main reasons behind the slow adoption of MPs by consumers is the lack of a clear understanding of the benefits. A consumer's intent to use new technology is based on his or her perception of the perceived usefulness of the technology (Davis, 1989). Perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Mallat, 2007). There is empirical evidence with a similar conclusion in mobile technology literature; perceived usefulness positively influences consumers to use MP technologies (Karnouskos & Focus, 2004; Kim et al. 2010; Pousttchi, 2003). Therefore, we propose the following hypothesis:

H1: Perceived usefulness will have a positive effect on the intention to use proximity MPs.

Ease of use.

Many researchers have demonstrated that perceived ease of use is an important aspect that influences a consumer's intention to utilize new technology (Agarwal & Prasad, 1999; Davis, 1989; Karnouskos & Focus, 2004; Zmijewska et al., 2004). Perceived ease of use, a key element of the TAM, is "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). The importance of perceived ease of use for MP acceptance is shown by other researchers (Dahlberg et al., 2003; Pousttchi, 2003). MP channels are self-service oriented, thus appropriate for simple routine service transactions (Dahlberg, 2002). Dahlberg (2002) has found that perceived ease of use is the most important element of MPs. These observations lead to the following hypothesis:

H2: Perceived ease of use will have a positive effect on the intention to use proximity MPs.

Subjective norm.

In the analysis of adoption of new technologies, the social context of the decision maker should also be taken into consideration (Nysveen et al., 2005; Schierz et al., 2010). In the early stages of technology involvement, most consumers could lack understanding of the technology, which they could try to compensate for with social interaction (Schierz et al., 2010). The subjective norm, in the context of MPs, is the degree to which a social environment perceives mobile payment as desirable (Schierz et al., 2010, p. 210). Fishbein & Ajzen (1975) describe the subjective norm as “the person’s perception that most people who are important to him think he should or should not perform the behavior in question” (p. 302). The concept stresses the role of opinions of relatives, friends, peers, etc. This factor is included as a direct determinant of behavioral intention in the Theory of Reasoned Action (Fishbein & Ajzen, 1975). It is important to take into consideration the subjective norm, as people may demonstrate a particular behavior even if they do not support such behavior, but if they believe that others who are important to them think that they should act in a certain way (Venkatesh & Davis, 2000). Accordingly, we present the following hypothesis:

H3: The subjective norm has a positive effect on the intention to use proximity MPs.

Compatibility.

Another extension of the TAM is compatibility, which was found to be a core innovation factor driving consumer acceptance (Tornatzky & Klein, 1982). Compatibility, in the context of MPs, is defined as the degree to which mobile

payments are compatible with the values, experiences and behavioral patterns that consumers already have (Schierz et al., 2010; Lu et al., 2011). For example, if they already use MPs for other purchases, they are likely to also use it in restaurants. As another extreme example, if a person only believes in making cash payments as a matter of principle (i.e. values), there is a low compatibility with the notion of using MPs and hence they are not very likely to have any intention to use MPs in restaurants. Mobile services compatibility with consumer needs has a positive effect on the intention to use these services (Mallat, 2007). Compatibility together with perceived ease of use and perceived usefulness indirectly affect a consumer's intention to use MPs (Kim et al., 2010). People's lifestyles will greatly affect their decision to use MP services (Lu et al., 2011). Schierz et al. (2010) has found that perceived compatibility is a useful extension of the TAM, and thus, could increase the predictive power in the decision making process of using a technology. Therefore, we propose the following:

H4: Perceived compatibility will have a positive effect on the intention to use proximity MPs.

Security.

Along with the perceived benefits (ease of use and usefulness), new technologies usually pose some risks (Schierz et al., 2010). In the context of mobile services, the biggest concern for consumers lies in the probability of the invasion of their privacy. Security issues are especially problematic for the restaurant industry, as this industry includes a great number of small merchants, while financial institutions and large telecom operators have enough trust from consumers and consequently consumers provide their personal information to these large companies with much more ease (Mallat & Tuunainen, 2008). With the current state of safety for electronic

transactions as well as commercial information exchange, security becomes the most important concern (Kadiwai & Zilfiqar, 2007). Security is one of the major issues standing in the way of an MP market breakthrough (Kim et al., 2010; Linck et al., 2006).

According to Matthew B. Gross, Jeanne M. Hogarth, and Maximilian D. Schmeiser (“Consumers and Mobile Financial Services,” Board of Governors of the Federal Reserve System, March 2012), identity theft and the possibility of losing mobile phones are major concerns of smartphone users with respect to MPs. The portability of mobile phones makes them more vulnerable to loss, theft, and damage. Customers’ perception of the safety and security of mobile payment operations is the central concern and barrier for a breakthrough in the use of MPs.

The other barriers for MP adoption in the United States are concerns about hacker attacks on consumers’ mobile accounts. It is found to be the core impediment to consumer adoption of new MP technologies (Tavilla, 2012).

Kreyer et al. (2002) claims that the security concept could be divided into two dimensions - objective and subjective security. Objective security is a formal technical characteristic, which could respond to all of five security objectives: confidentiality, integrity, authentication, authorization and nonrepudiation. Subjective security is an important antecedent for mobile payment acceptance. Subjective security is considered to be the degree to which a “person believes that using a particular mobile payment procedure would be secure” (Pousttchi & Wiedemann, 2007). It is important to note that objective and subjective security are neither disjointed nor independent. Although subjective security has no effect on objective security, the level of objective security influences the level of subjective security.

Another study has shown that the true reason for security concerns from a customers' viewpoint is neglecting subjective security (Linck et al., 2006). Therefore, we hypothesize that perceived security of use of proximity MPs should exert a positive effect on the intention to use this type of payment:

H5: Perceived security will have a positive effect on the intention to use proximity MPs.

Previous experience with MPs.

Even though there are just a few studies testing the relationship between previous experience with proximity MPs and intention to use this type of payment (Kim et al., 2010), this study attempts to determine this relationship. Taking into account the popularity of mobile and smartphone devices, it is important to determine whether those who already had a chance to make remote payments via a mobile phone would be more adoptive in using proximity MPs in the future. With a limited amount of research on this subject, this study tries to explore the impact of previous experience with proximity MPs on perceived ease of use, perceived usefulness, perceived compatibility, and overall intention to use this technology in the future. Mobile users who have already tried proximity MPs are likely to find proximity MP systems to be easier to use compared to users who do not have such experience (Kim et al., 2010). The following hypothesis details the relationships:

H6: Previous experience with MPs will have a positive effect on the intention to use proximity MPs in restaurants/café/bars.

The conceptual research model implied by our six hypotheses and empirically tested in the following section appears in Figure 2.

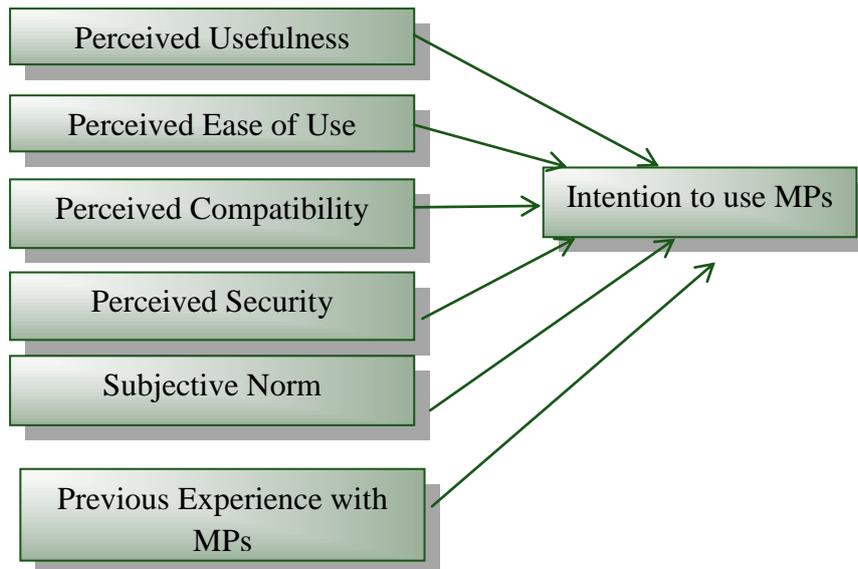


Figure 2: Conceptual Model

III. Methodology

An online survey was used to test the developed model. We constructed the survey by adapting the measurement scale of previous studies on MPs. The convenience sampling method was used, which has weak external validity and has a risk of biased answers.

Study Procedure

The survey of 23 questions was conducted using an online questionnaire. A cover letter was attached to explain the purpose of the study and ensure respondent confidentiality. A qualifying question was employed to filter respondents. Respondents would only proceed with the survey if they had used a smartphone within the last five years. With this qualifying question, the survey was limited to those consumers who already use smartphones.

To ensure all respondents had the same understanding of an MP transaction, the first part of the survey included a definition of an MP with a 30-second video clip showing how an MP works.

The next block of questions asked respondents about their previous experience with MPs, specifically why they had or had not used MPs in the past. Then, respondents were asked to rate their agreement level with each of the questionnaire items. Each item represented one of the factors identified in this study as being important in the adoption acceptance of proximity payments in the restaurant industry: usefulness, ease of use, security, compatibility and the subjective norm. The respondents indicated their agreement level with a set of statements, using a seven-

point Likert scale (“Strongly Disagree,” “Disagree,” “Somewhat Disagree,” “Neither Agree nor Disagree,” “Somewhat Agree,” “Agree,” and “Strongly Agree”).

In the final part of the survey, we included several demographics-focused background questions. The questions addressed respondents’ gender, age, educational level, occupation, and income level.

Measurements

Based on the models from existing MP literature as well as the latest industry reports, we identified the factors for customer acceptance of MPs in restaurants and employed these factors as independent variables: perceived usefulness, security, ease of use, compatibility, and the subjective norm. The measures of perceived usefulness, security, ease of use, compatibility, and the subjective norm were adapted from the previous works related to the customer perception of MPs.

Compatibility measurement items were taken from Moore & Benbasat (1999) and Pouffe et al. (2001):

- I would appreciate using mobile payment services in a restaurant/cafe/bar instead of alternative modes of payment (e.g., credit card, cash)
- I think a mobile payment is compatible with my lifestyle
- Using a mobile payment at a restaurant/cafe/bar fits well with the way I like to purchase products and services

To address the element of perceived security, this study used the items from Parasuraman et al. (2005):

- The risk of abuse of usage information (e.g., names of business partners, payment amount) is low when using mobile payment services

- The risk of abuse of billing information (e.g., credit card number, bank account data) is low when using mobile payment services
- I find mobile payment services secure for conducting my payment transactions

This study used the perceived ease of use measurement scale as adapted from Venkatesh & Davis (2000) and Chandra et al. (2010):

- Learning to use a mobile payment would be easy for me
- It would be easy to get a mobile payment system to do what I want it to do
- My interaction with a mobile payment system would be clear and understandable
- It would be difficult for me to become skillful at using a mobile payment system (Reverse coding question)
- Overall, I would find the mobile payment system to be easy to use

Perceived usefulness items were utilized from Van der Heijden (2003) as well as Chandra et al.(2010) and Kim et al. (2010):

- Using mobile payments would enable me to pay more quickly
- Using mobile payments would make it easier for me to conduct transactions
- Using mobile payments would take more time and effort than using traditional payments (Reverse coding question)
- By using mobile payment services, my experiences as a consumer would be improved (flexibility, speed, convenience, security)
- Overall, I find that mobile payment systems would be useful for making payments

Finally, Venkatesh & Davis's (2000) measures were employed in order to estimate the subjective norm:

- People who are important to me would find using mobile services beneficial
- People who influence my behavior think I should use mobile payments
- People who are important to me think I should use mobile payments

The dependent variable was the intention to use MPs in future:

- I am likely to use mobile payment services in the near future
- I am willing to use mobile payment services in the near future
- I intend to use mobile payment services when the opportunity arises

Overall, 19 final scales were used to measure six core MP adoption factors.

Pilot Testing

The research included a two-stage survey to test the research hypotheses. First, we carried out a pilot test in order to examine construct reliability as well as to validate the initial version of the survey questionnaire prior to conducting the main study. Faculty and staff members were recruited from a southeast state university. The sample comprised approximately 67 individuals, who were asked to complete general questions about smartphone usage and a seven-Likert scale questionnaire regarding the factors tested in the main study. Female respondents represented 60.5% and male, 37.2%. More than half of respondents (53.5%) were older than 50 years of age with four-year (20.9%), Master's (20.9%), and Doctoral (37.2%) degrees. The majority of respondents (65.1%) had teaching occupations. The highest income groups counted 23.3% with \$51-70K and 23.3% with above \$100K as well as 16.3% with \$31-40K and 16.3% with \$71-100K.

The results from the pilot test helped refine the final version of the questionnaire. Face validity was examined by checking for consistency between the measurement items and the existing literature.

The Cronbach's Alphas for each of the testing factors resulted in: usefulness – 0.959; security – 0.883; ease of use – 0.929; compatibility – 0.839; subjective norm – 0.933; and intention to use – 0.973. The results of the pilot test established the reliability of the final questions.

Main Study

A structured, web-based survey was distributed over the course of two days through the online agency Amazon Mturk in the United States in February 2013. To encourage participation, participants were given a financial incentive to complete the survey. The population of the study was comprised of consumers in the United States over 18 years of age and who had used a smartphone within the last five years.

At the end of the data collection period, 258 survey results were considered as valid for statistical analysis. In order to ensure accuracy and increase external validity of the survey results, 42 of 300 collected questionnaires were disqualified due to missing data, invalid responses, or incomplete responses. Therefore, 258 questionnaires were ultimately utilized for empirical analysis.

There were approximately twice as many male respondents as female (male – 64.3%; female – 35.7%). The majority of respondents were from 18 to 35 years old (72.1%) with 2-4 years of college or a college degree (77.2%). Almost half of the respondents (48.9%) had one of the following three occupations: engineering, student, or unemployed and earning under \$30K (46.1%).

The Cronbach's Alphas for each of the testing factors resulted in: usefulness – 0.895; security – 0.873; ease of use – 0.906; compatibility – 0.933; subjective norm –

0.845; and intention to use – 0.933. A Cronbach's Alpha score of 0.70 was deemed appropriate by Hair, et. al. (2010).

VI. Results

In order to determine the effects of six factors (perceived ease of use, usefulness, compatibility, the subjective norm, security, and intention to use) on future intention to use MPs, the linear regression analysis was conducted. For demographics, descriptive statistical analysis was used.

Demographics

A total of 258 responses were utilized in the analysis. Based on previous research (Venkatesh & Davis, 2000), the most important demographic characteristics that explain MP adoption are gender, age, education, occupation, and annual income.

The demographic characteristics of respondents are given in tables 1, 2, 3, and 4. The sample comprised 64.3% male and 35.7% female respondents.

According to the results of the survey, 25.2% were between 18 and 24 years old, 30.2% were between 25 and 30 years old, 16.7% were between 31 and 35 years old, 12.0% were between 36 and 40 years old, 10.5% were between 41 and 50 years old, and finally, 5.4 % were 51 or older.

Respondents between ages 18 and 35 years of age represented 72.1% of the sample, which could seem unbalanced and be perceived as a potential limitation of generalization. However, according to the existing literature (Becker, 2007; Tavilla, 2012), young as well as middle-aged users of MPs are the core demographic of the MP user population and are poised to be the most active adopters of MPs in the coming years.

Table 1: Age

| | | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | 18-24 | 65 | 25.2 |
| | 25-30 | 78 | 30.2 |
| | 31-35 | 43 | 16.7 |
| | 36-40 | 31 | 12.0 |
| | 41-50 | 27 | 10.5 |
| | 51-60 | 13 | 5.0 |
| | 61-70 | 1 | 0.4 |
| | Total | 258 | 100.0 |

In Table 2 we can see that the majority of MP users have four-year degrees (35.7%) or some college (30.6%).

Table 2: Education

| | | Frequency | Percent |
|-------|------------------------------|-----------|---------|
| Valid | Less than High School | 2 | 0.8 |
| | High School | 37 | 14.3 |
| | Some College | 79 | 30.6 |
| | Two-year College Degree | 28 | 10.9 |
| | Four-year College Degree | 92 | 35.7 |
| | Master's Degree | 16 | 6.2 |
| | Doctoral Degree | 1 | 0.4 |
| | Professional Degree (JD. MD) | 3 | 1.2 |
| | Total | 258 | 100.0 |

Table 3 shows three significant and approximately equal occupation groups : engineering and technical occupations (16.3 %), unemployed (16.7%), and students (15.9%).

Table 3: Occupation

| | | Frequency | Percent |
|-------|---|-----------|---------|
| Valid | Entrepreneur Professional (medicine, law, etc.) | 8 | 3.1 |
| | Teaching, educational | 11 | 4.3 |
| | Managerial, executive | 14 | 5.4 |
| | Administrative, clerical | 26 | 10.1 |
| | Engineering, technical | 42 | 16.3 |
| | Marketing, sales | 12 | 4.7 |
| | Skilled craft or trade | 20 | 7.8 |
| | Entrepreneurial, Self-Employed | 21 | 8.1 |
| | Not currently employed (e.g. homemaker, retired, job hunting, etc.) | 43 | 16.7 |
| | Student | 41 | 15.9 |
| | Other (please specify) | 20 | 7.8 |
| | Total | 258 | 100.0 |

Table 4: Income

| | | Frequency | Percent |
|-------|------------------|-----------|---------|
| Valid | Under \$10K | 48 | 18.6 |
| | \$11-\$30K | 71 | 27.5 |
| | \$31-\$40K | 42 | 16.3 |
| | \$41-\$50K | 27 | 10.5 |
| | \$51-\$70K | 36 | 14.0 |
| | \$71-\$100K | 27 | 10.5 |
| | More than \$100K | 7 | 2.7 |
| | Total | 258 | 100.0 |

The income distribution includes the low-income majority (27.5% of respondents earn \$11-30K and 18.6% earn under \$10K) (Table 4).

Previous Experience with MP

In addition to the basic demographic characteristics shown above, respondents were asked to indicate if they have ever made MPs in general and MPs in restaurants in particular. Approximately a quarter of respondents (25.2%) answered that they had experience using MPs (Table 5).

Table 5: Experience With MPs

| | | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | Yes | 65 | 25.2 |
| | No | 193 | 74.8 |
| | Total | 258 | 100.0 |

Moreover, respondents who had experience in making MPs were asked to report the frequency of using MPs and the overall length of time using them. Table 6 demonstrates that the vast majority of respondents who had made MPs before did not utilize MPs very often (1-3 times per month, 83.1%), which is similar to the results of Kim et al. (2010). Only one respondent indicated that he or she was making 11-20 MPs per month.

Table 6: Frequency of using MP per month

| | | Frequency | Percent | Valid Percent |
|---------|-------------|-----------|---------|---------------|
| Valid | 1-3 times | 54 | 20.9 | 83.1 |
| | 4-10 times | 10 | 3.9 | 15.4 |
| | 11-20 times | 1 | .4 | 1.5 |
| | Total | 65 | 25.2 | 100.0 |
| Missing | System | 193 | 74.8 | |
| Total | | 258 | 100.0 | |

Table 7 shows that the majority of respondents who had made MPs before started using MPs relatively recently, less than one year ago (70.8%).

Table 7: Length of Using MPs

| | | Frequency | Percent | Valid Percent |
|---------|------------------|-----------|---------|---------------|
| Valid | Less than 1 year | 46 | 17.8 | 70.8 |
| | 1-2 years | 11 | 4.3 | 16.9 |
| | 2-3 years | 3 | 1.2 | 4.6 |
| | Over 3 years | 5 | 1.9 | 7.7 |
| | Total | 65 | 25.2 | 100.0 |
| Missing | System | 193 | 74.8 | |
| Total | | 258 | 100.0 | |

Respondents who had experience in making MPs were asked to identify the reason they had used MPs. The most popular reason was ease of transaction (29.2%); having a smartphone with them (27.7%) and trying new technologies (15.4%). The results were very comparable to those from Kim et al. (2010).

Table 8: The Reason for Using MPs

| | | Frequency | Percent | Valid Percent |
|---------|--|-----------|---------|---------------|
| Valid | Always carry smart-phone with me | 18 | 7.0 | 27.7 |
| | Easier access than cash | 6 | 2.3 | 9.2 |
| | Ease of transaction | 19 | 7.4 | 29.2 |
| | Quick access to account | 6 | 2.3 | 9.2 |
| | It reduces the risk of personal data theft | 1 | .4 | 1.5 |
| | Trying new technologies | 10 | 3.9 | 15.4 |
| | Easy to learn and simple to use | 4 | 1.6 | 6.2 |
| | If other, please indicate | 1 | .4 | 1.5 |
| Total | | 65 | 25.2 | 100.0 |
| Missing | System | 193 | 74.8 | |
| Total | | 258 | 100.0 | |

In order to better understand the relationships between experience in using MPs and various demographic characteristics, cross tabulations were used.

The most popular reason for not using MPs was lack of awareness of the application (55.8%), privacy concerns (30.6%), security breaches (26.7%), identity doubts (20.5%), and lack of knowledge of how to do it (19.7%).

In addition, respondents who indicated that they had used MPs before were asked to indicate if they had ever made MPs in a restaurants. The results demonstrated that only 10% of those respondents used MPs in the restaurant industry. Out of 258 valid responses, only 26 people had used MPs in restaurants (10.1%) (Table 10).

Table 9: The Reason for Not Using MPs

| | N | Percent |
|-----------------------------|-----|---------|
| Not Aware of App | 258 | 55.8% |
| Privacy Concerns | 258 | 33.6% |
| Security Breach | 258 | 26.7% |
| Identity Doubts | 258 | 20.5% |
| Don' t Know How To Do it | 258 | 19.7% |
| Don't Need It | 258 | 17.8% |
| Cash Is Easier | 258 | 13.2% |
| Don't Want to Change Things | 258 | 8.1% |
| Too Complicated | 258 | 5.4% |
| Difficult To Use | 258 | 2.7% |
| Valid N (list wise) | 258 | |

Table 10: Experience with MPs in a Restaurant/Cafe/Bar

| | | Frequency | Percent | Valid Percent |
|-------|-------|-----------|---------|---------------|
| Valid | Yes | 26 | 10.1 | 10.1 |
| | No | 232 | 89.9 | 89.9 |
| | Total | 258 | 100.0 | 100.0 |

Table 12 shows that males and females are very similar in the way they decide to make MPs or not.

Table 11: Cross Tabulation Results Between Experience with MPs and Gender
% within Gender

| | | Made MP | | Total |
|--------|--------|---------|-------|--------|
| | | Yes | No | |
| Gender | Female | 25.0% | 75.0% | 100.0% |
| | Male | 25.3% | 74.7% | 100.0% |
| Total | | 25.2% | 74.8% | 100.0% |

The relationship between experience with MPs and age gives the picture that most users of MPs belong to the age group 18-40, which is in line with the results from other studies (Becker, 2007; Tavilla, 2012). Surprisingly, there is a small decrease in usage inside this age group, from 31-35 years. At the same time, the senior generation is generally not willing to use MPs.

Table 12: Cross Tabulation Results Between Experience with MPs and Age
% within Age

| | | Made MP | | Total |
|-------|-------|---------|--------|--------|
| | | Yes | No | |
| Age | 61-70 | 0% | 100.0% | 100.0% |
| | 51-60 | 23.1% | 76.9% | 100.0% |
| | 41-50 | 18.5% | 81.5% | 100.0% |
| | 36-40 | 22.6% | 77.4% | 100.0% |
| | 31-35 | 16.3% | 83.7% | 100.0% |
| | 25-30 | 28.2% | 71.8% | 100.0% |
| | 18-24 | 32.3% | 67.7% | 100.0% |
| Total | | 25.2% | 74.8% | 100.0% |

The occupational characteristics of the most active MP users are entrepreneurs (37.5%), students (34.1%) and engineering and technical specialists (26.2%). Also, it is interesting to see that managerial executives are not experienced in using MPs (Table 13).

Surprisingly, most active users of MPs have less than high school education (50%) or two-year college degrees (42.9%), followed by people with professional degrees (33.3%), whereas respondents with Master's and Doctoral degrees as well as high school diplomas are very passive in adopting MPs.

Table 13: Cross Tabulation Results Between Experience with MPs and Education

% within Education

| | | Made MP | | Total |
|-----------|------------------------------|---------|--------|--------|
| | | Yes | No | |
| Education | Professional Degree (JD, MD) | 33.3% | 66.7% | 100.0% |
| | Doctoral Degree | 0% | 100.0% | 100.0% |
| | Master's Degree | 18.8% | 81.3% | 100.0% |
| | 4-year College Degree | 21.7% | 78.3% | 100.0% |
| | 2-year College Degree | 42.9% | 57.1% | 100.0% |
| | Some College | 27.8% | 72.2% | 100.0% |
| | High School | 16.2% | 83.8% | 100.0% |
| | Less than High School | 50.0% | 50.0% | 100.0% |
| Total | | 25.2% | 74.8% | 100.0% |

Table 14: Cross Tabulation Results Between Experience with MPs and Occupation

% within Occupation

| | | Made MP | | Total |
|------------|--|---------|-------|--------|
| | | Yes | No | |
| Occupation | Other (please specify) | 25.0% | 75.0% | 100.0% |
| | Student | 34.1% | 65.9% | 100.0% |
| | Not currently employed (e.g. homemaker, retired, etc.) | 25.6% | 74.4% | 100.0% |
| | Entrepreneurial, Self-Employed | 23.8% | 76.2% | 100.0% |
| | Skilled craft or trade | 25.0% | 75.0% | 100.0% |
| | Marketing, sales | 25.0% | 75.0% | 100.0% |
| | Engineering, technical | 26.2% | 73.8% | 100.0% |
| | Administrative, clerical | 15.4% | 84.6% | 100.0% |
| | Managerial, executive | 14.3% | 85.7% | 100.0% |
| | Teaching, educational | 18.2% | 81.8% | 100.0% |
| | Entrepreneur Professional (medicine, law. etc.) | 37.5% | 62.5% | 100.0% |
| Total | | 25.2% | 74.8% | 100.0% |

Table 15: Cross Tabulation Results Between Experience with MPs and Income

% within Income

| | | Made MP | | Total |
|--------|----------------|---------|-------|--------|
| | | Yes | No | |
| Income | More than 100K | 28.6% | 71.4% | 100.0% |
| | 41-50K | 25.9% | 74.1% | 100.0% |
| | 31-40K | 14.3% | 85.7% | 100.0% |
| | 71-100K | 25.9% | 74.1% | 100.0% |
| | 51-70K | 22.2% | 77.8% | 100.0% |
| | 11-30K | 32.4% | 67.6% | 100.0% |
| | Under 10K | 25.0% | 75.0% | 100.0% |
| Total | | 25.2% | 74.8% | 100.0% |

The income of the people with MP experience is mostly under \$30K.

Hypothesis Testing

Based on the information collected, statistical analysis was conducted to examine the restaurant consumer's drivers of acceptance of proximity payments. Using SPSS (Statistical Package for Social Sciences), a regression analysis was conducted on scaled items.

A multiple regression was used to estimate the effect of the six identified factors (usefulness, ease of use, security, compatibility, the subjective norm, and previous experience with MPs) on the likelihood of using MPs in future. A multiple regression is a “method of selecting variables for inclusion in the regression model that starts by selecting the best predictor of the dependent variable” (Hair et al., 2010, p. 147).

The regression model was proposed as follows:

$$Y_s = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_6 X_6,$$

Where:

Y_s = Intention to use MPs in restaurants/café/bars

β_0 = Constant (coefficient of the intercept)

X_1 = Usefulness

X_2 = Ease of use

X_3 = Security

X_4 = Compatibility

X_5 = Subjective norm

X_6 = Previous experience with MPs

For the purpose of the regression analysis the categorical variable “previous experience with MPs” was coded as follows: YES, the respondent had experience with MPs – 1; NO, the respondent did not have experience with MPs – 0.

The adjusted R Square was 76.6%, or 76.6% of the variance was explained by the six factors (security, usefulness, ease of use, compatibility, the subjective norm, and previous experience with MPs), which is reported as a good fit for the regression model (Hair et al., 2010).

Table 16: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | Durbin-Watson | |
|-------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | | Sig. F Change |
| 1 | .880 ^a | .775 | .770 | .67789981 | .775 | 144.126 | 6 | 251 | .000 | 2.194 |

a. Predictors: (Constant), Made MP, Subjective Norm, Ease Of Use, Security, Usefulness, Compatibility

b. Dependent Variable: Intention to Use

Based on the ANOVA, Sig. represents the statistical significance of the regression model that was applied. F-statistic is 144.126 with p-value of 0.0001. The model explains the deviations in the dependent variable (Hair et al., 2010).

Table 17: ANOVA^b

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1 | Regression | 397.396 | 6 | 66.233 | 144.126 | .000 ^a |
| | Residual | 115.347 | 251 | .460 | | |
| | Total | 512.743 | 257 | | | |

a. Predictors: (Constant), Made MP, Subjective Norm, Ease Of Use, Security, Usefulness, Compatibility

b. Dependent Variable: Intention to Use

Based on the regression analysis slopes, five of the independent variables are statistically significant, which means that five independent variables are significant

predictors of intention to use MPs (the subjective norm, compatibility, security, usefulness, and previous experience with MPs). The ease of use factor is not statistically significant ($p= 0.746$).

Multi-collinearity among independent variables is a common problem when using a multiple regression model (Hair et. al, 2010). To address this problem, Hair et. al (2010) suggests examining variance inflation factors (VIF) and tolerance values to determine the correlation between independent variables. The VIF and tolerance values report the degree to which each independent variable becomes a dependent variable and is regressed against the remaining independent variables. Small tolerance values and high VIF denote high collinearity. According to Hair et. al (2010), a common cutoff threshold is a tolerance value of 0.10, which corresponds to a VIF value above 10. None of the independent variables had a VIF value more than 10.

Table 18 shows the effects of independent variables (perceived usefulness, perceived ease of use, perceived security, perceived compatibility, the subjective norm, and previous experience with MPs) on the dependent variable (intention to use MPs in the future). Regression coefficients for each of the named factors provide estimates for their magnitude and direction.

According to Table 18, compatibility is most closely correlated to the intention to use MP factor, followed by usefulness, the subjective norm, security, and previous experience with MPs.

The results revealed that five out of the six variables remained significant in the equation with a different value of the beta coefficients, thus contributing different weights to the variance of restaurant customers' likelihood of using MPs in the future. Therefore, the explanatory power of the model is good. Given the coefficient of the

significant independent variables, the regression equation for the return model can be written as follows (See Table 18):

$$Y = - 0.846 + 0.393(\text{Usefulness}) + 0.123 (\text{Security}) + 0.496 (\text{Compatibility}) + 0.165 (\text{Subjective Norm}) + 0.243 (\text{Previous Experience in MP}).$$

The first hypothesis, which proposed that perceived usefulness would have a positive impact on intention to use MPs in restaurants/cafés/bars, was supported with the standardized regression coefficient of 0.288 ($p < 0.001$).

The second hypothesis, which proposed that perceived ease of use would have a positive impact on intention to use MPs in restaurants/cafés/bars, was not supported with the standardized regression coefficient of -0.012 ($p = 0.746$). The p-value is more than 0.1 of the coefficient estimate and is not reliable because it has "too" much dispersion/variance (Hair et al., 2010).

The third hypothesis, which proposed that the subjective norm would have a positive impact on intention to use MPs in restaurants/cafés/bars, was supported with the standardized regression coefficient of 0.137 ($p < 0.001$).

The fourth hypothesis, which proposed that perceived compatibility would have a positive impact on intention to use MPs in restaurants/cafés/bars, was supported with the standardized regression coefficient of 0.451 ($p < 0.001$).

The fifth hypothesis, which proposed that perceived security would have a positive impact on intention to use MPs in restaurants/cafés/bars, was supported with the standardized regression coefficient of 0.115 ($p < 0.002$).

The last hypothesis, which proposed that previous experience with MPs would have a positive impact on intention to use MPs in restaurants/cafés/bars, was supported with the standardized regression coefficient of 0.075 ($p < 0.026$).

Table 18: Regression Coefficients

| Model | | Unstandardized | | Standardized | | | Correlations | | | Collinearity | |
|-------|-----------------|----------------|------------|--------------|--------|------|--------------|---------|-------|--------------|-------|
| | | B | Std. Error | Beta | t | Sig. | order | Partial | Part | Tolerance | VIF |
| 1 | (Constant) | -.846 | .343 | | -2.462 | .014 | | | | | |
| | Usefulness | .393 | .080 | .288 | 4.901 | .000 | .812 | .296 | .147 | .259 | 3.858 |
| | Ease Of Use | -.020 | .062 | -.012 | -.325 | .746 | .445 | -.020 | -.010 | .710 | 1.409 |
| | Security | .123 | .038 | .115 | 3.202 | .002 | .536 | .198 | .096 | .690 | 1.449 |
| | Compatibility | .496 | .065 | .451 | 7.636 | .000 | .839 | .434 | .229 | .257 | 3.891 |
| | Subjective Norm | .165 | .043 | .137 | 3.845 | .000 | .560 | .236 | .115 | .708 | 1.411 |
| | Made MP | .243 | .109 | .075 | 2.241 | .026 | .391 | .140 | .067 | .801 | 1.249 |

a. Dependent Variable: Intention to Use

All six independent variables are not correlated to each other.

V. Discussion

Proximity MPs in the United States have generated much discussion, but have not been widely used. The primary objective of this investigation was to examine the consumer acceptance of proximity MPs in the restaurant industry across the United States in the light of the TAM with new added variables. These new variables included security, the subjective norm, compatibility, and previous experience with MPs. The measurement scales were adopted from the relevant existing literature. To enhance the face validity, they were pretested in a small pilot study, and several items were modified.

This study provides important theoretical and practical contributions to the area of consumers' behavior towards MPs in the restaurant industry. To the best of my knowledge, we are among the first who tried to cast light upon this topic and test determinants of the consumer acceptance of proximity MPs in restaurants/cafés/bars.

As indicated by the results, one of the most significant theoretical findings is that compatibility has the greatest impact on the intention to use MPs in restaurants/cafés/bars. Thus, in order to consider adopting MP services in the restaurant business, people must find them to be aligned with their existing behavioral patterns. This is an important finding since perceived compatibility is not a part of the original TAM. It also resonates with the results of Lu et al. (2011) and Schierz et al. (2010), which found that compatibility is a strong determinant of behavioral intention. Lu et al. (2011) also found that compatibility has a special importance for students,

as students tend to form their MP services adoption intentions mainly by considering their associated social image.

According to the study results, the perceived usefulness of MP services in restaurants positively affects customers' intention to use MPs in restaurants. Consumers are only likely to adopt a new way of payment if it provides significant added value. These results are in line with similar studies on MP adoption (Dahlberg & Mallat, 2002; Kim et al., 2010; Zmijewska et al., 2007).

The subjective norm exerts a positive effect on intention to use MPs in restaurants; it is another key component of consumers' acceptance of MPs. Therefore, it could be implied that reference groups play an important role in the diffusion of MPs and users of MPs in the restaurant industry are influenced by their peers in their decisions. This coincides with the results of other studies (Shin, 2010; Schierz et al., 2010; Venkatesh & Davis, 2000).

This study also confirms the importance of perceived security in the intention to use MPs; it is in line with the results of other researchers (Dahlberg & Mallat, 2002; Shin, 2010; Pousttchi, 2003; Ding & Unnithan, 2005). While we found a positive relationship of this factor with intention to use MPs, the link was not as strong as expected, giving increasing importance to the subjective norm, perceived usefulness, and compatibility. It contrasts with the results of other studies on MPs, where security emerged as a major inhibitor of MP acceptance (Becker, 2007; Shin, 2010; Kim et al., 2010).

Additionally, previous experience with MPs also has a positive impact on the intention to use MPs. According to the findings, the impact of previous experience on intention to use MPs in future is not as strong as other tested factors.

Surprisingly, the study finds no evidence of a statistically significant relationship between the ease of use in proximity MPs and the intention to use MPs in restaurants. Taking this fact into account, we can assume the current study did not provide support for the classic TAM. The results of this research are not consistent with the results of the majority of studies on MPs, where perceived ease of use was found as direct determinant of MP usage in restaurants/cafés/bars by consumers (Andreev & Pliskin, 2012; Dahlberg & Mallat, 2002; Shin, 2010; Kim et al., 2010; Zmijewska et al., 2007). This finding is expected considering that the demographic characteristics of the majority of respondents are comprised of relatively young people (from 18 to 35 years old). This generation typically has more experience with new technology; therefore ease of use is not an obstacle. The other possible reason for this failed hypothesis is that MP technologies have been adjusted to the level of an average user. Because of this, perceived ease of use is not considered as a big challenge from the customer's prospective.

VI. Implications

Unlike prior MP studies that attempted to examine customers' adoption of MPs, we attempted to apply the TAM model to the restaurant industry and identify the factors which are more relevant for this market sector. Several new insights were generated from the results of this work. It is important for industry parties to clearly understand consumers' preferences, which should be a key consideration in the decision-making process.

MP Promotion Strategies

First, the study indicated that restaurant industry merchants, as well as MP service providers, should pay close attention to five factors: compatibility, usefulness, the subjective norm, security, and previous experience with MPs. These factors can serve as guidelines for increasing further restaurant market penetration of MP services and can effectively boost the number of MP users in the restaurant industry.

Second, the strong influence of compatibility on the intention to use MPs has important implications for marketing specialists, particularly those who are working with the positioning of MPs in restaurants. Thus, industry players are challenged to develop and advertise proximity MP solutions in the restaurant industry in the way that consumers regard them as well-suited to their individual behavioral patterns, prior experience, current values, needs, and lifestyle. A potential marketing strategy could be producing advertisements catered to a trendy, innovative, tech friendly generation of individuals, consumers who desire the flexibility that MPs give. The campaign would highlight the advantages of MPs, including the ease of using one's

smartphone as their wallet and having everything in one device. Promoting a mobile lifestyle for people who are not afraid of entering the MP era could be another good idea for an MP marketing approach.

Third, in order for users to utilize MPs in the restaurant industry, MPs should be designed and developed to provide an added value to the user. Value could be enhanced by offering less complex MP services. This is especially important for the established United States payment market. Consumers should have a convincing reason for shifting towards MPs. Most likely, consumers will not shift from cards to MPs if the added value of smartphone payments is not significant. Marketing promotion of proximity MPs in the restaurant industry will not be successful if the value of the new solution for consumers is not in place. Merchants should educate consumers on the benefits and advantages of a new way of payment or create functions or features that will help consumers adapt to this new form of payment in the restaurant industry.

Fourth, it is important to increase the source credibility of social information to improve communication campaigns that raise the prestige associated with MP use in restaurants/cafés/bars. This will increase identification. Thus, management needs to focus on the creation as well as promotion of the image of consumers who use MPs by implementing word-of-mouth techniques while designing the advertising campaign.

Fifth, one managerially interesting insight can be gained from the positive impact of the perceived security on intention to use MP solutions in restaurants in the future. Merchants could encourage consumers to set up basic protection measures, such as passwords, anti-virus software, and alert services for various account activities. This will build the necessary level of trust from the consumer's side. The

other possible solution for increasing the security of MPs is to educate consumers on what not to do, such as downloading questionable applications, opening suspicious emails, etc. Not all MP users are aware of the fact that they have the same level of protection on mobile payment accounts if it is funded with a credit, debit or bank checking account, as with regular bank accounts (Tavilla, 2012). Educational programs can help possible MP adopters to understand that NFC MP Technology has the potential to provide even safer payment transactions than those that exist today.

The positive effect of previous experience with MPs on intention to use MPs in the future is relevant for merchants because it infers that people who have made at least one MP in their lifetime are more likely to repeat it than people who have not used MPs before. The possible solution for restaurant merchants to increase the number of people actively using MPs is to have waiters, for instance, trained in installing MP applications, instructing and guiding consumers with their first MP experiences.

Multiple regression results gave an unexpected ranking of the factors that affect consumers in their decisions regarding using MPs in the restaurant industry. The most significant factor is compatibility, followed by usefulness, the subjective norm, perceived security, and finally previous experience with MPs. In other words, contextual factors such as lifestyle compatibility and the subjective norm, along with usefulness, have a stronger impact on consumers than technical factors such as security and previous experience.

MP User Profile

According to the sample cross-tabulations for experience with MPs combined with the different demographic characteristics, it has been determined that there is no significant gender difference in the proportion of consumers who have used MPs.

This allows for gender-neutral marketing campaigns. The correlation between experience with MPs and age group shows that most users of MPs are in the 18-40 age group, which correlates with the results from other studies (Becker, 2007; Tavilla, 2012). Consequently, the major target audience for MPs should be people under 40 years old.

Another demographic analysis indicated that the most active users of MPs have less than a high school or a two-year college degree, being students and entrepreneurs with an income of less than \$30K. This correlates with age results and supports the statement that the target group for a marketing campaign should be young people finishing high school or beginning their higher education.

Finally, service providers should understand the different behaviors among groups of customers in MP services adoption within the restaurant industry and consider using marketing segmentation tactics to attract different groups of users. MP advertisements will need to be customized to reach different customer demographics.

VII. Limitations and Future Research

Though this investigation provides significant contributions, it has limitations that should be pointed out.

First, the sample limitation infers the sample could not be considered a representation of the whole country, which makes the generalizability of the results an issue. Future studies may capture a larger sample of the United States population, and could potentially expand to other countries, such as Kenya, Finland, China, and Korea, where the popularity of MPs is rapidly growing.

Second, the study did not sample non-Internet users including the elderly and the computer illiterate segments of the population. However, this is not a significant limitation as the research focused on using MPs in restaurants, which requires basic knowledge of Internet and computer usage.

Third, another sample limitation is the proportion of actual MP users (approximately one quarter of the sample). The number of users was much smaller than non-users, which may have introduced some bias in the results. Future researchers could obtain a sample with better representation of respondents with experience with MPs. Similarly, future researchers could include teenagers in the sample and discover the potential of that age group, which is the market segment most likely to adopt MP solutions.

Fourth, although the research comes up with some significant findings from the viewpoint of consumers, it does not include all factors that affect consumers'

intention to use MPs. This includes factors such as trust, risk, costs, etc. Technological factors can also be taken into consideration in future research.

Fifth, future research should shed more light on how other factors affect intention to use MPs in restaurants/cafés/bars as exemplified by a larger sample of the United States population. This will ensure the results can be generalized beyond the population of the United States.

Sixth, further research may examine the difference between consumers' intention to use different types of MPs in quick-service restaurants and full-service restaurants, using an extended measurement scale.

The seventh limitation is related to testing one particular type of MP (Proximity MP). Some respondents may have experience with MP methods other than proximity MPs, and may provide answers based on these experiences. Answering the questions with other MP methods in mind would result in irrelevant information, as this study is examining proximity MPs exclusively.

Finally, the current investigation is limited by the consumer point of view. Further research could be conducted in order to find the barriers for MP adoption in the restaurant industry from the merchant's side.

These limitations aside, the results represent a promising step towards the understanding of the drivers of MP use in the restaurant industry. Considering these limitations, our research establishes an important stepping stone for future research in different national settings which involves an investigation of the factors that influence consumers' intention to use MPs in the restaurant industry.

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