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Niina Mallat
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Abstract

This paper examines consumer adoption of a new electronic payment service, mobile payments. The empirical data for the explorative study was collected by establishing six focus group sessions. The results suggest that the relative advantages of mobile payments include time and place independence, availability, possibilities for remote purchases, and queue avoidance. The interviewees found mobile payments to be mostly compatible with digital content and service purchases and to complement small value cash payments. Interestingly, the findings suggest that the relative advantages of mobile payments depend on certain situational factors such as lack of other payment methods or urgency. There are, however, several barriers to the adoption of mobile payments, including premium pricing of the payments, complexity of payment procedures, a lack of widespread merchant acceptance, and perceived risks.

Keywords: Mobile payment systems, Mobile payment adoption, Mobile commerce

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Abstract

This paper examines consumer adoption of a new electronic payment service, mobile payments. The empirical data for the explorative study was collected by establishing six focus group sessions. The results suggest that the relative advantages of mobile payments include time and place independence, availability, possibilities for remote purchases, and queue avoidance. The interviewees found mobile payments to be mostly compatible with digital content and service purchases and to complement small value cash payments. Interestingly, the findings suggest that the relative advantages of mobile payments depend on certain situational factors such as lack of other payment methods or urgency. There are, however, several barriers to the adoption of mobile payments, including premium pricing of the payments, complexity of payment procedures, a lack of widespread merchant acceptance, and perceived risks.

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1. Introduction

Mobile payments have been suggested as a solution to facilitate micro-payments in electronic and mobile commerce, and to provide an alternative for the diminishing use of cash at POS (Begonha et al., 2002; Coursaris & Hassanein, 2002). The development of mobile payment solutions is based on proliferation of mobile telecommunications technology, wide use of mobile phones, and the success of early mobile content and services such as logos and ring tones.

Prior studies suggest that there is a general consumer interest towards using mobile payment applications (Dewan & Chen, 2005; Kreyer et al., 2003). The initial adoption of mobile payments has not, however, been as rapid or widespread as expected (BIS, 2004). While there are many successful applications such as London city traffic tolls by SMS (www.cclondon.com), there are also many discontinued mobile payment services such as Paybox in Germany and the Simpays initiative in Europe. These recent examples together with previous failed launches of electronic payment systems (Van Hove, 2001) show that deeper knowledge on consumer adoption of payment systems is needed to guide future development of mobile payments. Reviews of the present research equally emphasize the need for more explicit research about adoption of specific technologies (Y. Lee et al., 2003b; Orlikowski & Iacono, 2001).

The objective of this paper is to explore consumer adoption of mobile payments by empirically examining the adoption determinants that are specific for the mobile payment context. The paper contributes to existing mobile commerce and adoption research by presenting a detailed description of factors that enhance and inhibit mobile payment adoption, and by giving propositions for future research of this emerging topic.

2. Adoption of mobile and electronic payment systems

Mobile payments are defined as the use of a mobile device to conduct a payment transaction in which money or funds are transferred from a payer to a receiver via an intermediary, or directly without an intermediary. While this definition includes mobile payment transactions conducted via mobile banking systems, a distinction between mobile payments and mobile banking services should be noted. Mobile banking services are based on banks' own legacy systems and offered for the banks' own customers. Mobile payments, on the other hand, are offered as a new payment service to a retail market, which is characterized by 1) a multitude of competing providers such as banks and telecom operators, 2) two different and demanding groups of adopters; consumers and merchants, and 3) challenges regarding standardization and compatibility of different payment systems. All these factors increase the complexity of mobile payment adoption environment. This paper analyzes this complex environment and focuses on examining consumer willingness to use mobile phone as a payment instrument in transactions where money is transferred from consumer to merchant in exchange for products or services.

The theoretical background of this study is drawn from the diffusion of innovations theory (Rogers, 1995), which has been widely established as a powerful tool to explain the adoption of a variety of financial and mobile technologies including electronic payments (Szmigin & Bourne, 1999), mobile commerce (Teo & Pok, 2003), and mobile banking (M. S. Y. Lee et al., 2003a). Especially the relative advantage, complexity, and compatibility constructs have provided the most consistent explanation on the technology adoption decision (Tornatzky & Klein, 1982) and are therefore deemed as valid predictors for mobile payments adoption as well. To gain further insight on factors affecting consumer choice of payment instruments, prior literature on e-payments and mobile banking adoption was reviewed.

Relative advantages of mobile payment systems: previous studies suggest that mobile banking offers customers additional value in terms of location-free access (Laukkanen & Lauronen, 2005). Similarly, mobile payments provide consumers with ubiquitous purchase possibilities, timely access to financial assets and an alternative to cash payments. The users can, for example, pay for transportation tickets or car parking remotely without the need to visit an ATM, a ticketing machine or a parking meter (Begonha et al., 2002; May, 2001). Advantages of mobile payments compared with traditional payment instruments are thus likely to pertain to time and location independent purchase possibilities.

Compatibility: compatibility captures the consistency between an innovation and the values, experiences, and needs of potential adopters (Rogers, 1995). For payment systems, consumer ability to integrate them into their daily life is an important aspect of compatibility (Jayawardhena & Foley, 1998; M. S. Y. Lee et al., 2003a; Shon & Swatman, 1998). The compatibility of mobile payments with consumers' purchase transactions, habits, and preferences correspondingly influences the diffusion progress.

Complexity: complexity and problems with usability have contributed to the low adoption of a variety of payment systems, including smart cards and mobile banking (Laukkanen & Lauronen, 2005; Szmigin & Bourne, 1999). Similarly, ease of use and convenience have been found to affect consumer adoption of Internet payments (Shon & Swatman, 1998) and WAP financial services (Kleijnen et al., 2004). Mobile payments are commonly expected to

increase consumer convenience by reducing the need for coins and cash in small transactions and increasing the availability of purchase possibilities (Coursaris & Hassanein, 2002). Limitations in mobile device features, however, diminish the usability and user-friendliness of mobile technologies (Siau et al., 2004). Typical limitations include small displays and keypads, limited transmission speed and memory, and short battery life.

Network externalities and creation of critical mass: Payment systems exhibit network externalities as the value of a payment system to a single user increases when more users begin to use it (Van Hove, 2001). Consumer decision to adopt a payment system is therefore significantly affected by the amount of other consumers and merchants using it. Failure in creating critical mass has contributed to discontinuance of several previous payment systems, including several smart card systems (Szmigin & Bourne, 1999). As mobile payments represent a new system introduced to the market, reaching a wide enough initial adopter base of consumers and merchants is a critical success factor for m-payments as well.

Costs: The cost of a payment transaction has a direct effect on consumer adoption if the cost is passed on to customers. Fenech (2002) studied consumer intention to WAP shopping and found that the strongest characteristic differentiating the high and low intention groups was price consciousness. As shoppers in electronic channels are attentive to price the transaction costs of mobile payments should be low enough to make the total cost of the purchase competitive with physical world prices.

Payment system security and trust in payment systems providers: In a mobile environment, lack of consumer perceived security and trust in vendors and payment systems is one of the main barriers to electronic and mobile commerce transactions (Siau et al., 2004). the key requirements for secure financial transactions in electronic environment include confidentiality, data integrity, authentication, and non-repudiation (Shon & Swatman, 1998). Other security factors important for consumer adoption are anonymity and privacy, which relate to use policies of customers' personal information and purchase records (Jayawardhena & Foley, 1998; Shon & Swatman, 1998).

3. Methodology and data collection

As mobile payments are a relatively new research area with little previous empirical work on the subject, a qualitative approach using focus group interviews was chosen to explore consumer adoption of mobile payments. Focus group interviews have been suggested as a suitable method for explorative studies (Calder, 1977) and previous research has demonstrated their feasibility in studying innovative mobile services (Jarvenpaa & Lang, 2005).

The strength of focus group interviews lies in the group dynamics and interaction, which provide researchers with elaborated perspectives to the topic under discussion (Wilkinson, 2004). For the interaction to succeed and group dynamics to work, the selection of groups is especially important. Stewart and Shamdasani (1990, p. 33) note that "the usefulness and validity of focus group data are affected by the extent to which participants feel comfortable about openly communicating their ideas, views or opinions". Naturally forming groups are particularly found to be relaxed and at ease in conversations (Bryman, 2001).

To ensure proper discussion and interaction during the sessions, six naturally forming groups were selected for the current study. The members knew each other as friends, classmates, co-workers, or through a common hobby. We attempted to form a number of

cohesive groups which loosely cover the phases of the Wells and Gubar's (1966) original consumer life cycle, CLC. Wilkes (1995) postulated the validity of CLC in consumer inquiry; transitions in the family situation can be meaningfully related to systematic spending behavior. The following groups were interviewed: teenagers (14-15 years of age), university students, young adults who had already entered working life, parents of small children, and middle-aged persons. The discussions followed a semi-structured guide, which was tested with a pilot group of young adults I. As no major modifications to the guide were necessary and the group was consistent with the research design, the data was included in the study. The group sizes varied between 6 and 9 subjects and the total number of subjects was 46, which follows the common recommendations for focus group composition (Wilkinson, 2004). A further selection criterion for participants was previous experience on mobile phone use. Experience on mobile phone use was estimated to be necessary in order for the participants to be able to discuss the use of mobile payments.

Table 1. Focus group description

Group (N)	Description
Teens (8)	Teenagers and classmates, 14-15 years of age
Students (7)	Students and members of a student association in University of Helsinki, most in their early twenties
Young adults I (8)	Young professionals who have entered working life, most in their twenties
Young adults II (8)	Young professionals who have entered working life, in their twenties
Parents (6)	Parents of small children and work colleagues, most between 30-39 years old
Middle-aged (9)	Members of a hobby group, most between 50-59 years old

The interviews lasted between one and two hours. A €14 gift certificate was offered for each participant as an incentive. The interviews were conducted in the Helsinki metropolitan area in Finland in late 2002. The general financial and telecommunication infrastructure in the country is favorable towards diffusion of new mobile payment services, as mobile phone penetration in Finland is 96%, and as private persons conduct 79% of their payment transactions via electronic channels. The timing of the interviews was suitable for the study because mobile payments were available in the market but not yet widely adopted by consumers. The Helsinki metropolitan area was deemed appropriate for the exploratory research as consumers are able to pay for a variety of purchases with mobile phones there including vending, public transportation, and parking.

Four researchers conducted the interviews in pairs where one moderated the discussion and the other managed a recorder and the facilities. The discussions were held either at the Helsinki School of Economics' facilities or at a common place of assembly of the interviewed group, depending on which arrangement was preferred by the participants. The interviews were recorded and transcribed and the transcriptions were coded with Atlas.ti 4.2 software. The coded segments included specific words, themes or issues, which commonly occurred within and across the discussion groups. The coding followed the qualitative clustering method, i.e. grouping and then conceptualizing excerpts that have similar patterns or characteristics (Miles & Huberman, 1994). The object of the analysis was to identify

determinants for mobile payments adoption. As mobile payment markets are currently at the early development stage, discussions on mobile payments adoption concerned adoption intention in the future.

4. Results

4.1. Mobile phone and mobile service use

The use of mobile phones and services was more similar between the interviewed groups than actually expected. The group members had an average of 4 to 7 years experience in mobile phone use. The phones were mostly used for communication either by calling or sending an SMS. Premium SMS services and WAP services were used more infrequently.

Each interviewed group included persons who had made purchases with a mobile phone. Altogether, 39 out of the total 46 interviewees had some experience in using mobile payments. Typical purchases paid for with a mobile phone included mobile phone content such as ring tones and logos, purchases from vending machines such as soda and candies, car parking tickets, and public transportation tickets. The payments were not conducted regularly, however, but more on a trial basis and the groups commonly discussed mobile payment adoption using the future tense. A summary of group characteristics, which were queried with a one-page form in the beginning of each interview, are reported in Table 2.

Table 2. Mobile phone and service use experience between the groups

Group (N)	Mobile phone use, in years	SMS sent per day	Use frequency of premium SMS services	Use frequency of WAP services	Persons who have used m-payments
Teens (8)	5	7	Monthly	Less than monthly	8
Students (7)	5	3	Less than monthly	Less than monthly	7
Young adults I (8)	7	3	Less than monthly	Less than monthly	8
Young adults II (8)	7	4	Less than monthly	Less than monthly	7
Parents (6)	6	2	Monthly	Less than monthly	5
Middle-aged (9)	4	2	Less than monthly	Never	4

A few differences between groups were detected. As predicted, the teenage group was distinguished by their financial dependence on their parents who in the end made the decisions concerning the teens' use of money and payment instruments. The middle aged group had the least knowledge of and experience on mobile payments use and they stated fewer advantages of mobile payments than other groups. They did, however, mention several useful applications for mobile payments and their perceptions corresponded with the views of

other groups. The following sections discuss the mobile payment characteristics, which emerged as determining factors for mobile payments adoption.

1.2. Relative advantages

The relative advantages of mobile payments mentioned by interviewees included the possibility to make purchases ubiquitously, independence of time and place, and possibility to avoid queues. Interviewees perceived independence of location as useful because purchases could be conducted remotely without having to move to a point of sale. Remote purchasing was perceived as especially convenient for items that can be digitized and sent directly to a person's phone, such as movie tickets. Furthermore, interviewees commonly visualized points of sale as crowded and expected to avoid queuing by paying remotely with a mobile phone.

“I think that the biggest advantage of a mobile phone is that if the payment is in a difficult place either because of queues or distance-wise, you don't have to go to the point of sale just for that purpose.” (Parents)

“Take a cinema ticket, for example. You leave home, sit on a tram and already have the ticket in the form of an SMS and then you just walk past the box office directly to the theatre and show them that you have the ticket.” (Young adults I)

Mobile payments were also considered advantageous because people carry mobile phones with them most of the time and the phone is therefore conveniently available in most situations. Many interviewees stated that they often did not have enough cash or small coins with them and described that lack of exact change could potentially cause problems, for example, with vending machines, public transportation, and small payments in shops and kiosks. Compared to cash, the benefits of mobile payments are that the payment method is more often available, the payer always has exact change and that there is no need to find an ATM to withdraw cash.

“If you are in downtown and would like to go to movies with your friends but you don't have any money you could pay with your mobile phone” (Teenagers)

“At the moment a passport photo where you need a certain amount of certain coins. Or a locker or a parking meter where you need certain size of coins. You usually don't have them and then you need to exchange them or buy something small to get them.” (Students)

Some interviewees noted that in addition to complementing cash use, some plastic cards could be integrated in mobile devices to reduce current multitude of cards carried in a wallet, provided that the security of mobile payments would become good enough to prevent fraud and misuse.

1.3. Compatibility

The compatibility of mobile payments was evaluated in terms of how compatible mobile payments are with different types of purchases. The findings suggest that mobile payments are most compatible with small value payments contemplating cash payments.

“Train tickets could be [suitable for mobile payments], travel tickets.” (Middle-aged)

“At the moment it would feel sensible to purchase just these items, tram tickets and parking, things that you can pay for with a mobile phone at the moment.” (Young adults II)

Based on the group discussions, the following four categories were identified as particularly suitable for mobile payments: (1) electronic ticketing such as movies, public transportation, car parking, and concerts, (2) mobile content and services such as games, music, pictures, news, directory enquiries, and public transport route information, (3) purchases on vending machines and various other forms of self service machines such as lockers, photo booths, hair dryers in locker rooms, and self service gas stations, and (4) small value payments at POS such as a chocolate bar or a newspaper on a kiosk, or a bottle of milk in a corner shop on a way home.

Compatibility of mobile payments with larger value purchases was perceived as poor and some interviewees found that mobile payments provide no additional value at POS. Reservations concerning larger value payments were mostly caused by a perceived lack of suitable charging models, security, need, and payment documentation. In general the interviewees concluded that the possibility of paying for high value items with a mobile phone was a long term development and not likely to diffuse in the near future. Currently, the interviewees were ready to pay for purchases up to 10-100 Euros with mobile phones.

1.4. Complexity

Complexity of mobile payment services frequently emerged as a barrier to adoption in the discussions. Among the most complex issues in current mobile payment methods was the use of SMS, which received heavy critique from the interviewees. Interviewees explained that message formats are often complicated and slow to key in, various payment codes and premium service numbers are difficult to remember, and instructions for making payments are difficult to find. The critique indicates that mobile payment procedures need to be simpler and faster, including just a few keystrokes and possibly another technology to replace SMS.

In addition to SMS, complex registration procedures and separate billing arrangements were also a cause for additional complexity in payment system use. In particular, interviewees considered separate accounts for mobile payments as a burden because they require money transfers to and from the mobile account and because it is difficult to follow up the mobile account's balance. Interviewees also noted that decentralizing one's money to many different accounts was complex and difficult to manage.

"It [purchasing a mobile tram ticket] was a bit difficult. I only found instructions on how to do it in one place. And then when you need it you don't know how you can order it. (Teenagers)

"Well, for example, I haven't signed up for the [mobile] parking service because I would have to register somewhere and I haven't bothered to find out where I should register and what it would require from me ... they have not made it easy for me."
(Parents)

1.5. Network externalities

The interviewees stated that a lack of large merchant acceptance inhibits adoption of mobile payments. At present, there are not enough opportunities for consumers to use and become familiar with mobile payments. Furthermore, the potential for mobile payments to complement small cash payments is small if mobile payments are not commonly accepted. Some of the interviewees expected mobile payments to be as common as the conventional payment methods. Others would be satisfied with a frequent acceptance within selected product categories.

"It would probably be easier to use if it were familiar. Now it is used here and there... but it is just that it is in hardly any places and you always ask yourself how it works."
(Young adults I)

Interviewees further noted that mobile payments should not be exclusive to customers of certain financial and telecommunication service providers but widely available for all customers of different banks and mobile operators. Similarly, interviewees were reluctant to change their mobile phone model or manufacturer just to gain the payment functionality.

1.6. Costs

Some interviewees said that they had refrained from using mobile payments because of premium pricing. If there is a cash payment alternative for mobile payments in vending machines, for example, the item paid for with a mobile phone costs commonly more than the same item paid for with cash. Interviewees were very critical towards the premium pricing and it clearly discouraged them from using mobile payments.

"I noticed that I could pay for purchases on a vending machine with a mobile phone, but it was more expensive than using coins and I thought it was totally unnecessary and I used coins." (Young adults I)

"I think it is a precondition in new things like this that it won't cost more. I won't pay for paying with it. I think it kills good ideas from the start because nobody is ready to pay for it as long as debit cards and others work as well as they do". (Students)

1.7. Perceived risks and trust in mobile payment service providers

Perceived risks of mobile payments described by the interviewees related to six different categories, which are discussed in more detail below.

Unauthorized use of the mobile phone was perceived as a risk by interviewees who were concerned that someone would be able to pay with their mobile phone if the device was lost, stolen or hacked, for example.

"These code detections. Someone listens to your phone and gains control of it from the frequency so that he hears which keys you push in different phases and picks up your code and starts to charge and you get the bill after a month and its all in red." (Young adults II)

Lack of transaction record and documentation was considered as risky by interviewees as it made follow-up on past payments more difficult. Interviewees suspected that without proper documentation they could easily end up spending more money than they intended. Furthermore, without a receipt a payer has no proof of the payment transaction, therefore making any claims for a refund difficult.

Errors in payment transactions were perceived as another potential risk by the interviewees. The errors could be caused by the payment system or by their own mistakes in their use of the system. A common concern was whether a right amount would be credited and sent to a right account when paying with a mobile device.

"...and if you pay for say a bus ticket and then the code is such that it pays for something else which costs a hundred euro more or something, how can you make sure that you pay for the right service totaling the right amount at the time you make the payment." (Middle-aged)

Vagueness of the transaction and perceived lack of control was mentioned by many interviewees when they described their experiences with mobile payments. The interviewees were unsure whether the payment had taken place or not and whether or not the payment had been charged. One interviewee described a situation where delays in the process had led to the interviewee repeating the purchase order operation, with a result that a single product was purchased twice:

"I have had problems a few times because the return message comes very slowly and I have thought that OK my message did not get through and I have made the purchase again and then I could not cancel the first purchase". (Young adults I)

Device and mobile network reliability was a common concern among the interviewees who were worried that the phone's battery could run out or the network connection could fail in the middle of a payment transaction.

Compromise of privacy was perceived as a risk by some of the respondents who therefore were unwilling to disclose their information to payment service providers. They were concerned that their purchases would be tracked, personal information misused or that they would begin to receive a lot of advertisements if they registered to a new payment system.

"...similar to payment cards the mobile phone will leave traces about where and what you have purchased.. And I already have the feeling that Big Brother is watching." (Students)

The findings further indicate that trust in mobile payment service providers and merchants reduced perceived risks of mobile payments. The interviewees were more willing to conduct payments with trustworthy transaction parties and regarded established banks, credit card companies, and telecom operators as reliable mobile payment service providers. Banks were slightly preferred to other providers. The results suggest that reliable and well-established payment service providers are appreciated more than unknown and smaller competitors. The results further augment existing research (Siau et al., 2004) by suggesting

that not only vendors but also payment and network service providers contribute to consumers' trust formation.

“One thing which makes mobile payments safe for me is the collaborating partner. If there is some nonsense company I certainly won't use it. But if there is my operator and my bank they have credibility as companies, so that it is enough to convince me that they won't mess up. But it requires a name behind it to guarantee that it works.” (Young adults II)

1.8. Additional findings – impact of use situations

In addition to the adoption determinants that were based on prior theory and discussed above, an additional factor affecting the adoption frequently emerged in the group discussions; use situation.

It was often highlighted in interviewee comments that the advantages of mobile payments are dependent on situational factors such as presence of queues, lack of alternative payment methods, hurry, and unanticipated need. Interviewees perceived mobile payments as most advantageous in these situations and considered them as a back-up for existing payment methods.

“If you have left your travel card home and have jumped into a tram and just then remember that oh no then with a mobile phone you can still fix the situation” (Young adults I).

Situational factors did not have similar impact on other adoption determinants as they had on advantages. This is understandable, as it is the advantages that reflect the ubiquitous features of mobile payment services that enable reactions to unexpected situational conditions.

5. Discussion and conclusions

The purpose of this paper was to explore factors that affect consumer adoption of mobile payments. The findings are summarized in Table 3, which lists general adoption determinants and related contributing factors that are specific for mobile payment environment. The final two columns indicate whether the factors have a positive or a negative effect on adoption and whether the effects change dynamically depending on use situation.

The findings suggest that the relative advantages of mobile payments are related to the specific benefits provided by the new mobile technology; time and place independent payments, remote and ubiquitous access to payment services, and the possibility to avoid queuing and complement cash payments. Furthermore, the findings indicate that the advantages become more important in certain use situations including presence of queues, unexpected need for a payment, time pressure, and lack of cash or loose change. The most compatible application areas for mobile payments include electronic ticketing, purchases on vending machines, mobile content and services, and small value payments at POS. Preferred maximum payment size varied from micro-payments (10€) to low end macro-payments (100€).

Factors inhibiting mobile payment adoption reflect the immature state of mobile payment market, and include complex solutions, premium pricing, low adoption rates, perceived risks

and perceived incompatibility with large value purchases. These findings suggest that in order to create volume, mobile payment systems need to be better integrated with existing financial and telecommunication infrastructures. Proprietary systems with exclusive service providers and infrastructures are not likely to succeed in the long term. Instead, compatibility with users' existing services and common standards between different service providers could facilitate adoption and advance the emerging market.

Table 3. Factors affecting consumer adoption of mobile payments

Adoption determinant	Contributing factors	Proposed effect on adoption	Effect dynamic depending on use situation
Relative advantage	<ul style="list-style-type: none"> ▪ Time and place independent purchases ▪ Queue avoidance ▪ Enhanced payment instrument availability ▪ Complement to cash 	<p style="text-align: center;">+</p> <p style="text-align: center;">+</p> <p style="text-align: center;">+</p> <p style="text-align: center;">+</p>	yes
Compatibility	<ul style="list-style-type: none"> ▪ High with digital content and services ▪ High with small value purchases at POS ▪ Low with large value purchases 	<p style="text-align: center;">+</p> <p style="text-align: center;">+</p> <p style="text-align: center;">-</p>	no
Complexity	<ul style="list-style-type: none"> ▪ Complex SMS formats, codes, service numbers ▪ Management of separate accounts burdensome ▪ Complex registration procedures 	<p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p>	no
Costs	<ul style="list-style-type: none"> ▪ Premium pricing & high transaction costs 	-	no
Network ext.	<ul style="list-style-type: none"> ▪ Lack of wide merchant adoption ▪ Proprietary devices / services 	<p style="text-align: center;">-</p> <p style="text-align: center;">-</p>	no
Trust	<ul style="list-style-type: none"> ▪ In merchants ▪ In telecom operators ▪ In financial institutions 	<p style="text-align: center;">+</p> <p style="text-align: center;">+</p> <p style="text-align: center;">+</p>	no
Perceived security risks	<ul style="list-style-type: none"> ▪ Unauthorized use ▪ Transaction errors ▪ Lack of transaction record and documentation ▪ Vague transactions ▪ Concerns on device and network reliability ▪ Concerns on privacy 	<p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p> <p style="text-align: center;">-</p>	no

This study provides important theoretical contributions to the existing adoption research. The findings suggest a partial adoption pattern for mobile payments. The interviewed consumers were willing to use mobile payments in specific situations and for specific purchases but not to substitute them for existing payment systems. The traditional adoption models, however, are based on the assumption that new ideas are communicated and new technologies introduced to replace the old ones (Moore & Benbasat, 1991; Rogers, 1995).

More dynamic adoption models are therefore needed to describe the adoption of mobile payment services that complement existing payments and are preferred under certain situational conditions.

The findings further indicate that the advantages of mobile payments relate to the increased availability of the payment service enabled by the mobile technology and are different from the traditionally highlighted performance measures such as cost or efficiency (Davis et al., 1989; Rogers, 1995). The existing adoption constructs are not fully capable to capture the advantages of mobile payments and a new construct highlighting the benefits of mobility may therefore be needed.

The situational factors and benefits of mobility are likely to be influential in the adoption of mobile technologies and services in more general. Lee et al. (2005) studied mobile Internet services use in Korea and found significant correlations between situational factors (designated as contextual factors) and specific types of mobile services. The present mobile commerce adoption research (see, e.g., Nysveen et al., 2005; Wu & Wang, 2005; Yang, 2005), however, has not yet widely studied the effect of situational factors on mobile commerce adoption.

From a managerial perspective the findings suggest that more attention should be paid in particular to usability and pricing of the service, and creation of critical mass. One viable strategy for mass creation is to launch the new payment service initially in an area where there is a large base of established users, such as public transportation, and then gradually develop the market by including more services and application areas (Poon & Chau, 2001; Szmigin & Bourne, 1999).

Due to the explorative nature and small number of subjects, the findings of this study can not be generalized to population. Instead, the findings are generalized to theory (A. S. Lee & Baskerville, 2003) and used to build ground for the emerging mobile payments adoption research by identifying relevant factors in a systematic way through sound research approaches. In the future, the adoption effects proposed in Table 3 should be further validated by testing them with a large sample and, e.g., quantitative methods. Future research could also study the dynamic nature of mobile payment adoption further and investigate whether similar partial adoption is characteristic to other mobile services, too.

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References

- Begonha, D. B., Hoffman, A., & Melin, P. (2002). M-payments; hang up, try again. *Credit Card Management*, 15(10), 40-44.
- BIS. (2004). *Survey of developments in electronic money and internet and mobile payments*: Bank for International Settlements, March 2004.
- Bryman, A. (2001). *Social Research Methods*. New York: Oxford University Press.

- Calder, B. J. (1977). Focus groups and the nature of qualitative marketing research. *Journal of Marketing Research*, *XIV*, 353-364.
- Coursaris, C., & Hassanein, K. (2002). Understanding m-commerce - a Consumer Centric Model. *Quarterly Journal of Electronic Commerce*, *3*(3), 247-271.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer-Technology - a Comparison of Two Theoretical-Models. *Management Science*, *35*(8), 982-1003.
- Dewan, S. G., & Chen, L.-d. (2005). Mobile Payment Adoption in the USA: A Cross-industry, Cross-platform Solution. *Journal of Information Privacy & Security*, *1*(2), 4-28.
- Fenech, T. (2002). Exploratory study into wireless application protocol shopping. *International Journal of Retail & Distribution Management*, *30*(10), 482-497.
- Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the paradoxes of mobile technology. *Information Systems Management*, *22*(4), 7-23.
- Jayawardhena, C., & Foley, P. (1998). Overcoming Constraints on Electronic Commerce — Internet Payment Systems. *Journal of General Management*, *24*(2), p19-35.
- Kleijnen, M., Wetzels, M., & de Ruyter, K. (2004). Consumer acceptance of wireless finance. *Journal of Financial Services Marketing*, *8*(3), 206-217.
- Kreyer, N., Pousttchi, K., & Turowski, K. (2003). Mobile Payment Procedures. *e-Service Journal*, *2*(3), 7-22.
- Laukkanen, T., & Lauronen, J. (2005). Consumer value creation in mobile banking services. *International Journal of Mobile Communications*, *3*(4), 325-338.
- Lee, A. S., & Baskerville, R. L. (2003). Generalizing Generalizability in Information Systems Research. *Information Systems Research*, *14*(3), 221-243.
- Lee, I., Kim, J., & Kim, J. (2005). Use Contexts for the Mobile Internet: A Longitudinal Study Monitoring Actual Use of Mobile Internet Services. *International Journal of Human - Computer Interaction*, *18*(3), 269-292.
- Lee, M. S. Y., McGoldrick, P. J., Keeling, K. A., & Doherty, J. (2003a). Using ZMET to explore barriers to the adoption of 3G mobile banking services. *International Journal of Retail & Distribution Management*, *31*(6), 340-348.
- Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003b). The Technology Acceptance Model: Past, Present, and Future. *Communications of the AIS*, *12*, 752-780.
- May, P. (2001). *Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business*: Cambridge University Press.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis : an expanded sourcebook* (2 ed.): Thousand Oaks: Sage.
- Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, *2*(3), 192-223.
- Nysveen, H., Pedersen, P. E., & Thorbjørnsen, H. (2005). Intentions to Use Mobile Services: Antecedents and Cross-Service Comparisons. *Journal of the Academy of Marketing Science*, *33*(3), 330-346.
- Orlikowski, W. J., & Iacono, S. C. (2001). Research Commentary: Desperately Seeking the 'IT' in IT Research--A Call to Theorizing the IT Artifact. *Information systems research*, *12*(2), 121-134.
- Poon, S., & Chau, P. Y. K. (2001). Octopus: The Growing E-payment System in Hong Kong. *Electronic Markets*, *11*(2), 97-106.

- Rogers, E. M. (1995). *Diffusion of Innovations* (4th ed.). New York: Free Press.
- Shon, T.-H., & Swatman, P. M. C. (1998). Identifying effectiveness criteria for Internet payment systems. *Internet Research*, 8(3), 202-218.
- Siau, K., Sheng, H., Nah, F., & Davis, S. (2004). A qualitative investigation on consumer trust in mobile commerce. *International Journal of Electronic Business*, 2(3), 283-300.
- Stewart, D. W., & Shamdasani, P. N. (1990). *Focus Groups: Theory and Practice*. Newbury Park: Sage Publications.
- Szmigin, I., & Bourne, H. (1999). Electronic cash: a qualitative assessment of its adoption. *International Journal of Bank Marketing*, 17(4), 192-202.
- Teo, T. S. H., & Pok, S. H. (2003). Adoption of WAP-enabled Mobile Phones Among Internet Users. *Omega*, 31(6), 483-498.
- Tornatzky, L. G., & Klein, K. J. (1982). Innovation Characteristics and Innovation Adoption Implementation: A Meta-Analysis of Findings. *IEEE Transactions on Engineering Management*, 29(1), 28-44.
- Van Hove, L. (2001). The New York City Smart Card Trial in Perspective: A Research Note. *International Journal of Electronic Commerce*, 5(2), 119-131.
- Wells, W., & Gubar, G. (1966). Life Cycle Concept in Marketing Research. *Journal of Marketing Research*, 3(November), 355-363.
- Wilkes, R. E. (1995). Household Life-Cycle Stages, Transitions, and Product Expenditures. *Journal of Consumer Research*, 22(June), 27-42.
- Wilkinson, S. (2004). Focus group research. In D. Silverman (Ed.), *Qualitative research. Theory, Method and Practice*. (2 ed.). Thousand Oaks, CA.: Sage Publications.
- Wu, J.-H., & Wang, S.-C. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(5), 719-729.
- Yang, K. C. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and Informatics*, 22(3), 257-277.

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