Mobile Payment Systems in North America: User Challenges & Successes

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Abstract

As smartphones continue to increase in popularity in North America so too does the opportunity to expand their use and functionality. Our study looks at one of these new opportunities, Mobile Payment Services (MPS). This study investigates user behaviors, motivations and first impressions of MPS in Canada and the United States through interviews with veteran users and interviews and diaries with new users. Participants used a variety of MPS, including: Google Wallet, Amazon Payments, LevelUp, Square and company apps geared towards payments (e.g., Starbucks). Our preliminary findings are presented as user successes and challenges.

Keywords

Mobile Payment Services; Google Wallet; LevelUp; Square; Ubiquitous Commerce; User Experience

ACM Classification Keywords

H.5.2 [User Interfaces]: User-Centered Design

Introduction

Recently, we have seen Mobile Payment Services (MPS) increase in usage around the world. For example, in 2011, using feature phones—not smartphones— Kenyans demonstrated a higher preference to shop

through a mobile device rather than through desktop computers or in stores using M-PESA. China has also found some success with Alipay, while GCash has had well documented success in the Philippines. Surprisingly, in the last few years North America has not been able to reach the success that these other countries have had with the adoption of MPS.

While a number of studies have looked at MPS in developing countries (e.g., [2]), and even developed countries in Europe [6,7] and Asia (e.g., [5]), this past body of work has not focused on the North American market and smartphones. Our research looks to fill this gap by focusing on understanding how users are participating in MPS in North America on smartphones with the goal of understanding how to design MPS to increase user satisfaction.

Related Work
MPS have been classified as a subset of mCommerce and a form of eCommerce [7]. The definition of MPS is "all payments for goods, services and bills authorized, initiated or realized" [7] with a mobile phone.

While there have not been any studies on MPS usage in North America with current smartphone technologies, there are some that focus on earlier versions of MPS in industrialized countries in Europe.

First, Schierz et al. [7] tested MPS use in Germany. Scheirz et al.'s findings show that perceived ease of use, compatibility, security, and usefulness, along with individual mobility positively affected users' attitudes towards the use of MPS.

Second, and the closest study to our own in terms of its findings, Mallat [6] explored MPS usage in Finland over

ten years ago when MPS was based solely on SMS (direct billing) technology. Results showed that users found MPS faster and more convenient than cash; mobile payments were most compatible with small value payments; and complexities around the use of the systems along with a lack of large merchant acceptance were barriers to adoption [6]. Users also described issues with trust where they had feelings of "vagueness" and "perceived lack of control". Users were also concerned about trust in network reliability and having their phone accessed if it was hacked, lost, or stolen [6]. While valuable, we caution that this study focused on feature-phones, not smartphones, from ten years ago. Technology and culture have radically changed in this time period.

MPS has also been studied in non-industrialized countries. Hinman and Matovu [2] investigated opportunities and challenges around mobile-based finances in rural Uganda. Their study found that users had a strong affinity to fixed assets, lacked access to capital, and overall lacked the mental model to interact with such services [2].

Participants
Through postings on online forums and word of mouth, 21 participants (11 female) were recruited for our study. Ages ranged from 21 to 49, with a median age of 27. Seventeen participants were from within Canada with many from our own major metropolitan city. We augmented this with an additional four people from the United States to offer a basic point of comparison. Yet we did not find any differences between the two, in terms of how they used MPS. Occupations of participants varied heavily. Participants' technical

MPS	New	Existing
Google Wallet	0	3
Amazon Payments	0	1
App (e.g. Starbucks)	7	7
Square	1	2
Bank Transfer	1	2
LevelUp	1	0
PayPal	0	6

Table 1: Participants' experience with MPS

abilities could be described from average to expert and all participants owned a smartphone.

Table 1 shows the breakdown of our participants experience with MPS types by user. The skew of new users to the Starbucks app in particular speaks to what users were comfortable using MPS for and the monetary value risk during the start of adoption.

Study Methodology

The goal of the study was to understand motivations, behaviors, and first impressions of MPS users in North America. To address this, we investigated two main groups of participants through interviews: those who currently use a MPS, and those who do not.

Method 1: Current Users of MPS
The goal of Method 1 was to understand past experiences and behaviors of existing users. Therefore, we recruited eleven current MPS users for a semi-structured interview. Questions were based on understanding the user's specific instances of use and interviews usually lasted around thirty minutes. This method has been used in similar studies (e.g., [4]).

Method 2: New Users of MPS
The goal of Method 2 was to understand the experiences of new users trying MPS for the first time, their experiences around use, behaviors and motivations. Ten users, who had not used MPS before, were asked to complete an e-diary over a two-week period while trying out any MPS service(s) of their choice. The diary method was chosen specifically to capture the user's experience in the moment over the first two weeks of use. This method has been used in similar studies (e.g., [3]). After

participants completed the diary entry phase, they participated in a semi-structured interview.

All data was analyzed using open, axial, and selective coding to draw out the main themes. Within these purchase activities and experiences, our findings revealed clear successes that participants had in terms of MPS creating positive purchasing experiences. In addition, we also saw clear challenges that MPS posed for participants. Our results focus on these two main sections.

User Successes with MPS

Participants had a variety of successes using MPS; in this section we review these findings.

Habitual Routines
First, we found that MPS lent itself well to habitual purchases—purchases that were frequent and re-occurring. Participants who used MPS as a part of habitual purchasing activities felt it worked well, and they liked it, because they could easily fit it in to their 'routine'. Participants explained these purchases, sometimes as explicit knowledge, while other times it appeared to comprise only a tacit understanding of their habitual routines.

About half of veteran users reported that they very clearly had a daily habitual-type routine when using their payment service. For example, when asked how often P6, a veteran user, used MPS, she told us "everyday". She then proceeds to describe the time of day, and variations based on her weekend and week schedule. But further to this, she also described how this routine has also made her a more loyal user.

"I rarely go to any other coffee shops [now]… I've just got accustomed to Starbucks…" - P6, veteran user

Ease of Use
Veteran users and new adopters identified many motivations and benefits to using MPS. When asked for the benefits of using MPS, all veteran users and new users mentioned ease-of-use, with no bias toward the type of MPS. When asked to elaborate, responses mostly included two key elements: The process was *easier* and *faster* than other payment methods. For example, P17, a new user, mentions how the mobility and shortcut to make a bill payment allowed him to multi-task while in a class. He describes this process as easier than going to the bank or waiting to use his computer later.

Gamification and Entertainment
Many MPS systems designed as phone apps provide gamification elements where a user can score points, level-up, and receive rewards for purchases. The majority of users mentioned that they enjoyed the gamification of the MPS they used. In fact, they would often describe the experience of purchasing as "more entertaining" and "funner" because of the gamification.

For example, P12, a new user, described how much she enjoyed seeing the stars from the Starbucks app "dropping in the cup", indicating she was getting closer to a free drink. This elevated the transactional experience compared to paying by credit card or cash. In this case, Starbucks has taken a desired action, buying Starbucks coffee, which is not normally game related and attached a game mechanism around collecting stars for rewards with every purchase. LevelUp also uses similar game mechanics, and while they are light and simple, it clearly has an added benefit for users. Some

users also mentioned the gamification as a loyalty draw for them.

Social Perception
A number of findings around social issues were also identified. These included how users felt about people watching them use the services and confidence using MPS. Overall, new users and veteran users generally described the MPS experience as a positive social experience. Participants often described how they felt "cool" using MPS, how the efficiency of payment aided in a positive social experience, and to a lesser extent, how it helped them engage with their community. Users described being watched by other patrons and sometimes even engaged in a positive discussion around MPS with friends or customers during or after purchases. The ease of using MPS would also allow the users to make payments faster (than debit or credit) which helped the lineup move faster, easing impatient employees and customers.

For example, P21 talks about the experience of paying via MPS:

"[Other store patrons] like it because the line moves faster; you can see they are impatient if you are looking for cash or a lot of extra steps for [the employee] to key in a credit card purchase." - P21, veteran user

User Challenges with MPS
Naturally, like any 'new' technology, users also experienced challenges with MPS. In this section, we present the challenges that users faced.

Routine Misalignment and a Lack of Benefits
The value of routines was still high for participants who did not enjoy the MPS experience. However, their view on how MPS fit into their routines and to what benefit

varied. That is, a main reason that participants did not like the MPS experience was that it did not fit into their routines, thus providing little benefit. As an example, P19, a new user, explains how the MPS service did not fit his purchasing routines:

"The Starbucks one is nice, it sounds quite cool but I don't use it – I don't buy Starbucks often enough to use it." - P19, new user

This quote speaks to the fact that MPS is currently only available in a small number of instances and stores within North America. For it to be readily used within Canada and the United States, MPS payment options must map to the specific stores or activities that a person regularly utilizes. The quote illustrates that people who use Starbucks can easily use MPS because Starbucks has a specific app. Yet people who might drink coffee at another location, such as Tim Horton's in Canada, will not have the same opportunities because the store that they routinely frequent does not support MPS. This suggests that, over time, if more stores adopt MPS as a payment option, the practices of new users might be different. Until this point, new users often did not see the point of using a store 'once in a while' simply so they could use a MPS.

Fragmented MPS Solutions
A few participants mentioned that they did not like to leave money or personal information untouched and not regularly used. That is, they really disliked the idea of creating multiple accounts for each vendor they might use. Instead they wanted just a single global account. The participants specifically told us they needed to "touch" their money often (e.g., by spending small amounts with each MPS) to both ease trust concerns and overall fear of money loss.

For example, P17, a new user, mentioned how he had information saved in a PayPal account from years ago. He expressed concern about not regularly using the account and felt uneasy about having his information just "languishing" there for years. This ultimately gave him a negative feeling towards PayPal. He mistrusted PayPal as a brand and the information that was stored with them.

Similar, P19, a new user, also said he would not use a system for payment unless it was accepted at nearly all stores he frequented. He, too, disliked the idea of having money in numerous places and was concerned this would lead to a loss of money as it "just sits in an account somewhere."

Pre-Purchasing Anxiety
A common trend throughout all user groups was pre-purchase anxiety. That is, before they made the purchase, users often tried to get their phones ready and were nervous the phone would not be ready to be scanned. They harbored anxiety that the phone would turn to screen saver mode, and then require a password to be entered, or the barcode would not be ready to be scanned. This could cause a longer wait for people in lines, confusing discussions with store clerks, feelings of inadequacy in not being able to know how to use the technology, or the need to switch to another payment form. For example, P12's diary had numerous entries on pre-purchase anxiety:

"I like making sure I have the screen ready -- that my screen does not go to sleep. It has more to do with my performance anxieties than the app or the interaction." - P12, new user

Overall, the amount of tension around using MPS was far greater than participants thought they would feel.

Surprisingly, while these feelings did diminish over time, they were still mentioned by veteran users.

Mental Model Development
Mental models often help shape behavior and explain a person's thought process on how something works [6]. Some participants, both within the non-adopting and new users groups, described how they just could not understand how paying with their phone worked or how to start the process. For example, P16, a new user, explained during the interview that she had a complete lack of knowledge around what direction to proceed to even start the study. She said she did not know what apps to look for or download. As a technically engaged individual this was shocking for her. She told us:

"I didn't know, like when I agreed to do it, I didn't know what apps to download, I didn't even know what to look for."
- P16, new user

P17, a new user also told us "it never even occurred" to him to use his cell phone to make a purchase. For him the thought of doing something serious like making a payment on the same device he uses to make "stupid text messages" from seemed unheard of. In his mind "the mental model for what a cell phone does did not include paying for stuff."

Conclusion
To summarize, mobile payment services are in their infancy in North America. The potential to enhance users' experience with faster and more useful transactions is possible by focusing on designing around user's routines, incorporating gamification and entertainment, and being mindful of the social experience of the user. However, user challenges with MPS still exist. These include: lack of perceived benefit of users, fragmented MPS solutions, pre-purchase anxiety, and a lack of mental model development.

We are continuing to analyze this data to explore these findings.

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