

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF SUPPLY CHAIN & INFORMATION SYSTEMS

THE MOBILE WALLET

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Spring 2011

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Management
with honors in Management Information Systems

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ABSTRACT

Physical and digital functionalities are converging with more velocity every day. This convergence will induce the American consumer and relevant market players to adjust. This thesis specifically examines the concept of a mobile, digital wallet defined as the integration of cashless payments and the mobile phone into one device. The possibility of a mobile wallet is the result of increased mobile network and smart phone capability coupled with the opportunity for revenue stream enhancements.

The potential of mobile payment systems has been illustrated with relative success. With new technology these devices are capable of providing a more mutually beneficial shopping experience for all involved parties. This had practical implications in Japan, where the first mobile wallet platform was implemented. A case study on the mobile wallet in Japan reveals similarities and differences to the situation unfolding in America. Despite the similarities, the number of potential contenders in the American market with relevant strategic positions complicates the situation. Each contender's ability to capitalize on a given market advantage will dictate how the architecture of the market itself eventually forms.

The development of the mobile wallet will also largely depend on how usable and functional it is, both to end users and service providers. Revenues can be generated by providing transaction processing, data management, or a combination of the two services. Payment service providers have an established business model for the credit card services they provide. These providers can develop a competitive edge by obtaining a favorable position in the mobile wallet market. There is also a significant advantage to be gained by the contender providing the software for mobile payment, thus controlling the data generated by it as well. This massive amount of potential data generation detailing end user behavior represents an opportunity for

another advantage to be gained, that is the ability to negotiate successful relationships between consumers and the companies seeking to reach them.

The American mobile wallet will present opportunities for the end user and the organizations responsible for its implementation. A solution will have appeal to both merchants and consumers. Merchants will need to be equipped with the necessary hardware and the marketing services allowing them to benefit from the concept. Consumers will require an incentive to adopt the service and a commitment to respecting their privacy. The complexity of the market allows for different methods of potential revenue generation, but requires careful management of the mix between product functionality and consumer needs.

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Chapter 1: Background and Predecessors

The United States wireless industry consists of wireless subscribers representing 96% of the population. It is responsible for \$159.9 billion in revenues. There are an estimated 63.2 million smart phone users (Wireless). This represents 27% of total mobile subscribers (comScore 5). These smart phones are powerful machines because they are networked and equipped with sensors. The subscribers that use them are able to download applications giving the phones even more functionality. One of the newest functions the smart phone will likely adopt is the personal wallet. This adoption requires the mobilization and networking of an item typically regarded as a physical means of identification and payment.

Several success stories involving combinations of previous mobile payment systems and different emerging technologies hint at the potential for mobile phone-based “wallets.” The integration of smart phones with a hypothetical technology standard enabling contactless device communication may drive the U.S. to begin a transition to a mobile, digital wallet platform.

RFID Technology

RFID, or Radio Frequency Identification, is the sensor technology that allows for wireless tracking of identification tags via a monitoring device. The device “reads” the ID through radio waves and the ID can be linked to an object, person, or anything that a small RFID tag can be affixed to. This technology essentially enables wireless tracking or detection of anything previously tagged, provided the “tag” is within range of a compatible reader.

The RFID technology was used for business purposes with success in several different situations. Consumers were able to use RFID-equipped passes to purchase gas at select stations as their unique RFID was linked to their financial account. Wal-Mart, a retail giant, was able to document and analyze their supply chain by equipping it with RFID technology and requiring its

suppliers to do the same. In N.E. America, RFID tags allow commuters to bypass toll lines as their ID is linked to an account with transportation services paying their toll as they move through a lane.

More recently organizations are using RFID technology to offer users convenience through increased functionality. For example, Jay Peak Resort issues its guests one card equipped with an RFID chip with several functions, including room key and lift ticket. In the future, the ski lodge plans to increase the usability of the solution by incorporating the RFID chip within a wristband rather than a card. The functionality of the solution will also be expanded, as it will become capable of providing payment for anything at the resort (Wasserman).

NFC Technology

NFC, or Near Field Communication, technology represents a potential standard for inter-device contactless communication (Forum). This technology, unlike former RFID communication, only works within small distances (centimeters) and allows for a secure dual communication channel. The work is the result of a “forum” founded by Sony, Philips, and Nokia and now consisting of roughly 150 members (Preuss). Its future application will be quality-assured due to a certification program released in December 2010 by the Forum for NFC Development (a group that serves as the authority on the technology) (Forum). There are several past examples of such “technology standard forums.” The USB standard is an illustration of how successful these forums have the ability to become. An NFC standard is likely to develop as many of the major contenders in the mobile wallet creation arena have already committed to this as the enabling technology.

Starbucks Mobile Payment

Starbucks is attempting to use existing technology (the smart phone) to simplify consumers' purchase experience and potentially increase the chain's knowledge about consumer purchase habits. Essentially, the company is encouraging its customers to pay using their existing Starbucks card account and a smart phone. This method of payment was rolled out on a national scale on January 19, 2011 to almost 8,000 locations. Prior to the launch of this mobile phone application-based payment system, Starbucks estimated as many as 20% of their customers' transactions are made using a Starbucks card (Debits). Data like this coupled with the fact that 27% of American mobile phone users have a smart phone pointed to a painless transition to digital payment, at least for coffee purchases (comScore 13). Consumers simply need to download an "app" to their smart phone and load their Starbucks account to use the service, and no new technology is required to register the purchase.

The application creates a 2-D black and white barcode on the screen of the end user's mobile phone which is scanned at the register, linking the transaction to the customer's Starbucks account which is loaded through the use of the application or website. Visa encouraged customers to spend using the application by offering an extra \$5 to any customer loading \$25 or more through their Visa credit card. The mobile application is free and currently offered for certain Blackberry models and the Apple line of products. It was tested in select West and East coast markets, including Seattle and New York City (Debits). This payment system, while primitive in that it hinges on the scanning of a graphic, represents the beginning onslaught of companies utilizing mobile payment development as a competitive edge in their respective market. This simple application allows Starbucks to track consumer spending and reward on an individualized basis, providing the potential competitive advantage of advanced customer

relationship management.

Because Starbucks released this application to only Apple and Blackberry smart phone users the success of the program was, at the very least, partially limited. Fortunately, over three million consumers have chosen to pay using the app in roughly three months' time (Van Grove). This number could only increase if the company decided to include Android operating mobile phones in the program. Starbucks released this number at their shareholder's meeting, but did not comment on how many customers *repeatedly* use the application or if they have received any negative feedback regarding the device. While this method of mobile payment does not utilize NFC technology, it provides a functioning example of Americans using mobile payment alternatives.

The Success of M-PESA

The potential of paperless, wireless, and secure monetary transactions can be seen through the success of M-PESA in developing countries. M-PESA is a text based money transfer service that is provided by the largest mobile service provider in Africa, Safaricom. Customers need to have access to a cell phone registered with Safaricom and then purchase "e-float" credit from an agent employed through a network by the parent company (Jack 12). These credits are sent and received through a mobile text service over the Safaricom network and can be cashed at any agent location. A case study found that the service is widely respected and used by consumers, so much so that some choose to save with it instead of a bank account (Jack 17). Each account is secure because it is attached physically to a SIM card and requires a PIN password to be accessed (M-pesa). This credible reputation and well developed customer confidence could be critical factors involved in this digital money transfer service's success. M-PESA creates revenues by taxing users converting "e-float" credit to cash. This type of revenue

generation will not likely be accepted by users of an American mobile wallet because of the existence of credit cards and a reputable credit and banking system. Americans would be less willing to incur an additional fee to convert their financial resources into digital financial resources.

NTT-Docomo

The Japanese mobile market is one of the most mature in the world, thus providing an example of what the US can expect when its own market reaches relative maturity (comScore 19). In this market, almost 10% of mobile users used their mobile phone instead of a physical wallet to make a purchase (comeScore 21). The current enabling technology standard is a smart chip made by Sony, but throughout 2012 the transition to NFC (Near Field Communication) will begin (Clark). In Japan one mobile network provider, NTT Docomo, accounts for roughly half of the population's subscribers. Docomo pioneered the mobile wallet concept with its 2004 launch of Osaifu-Keitai, or "mobile phones with wallet functions" (Osaifu-Keitai). The structure Docomo has implemented in Japan highlights one possible way the mobile wallet market can be architected.

Chapter 2: Japanese Model

The mobile wallet system structure in Japan provides a potential blueprint for the United States. At the very least this example provides insight as to some critical factors in the deployment of a successful platform and the benefits generated by the existence of such a system.

From “E-Ticket” to Advanced Customer Relationship Management

NTT Docomo, the dominant Japanese mobile services provider, launched its mobile wallet in June 2004, powering their mobile phones with Sony’s FeliCa technology (smart chip). These wallets were designed to replace several functions of physical wallets and could be used under 39 different mobile service providers. They were intended to be used for identification, transportation ticketing, and credit/debit transactions (Docomo Press Release June 16, 2004). Less than one year later this FeliCa mobile wallet platform combined with an existing smart card train ticketing platform (with over 10 million cards in existence) creating an instant incentive for consumers that travel frequently to absorb their existing transportation card into their mobile phone’s wallet for convenience.

The mobile leader then sought out an alliance and strategic partnership with Sumitomo Mitsui Financial Group, Card Company, and Banking Corporation (Docomo Press Release April 27, 2005). This provided Docomo with the financing, banking, and cardholding services needed to manage consumer spending through the mobile wallet. Sumitomo provided the alliance with the capital knowledge needed to create a successful infrastructure and the capital investment needed to implement payment processing machines and ATMs (Docomo Press Release February 22, 2005). This alliance developed the architecture and resources necessary for a successful “Osai-fu-Keitai” launch – that is a functional and expandable mobile wallet.

In July, the East Japan Railway Company and Docomo officially agreed to a sole platform for both Docomo's "Osai-fu-Keitai" and East Japan Railway's Suica e-money smart card. This was beneficial for both parties; the same technology used to process the existing Suica smart cards would process the mobile wallet as the offering became more popular. To aid in merchant adoption of the technology East Japan Railway, Docomo, and an IT systems provider formed a joint venture shouldering the investment necessary for any merchant or organization to become compatible with the platform (funding the installation of FeliCa reading transaction processors) (Docomo Press Release July 28, 2005).

To further increase potential merchant involvement in the platform, Docomo released their ToruCa service. ToruCa provides end users with the ability to scan products, stores, or essentially anything using the same platform powering "Osai-fu-Keitai." Stores could offer these consumers specific discounts, coupons, or just additional information through the use of the mobile wallet technology and store sensors (Docomo Press Release September 14, 2005). Docomo and Hewlett-Packard then partnered to create the necessary "middleware" platform needed for full communication between sensors and mobile phones, creating even more customer relationship management potential (Docomo Press Release, October 13, 2006). The mobile wallet could then be used in an environment that "knew" the shopper using it, who could be induced to spend. This spending data could be used to offer more relevant and successful advertising. Docomo recognized the CRM potential in this platform and formed a joint venture with a retail technology solutions company (Casio) known as CXD NEXT Co. CXD NEXT Co provided the consulting services necessary for merchants to implement efficient new systems capable of utilizing the mobile wallet and CRM platform to its full potential (Docomo Press Release July 3, 2007).

Mobile Credit Services

The mobile wallet's platform orientation enabled partnership with many different organizations for development. This functionality was further built upon when Docomo launched its iD credit card service within the wallet. End users could "fill" their mobile wallet with approved credit cards through the use of a downloadable application (Docomo Press Release November 8, 2005). To capitalize on the mobile credit offering, Docomo released its own DCMX consumer credit services on their iD platform. The amount of credit available varied, as did the fees and rewards, based on age and type of credit plan chosen (Docomo Press Release April 4, 2006). Choosing Docomo's own credit services resulted in rewards for consumers, able to be applied to their mobile plan payments or mobile phone upgrades (Docomo Press Release April 23, 2007).

Merchant Partnership

Users are not willing to entertain the learning curve of a new service if it will not simplify or improve their life in some way. Docomo recognized the need for widespread penetration at retail and partnered with select organizations to further this. They targeted and partnered with convenience stores, where transactions are typically low in dollar amount and quick in nature. Additionally, Docomo formed a close relationship with McDonald's, enabling a customer loyalty program on the Osaisu-Keitai mobile wallet (Docomo Press Releases March 28, 2006/May 28, 2007/February 26, 2007). Incorporating these high volume chain stores into the endeavor ensured shoppers would have a place to engage in a rich mobile environment, thus increasing the likelihood of permanent adoption.

Conclusion

In Japan, a powerful mobile service provider was able to pioneer a mobile wallet platform. Strategic alliances and critical investments made this possible. While only 10% of mobile subscribers use their phone as a wallet, the platform can still be considered a success. Its creation resulted in increased phone functionality and convenience for users, while at the same time allowing for the creation of revenue generating services. Docomo achieved this success due to its unending focus on creating large scale functionality by involving transit companies, merchants, and consumers in the process. For this reason, Japan adopted the mobile wallet years before the rest of the world. Partnerships with merchants and the transportation industry helped to minimize costs and maximize coordination and marketing potential. This resulted in the necessary payment processing technology becoming standard. End users were able to use the service for a variety of functions (ticketing, purchases, discounts, identification) and in a variety of places. This large scale deployment and functionality proved to be enough to overcome the learning curve for using the new service, as well as any doubts the consumers may have had.

Chapter 3: Market Needs

The American market needs a mobile wallet solution that is fast, dependable, usable, private, functional, and secure. Docomo was successful in its mobile wallet implementation because its strategy was strategically guided by looking at the needs of the market, specifically the merchants and consumers. U.S. consumers may be even more willing to adopt alternate methods of payments than their Japanese counterparts. A study completed in 2001 found that Americans, on average, make 9 times the number of cashless transactions than the Japanese do (CPSS 189). On the other hand, mobile wallet implementation in Japan was aided by its partnership with railway transit which is used by 30% of commuters (Transport). In America 76% of commuters drive (Reschovsky 1). Regardless, a successful solution in the United States will need to have viable reasons for merchants and consumers wanting to use it; both parties must have something to gain from the service.

Critical Factors

The parties involved in the creation of a digital wallet solution include hardware and software providers, the mobile service companies, the financial service providers, the merchants, and most importantly the consumers. If the solution does not meet user expectations and requirements it will never replace the wallet, a staple of modern life. A credit card swipe is simple and fast. The shopper trusts the merchant has a secure payment processing solution, expects to sign a receipt, and knows that a record of the transaction is available. Additionally, shoppers are confident carrying the credit card in a wallet because they know if it is lost the card can be cancelled and any transactions made prior to the cancellation will be refunded. If the person has privacy concerns, cash can be used without any trace of the purchase.

Several key factors can be highlighted from examples as critical in the success of a

mobile endeavor. Consumers will need to be offered a highly usable solution. It cannot be overly complex or it will not be adopted. They will most likely not prefer to use their phone to make a purchase if a series of logins and passwords are required. Consumers will also need to be assured the solution they are adopting is entirely secure. Any semblance of vulnerability will deter use of the service. End-user privacy concerns could also prevent many from using the mobile wallet. Finally, consumers will need to be enticed into making a transition to the new product offering (ie. Visa rewarding Starbucks consumers for loading money on their card). This means that an individual's mobile wallet will need to be easily created, probably from an existing account, and the wallet must be functional on a large scale. Docomo was able to ensure their wallet had large scale functionality; it could be used for ticketing and purchasing with various organizations across Japan.

There are different reasons end users choose to use a service. The Starbucks mobile payment application provides an example for engaging consumer use. Patrons were already using their pre-loaded Starbucks cards prior to the mobile payment application launch. This ease of transition in payment style allowed the consumer to continue paying through an account they had easy access to and trusted using. Reliability and reputation are another factor for choosing to use a service. M-PESA's success, as mentioned, had much to do with Safaricom's size, scale of network coverage (as compared to competition), and consumer trust (not to mention market need). While there was a learning curve to use the service, the consumers could clearly see the value the service provided and were willing to adapt to it. As consumers were opting to use mobile credit as their savings rather than bank institutions, it is plausible to say M-PESA established a good reputation.

Possibly the biggest issue with the mobile payment is security. This also happens to be

one of the largest threats to the entire mobile wallet concept. For this reason, it is beneficial to apply a comprehensive security analysis to the concept.

Security Analysis

Security expert Bruce Schneier discusses the importance of knowing where the risk of failure lies through careful analysis. Only by acknowledging true risks and tradeoffs can one implement effective risk management practices. Given the importance of user confidence and creating a trusted brand, Schneier's 5 Question analysis can serve as a guide to highlight the requirements for a successful mobile payment endeavor (Schneier).

- What assets are you trying to protect?
- What are the risks to these assets?
- How well does the security solution mitigate those risks?
- What other risks does the security solution cause?
- What costs and trade-offs does the security solution impose?

Assets and Risk

The assets at hand in this situation are two-fold, the consumers' financial resources and their buyer behavior. A truly successful mobile wallet solution will offer both financial security and privacy for consumers. This will assure them that not only is their money as safe as it was inside their physical wallet, but also their privacy is being respected by the organizations being given their trust.

Schneier says, "Security usually fails at the seams." This statement directly applies to the mobile wallet concept. The idea of a mobile wallet involves the creation of a secure platform operating as seamlessly as possible. This is an absolute necessity for customers to be willing to make the switch from physical to digital. The concept and its involved parties must be branded

with integrity and reliability. Any breach in security would severely hamper this for a long time.

There are several “seams” in the concept of a mobile wallet that could be targeted. Technically savvy criminals could potentially force entry into the system. In the infamous TJ Maxx credit card theft a hacker was able to access a store’s entire platform due to one weakness in the platform’s security (outdated access authorization technology) (Ngugi 20). The criminal then obtained a large number of stolen credit card numbers. While this type of attack is a real risk to mobile wallet users, often systems fail in a less technical way. A technically adept criminal could try and gain access to the consumer’s personal phone or the store’s platform, or an average smart phone user could actually steal the physical phone and then use basic knowledge to commit the theft. In fact, this is exactly the type of that occurred in the existing American mobile money market place.

The Starbucks mobile payment application for iPhone and Blackberry users was already cracked, and it didn’t require much “hacking.” In fact Kelley Langford, the “thief,” was a VP of Sales and Marketing for a Florida based company and can complete the entire process in just a few minutes. The iPhone’s “screenshot” feature allowed Langford to snap a photo of the barcode needed for payment, email it to his own account, and use or distribute as desired. He then erased all history of the act before the target returned to his phone (Kats). Mobile wallet theft could occur in a solitary transaction, or could be multiplied over several people and transactions across a period of time. Providers will need to ensure customers have the same credit protection currently afforded to them by credit card providers if any transition is to be made.

Risk Mitigation

For a system to be secure it will need to authenticate the end user before allowing a purchase. Ideally, this requires a three factor process, with each factor consisting of something

the user knows (pin number), has (SIM card), or “is” (biological identifier). (Logan).

Unfortunately, as this process becomes more complex and secure, the end user becomes less likely to be able to complete it successfully, thus its usability decreases. Realistically, a pin number would serve as something the consumer knows and thus authenticate the purchase. The pin number technique paired with a SIM card worked successfully for M-PESA. The solution that balances end-user security with usability will be best suited for long term success.

A mobile wallet requiring a fingerprint, voice verifier, or picture ID to be used would need to offer serious rewards for a consumer to be willing to forgo a simple credit card swipe. A more usable alternative to security is necessary for success. Equipping phones with remotely accessible security software providing both location information and, for lack of a better word, a “killswitch” option could solve the problem of financial theft resulting from a physical mobile phone theft. Upon realizing a phone is lost, the end user could suspend the financial capabilities of the phone or lock it down entirely from an account in a remote location. This would be a desirable attribute for mobile phones to be equipped with as physical theft will likely increase with the knowledge that a victim’s wallet is essentially within their phone.

Additional Risk

While this suggested solution creates a consumer perception of security, there is also the issue of privacy protection. Merchants will have the capability to monitor and reward consumer buyer behavior, which implies this behavior is being recorded. The current business models of both Google and Facebook involve using their relationship with their consumers as a profit engine in advertising services. The recorded consumer behavior could be owned by a number of involved parties, pending which mobile wallet architecture is actually implemented. While financial service companies already have a record of consumer non-cash purchases, this data is

nowhere near as rich as the data that could possibly be gathered by a sensor-equipped mobile wallet within a sensor-equipped store. The buyer behavior data represents the true asset in the proposed solution; it could be the primary revenue generator for whichever party has control of it.

Tradeoffs

In the current consumer credit purchase model, the merchant reports, at the very least, the time and amount of a transaction. This is linked to the individual account holder. Financial services companies can and do mine the data to better understand what type of consumer the cardholder is (Prater). This type of activity is legal; however, federal law prohibits the financial institutions from selling or releasing the information to third parties for marketing or advertising purposes (United).

As illustrated in Item 2 (Appendix), for a buyer to make a purchase using their mobile wallet, some sort of application or operating system process will likely need to be activated. Because of the need for usability, one of the involved parties will likely create a simple application to be used when making a purchase. This application would be responsible for authenticating the consumer, suggesting any merchant-provided incentives (CRM), and giving feedback to the consumer detailing the completed transaction. The critical factor here is the mobile application enabling the purchase experience, thus having access to the data being created. While providing an easy interface for receiving deals and making purchases, this application can collect buyer behavior data. As stores and products become equipped with more sensors and mobile-friendly offerings such as QR codes, this application will gather richer and richer data. This is critical because the provider of the application will most likely not be a financial institution, making the data a commodity able to be mined and sold for a profit.

Conclusion

The mobile wallet will generate revenue in some manner. The two most obvious business models include transaction taxing and data management. The transaction taxing method would decrease the likelihood of end user adoption if it included new fees for making a purchase with an existing account. The user will need to see a benefit, not a tax, of using the service. A business model offering the wallet service for free and using the data created by it to drive revenues would have the most chance for success based on the needs of the users in this market. Google currently mines search data and has created a lucrative advertising business. The company provides such a rich “product” offering consumers knowingly or unknowingly choose to use the search engine regardless of their possible privacy invasion. The same can be said for Facebook. In both cases consumers are accepting a tradeoff, a free product offering in return for their personal data. This same business model could be adopted in the mobile wallet concept.

The number of organizations attempting to carve a stake in the American mobile wallet concept increases every day, making the market complex and hard to predict. Those parties recognizing the need to manage the tradeoff between user privacy and functionality properly will capture a distinct competitive advantage. The solution with the least fees passed on to the end user will also develop an advantage. This means that the mobile wallet will need to allow for consumer specific advertising and relationship management, making merchants more likely to support the platform. On the other hand, consumers will want access to exclusive rewards and offers for using the service without having their privacy concerns violated. This tradeoff represents a fine line organizations in control must manage in creating a mutually beneficial relationship with users.

Chapter 4: Significant Players

There are several significant parties potentially involved in the creation of the mobile wallet marketplace in the United States. In Japan, one large mobile service provider created an open platform for wallet development. Docomo then orchestrated a series of partnerships making the platform technology a standard in mobile device communication and implementing it within large retail chains dependent upon quick purchases and the transportation industry. The mobile wallet platform in America, if it develops similarly to the Japanese platform, will involve an open architecture in which one wallet solution could become the preferred alternative. While there are notable differences between Japan and the United States, the deployment style of the system and its basic functionality are largely similar. The complexity of the hypothetical American market prevents any sole solution from being a “favorite” in the long run, but certain organizations can be targeted as contenders.

Isis

The three major US mobile companies; AT&T, Verizon Wireless, T-Mobile; formed a joint venture titled “Isis.” This JV was created with the long term goal of mobile wallet creation. The JV chose to partner with both Discover and Barclaycard to provide payment infrastructure (Isis). While Discover represents a minimal percentage of total paperless purchases (3%, Item 1 in Appendix), the three mobile companies in the joint venture represent the three strongest providers in the mobile market. This powerful entity and its partnership with an existing payment services provider are extremely similar to Docomo scenario. Additionally, their proposed model is similar to the Docomo open platform in that it “will be available to all merchants, banks, payment networks, and mobile carriers” (Clark). This proposed open architecture, based on the

Japanese model, could be a necessity for widespread adoption. Creating an exclusive platform would only limit its adoption, functionality, and use – thus limiting its chances of success.

In Japan, the mobile provider Docomo was able to strategically create an open mobile wallet platform. This was done first through an agreement to incorporate a transportation services ticketing card into the platform, consequently increasing the capabilities and uses of an individual's wallet. Isis is attempting to do the very same thing in launching its mobile wallet platform with the Utah Transit Authority in Salt Lake City 2012. The joint venture has committed to equipping the Salt Lake City area with the necessary equipment to make the platform a reality (Clark). This move would presumably increase the strategic relevance of the joint venture in the market, as this was the first hypothetical merchant-focused move in the NFC mobile wallet playing field (Merchants).

Alignment with the transportation industry solidified the deployment of Docomo's wallet. However, in America only 5% of people commute to work each day using public transportation (Public 12). Strategically selecting alternative partners to bolster the Isis wallet functionality would help to strengthen its likelihood of success. Because 76% of Americans drive to work, one such potential partnership could be with the gas station industry (Reschovsky 1). Correct merchant involvement could be the distinguishing factor in deciding which conglomerate develops the mobile wallet solution the majority of consumers will adopt, as the scale of the Isis wallet's functionality increases so too does the likelihood it will be used.

Google

Google CEO Eric Schmidt has stated very clearly that his company aims to be the “technology provider” in the mobile wallet development (Weintraub). It is not surprising that Google created its most recent Android OS update, “Gingerbread,” with the anticipation that an

NFC revolution was on the horizon. The system is currently the only American smart phone software capable of incorporating NFC functionality (Efrati). Additionally, the only mainstream smart phone available in America with NFC technology is Samsung's Nexus S – which runs Gingerbread (Kharif). Google has the hardware and software to pioneer a mobile wallet movement, but the company needs to determine how the payments will be processed and how revenue will be generated. The company chose to pursue a partnership with an electronic payment solutions company (producer of credit card readers) known as VeriFone, paying for the installation of new machines NFC-ready (Kharif). This will be viewed as a powerful move within the digital wallet market. Google further strengthened its strategic positioning by announcing both Citigroup and MasterCard as part of the program (Efrati). This provides the project with a major credit card company's significant client base (see Item A in Appendix for MasterCard's representative portion of US credit/debit transactions in 2010).

While the contactless payment movement is gaining momentum, it still needs to be accepted by both merchants and consumers for any party to benefit. Google's project again appears to have poised itself for success by addressing each of these issues. Merchants may favor this project over others because VeriFone will provide them with the necessary hardware and support, financed by Google. Consumers already having an active MasterCard account could easily begin using the service, much like Starbucks card owners were able to easily use an application instead. Google has significant experience in creating revenue streams from business models in which end users are able to utilize a service for free in return for the data they generate. This experience could prove critical in achieving mobile wallet success.

Apple

Apple will likely pursue a role in the mobile wallet marketplace. The company is expected to release the iPhone 5 in 2011, although there have been no official press statements from the company regarding the new device and NFC functionality. The company allegedly said they would incorporate that standard into the phone once development of “a standard” is complete. This news is received with several rumors that the phone will in fact have NFC capabilities coupled with the fact that Apple has made several moves to bring personnel with NFC experience on board (Johnson). Given Google’s recent aggressive moves, Apple will soon need to commit to an alternative mobile payment solution or incorporate NFC technology into its hardware and software immediately. In fact, this NFC incorporation has likely already happened. Despite a lack of official statements regarding the mobile wallet, Apple remains a significant contender due to the large number of existing payment accounts the company has with its customer base. iTunes, Apple’s music downloading service, already has 160 million active accounts. These accounts could easily be used to make any purchase if the user’s phone becomes an instrumented wallet (Vijayan).

Visa

Visa is in possession of the self proclaimed “largest payments network in the world.” The company has also committed to developing a “Visa Mobile Platform” through flexibility and partnership (Visa). Visa’s payment structure capital and mobile commitment make the company extremely relevant. Additionally, Visa made headway at developing a mobile NFC standard chip by working with DeviceFidelity to test and credential their In2Pay NFC microSD technology. A special NFC-enabling case was also developed for Apple’s iPhone. The technology passed several tests, involving both security and usability, on various smart phone models. Essentially,

these tests developed a case for the partnership and the technology to become the standard in mobile payment powered by NFC (Clark). This type of “universal” solution has existed since November 2009, able to be inserted in any phone’s microcard slot and activated. Microcard inserts could provide the enabling chip for NFC functionality in the future, or smart phone companies could include the chip built within the original device as it becomes a standard in the industry.

If the In2Pay NFC chip becomes the industry standard Visa will be well suited to profit from the mobile wallet platform. The company would be in possession of a potential payment system architecture and the required NFC hardware. Visa could profit from taxing the use of both of these assets. Alternatively, Visa could provide the NFC technology for free and in return require the use of its payment systems, capturing majority market share of the new mobile wallet platform. The company clearly intends to maintain or grow its role in the “wallet” of Americans, leveraging its payment system capital and NFC involvement.

Europe

Barclaycard and Everything Everywhere announced that by summer 2011 their consumers will be making purchases via mobile phone. Barclaycard represents a sector of Barclay’s Global Retail Banking Division. Everything Everywhere is a communications conglomerate comprised of both T-Mobile (UK) and Orange (Everything), which are both mobile service providers.

Pending regulatory approval, T-Mobile USA has been bought for \$39 billion. It was previously owned by Deutsche Telekom, one of two “Everything Everywhere” owners. This merger indicates a significant strategic move in the mobile payment market front. Deutsche Telekom, a force behind the scenes in the European mobile payment market is now the largest

shareholder in the new AT&T - T-Mobile USA merger, which represents two of the three parties in the Isis joint venture (T-Mobile USA). This commonality within the Isis JV only strengthens its strategic relevance within the mobile payments market in America and the likelihood of its success.

Wildcards

Aside from the obvious contenders in the mobile industry, several organizations have expressed interest in the mobile wallet concept and could have an impact on the platform's development. Application developers for any of the mobile operating systems have proven to be capable of providing inexpensive alternative solutions to existing services. Charge Anywhere is an example of one such developer. The application allows a user to accept NFC payments from another user's NFC-enabled phone, accept credit card payments, and track activity. It provides functionality and support for a monthly subscription fee (Whitney). A well designed application from a wildcard partnering with a major contender could become the preferred end user service.

Any existing company with a large number of significant customer relationships can attempt to leverage their position in the mobile wallet marketplace. PayPal is an example of one such company. Currently the company has 94.4 million users with accounts. The service allows users to pay for online purchases or send money through the use of their PayPal account rather than inputting credit card information (PayPal). A PayPal account is essentially a digital wallet already. If combined with a physical mobile phone the account could easily provide a mobile wallet solution. Facebook is another organization that could attempt to leverage its user base within the mobile wallet marketplace. Currently, 150 million Americans actively use the social networking platform. The service is extremely popular to mobile users as well, with over 250 million people accessing it through a mobile device (Statistics). An application could be created

for the platform to integrate a person's payment information (wallet functionality) and through the use of a smart phone serve as a mobile wallet. The sheer volume and quality of Facebook's client relationships makes it, and any company similar to it, a wildcard in the mobile wallet development.

Conclusion

Contenders from various different industries all have the potential to be involved in the mobile wallet platform creation. The American market is a highly competitive and complex market, much more so than the Japanese market Docomo operated within. For this reason, although Isis has a position similar to Docomo's, the development of the American platform may not follow a pattern similar to Japan. Opportunities exist for a number of different strategic partnerships that could result in control of a previously noted potential revenue driver, the buyer behavior data or the existing transaction taxing revenues.

Chapter 5: Implications

It is apparent that the necessary technologies to pioneer a mobile wallet platform exist. The development in America, the Japanese model, the requirements of the market, and the potential contenders reveal certain characteristics about the solution that will likely prevail. However, the American smart phone user will ultimately be the deciding factor in which organization's solution is the most used, thus the most valuable.

Enough of the major contenders in the marketplace have committed to an open wallet platform that those organizations focused on flexible wallet development and partnership will likely provide the most usable and functional service. The deployment of the service will need to be large in scale. The service must also take into account privacy concerns, but have the ability to provide incentives to consumers and merchants for using it. As previously stated, this is a delicate balance to maintain and having consumer trust is paramount. Each party involved in the market has something to gain or lose depending on the final platform architecture.

Consumers

Consumers will seek to use a mobile wallet that is functional across merchants and services and no more difficult to use than a credit card. They will not choose a solution that further taxes their purchases or one that does not have a good reputation regarding privacy rights. Recently, a consumer privacy report found distinct differences in how different contenders treat their confidential information. Apple and Verizon both failed the report, not respecting their clients' information. Google and Facebook, however, were praised for their commitment to privacy (Srivastava). Results of similar reports and existing organizations' reputations could have a serious impact on the consumer wallet decision. Google currently maintains a good reputation with American users despite the fact that its business model involves user data as a

revenue generator.

Merchants

The same technologies enabling the mobile wallet will enable merchants to provide a richer shopping experience for the mobile user. In the future, the role of the clerk could change significantly. Rather than serving as a “transaction enabler” the store employee would serve a more “maintenance centric” role, responsible for product replenishment and any customer service that could not be provided through mobile applications. Financial resources previously allocated for labor could be redirected to understanding the consumer and providing individualized shopping experiences, capitalizing on the existing relationship between the two parties.

The potential to manage this relationship provides an incentive for merchants to adopt the necessary technology powering the mobile wallet. This will allow them to provide rewards to consumers in return for their patronage. For example, a patron frequently eats at McDonald’s and consistently pays using their mobile wallet application. McDonald’s is able to employ a CRM program using the data generated by the mobile wallet, possibly creating a lifetime customer. That customer then receives exclusive deals fueling their spending. Third parties could easily provide this type of service. For example, a company already exists that provides users with relevant exclusive deals. This company, known as Groupon, can offer the end user discounts via a smart phone application, a social networking site, or even email. It has been largely successful, amassing over 11 million subscribers and a \$135 million backing from a former Facebook investor (Goode). Integration of a service similar to the Groupon offering within the mobile wallet could significantly fuel consumer spending.

Retail organizations will not provide the investment needed to implement any new

technology necessary to power a mobile wallet. The mobile wallet provider that partners with these organizations and provides the investment will have an advantage. Google's partnership with Verifone and their commitment to supplying retail with compatible payment processing machines strengthens their future role in the mobile wallet platform. Isis's willingness to equip merchants with necessary machines in the Salt Lake City Area increases the test market's likelihood of success. An NFC chip standard and a standard retail processor will need to be established for the concept of the mobile wallet to reach its full potential.

Billing Relationships

One primary question regarding the model is who will own the billing relationships powering the mobile wallet. In Japan, the mobile wallet platform was constructed in such a way that any credit card could be attached to the end user's mobile device. Docomo allowed this and offered its own brand of payment services, which users were rewarded for choosing to use. A platform built this way would mean no significant changes in the billing relationships consumers already have established. This type of model is one potential United States solution. However, if key parties are able to successfully leverage their market positioning to its full potential an entirely different model could be enacted. If Visa is able to establish its NFC chip as the adopted market standard it is possible all transactions would be processed through its system. This would be an ideal positioning for the company, but is not necessarily the most likely scenario. Apple is another example of a company that could potentially create an alternate model. If it is able to leverage the combination of iPhone users and iTunes accounts to successfully offer its own mobile wallet alternative the company would not need a financial services partner like Visa or MasterCard to process billing.

Control of Data

Another question to be answered is who will control the data the mobile wallet generates. In Japan, the mobile leader Docomo was able to orchestrate the deployment of a mobile wallet platform, thus positioning itself in control of the data. In America, Verizon and AT&T are industry leaders, but do not have the level of mobile market dominance Docomo did. Financial services institutions will likely not be contenders for rights to the data, as current law prohibits these organizations from sharing any transaction information with third parties. Mobile communications companies provide the network the digital wallet will operate on, but not the hardware or software responsible for creating and transmitting the data.

Currently mobile phone applications on Blackberry, Android, and Apple smart phones have access to a significant amount of personal information on the user's phone. These applications use the information to function and in some instances to generate a profit. For example, mobile users give an application known as Foursquare the ability to access their location data and provide them with relevant deals in the area. Application users are willing to generate data in return for an exclusive deal. Given the existing architecture of mobile development, it is possible each smart phone operating system will create its own mobile wallet application in an effort to control the data. Consumers will accept the tradeoff if some level of privacy is maintained and if the product offering is significant enough.

Customer Relationship Management and Advertising Services

Customer relationship management and advertising services could prove to be the profit drivers in the proposed mobile wallet model. Grocery stores, among other organizations, have been engaging in customer relationship management through the use of accounts linked to a card. These types of systems allow organizations to reward consumers for their loyalty.

Starbucks, in their mobile payment application, has taken potential customer relationship management to the next level – the mobile level. In Japan, Docomo was able to position itself in a joint venture as a provider of CRM services through the mobile wallet platform it pioneered. Google provides highly targeted ads based on user generated data. Even simple mobile peer to peer gaming applications, such as Words with Friends (Scrabble), have found success in offering a service for free and using that service to generate advertising profits. If transaction taxing proves to be a deterrent for mobile wallet use, as it will, consumers could accept a product offering in exchange for the data they generate.

Conclusion

The additional revenues a mobile wallet platform will create through advertising and CRM services will belong to the organization controlling the users' data. As stated, this could be any company capable of creating a mobile wallet application that is widely used. Due to the complexity of the American mobile market it is unclear exactly how deployment and adoption of the mobile wallet will happen. The Isis joint venture represents an entity similar to that which found success in Japan. It will need to develop a large scale deployment plan unique to America to capitalize on its current market strength. Google appears to have a unique positioning in the American market making it an advantageous partner to ally with. Visa's involvement with the creation of an NFC standard makes it another powerful contender. These three organizations will likely have significant influence on the implementation process, but any wildcard company could easily develop their own positioning.

Chapter 6: Conclusion

The Mobile Wallet is an emerging reality for the American smart phone user. Based on findings in Japan, a successful platform will likely revolve around open architecture powered by sensor technology with a variety of stakeholders involved in its implementation and development.

There is profit potential not only in “transaction taxing,” but also in the management of consumer data that will inevitably be collected. Because of the number of involved parties (mobile service provider, financial services provider, app provider), the “transactional taxing” method may act as a deterrent to development and use of the service. However, collecting and mining consumer data for a profit may violate the end-user’s privacy concerns and thus act as an equally compelling deterrent.

Currently, several significant players in the mobile industry have the potential to obtain a desirable position within the mobile wallet platform (similar to the positioning Docomo was able to negotiate). The Isis joint-venture represents an entity similar to Docomo attempting to pioneer its platform through a transportation industry partnership. Smart phone hardware and software developers in America have the potential to position themselves in control of the data, and for this reason companies such as Google and Apple could stand to profit the most in the end game (through data management, advertising, and customer relationship management services).

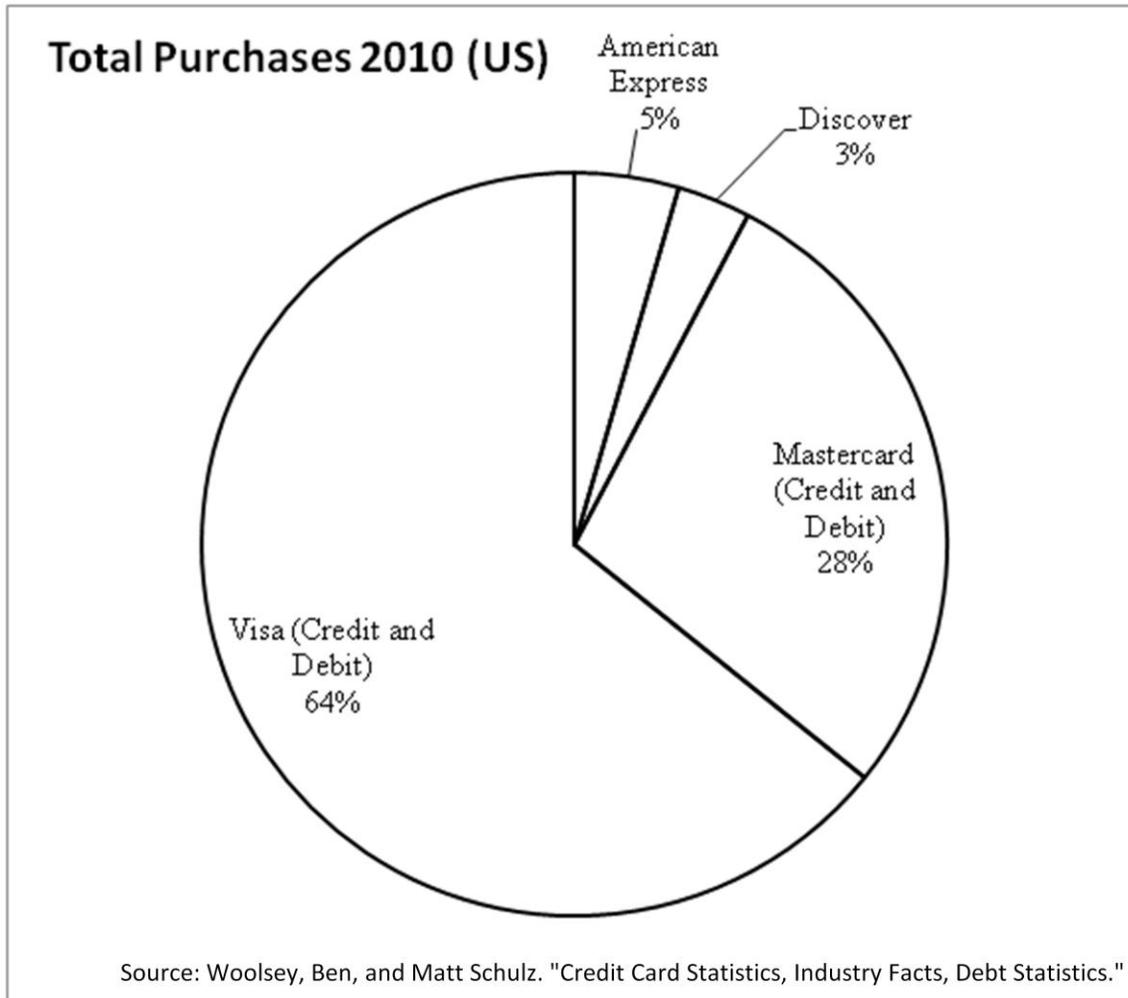
Regardless of how the platform development actually unfolds, the successful mobile wallet will require a balanced offering providing functionality that is appealing to both merchants and consumers. The merchants will want to know more about the consumers, while the consumers will want more exclusive benefits in return. Proper consideration of this balance could be the determining factor in which party is able to negotiate the most profitable position in

the marketplace.

Appendix

Item A

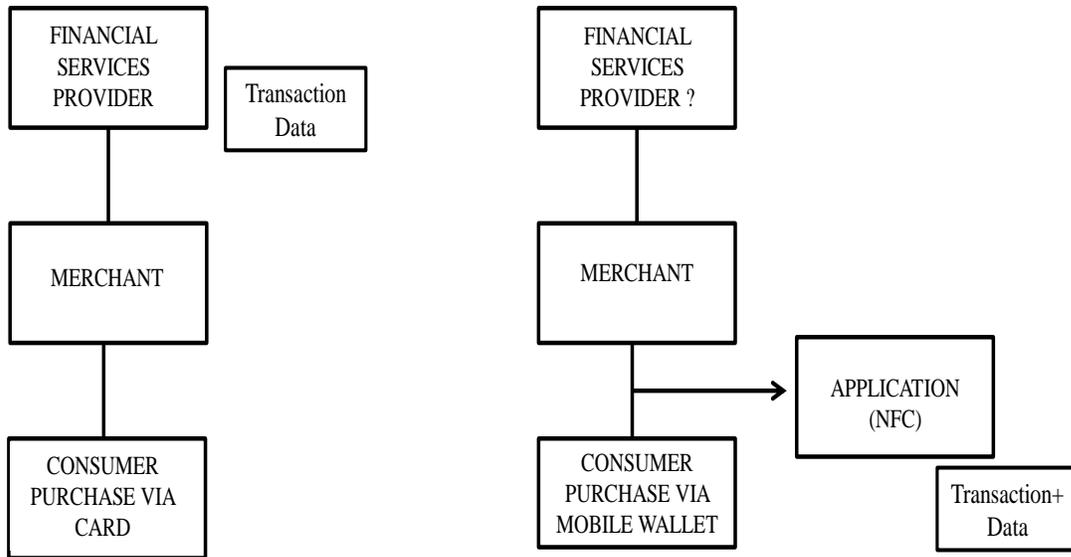
Total US Credit/Debit Purchases 2010



Appendix (cont)

Item B

Data Flowchart, Current Model vs. Proposed Future Model



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