

white paper

Making Mobile Payments Make Dollars and SENSE for Small-to-Medium Businesses

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ELECTRONIC TRANSACTIONS ASSOCIATION
Advancing Payments Technology

Overview

The mobile payments industry is one of the most exciting, rapidly evolving sectors of the technology economy. Smartphones and tablets are being combined with card readers to provide merchants and consumers with an ever-expanding set of features and capabilities to accept payments, forever changing the electronic payments landscape. These mobile devices and applications offer consumers and merchants an unprecedented opportunity to move everyday transactions into the dynamic mobile ecosystem. Implementing mobile payments capabilities empowers both consumers and Small and Medium Enterprises (SMEs). The new Mobile Point of Sale (mPOS) options enable a mobile device to facilitate card acceptance at a lower cost point, with a dizzying array of options for couponing, inventory management, customer care, and coordination with back office functions.

We seek to educate the SME market on the risks, ecosystem, consumer payment technology and merchant payment acceptance hardware and software, to assist you in making informed decisions on these critical services and products. For merchant payment acceptance hardware and software applications, we provide business and basic technical criteria to assist you in understanding and formulating plans to deploy mobile payment acceptance options.

This document specifically addresses Mobile Point of Sale (mPOS) best practices for the SME merchant, and criteria to support merchants in making informed decisions for use and deployment. Mobile Point of Sale solutions enable a diverse and wide range of merchants — including door-to-door salespeople, tradespeople, restaurants, and retail kiosks — to easily accept cards and digital wallets for payments using their smartphone or tablet devices.

There are many potential advantages for merchants who implement mPOS solutions over traditional POS terminals; among them are:

- Lower total cost of ownership
- Better portability and greater ease of use
- More flexible software options for managing your business
- Better user interfaces that offer expanded capabilities

This paper is intended for SME business entities that are evaluating or are already underway with mPOS solutions, including those who have a relationship with an acquirer or payment facilitator/merchant aggregator. This paper focuses on face-to-face card transactions and does not address card-not-present (CNP), e-commerce, or mail order / telephone order (MOTO) transactions.

Informed Decisions for Merchants: What do you need to decide?

To create a profitable and secure mPOS solution that empowers you and your employees and dazzles your customers, you need to consider factors such as your business model, the profiles and expectations of your customers, your tolerance for risk, your budget, and your supporting infrastructure. In this section, we'll provide an overview of sample merchant business models and the level of risk that merchants select, and a sketch of the Mobile Payment Acceptance Ecosystem. Based on this discussion, we'll then outline the options for consumer payment mechanisms followed by a deep dive on mobile merchant payment acceptance devices, applications, and input readers.

Merchant Business Models

A solid starting point for defining your business model for mobile payment acceptance is your customer. Since the smartphone is currently the most popular device for consumer mobile payments, a view as to how many of your customers use smartphones, the level of sophistication of their devices, and the receptiveness of your customers to accept more options through their mobile devices, such as couponing or loyalty programs, is crucial

to your planning. Factors that correlate with high mobile phone ownership and usage include the consumer's age, household income, ethnicity, and community type.

In addition to your own observations and data as to your customer base, many organizations provide free information on smartphone usage among various consumer groups. For example, the Pew Research Center Internet Project offers a Mobile Technology Fact Sheet online that is continually updated with new research. By reviewing this data and considering your own customer base and business, you can begin developing a framework to assist with your important investment decisions and strategies. A few sample data points that can assist in your analysis are:

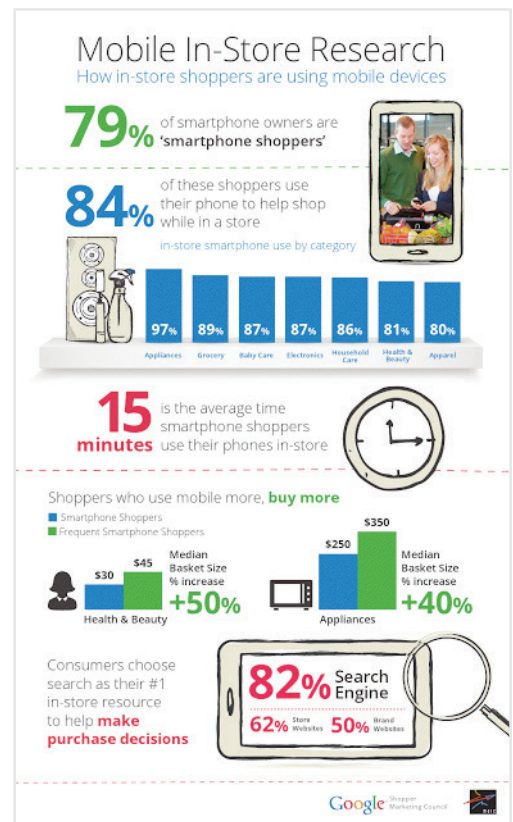
- Increasingly, consumers are carrying smartphones – 58% of American adults have a smartphone and 42% of American adults own a tablet computer.
- While household income influences smartphone ownership, ownership is high among all income groups – 47% of households earning less than < \$30,000 annually and 53% of households with incomes between \$30,000 and \$49,999 own smart phones.
- Consumers use their mobile phones to make decisions about retail visits. According to Pew's April 2012 Mobile Technology study, 30% of consumers used their phone in a decision whether to visit a business, such as a restaurant, within 30 days of the survey.

The Internet can provide you with additional information specific to retailers, since many market researchers are working to determine the influence of mobile technology on consumers' buying patterns. The sample infographic on this page shows research by the Google Shopper Marketing Agency Council and M/A/R/C Research on consumer behavior in-store with their smart phones. The infographic provides data on the types of products that consumers search on their smartphones, the amount of time that consumers spend on their phones in-store, and the differentials in money spent on product purchases with and without smart phone usage.

By planning your mobile payment strategy in the context of your business model, you can design a mobile payment program that greatly enhances your merchandising and sales.

The information points discussed above offer a sample framework for you to consider consumers in general; next evaluate your own customers and merchandising environment. Discussion points that you may consider include:

- Given my customer profile, what percentage will purchase with a mobile device?
- Will my customers be open to using loyalty programs and coupons on their mobile devices, and is it worth it for me to offer these incentives?
- Are my products the type of products that are trending towards mobile purchases?
- How can I increase purchases through use of mobile communications with my in-store consumers?
- How sophisticated is my current Point of Sale System?
- What is my budget for upgrading my system?
- Based on the preferences of my customers, how should I prioritize my purchases of hardware and applications?



- What management capabilities should I prioritize with the mobile payment implementation? Inventory? Accounting? Customer data collection? Customer relationship Management (CRM)?
- How can I conveniently and cost-effectively secure my mobile payment acceptance processes?

Mobile Payment Ecosystem

Many of the providers and stakeholders in the Mobile Payment Ecosystem are familiar faces, such as the credit card associations, acquirers, processors, and ISOs (Independent Sales Organizations). In this section, we focus on the new and emerging industry stakeholders that factor into your decision-making process. These entities are discussed in more detail in the following sections.

The diagram below presents an example of a mobile payment ecosystem from the perspective of merchants. Please note that your customers carry a number of different devices with multiple forms of payment. In this diagram, we've emphasized the informed choices that merchants need to make to transact with their customers, and to maximize the data and management opportunities in that transaction. We've placed less emphasis on the gateway and processing, since those headaches are the diligent work of your acquirers, ISOs, processors, and other financial service providers.

Key new and emerging stakeholders in the Mobile Payment Ecosystem:

- Mobile Point of Sale (mPOS) terminal manufacturers
- mPOS and Mobile Applications
- mPOS readers (SLEDS, chip acceptance)
- Mobile Merchant Services Providers
- Point 2 Point Encryption for Mobile
- eWallets
- eWallet Platforms

Figure 1. Mobile Payment Ecosystem for Merchants



Overview of Consumer Mobile Payment Mechanisms

To compete in today's high tech retail environment, merchants must be familiar with current and emerging consumer payment mechanisms. The industry is undergoing continuous evolution as new technologies are developed for consumers to pay for goods and services. This evolution is improving the ease and security of the electronic and mobile payment experience.

The "traditional" credit card concept was introduced in 1949 when the card associations launched the ubiquitous magnetic stripe based technology on a plastic card. This form factor is still the most common electronic payment instrument in the US. Magnetic stripe card design and information layout have been defined and standardized to comply with payment industry standards (addressing the physical properties of the card, including size, flexibility, position of the magnetic stripe, magnetic characteristics, and data formats).



The vast majority of merchants that accept face-to-face payments are equipped with a magnetic stripe card reader. This reader has the ability to electronically capture cardholder and account information using an automated payment acceptance device at the point of sale/service. These magnetic stripe readers can be embedded in or attached to mobile devices to deploy as mPOS that accept mobile payments with magnetic stripes.

Magnetic stripe technology has several disadvantages in an increasingly sophisticated payment experience. A key disadvantage is that the credit card data embedded in the stripe is static, and thus can be exploited by cybercriminals. Further, this magnetic stripe technology is not readily deployable in the diverse form factors that customers are trending towards. Contact or contactless/RFID processor integrated circuit chips have been introduced in devices beyond the traditional plastic card, including specialty fobs, watches, tags, etc. Most recently wireless payment acceptance from Near Field Communications (NFC) enabled mobile devices is in the forefront of new payment instrument technology.



While plastic magnetic stripe cards currently are the most common electronic payment instrument in the US, the leading card associations have mandated a migration to the EMV (Europay, MasterCard and Visa) standard and acceptance of EMV chips for transaction payment. EMV is a global standard for integrated circuit chip technology designated to replace magnetic stripe cards for most retail establishments by 2015. (This date excludes automated fuel dispensers.) In October 2015, the leading card associations will institute a financial liability shift for any damages and costs that are incurred in a data breach. In general, the party that has made investment in EMV options is

protected from financial liability for card-present fraud losses for both counterfeit and lost, stolen and non-receipt fraud. Thus, if a merchant has not made investments in EMV technology, such as EMV-enabled mPOS, and its corresponding processor has made these investments, the merchant would be liable for costs and damages for the data breach. We recommend that you review the precise terms for this liability shift for the card associations with which you transact your payments. Further, we suggest an early discussion of the EMV shift with your financial services and processing providers - October 2015 will be here soon!

Mobile devices are an excellent conduit to implement EMV technology. EMV can be fulfilled with the mobile devices in several methods, including cloud-based mobile wallet technology or directly embedding the EMV application on the SIM (Subscriber Identification Module) chip in the mobile device. With the October 2015 deadline arriving shortly, requirements for EMV chip acceptance can be factored into your decision as to the types of payments to accept.

The more popular consumer mobile payment mechanisms and technologies that we anticipate merchants will want to accept from their customers are:

- **Chip.** A small piece of semiconducting material (usually silicon) embedded with an integrated circuit (IC). Mobile phones contain IC chips, and payment applications can be managed on these IC chips.
- **EMV.** (Europay, MasterCard and Visa). A global standard for inter-operation of integrated circuit cards (IC or “chip cards”) and IC card capable point of sale (mPOS and POS) terminals and automated teller machines (ATMs), to authenticate credit and debit card transactions.
- **Contactless.** A family of proximity-based wireless technologies that enable payment transactions via chips embedded in payment cards, tags, and mobile phones. Near Field Communications (NFC) technology is a leading contactless standard implemented in the mobile payment industry.
- **Mobile Coupon / eCoupon.** A digital image that can be exchanged for a financial discount or rebate when purchasing a product or service. Usually these discount offers are sent to the consumer mobile device, and are redeemed at the merchant POS directly from the phone. These coupons can be part of a Loyalty Program, which is a structured marketing effort that rewards and therefore encourages repeat buying behavior, to potentially benefit the merchant as well as the customer.
- **Mobile Wallet or eWallet.** An electronic account accessible from a mobile device that can be used to store user payment information such as existing credit and debit cards. The Mobile Wallet Application enables payment services with consumer devices such as a smartphone or tablet.
- **Show ‘N Go.** A non-electronic transfer of information from a consumer to a merchant through a mobile device. This use case occurs when a consumer presents a static image on his/her mobile phone to a merchant to show proof of purchase, redemption of a coupon or other related activity that typically involves a manual intervention on the merchant side.
- **SIM (Subscriber Identification Module).** SIM is a memory chip deployed in smart phones and tablets. The SIM card can store user identity, location and phone number, network authorization information, personal security keys, personal contact lists and text messages. Security features include authentication and encryption. The SIM card can also contain other electronic chip applications such as a secure element module to store highly sensitive payment credentials.

Emerging technologies to keep in view for the consumer and retail segments include cryptocurrency. Cryptocurrency is defined as a digital medium designed to securely exchange transaction information in a process enabled by cryptography. At present, the majority of cryptocurrency is transacted online through electronic commerce sites, but cryptocurrency producers are making inroads to the brick and mortar retail market. Innovative retailers such as Starbucks are creating their own reward digital currencies. With Starbucks’ “Stars” reward points, consumers can purchase their coffee with their Starbucks plastic card that tracks their “Stars”.

Along with expecting merchants to accept mobile payments, consumers are increasingly anticipating a host of services with their mobile payment experience. These customer care services are rapidly proliferating with millions of inventive mobile applications in the marketplace. These complementary options can check and update inventory from the store floor, enable consumers to share potential purchases on social media, or search for product analysis on popular blogs.

While the thought of browser-enabled mPOS devices accessing diverse systems online may make security geeks apoplectic with breach anxiety, the reality is that key segments of consumers expect an interactive and holistic shopping experience. Merchants can succeed by understanding the wishes of their customers, and determine which customer service offerings they can select and manage cost effectively, and securely. By understanding your business model, customer, and consumer payment mechanisms, you can effectively evaluate and select your merchant mobile payment acceptance hardware, software, and more.

Merchant Mobile Payment Acceptance Hardware, Software, and More

One of the most important decisions that you will make in your transition to mobile is your mobile payment acceptance system. At present, the leading forms of mobile payment acceptance are:

- Mobile Point-of-Sale merchants (mPOS merchants) accept payments using merchant-end card-swipe hardware with a tablet or card reader attached to their device. These devices can be configured to accept magnetic stripe cards, EMV chips, or both.
- Mobile contactless merchants accept POS payments through a contactless method originating from the customer's mobile device (such as NFC and/or cloud-based solutions). These devices can accept magnetic stripe based data and EMV chip data, or both.
- Mobile billing merchants bill purchases to a customer's mobile carrier
- Mobile text payment merchants (SMS merchants) accept payments through SMS transfer

In the past two sections, we've discussed your business model and customer base as a merchant, and the types of payments and complementary services that consumers are anticipating. Building on this information, we'll review the considerations to assist you in making an informed decision on your mobile payment acceptance infrastructure.

The majority of small and medium sized merchants currently focus on the first two types of mobile acceptance forms. These mobile acceptances forms can accommodate both magnetic stripe technology and Integrated Circuit (IC) chip technology, as contact IC chips or contactless IC chips. Let's explore the key differences between these two types of chips, to better understand the type of readers that merchants need to select. We'll discuss selection considerations more fully in the following section.

- **Contact Chip Reader.** Contact chip cards take advantage of the basic design used with magnetic stripe cards, but incorporate an electronic processor chip. Chip cards, or integrated circuit cards (ICC), incorporate embedded integrated circuits that make electrical contact with a card reader mechanism associated with a point-of-sale device. Chip cards provide a better platform than the magnetic stripe for data security and data storage capabilities. Worldwide, chip cards (implemented under EMV regulations) are the most dominant form factor for accepting electronic payment. Contact chip cards are sometimes referred to as "Smart Cards", and many also include a magnetic stripe. Cards that enable both contact chip and magnetic stripe technologies are referred to as a "hybrid" cards. EMV chip card design and information layout has been standardized, and cards and payment acceptance hardware must comply with these payment industry standards.
- **Contactless/NFC (Near Field Communications) Chip Reader.** Contactless chip technology enables electronic payments using a Radio-Frequency Identification (RFID) protocol. NFC is one form of RFID protocol/ infrastructure. An embedded chip and antenna enable consumers to wave their NFC enabled smart device, contactless card, fob or other form factor over a contactless reader at the Point-of-Sale. Unlike contact chip technology, the use of contactless chips does not require a physical electrical connection between payment instrument and card reader to exchange data. Contactless payment programs have been implemented in several formats in recent years. One format emulates a magnetic stripe transaction, while the other more closely resembles an EMV transaction. Most current contactless payment acceptance hardware at the merchant POS is designed to accept both formats.

The leading hardware to accept consumer mobile payments and interactions is diverse. It is important to consider your selection, to meet your needs now and to “future proof” your business as much as possible. Here are some of the leading hardware readers that you’ll encounter in the mobile ecosystem:

- **Dongles.** In the mobile and payments space, dongles are used interchangeably as a magnetic stripe reader when plugged into a mobile device, usually in the audio jack. The dongle is a small piece of hardware that serves as an electronic “key” for designated software. The program will only run when the dongle is plugged in.
- **EMV Chip Readers.** Devices that read the dynamic transaction information generated with the IC chip. Authentication can be with “Chip and PIN”, where the consumer enters a four to six digit Personal Identification Number (PIN) to authenticate the transaction. The chips in these cards feature “PIN” ranked first in the list of possible cardholder verification methods (CVM), but with signature allowed as a fallback option (or even no verification at unattended terminals). Other EMV cards are either signature-only or prefer signature over PIN in their CVM list (i.e., signature at the POS, but PIN at unattended terminals or ATMs). These are often called “chip and signature” cards. EMV Chip readers can be part of the mPOS device, either built in or as an add-on.
- **Magnetic Stripe Readers.** The familiar magnetic stripe sled reads the static information embedded in the consumer’s card that enables the payment transaction.
- **NFC Contactless Chip Readers.** Near Field Communications (NFC) is a short-range wireless RFID technology that uses magnetic field induction to enable communications between devices by close proximity. These signals are read and transacted through the contactless chip scanners embedded in the merchant POS. Card accounts are linked to contactless NFC chips in mobile devices.

More than money: mPOS options beyond Mobile Payments

With their diverse capabilities for geo-location, built-in cameras, and billions of consumer-centric apps, Smartphones offer far more opportunities than just mobile payments and transactions. These options presently include checking inventory, sharing a contemplated purchase on social media, real time access to product reviews, loyalty programs, electronic couponing, and geo-location based marketing. As a merchant, you need to consider the functionality that you can leverage to empower your sales staff, enhance your merchandising, streamline your back office operations, and impress your customers. With the billions of apps produced by imaginative and entrepreneurial developers, the near future holds even more options.

“Big Data” is among the options that are available in small environments. Big data is an all-encompassing term for any collection of large and complex data sets that enable the analysis and discernment of information that is not available through traditional data collection and analysis. Big data usually includes data sets with sizes beyond the ability of commonly used software tools to capture, manage, and process data within a tolerable elapsed time. Small and medium sized merchants can also collect this data with the appropriate supporting apps and infrastructure. If you determine that a “Big Data” strategy is important to your business, you’ll need to question whether and how this data collection can integrate with the payment mechanisms that you select.

Implementation of an mPOS system is an excellent point to rethink your customer relationship management (CRM) tools and back office operations. mPOS systems offer opportunities for real time customer data collection, email and text opt-ins, enrollment in loyalty programs, email receipts, and additional customer database development and marketing opportunities. mPOS systems can interface with your back office operations, providing real time information for your accounting, sales, and inventory management. The extended operations can be cloud based, and encompass vendor management, price management, and order and replenishment management.

That four-letter word: RISK

It's almost time to make a few informed decisions. Before you begin, there's an additional consideration for your evaluation, and that is the risk and security of your selections. Small and medium size merchants generally implement payment acceptance solutions through channels where transactions are captured and transmitted to the processor without integration with point of sale back office systems. These merchants may choose to use simple, single purpose payment acceptance devices. However, the mobile payment ecosystem can facilitate more opportunities for integration with these back office operations, and thus merchants must understand new risks in implementing these systems. Larger merchants tend to implement more complex payment acceptance devices and integrated point-of-sale systems. Regardless of size of merchant, or complexity level of your system, merchants must have at least a basic understanding of the risks associated with mobile acceptance across many devices and technologies, and if selected, integration with back office or cloud based technologies.

A discussion on the risks of implementing specific devices and applications is important to have with product vendors and with your ISO, acquirer and processor. There are multiple robust and secure product solutions for mobile payment transactions, so you must balance your strategy of accepting diverse customer payment forms with the level of risk that you can tolerate and manage.

At the time of publication of this document, multiple product solutions on the market allow merchants to cost effectively and efficiently deploy secure mobile payment solutions. This is particularly true for multi-purpose mobile payment devices with browsers that provide the extended functionality on one device that is an attractive solution for SME merchants. While the experts continue to deploy robust solutions, here are a few points that are valuable for you to know about the leading topics in mobile security today:

- **Point-to-Point Encryption (P2PE) Solution.** A point-to-point encryption (P2PE) solution is offered by a third party solution provider, and is a combination of secure devices, applications and processes that encrypt data from the point of interaction (for example, at the point of swipe) until the data reaches the solution provider's secure decryption environment. The PCI Security Standards Council provides numerous resources on P2PE, including a list of approved P2PE solutions providers.
- **Semi-Integrated Environment.** The objective of semi-integrated technology is to enable the integration of cloud and mobile device technologies in transactions to process the sensitive payment data in the cloud environment, rather than on the mobile device. . An example is an mPOS tablet with a cash register application that can communicate with the retail inventory system. The payment components are included in these back office operations, and a browser is on the tablet. However, the back office operations enable the payment to flow through the traditional payment structure in the cloud. No sensitive data is sent through the mPOS tablet, except data to denote that the transaction occurred, such as the amount of the sale.
- **Hosted Card Emulation (HCE).** The purpose of Hosted Card Emulation is also to send the sensitive payment information in a sales transaction through the cloud rather than on the mobile device. HCE mirrors the function of Near Field Communication (NFC) in the cloud, and allows NFC-based payment applications on a consumer's mobile device to communicate directly with a merchant terminal.

Criteria for evaluating Merchant Payment Acceptance hardware / technology

At this point, you've considered the key topics of:

- Your merchandising and sales business model
- The rapidly changing and hard-to-predict mobile ecosystem
- Your customers' present and future payment mechanisms
- The diverse options for mobile payment acceptance hardware and software
- Risk and security considerations

Next is the fun part: deciding which payment acceptance hardware and technology will be the best solution for your business. In an effort to summarize these complex topics for you, we've prepared the following table that outlines the key requirements and considerations for use.

Table 1: Evaluation Criteria for Mobile Acceptance Payment Hardware, Apps, and More

Component	Description	Considerations for Evaluation of Merchant's Business Model
Mobile Point of Sale (mPOS) Device and Data Entry Options	Mobile Point of Sale (mPOS) references mobile devices that can accept payments through the addition of software and/or hardware to process a key entered, card swiped, or card dipped (EMV) transaction. mPOS devices include mobile tablets and smart phones, and may feature the payment sled or mechanism embedded in the device. mPOS options include accepting contact and/or contactless payments and magnetic stripe cards and/or integrated circuit chips.	<ul style="list-style-type: none">■ What types of transactions will this product enable me to accept? Credit cards? PIN based debit transactions?■ Am I "future proofing" my business with this device selection?■ Will the majority of my customers be able to transact with this device?■ Do I need to accept mag stripe cards and EMV chips? Contact and/or NFC?■ How secure is this device, and how much risk can I tolerate?■ Can my current ISO / Acquirer / Processor gateway and systems work with this device?■ What is the warranty or service commitment from the vendor?■ Does the device enable physical security, such as Mobile Device Management?
Mobile Payment Application	Mobile Payment Applications are the software that enables the mobile devices or hardware to accept diverse consumer payment forms. At present, the PCI Council Payment Application (PA-DSS) standard does not cover all types of mobile apps, so it is important to ask your stakeholders and vendor about application security and level of risk, particularly for mobile payment apps that interact with browsers on the device.	<ul style="list-style-type: none">■ Does the app demonstrate ease of use and compatibility with other apps?■ User interface and transaction flow?■ How does the register app function with the payment structure? How easy is the register function to use?■ Does the app accept the same type of electronic payments that my current system does?■ Does the app have the same functions for void, refunds, etc.?■ What type of payments does the app accept: mag stripe, EMV, NFC, and/or contact?■ Has the app been tested through a mobile app security testing process?■ Can my current ISO / Acquirer / Processor gateway systems work with this app?
Mobile Payment Complementary Services	Mobile Payment Complementary services refer to the rapidly expanding array of functions that can be accomplished during a mobile transaction. These functions include offering the customer more information on their purchase history, logging sales real time with your inventory and accounting systems, and allowing employees to view their work schedule.	<ul style="list-style-type: none">■ What complementary services do my customers want? On the spot inventory checks? On-line Product reviews? History of their purchases?■ What complementary services will support and streamline my business?■ Integration with my accounting systems? Inventory management?■ What complementary services will support my sales staff? Work scheduling tools? Instant Messaging?■ Can I capitalize on new analytics with these apps to better understand and serve my customers? Is "Big Data" applicable for my business?■ Can these apps help me to "future proof" my business?

Please cut out these steps and tape on your computer screen while you're planning. Or, if you're a customer, friend, employee, or family member and think that your favorite retailer needs to plan a mobile strategy, please provide them with a copy.

10 Steps for Making Informed Decisions on Your Mobile POS Implementation

1. Plan, plan, and then plan some more.
2. Evaluate your business and the potential for mobile technology in your business
3. Benchmark other businesses that have made the transition. Keep in mind that people love to give advice.
4. Review your current and prospective customer base, and estimate their preferences for consumer payments that you'll need to accept
5. Review your current payment technology infrastructure and plan which types of new hardware and applications that you will need to select
6. Determine the devices, applications, and infrastructure that are most empowering for your business, customers and sales staff
7. Determine the complementary services that will assist your business and assess their compatibility with your hardware, applications and infrastructure selections.
8. Discuss your plans with your ISO, acquirer, and/or processor as well as other interested parties (favorite customers, family, tech-savvy friends, etc.)
9. Contact vendors for competitive bids on your selections and evaluate at least three scenarios for your mobile payment system.
10. Plan, test and launch. Review your experience and sales data, and tweak your strategy and tactics as needed.

Best wishes for your success from ETA!

Resources and References

Resource Type	Question or Topic	Documents and / or URL
Consumer Information	Impact of mobile payments on consumers. Consumers' use of mobile devices and applications and implications for merchants.	<ul style="list-style-type: none">■ Pew Research Center. Mobile Technology Fact Sheet online■ Google Shopper Marketing Agency Council. How Mobile is transforming the Shopping Experience in Stores■ Federal Reserve. Mobile Payments: What's in it for Consumers?
Governing and Standards bodies	The industry groups that provide best practices, governing standards, and guidance for mobile payments and supporting technologies.	<ul style="list-style-type: none">■ Europay / Visa / MasterCard Company. Mobile Standards■ Europay / Visa / MasterCard Company. Payment Tokenization standards■ PCI Security Standards Council. PA-DSS and Mobile Applications FAQs■ PCI Security Standards Council. Mobile Payment Acceptance Security Guidelines for Merchants as End-Users v1.1■ PCI Security Standards Council. Accepting Mobile Payments with a Smartphone or Tablet
Card Associations	Guidelines and best practices from the leading card associations. Timeline for EMV chip migration and liability shifts.	<ul style="list-style-type: none">■ MasterCard. Best Practices mPOS■ MasterCard. List of mPOS and related providers■ VISA. Visa Digital Solutions■ American Express. Mobile Point of Sale■ AMEX. Mobile Payment Security■ Timeline for EMV migration and liability Shift to Merchants
Industry Associations	Organizations of industry stakeholders that participate in the mobile payment ecosystem.	<ul style="list-style-type: none">■ Electronic Transaction Association. Mobile Payment Solutions: Best Practices and Guidelines■ Electronic Transaction Association. Beyond the Hype: Mobile Payments for Merchants
Technology components	Technology components in the mobile ecosystem.	<ul style="list-style-type: none">■ QR Codes. What is QR Code?■ Bluetooth. Bluetooth Low Energy (BLE)
