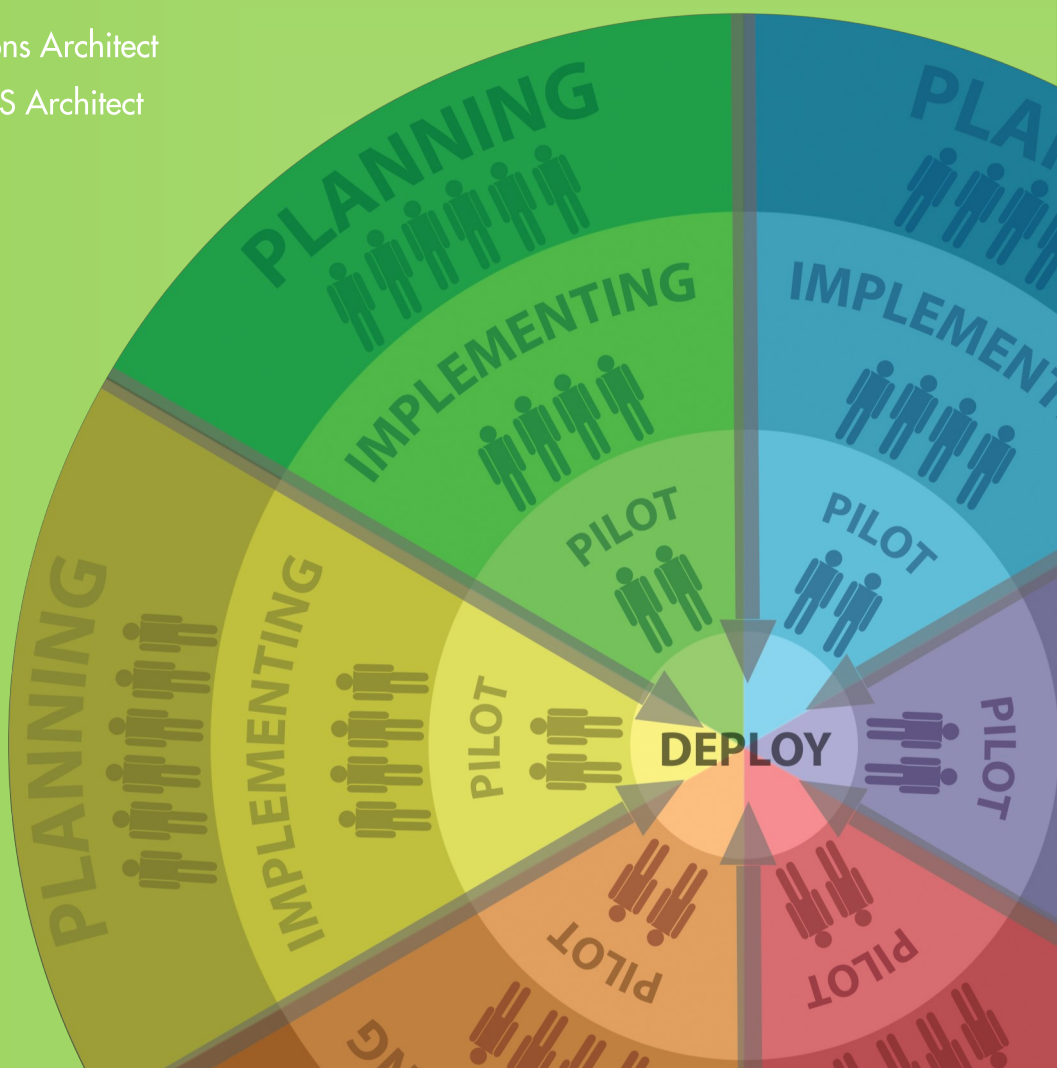# 13 Unlucky Lessons Learned:

Deploying Mobile Point of Sale with iOS

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Introduction

Retailers are presented with ever increasing competitive and economic pressures to do more with less. Now, with pervasive trends such as consumer tablets and smartphone devices, retailers are looking at how to use this technology to enhance revenue. In fact, recent research suggests that up to 99% of retailers are using or are planning on using mobile technology to enhance their profitability. This whitepaper highlights lessons technology veteran David Sipp and other retailers have learned from their Mobile Point of Sale deployments. In addition to stating the challenges of iOS and other consumer devices in enterprise retail environments, the whitepaper also outlines several things to consider before searching for a Mobile POS solution.

Workflows Drive the Technology Implementation vs. the Implementation Driving the Workflows

Mobility is a tool in service of an improved customer experience. Attention should be focused on avoiding implementing mobility in places where it is not needed or doesn't fit. Consider specific workflows that will enhance sales and customer loyalty, then architect solutions to fit these.

Don't buy software or services that force you into a pre-defined workflow. Every retailer has unique needs and a custom implementation. Continue to develop specific solutions for your needs.

For example, removing cash-wraps because they take up space is not really a new workflow. And it may force you into a Mobile POS system with a more cumbersome process if merchandise needs security tags removed or counter space is required for bagging merchandise. If countertop systems are used often, then consider mobile devices as a supplement and not a replacement.

Introduce Change at a Pace that Matches Your Workforce

One of the most common tenants of organizational behavior is that people resist change. When considering a Mobile POS solution, gauge the willingness of store managers and associates to embrace new practices. A staff that feels that too much is changing, especially if the benefits of the alteration to the staff or customers isn't obvious, will be resistant to the change.

To assess your staff's willingness to accept change, consider two different aspects. First, what are the demographics of your store personnel? Are they tech savvy people working in like-minded chains, like electronics or young fashions? Or, are they established, tenured salespeople? Are they generally comfortable with mobile computing? Will they accept carrying a tablet or other mobile device? Historically resistant retailers include auto-parts, hardware, furniture and interior design, as well as long-established clothing brands and department stores with established sales people. If the front line employees are unionized, the union may take a role in determining how the changed workflow affects their members.

The second consideration is how much variation will you introduce? If you are switching from an incumbent application with counter-based cash wrap to an all-mobile based system with new software and processes, associates who have exhibited eagerness for change are most likely to be successful. Otherwise, the magnitude of these changes will disorient most people and make them uncomfortable. Smaller, incremental changes are more likely to succeed, for example: instead of replacing all countertop systems, instead add mobile devices that run the same operating system and thus the same software as the countertop systems. This allows associates to use the mobile devices when they feel they add value, rather than feeling that the devices are forced upon them.

iPads/iPhones are Intuitive as Consumer Devices, but for Enterprise Use...

Deploying any device in a retail environment requires a deep understanding of how the systems work, how they interface into corporate databases, and how the software works.

Don't underestimate the effort to deploy ANY new device or capability. Underestimating iOS devices comes from the fact

that while iPads and iPhones are intuitive as consumer devices, this does not translate into easy-to-deploy or easy-to-use in a retail setting.

Why? Mainly because in retail, they are not used as entertainment devices. Instead, they are running sophisticated retail software applications designed to drive all the steps of a transaction. Cardholder data has to be protected and the PCI guidelines need to be followed. Network connectivity is critical – a network dropout while consuming entertainment is mildly annoying, a network dropout during a transaction breaks the session and may result in immediate lost sales.

If you were to switch from Windows to Linux, you'd hire Linux experts and train existing staff. Likewise, if switching from Windows to iOS, you need to obtain and develop the expertise for this platform. Don't assume that the familiarity of some technical staff with iPads translates into expertise using them in a commercial environment.

Technical staff needs skill with: OSX, Apple Configurator, iPhone Configuration Utility and Xcode. Also, some MDM (Mobile Device Management), MAM (Mobile Application Management) and MCM (Mobile Content Management) support will have to be installed.

Additionally, iPads and iPhones are designed to be single-user devices. Introducing them into a multi-user environment brings additional challenges in managing profiles for these devices. This lack of multi-user support becomes a big issue with Shift and Seasonal workers during holidays, and during times of heavy turnover.

In-Store IT Support

Another consideration is how to provide 1st level support for stores. Most retailers have established software and processes refined over a decade or more. Trained 1st-level staff are available to assist with enterprise software and POS. In many cases a new sales associate will ask a veteran associate about how to use the systems and they'll get good advice. However with a change to iOS devices, the protocol changes and new ways to interact emerge. Inevitably, there will be differences, like how to accept a return if the product is now on sale. Since there is new software, it is new to everyone in the store, so organic support of experienced users is not available. Worse, associates with misplaced confidence – people who are very comfortable with Apple devices for home use may think they can easily manage these same devices in a commercial setting. For example, you may have set-up a controlled Wi-Fi subnet for these devices and a store associate may connect instead to the Guest network. Or

maybe they'll try to download an unauthorized app, or change other settings. These same people would never think of going into the settings of an IBM or Fujitsu cash wrap, but an iPad is seen as an easily manipulated consumer device.

MDM (Mobile Device Management) allows items like cameras to be removed from iOS along with other items like iTunes, Safari, etc. Those who have no experience with MDM have assumed that the device is corrupt or otherwise malfunctioning. This has led to in-store personnel performing full factory resets, or have taken devices home to be plugged into personal PCs for troubleshooting.

And since iOS devices don't have effective lock-down modes, users can intrude in areas that you don't want them to. With iOS devices, whoever has physical possession of the device controls the device.

Lastly, there are device management costs. For example, if your iPad becomes corrupt, you'll need to connect it to something like an Apple Mac Mini to run the Apple Configurator tool to reimage the device. This can be a $1000 cost per store, plus you need to train someone to run the configurator. You'll be training your staff to be technical, and not on selling.

The Case for Cases

Consumer devices are not designed for the rigors of a retail workplace, so many retailers have tried to enclose the devices in protective cases.

One reason for these cases is to try to prevent unauthorized people from accessing the buttons to control the consumer device. Look for cases that fully enclose the device. Some cases have small gaps or pinhole openings. Retailers have seen instances of people inserting paperclips or the edge of a credit card to get access to the controls. So look for a mobile device where the buttons can be software disabled, or look for a case that fully encloses the tablet or other mobile device. Note the downside here is if the device needs to be accessed by the sales associate, a

key must be found ("Where is the manager?") to open the case.

Another obstacle is that carrying cases are mated to the exact dimensions of the consumer device. These device manufacturers are primarily focused on consumers, not business, so in their quest to quickly update to the latest technology, they will often change the dimensions of the mobile device. Tablets get smaller or bigger screens, new generations are often thinner, and connector formats can change. So either choose a mobile device from a manufacturer with a commitment to not change the form factor for a number of years, or expect to stock different cases for different versions of your devices.

Consumer Devices – Prone to Theft

Most computers in retail stores are not attractive to thieves. Even though stationary POS systems are often a PC at the core, they are specialized products. The gray market for commercial devices is very limited because most reputable businesses would never buy commercial-grade equipment from a questionable source.

That is not the case with consumer devices. These devices have a trio of characteristics to make them desirable to thieves: They are instantly recognizable as consumer devices, they have limited theft-prevention capabilities, and there is a large gray market for stolen devices.

These devices are also relatively small and are commonly laid down when performing another task. A quick distraction and the device is left for the taking. This is especially true for iPads which are too big to be placed in a pocket by the associate.

Retailers should expect attempts to hack the device used as kiosks. Retailers have experienced mischievous shoppers or others attempting to show off there iOS skills to friends or worse, attempt to remove the devices from the protective cases leading to many iPads being damaged.

Anticipate Customer Response

Another constituency that has to accept mobile devices is your customers. Think about how mobility will enhance the customer's experience. Many customers expect to find a cash wrap station. It is a home base, a place where they know that they can find help.

Sometimes customers are wary about using a mobile device to swipe their credit card, especially if the sales associate only approaches them to check them out. In contrast, a workflow that helps the customer, perhaps by showing alternative or complementary products, or scheduling delivery, for example, is value-add for consumers, and they immediately see the benefit of the service. If the end of this process is the payment, it will then be natural for the customer to hand over their credit card.

In contrast, a mistake some stores have made is to have a casually dressed associate approach a customer "cold" and offer to take payment for the items. Many consumers are immediately concerned that this is a scam.

You Still Need a Cash Wrap Station

Mobility in retail can add many useful workflows. Some of these are Assisted Selling, Line Busting, and mobile POS for additional lanes or pop-up stores. But in many cases, a retailer will still need to retain some of their traditional counter-based cash wraps.

Plan to retain many of your existing countertop cash wraps. You'll need a place to remove tags, bag merchandize, print receipts, etc. Yes, consumers can choose email or texted receipts – but be aware that many won't want to do this, many consumers still want the paper receipts. Also, you already have the receipt printers, cash drawers, etc. Plan to use them, even as you deploy mobile devices.

Often more important, consumer's see the cash wrap as a Home Base, especially in larger square-foot stores. They expect to see them in stores, it is where consumers go to talk with sales help or make returns. Some retailers have removed the cash wraps or hidden them, and there has been a noticeable lack of comfort with some shoppers. Even Apple has cash drawers in their stores.

Additional Investment in Wireless Network

Consumer devices are great content consumption devices. In a retail setting the enterprise software usually requires significant local storage and working space for databases of items and the queuing of transactions. Since consumer devices generally have limited internal capacity for these large working sets, the typical installation uses the network for cloud access. This works fine when the network is available.

One pitfall to avoid is an incomplete or inadequate wireless infrastructure. With always-connected wireless devices, you need to avoid any dead spots in your network in each store. This isn't just an inconvenience. With some retail software, a session will be broken with a network drop, resulting in the loss of the current activity or the need for the associate to re-authenticate. Getting a robust network with complete coverage requires professional network services. Some retailers have reported that the cost of a sufficient network upgrade and implementation was the single largest cost of going to mobile POS.

You also need to consider the radio-capability of your mobile devices. For example, one retailer found that their existing network needed significant upgrades. They found that their WAP (Wireless Access Points) could transmit further than their iPads could transmit back. The iOS radios were further attenuated by the sleds that were attached. Since iOS radio systems cannot be tuned, all work has to be done on the Wireless network side. Access point power levels will have to be tuned to provide proper power level across the store without the access point interfering with each other.

Another issue is with roaming: when a mobile device moves from one access point to another. It has to be seamless! One strategy has been to use OPK (Opportunistic Key Caching), but be aware that iOS does not support this, so the device will have to re-authenticate each time it switches WAPs, causing a lag in app performance and may cause session drops.

In order to avoid this limitation you must run your software on devices that have the capacity to operate even with the network down. Alternatively, do a detailed audit of the current wireless infrastructure in your stores, and plan for a network upgrade or replacement, and many months for tuning the system. Some retailers have had to install 2 networks, one for all their guests, and another for store functions since the store's iOS devices could not tolerate drops in bandwidth. The second Guest network can then also

serve as a backup if the MPLS (Multiprotocol Label Switching) link went down.

Many prudent retailers have implemented sophisticated schemes to keep stores operating even if network access fails. These systems often can run independently, scan all items in the retailer's database, and even queue up transactions for a batch-load when the network returns. But mobile POS systems that rely on constant network access will fail during a network failure. Some of these network failures can be significant events. Consider Hurricane Sandy in October of 2012: in Northern NJ and southern parts of Manhattan and Long Island, networks were down for days or weeks. Some retailers were still able to operate in these cases because their software ran in its entirety on the systems in the physical stores. A store that had to have network connectivity was out of business for those days.

Integration with Enterprise Information Systems

This can be a significant issue to overcome: applications that are information islands, or not connected to corporate databases fully can compromise the integrity of your data. Most retailers have sophisticated systems that have been established over many years to allow headquarters to see real-time activity, manage inventory, plan inventory replenishment, and do many of the "Big Data" functions. Your incumbent software provider may not be an iOS developer. Bringing in a separate retail package can force a choice between a wholesale switch to the new provider, or developing new methods to connect the 2 systems.

Save Money—Leverage Existing Accessory Investment

Receipt Printers, Cash Drawers, Scanners and Payment Terminals are needed in most mobile workflows. Obviously, you need devices that work with your mobile device. Bluetooth and Wi-Fi are reliable connection methods. But you also need to consider the interface software. Do you want to use OPOS (OLE for Retail POS) drivers to access your accessories?

Retailers already have an extensive amount of accessories throughout their stores. These devices are almost all based on Microsoft Windows drivers. (OPOS is built on Windows.) If you move to a consumer device, you will need to replace many or all of your accessories to get ones that are supported by Android or iOS. Most

suppliers of these peripherals have added devices that connect to consumer devices, however there are generally only one or two to choose from.

If you use a Windows-OS mobile device, you can often still use most of these devices. Whether connecting physically when docked, or wirelessly, the same Windows drivers can access these devices. Also, many wired peripherals can be converted for wireless access. For example, some printer manufacturers offer upgrade modules to convert them to Wi-Fi. In other cases, Ethernet devices can simply be attached to wireless router and become available to mobile devices.

Another thing to consider is that using iOS as a platform may drive you to peripheral suppliers different than those you currently work with. Where you have established satisfactory delivery, service and payment term contracts with your current suppliers, you may have to start working with new suppliers and new distributors.

PCI Compliance – Make sure your OS+App Combo is Certified

Accepting payments on mobile devices often requires a new PCI (Payment Card Industry) assessment of all the systems in use. And since, per PCI Council rule payment applications on consumer devices cannot be PA-DSS (Payment Application – Data Security Standards) certified, a new system to lessen the risk of cardholder data breeches needs to be developed and PCI risks assessed.

One way to avoid this pitfall is to use a commercial grade device that runs the same OS as was certified with the PA-DSS application. This can greatly lessen incremental PCI work and assessments.

Note that as of August 2013, there are 2570 PCI certified PA-DSS applications, across 28 different operating systems, there are none (0) for iOS or Android. A move to iOS requires a new PCI compliance plan without the benefits of PA-DSS technology.

Payment Processing – Prepare your Organization

Another pitfall is a mobile device that forces you into a new payment processor or credit card system. This is often necessary since a move to P2PE (Point to Point Encryption) is required since traditional methods to protect cardholder data aren't possible, such as the use of PA-DSS applications. There are often many reasons why you may want to change processors, but switching because of a move to mobile POS is not enough of a reason. If you like your current arrangement for processing credit and debit cards, you can probably continue to use it.

Sleds (large, attachable plastic pieces with mechanical connection features) can be used to connect credit card readers to mobile devices. Often the attached device talks to the tablet via Bluetooth (BT), 30-Pin connector or via the audio jack. Since the data transmission can be compromised, the card reader usually encrypts the data. This P2PE (Point to Point Encryption) method usually represents a change to a retailer's current payment processes, and may require a new payment gateway or a new charge per transaction for encryption services.

Reduce Risk by Reducing Number of Variables

Most of the pitfalls discussed in this whitepaper will need to be addressed if you are adding iOS-based mobile POS to an established retail environment. There is a lot to consider and a lot to plan.

There is also the issue of timing. The timing of all of these actions converges on the day of the rollout in a store. And as each slice of each category gets closer to the center (deployment), the available man-hours decreases and the inter-functional communication ramps up as critical issues crop up.

Conclusion

There are many advantages to mobile technology in a retail setting. Start by focusing on workflows with clear benefits to operations or to your customers' needs. Once they are set, consider how to minimize the disruptions that happen with the introduction of these mobile workflows. Be wary of providers who offer a stand-alone solution to address some of these workflows, they often force retailers into entirely new processes, and purchases of new accessory devices.

Most retailers have already invested in significant IT capabilities, including database connections for real-time business analysis. The in-store POS systems are proven reliable and are specific to your retail needs. Retailers have standardized on specific receipt printers, payment terminals, scanners, etc. IT has developed a wealth of skills managing the entire infrastructure. All of this represents a huge investment. This investment has paid off in terms of a reliable, scalable, secure, and integrated environment. Retailers would be best served if they choose mobile technology that protects most of this investment, or even builds on this investment.

By choosing technology that works within the current environment, retailers will see other benefits. Change can be managed and new features can be added incrementally. With these incremental changes, there will be less disruption to the core business. Sales associates and customers alike will experience change at a more comfortable pace and will be more likely to embrace it.

Retailers each have a unique architecture, developed specifically for their business needs. Adding mobile POS should not force most of the existing methods to change. Demand solutions that fit your needs and you will realize the full benefits of a mobile retail environment.

About the Authors

David Sipp is a 20 year veteran in IT. Having worked in various industries he brings a broad set of experiences to the table. He has spent the last three years focused on Enterprise Mobility and the many issues companies face as they try to leverage this opportunity. He holds many industry certifications including MCT and CISSP.

Bob Ashenbrenner has more than 25 years of computer engineering and engineering management experience, with 15 of those specific to mobility and 3 of those specific to retail. Since 2003, Bob has been with Motion Computing, a global mobility solutions company based in Austin Texas. Most recently, Bob has become Motion's expert in Point of Sale and payment terminal technologies. In this role, Bob has led the development of a suite of products, services and software that support retail, with an emphasis on fitting within a retailer's chosen environment.