Citi GPS

UPWARDLY MOBILE II

A Long and Winding Road for Mobile Payments – Eight Crucial Questions, Answered

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UPWARDLY MOBILE II

A Long and Winding Road for Mobile Payments – Eight Crucial Questions, Answered

Mobile Payments has been dubbed the Future of Money and the conventional wisdom is that this is how we will transact in the years to come. When we analyzed the global Mobile Payments opportunity in our first "Citi GPS: UPWARDLY MOBILE" report back in March 2012, we provided a good description of a variety of topics related to Mobile Payments. The past six months has been heavy with news flow indicating that there are now wider choices than before in Mobile Payment and these announcements have also given us better clarity on what can and cannot work. Subsequently, we've found that there is a need to address questions that go to the heart of what is changing within Payments. In this report, we focus on eight questions that address the issues of business model evolution, technology and adoption:

1. **Processing "Rails" and Transactions –** Do Mobile Payments alter the traditional 4-Party payments system? If yes how?
2. **Incumbents and Their Actions –** What are incumbent card networks doing to adapt to the rapid changes brought by Mobile Payments?
3. **Targeted Offers and Data Ownership –** How will the adjacent "Targeted Offers" market develop? Who owns the underlying data?
4. **Ecosystem Evolution –** What will the Mobile Payments ecosystem look like?
5. **Technology Choice and Timeframe –** Which technology is likely to win and become the global standard? Will it be the early leader, NFC (Near-Field Communications) or will cloud-based or other solutions win? When will the infrastructure be in place for widespread Mobile Payments?
6. **Global Standards and Regulation –** Will a global Mobile Payment standard emerge to address regulation, security and privacy concerns?
7. **Mobile Wallet Attributes –** What are the desirable attributes of a Mobile Wallet?
8. **The Holy Grail: Consumer Adoption –** What will drive consumer adoption?

We find most importantly, that mobile payments could simplify and alter some elements of the traditional four-party payments system as information and interaction increase in importance, versus the actual payment transaction itself. The type and timing of technology is still not clear but what is clear is that in the last 6 months, new and credible non-NFC solutions have emerged. Infrastructure must be upgraded to enable Mobile Payments for any technology that becomes the global standard and the timeframe will be technology dependent. Merchants may very well wait until there is more clarity on technology before making investments towards adoption. Finally, we believe consumer adoption will depend on the presence of a "killer app" – an app that is simple for both consumers to adopt and use and is widely available.

Although we are now able to hazard a guess at the lay-of-the-land for a future Mobile Payments ecosystem, we still look for a multi-year path to reasonably widespread adoption. It may be a long and winding road, but every day brings us closer to reality.

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Tough Curves on a Long and Winding Road

The best thing about the future is that it comes one day at a time.

- Abraham Lincoln

Progress lies not in enhancing what is, but in advancing toward what will be.

- Khalil Gibran

It is quite clear that the path to ubiquitous Mobile Payments is a long and winding road, even though a lot of incredibly smart people are trying to get there from here. As expected, tough questions come up about how we get to wide-spread adoption of Mobile Payments, and these questions kick off a lot of debate. Eventually, many of the answers to these questions are probably rooted in common sense – after all, we need a solution that makes life easier and more convenient for the consumer. The next several sections lend our own voice to the debate on the evolving Mobile Payments solution. Here are the questions we tried to answer.

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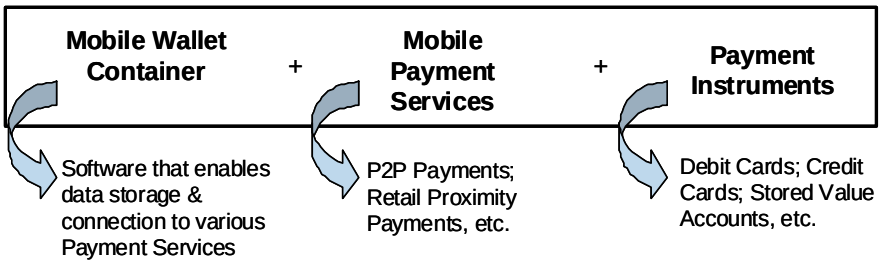
Upwardly Mobile: Where We Left Off

To set the stage for this second report to look at the future of Mobile Payments, we believe the following synopsis including key points and highlights from our first Mobile Payments report, should be useful.

Defining Mobile Payments

A Mobile Payment is a payment initiated from a mobile device such as a phone or tablet or a payment accepted by a mobile device. To make this simple description more useful, we define the various components of a Mobile Payment in Figure 1 – the mobile wallet container; mobile payment services and payment instruments.

Figure 1. Mobile Wallet Definition and Components



Source: Citi Research

The mobile wallet container is basically the software that handles credentialed access to both the payment services and payment instruments and also stores relevant information.

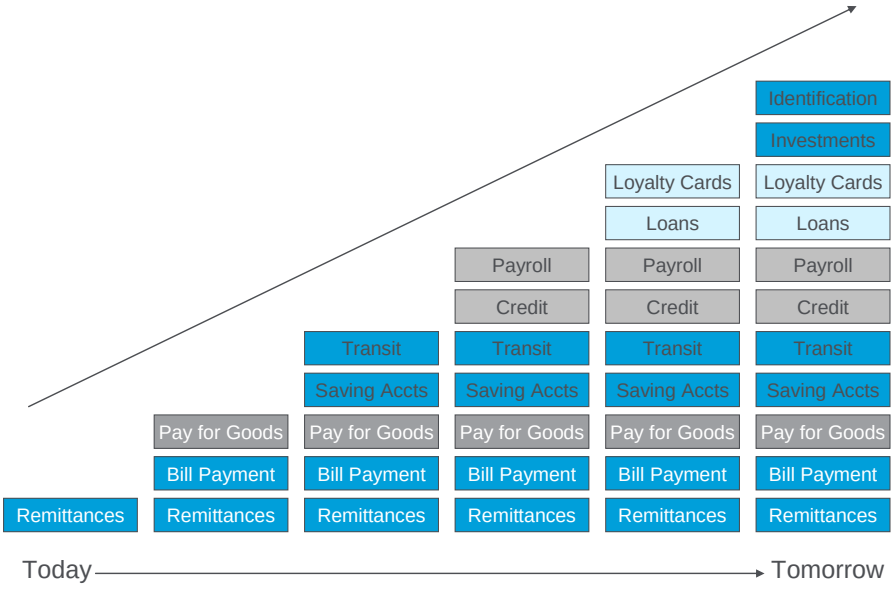
There are three generic types of payment services (i.e., functionality) that a mobile wallet should enable (listed below). It is worth noting that these are not the only functions of a mobile wallet and we expect that as the acceptance of mobile phone based credentials becomes more widespread, there will inevitably be more uses.

- **Retail Remote Payments** – these are e-commerce transactions done using the mobile web browser on the phone;
- **Retail Proximity Payments** – this is what most people visualize when they think of mobile payments, i.e., using the phone as a payment device. The other form of such proximity payments is to actually use the phone as a "cash register" or a payment acceptance device. So, there are actually two kinds of retail proximity payments – one introduces mobility to the consumer side and the other introduces mobility to the merchant side.
- **Person-to-Person (P2P) payments** – this has proven to be a critical use case in emerging markets, but we believe that the creation of an interoperable, inter-bank system can actually make this a "killer app" in developed markets as well.

The payment Instruments are the funding mechanism for the payment to happen – these include credit, debit, stored value or other payment options.

Lastly, with an eye to the future, we note that certain kinds of mobile applications, such as the money transfers involved in the enabling of mobile financial services (i.e., loans, deposits, insurance products, etc.), should also be included and are illustrated in Figure 2 below.

Figure 2. Proposed Evolution of Mobile Wallet Capabilities



Source: Citi Research

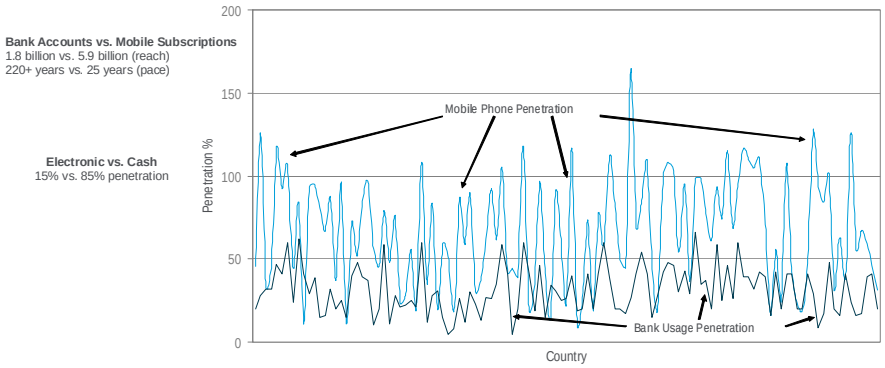
What drives the almost-universal interest in Mobile Payments?

The driver behind interest in Mobile Payments varies depending on the entity

A large number of entities, from governments to corporations in multiple verticals such as financial services, telecoms, retail, technology and services, have a vested interest in the eventual widespread adoption of Mobile Payments. What drives this vested interest? It varies by entity. A government may care about the indirect benefit from higher "financial inclusion" or from heightened transparency and speed of social funds distribution, for a telecom or technology company, Mobile Payments may represent a potentially lucrative new revenue source while a financial institution could potentially extend its reach into the hitherto unbanked and under-served demographic.

Optimism around the growth of Mobile Payments stems primarily from the above-mentioned widespread desire ("vested interest") to make it a success as well as the high levels of penetration of mobile phones (see Figure 3). This optimism has translated into real investment in the field. There are a range of estimates available for this emerging opportunity, and they are all very large - often approaching or exceeding $1 trillion by 2015-16.

Figure 3. Why Are Industry Participants Optimistic About Mobile Payments?



Source: Citi Research, Citi GTS, ITU, GSMA Mobile Money for the Unbanked

Mobile Payments Evolution – Emerging vs. Developed Markets

The Mobile Payments opportunity in Emerging Markets is likely to evolve quite differently from that in the Developed Markets.

Opportunity in Emerging Markets is in financial inclusion

- In Emerging Markets, we can leapfrog from a cash-based society to mobile payments - not very different from the communications industry wherein we went from post offices to mobile phones without stopping for the wire-line infrastructure to be laid out. Here, the ubiquity of mobile phones can help governments, businesses and individuals overcome a set of pressing and persistent issues, i.e., the general lack of access to financial services, computers and internet connectivity. This is a "blue sky" opportunity and typically there isn't any established competition to worry about. Our report delved into this in detail in several sections - from discussing Kenya as an example of success to a section on possible killer apps to suggesting the likely evolution of a broad product set.

Opportunity in Developed Markets is more smartphone based

- As for Developed Markets, the general take-away was that while the opportunity was large, there were incumbent payments industry players as well as a range of contenders and co-operation was not a given unlike in many Emerging Markets where the presence of a dominant financial services player or telecom resulted in quicker progress. We also discussed the relatively high levels of bank penetration as well as smartphone penetration in Developed Markets and what this can mean for the market's evolution. Last but not the least, we also described a relative success story, Japan, in considerable detail and compared it to other developed markets to calibrate what could be done similarly or differently in other markets.

Figure 4. Comparing Successful "Country-Level" Implementations

	Japan	Kenya
Main Mobile Wallets	Edy (BitWallet), iD (NTT DOCOMO), Suica (JR East)	M-PESA (Safaricom)
Active Mobile Wallets	~21 mil	~15 mil
% of population	~17%	~37%
Cash Use in Economy	~87%	~94%
Main Use of Wallet	Payment in Store, Vending Machines, Transit	Peer-to-Peer Payments (Remittances)
Technology Used	Contactless (RFID)	SMS (Text-based)
Funding Sources	Prepaid and Postpaid	Prepaid
Revenue Sources	Merchants	End Users
Revenue Types	Merchant Discount Rate, Float	Cash Out Fees, Transfer Fees, Float

Source: Citi Research

6 Months @ 16 Announcements per Day

Mobile Payments is an incredibly exciting and fast-moving field. Citi's Mobile Strategy team has said that they see and analyze an average of sixteen Mobile Payment announcements each day. Not every one of these is significant, but the list includes new product announcements, new partnerships, reports of progress (or lack thereof) on existing deals and initiatives.

Investment Direction in Mobile Payments

We consider six major categories of participants:

(1) Card networks;

(2) Banks and financial processors;

(3) Telecom companies;

(4) Technology and internet companies;

(5) Merchants;

(6) Niche vendors

Since a "sixteen-announcements-per-day" regimen can cause the best of us to miss the forest for the trees, we attempt to substantively capture in "broad strokes" the investment and strategic direction in which the main categories of participants – card networks; banks and financial processors; telecom companies; technology and internet companies; merchants; other (niche) vendors – have tried to position themselves for a future that includes Mobile Payments. Although these category boundaries themselves are beginning to blur somewhat, we use them as they are easy to visualize in an historical sense. The category lists are not comprehensive in terms of participants – but instead, a way to effectively represent each category, not to drill ad nauseam into one's psyche that a lot is happening within Mobile Payments.

Readers who have not closely followed the daily list of such announcements may find a brief detour to Appendix 1 helpful, because it contains a chronological list of specific news items and press releases by category. We also have a brief section on Regulatory Announcements – which although brief, is incredibly important given the widespread concern and tension that the potential risks and opportunities associated with Mobile Payments are causing for legislators, federal and reserve banks globally as well as for (other) financial and telecoms regulators.

Card Networks

Card Networks include companies such as Visa, MasterCard, American Express, Discover and China Unionpay

In the cards network category, we include Visa, MasterCard, American Express, Discover and China Unionpay. Specific major announcements for some of these companies follow later, but looking at the big picture, here is what the card networks have achieved in the last six months:

- Unveiled incremental details about their proposed respective wallets (such as partnerships, timelines, etc.);
- Focused on targeted offers through either M&A or specific merchant arrangements or both; and
- Worked on expanding their funding reach beyond traditional bank relationships by investing in prepaid and cash-based funding options.

Banks and Processors

Banks include US and non-US banks while processors include technology vendors such as Fiserv

On the bank side of this category, we looked at the actions of U.S. and non-U.S. banks while on the processor side, we include technology vendors such as Fiserv, Fidelity National Information Systems, Monitise and Total System. In the last six months:

- The processors have unveiled products that could extend mobile payments capability to smaller financial institutions;
- Larger U.S. Banks have agreed to collaborate / exchange data to facilitate person-to-person (P2P) transactions; and
- The category as a whole has unveiled regional inter-bank or bank/telecom collaboration on wallets.

Telecom Companies

Telecom companies include traditional telecom company but also a range of technology companies that focus on direct-carrier billing

In this category, we include not just telecom companies but also a range of technology companies that focus on direct-carrier billing including Boku, Bango, PayOne, payVia and others. The telecom category has been busy as well, having:

- Continued the process of starting regional partnerships to introduce wallets – partners included card networks, technology companies and sometimes, banks;
- Introduced direct-carrier billing relationships in several geographies; and
- Made progress on SMS-based (text messaging) mobile payments in several emerging markets.

Based on telecom company actions, support for NFC-based technology seemed very strong among "developed economy" telecoms, relative to other categories of participants. Obviously in regions where feature phones are more prevalent than smart phones, non-NFC technology is making progress.

Technology and Internet Companies

Technology and Internet companies include the obvious candidates like Apple, Facebook, Google and PayPal but also various point-of-sale (PoS) providers

The obvious candidates in this category are Apple, Facebook, Google and PayPal. Although Amazon and Microsoft are mentioned less often, we believe they will have more to say in the future as Mobile Payments develops.

Various point-of-sale (POS) providers constitute a key sub-category within the larger category. The POS providers themselves can be divided into two segments, although there are some companies such as VeriFone and Square that bridge these two segments.

- Mobile Payment Acceptance specialists – Essentially these companies sell card readers. This list includes VeriFone, Square, Revel, iZettle, mPowa, payleven, NCR and others.
- Loyalty and Targeted Offers enablers – This is a long list of companies, which includes LevelUp, Cardlytics and other such companies. This is clearly an interesting space and there are a significant number of participants in practically every single category from Banks to Card Networks to Technology Companies who believe they have a right to and an ownership of client data that seems to underpin success in this segment.

In terms of achievements in the past six months, the bigger technology and internet companies have:

- Introduced credible alternatives to NFC-centric technology – this included PayPal's fast-evolving offline approach and Google's redesigned wallet approach and, in our view, Apple's decision to not put its weight behind NFC;
- Made considerable progress on mobile wallet design and partnerships – whether banks, card networks or merchants – to promote usage;
- Set up merchant and technology relationships to promote mobile commerce; and
- Invested in supporting technology to enable security and funding.

In the last six months, the (mobile) POS have:

- Introduced chip-and-pin support in addition to standard card swipes;
- Tinkered with volume-based pricing plans to move upstream; and
- Invested in adjacent areas such as back-office integration and loyalty programs to promote merchant support.

Merchants

Merchant actions vary based on merchant size and geography

Merchant actions varied based on merchant size and geography. However overall, lowering transaction cost, minimizing POS changes and creating alternatives to the traditional card network status quo seemed to be key drivers of their actions, particularly in the U.S.

- Many of the larger merchants in the U.S. expended considerable effort to present their vision of a "by the merchants, for the merchants" Mobile Payments ecosystem through a venture called Merchant Customer Exchange (MCX);
- Formulated and grew partnerships with non-traditional payments providers;
- Continued their rapid support of non-traditional card acceptance systems, especially the smaller and micro-merchants; and.
- Indicated a strong desire to "own" customer data.

Other (Niche) Vendors

This is an eclectic list of niche vendors in diverse areas across the mobile payments arena, including chip manufacturers, particularly NXP Semiconductors, a key supplier of NFC chips and controllers as well as security, authentication and card-scanning companies.

Given the eclectic nature of this list, there isn't a consistent list of takeaways. In general, these companies obviously tried to maximize their reach through various partnerships and by continuing to develop their product set.

I. Processing "Rails" & Transactions

Do Mobile Payments alter the traditional 4-party payments system? If yes how?

The big change from introducing mobility is likely to be the increased focus on the location-based and social aspects of mobile commerce. In other words "information and interaction" increase in importance relative to the actual purchase transaction itself. This creates potentially large adjacent markets and gives rise to new business models. There is certainly the prospect of power shifts occurring among the various parties in the process.

The actual purchase transaction could also change with regards to where the data is stored, how it is retrieved, the point-of-sale methodology and where the actual processing occurs.

Given the significant disintermediation fears in every part of the Payments value-chain we end this section with our thoughts on the potential for disintermediation.

Although our discussion specifically cites a 4-Party system, the gist of our comments stays the same for a closed-loop or a 3-party system

A 4-party system includes the consumer/ card holder, the merchant, the issuer and the acquirer

Let us start with the elements of a traditional transaction, which are illustrated in Figure 5 below. In our analysis of this question, we are more focused on a retail transaction, not on a person-to-person transaction.

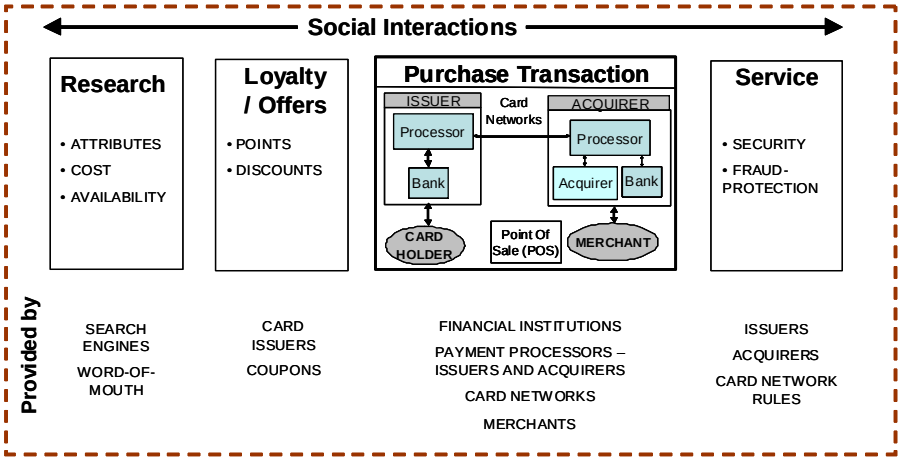
Figure 5. Elements of a Traditional Payment Transaction from a Consumer's Viewpoint

Traditional Payment

(1) Each step is typically distinct and on a separate platform.

(2) The transaction itself is bank-centric and follows a normal 4-party* method.

(3) The social / commerce aspects are not seamless.



Source: Citi Research

Frequent transactions, such as purchasing groceries or paying for lunch with a card may not involve much of the first step – research – but even in every day transactions a cardholder may think of points, i.e., card rewards, and hence prefer a particular payment instrument. Of course, an infrequent purchase most likely involves some level of research and comparison shopping – in traditional purchases, this research is typically done on a separate platform. The buying decision also incorporates some thought around the offers and discounts that may be available. Social interactions – asking friends for advice or preferences – are an integral part of how we live, but these are either offline or on a separate platform.

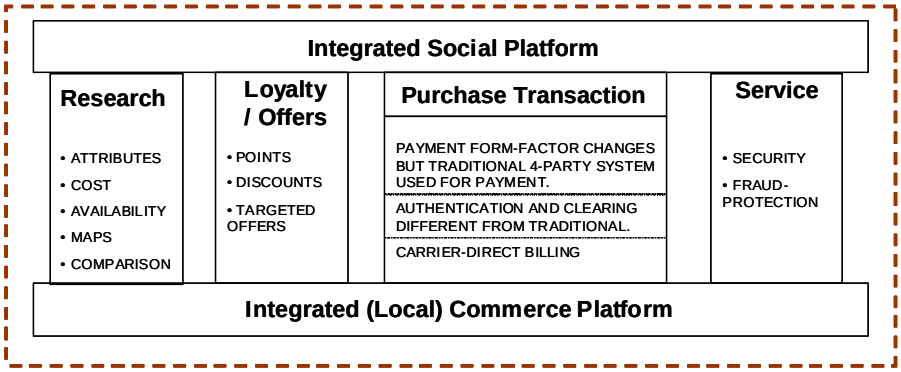
Obviously, underlying the choice to use a particular payment method such as a card payment is the relative ubiquity of card acceptance as well as implied security and fraud protection.

Mobile payments differ from a traditional transaction as the mobile phone is now an overlay to the payment transaction itself and the transaction itself can change

There are potentially two ways in which the mobile payment transaction differs from a traditional transaction, as shown in Figure 6 below.

- The most significant difference between a traditional payments transaction and Mobile Payments transaction is the power of a mobile phone to integrate a commerce platform – both information and interaction – as an overlay to the payment transaction itself. Why is this important? Because it creates potentially large adjacent markets and gives rise to new business models. For example, providing the consumer with an appropriately targeted offer that enhances the likelihood of a transaction can be of great value to the consumer. Similarly, integrating research, loyalty awards and location information to increase the likelihood of a purchase is quite important for a merchant.

Figure 6. Elements of a Mobile Payment Transaction from a Consumer's Viewpoint



Source: Citi Research

- The purchase transaction itself can change as well, in a number of ways. This is typically transparent to the user, although the choice of phone / carrier may determine the outcome in terms of technology used for mobile payments and so there is an indirect impact on the consumer from this point. Here are some examples of how the purchase transaction may be different from a traditional payment transaction.
  - The consumer can use NFC technology to perform the transaction. In this situation the only substantive change may be the form factor changes, i.e. from a credit card to a smartphone, while the traditional four-party system of payment remains unchanged.
  - Using 2D technology, a consumer can make a payment from a (closed-loop) prepaid account with the merchant.

- The (mobile) POS device may be the point of difference in the case where a traditional card is used to pay for goods or services. This is not a trivial difference, however. It raises the risk that a card network or issuer can be relegated to the background in terms of the customer relationship. In other words, it is quite possible that a good mobile wallet vendor – say, Apple, PayPal, Square or future versions of the Google Wallet – would be what a consumer associates with the convenience of a mobile payment. This in turn can give the mobile wallet vendor the opportunity to subvert the normal chain of events in a four-party system and execute the clearing and settlement functions outside the traditional system.
- The process of authentication and clearing may be different based on the mobile technology used, say for example, on a cloud-based system.

Disintermediation across the Payments Value Chain

Disintermediation is a concern that is raised for card networks, acquirers and point-of-sale providers

We know that a fair number of industry participants as well as investors are quite concerned about the threat of disintermediation as mobile is introduced in the Payments Value Chain. This disintermediation question is asked about the card networks; about acquirers and most certainly about the point-of-sale (POS).

We address the question directly and indirectly in a few different parts of the report but since it is such a central question, we felt it important to pull together our thoughts as a part of our response to the first question on business models.

Our view is the threat of widespread disintermediation across the value chain seems to be overblown

Our general view is that it would be normal for some incumbents to have a less defensible position as mobility increasingly becomes a more common way to "do payments". But the threat of widespread disintermediation across the value chain seems to be overblown. Partly, our view is based on our experience studying similar phenomena in other markets previously. In this regard, we note that in the 1998-2001 timeframe there was considerable fear that Internet Consultants would replace traditional IT Consultants, but instead most of the pure-play Internet Consultants no longer exist while their capabilities have survived and thrived and are now being provided by those same traditional IT Consultants. There are other examples within the technology sector where some of the larger processors are the by-product of extensive M&A over time as they have used their balance sheets to absorb the capabilities of potential disruptors. Even in the retail sector, we see several examples of successful eCommerce strategies being adopted by retailers to combat the real fear of disintermediation. Partly, it is a matter of competitive response and time-frame, i.e., incumbents are not sitting idle and the pace of change is often measured in years, which implies that incumbents often have time to react. And finally, we note that the incumbents have access to significant capital to defend their turf. Eventually, it seems quite likely that the disruptors will probably succeed more in influencing incumbent behavior – sometimes by being acquired by them – rather than by becoming a large independent player themselves.

What impact might the Merchant Consortium have on this analysis?

The Merchant Consortium (MCX) is an entity that was set up recently by notable merchants. Its membership roster and merchants' position in the commerce value chain warrants that MCX be taken seriously. Unfortunately, so far there are few available details on this merchant-led initiative, but we do know that the intent is to lower interchange-related costs. MCX envisions a number of consumer-use cases including payments, discounts, promotions and marketing while minimizing the need for merchants to invest in new technology and point of sale equipment. The MCX platform will also take a "hands-off" approach to retailer's transaction and customer data.

However because MCX has not provided any specific details beyond the generic goals stated above, we are left with little choice but to indicate that should the merchant initiative succeed it would obviously negatively affect our view on disintermediation for all the players except possibly the POS providers and possibly acquirers, who would still be in the mix for all transactions. To the extent a certain percentage of transactions would flow over the Merchant network, they would probably not flow over the traditional card networks and so the networks and issuers would be negatively affected. But there are significant uncertainties associated with this outcome, which we regard as unlikely in the near-to-intermediate future.

What about potential Card Network disintermediation?

We believe it is unlikely that the incumbent card networks will face any significant level of disintermediation

We believe it is unlikely that the incumbent card networks will face any significant level of disintermediation from Mobile Payment disruptors. Many of the newer participants will continue to rely on the incumbent processing rails (i.e. the traditional structure) as their play is often an attempt to grow an adjacent market (advertising, offers, etc.). We point out in other parts of this report that Card Networks have set up their own relationships and investments to grow in these adjacent markets and be a player with non-interchange-based models in addition to the traditional interchange-based model.

Online/ offline (e-commerce/ bricks and mortar) business model convergence is also an area where disintermediation fears can arise. It is important to understand that this is largely a developed market question since emerging markets do not have much by way of online channels. But even in a well-developed market like the U.S., the online channel, while large in absolute terms, represents less than 10% of the overall spend. So it would seem that the incumbent networks would have something to say about online/ offline convergence.

Finally, there will clearly be some situations internationally where a bank issuer and/or a telecom company go to market with a Mobile Payments offering without a card network, but such emerging market potential is large enough that a Card Network can also go to market with a similar relationship (for example, MasterCard has tied up with Telefónica to penetrate the Latin American market). So, at the most we can say there could be more competition in the future for the incumbent card networks, but we would not extend this so far as to indicate disintermediation.

What about potential Acquirer disintermediation?

Many new entrants are considered potential disruptors especially at the extreme low-end of the merchant size spectrum

Many of the new market entrants such as Square, iZettle and LevelUp are considered potential disruptors in the Merchant Acquirer space. Such new entrants have been quite successful at the extreme low-end of the merchant size spectrum as the steady convergence of the online and offline channels also offers a sustainable growth opportunity to these players. These potential disruptors tend to bring greater pricing transparency, which is a positive change to the broader Merchant Acquiring market, in our view. At the same time the weaknesses of these potential disruptors are also obvious. They tend to lack processing capability – which is a multi-year investment that the traditional Merchant Acquirers have made – and they also tend to lack servicing and (sometimes) sales capabilities, making it especially to target larger merchants in a disciplined fashion. At the low end of the merchant size spectrum, such a serious lack of capabilities is not a disadvantage – many of these smaller merchants are being converted over from a cash-only economy to using cards – but larger merchants do expect a relatively full-service model.

What about potential POS provider disintermediation?

A “dongle” adapter is a smartphone attachment to convert it into a payment acceptance device

Given the proliferation of "dongle" adapters that convert smartphones and tablets into payment acceptance devices, disintermediation fears in the point-of-sale (POS) device market are running high. In the near-term, we would expect most disruption to continue to occur among the smallest merchants where simple pricing, installation and convenience can outweigh the benefits of a more robust solution. At the high end, we believe POS vendors remain well-entrenched at the moment given the importance of security, reliability and low-cost transaction types such as PIN debit. Over time, existing POS vendors will have to adapt to these changing times and to work with new forms of payment, enhance product functionality / features (e.g. mobile POS) and perhaps offer a broader-array of payment-related services to make their relationships stickier.

What about Card Issuers?

There seems to be no direct disintermediation worry for card issuers in terms of the relationship with the consumer. However, if the "Merchant of Record" model gains significant traction, the issuer loses their end-to-end view of the transaction, which can impact their ability to service the consumer effectively. It can also severely limit the issuer's role and usefulness with newer “offers-based” business models because the issuer does not know where the card holder shopped.

II. Incumbents and Their Actions

What are incumbent card networks doing to adapt to the rapid changes brought by Mobile Payments?

The question of Mobile Payments-led disintermediation has arisen in multiple parts of the ecosystem, including for the larger card networks. Although the data does not support that existing card network rails are at risk of material disintermediation, there is no question that card networks have to adapt to the emerging market situation.

All the major networks have invested in the online arena in addition to offline; they have built partnerships with other market participants (sometimes implying a different strategy in different geographies) and they have invested in non-traditional models, both in terms of technology and in terms of developing adjacent markets, such as targeted offers.

Earlier, we included key mobile payment headlines from the past 6-8 months and included commentary on what today's major industry participants are doing in the space. However, we feel it is worthwhile to delve a little deeper into the actions and strategy of the largest players in the payments market today.

Visa

Visa's ultimate goal is to drive more volume and seems committed to a B2B model

Visa's ultimate goal with Mobile Payments seems to be to drive more volume through VisaNet. Visa seems committed to a business-to-business (B2B) model, and this is reflected in multiple areas – organic initiatives like V.me; acquisitions such as CyberSource, PlaySpan and Fundamo; alliances like the recent one with Vodafone as well as with Monitise; and venture investments such as Square.

Visa's actions seem intended to open up multiple fronts.

- CyberSource was a gateway for online merchants and gave Visa a significant share of the e-commerce dollars transacted in the U.S. They deepened this capability with PlaySpan, a virtual goods monetization platform.
- Internationally, Visa's acquisition of Fundamo – an emerging market mobile financial services platform provider – set the stage. Through the use of their network, Visa is enabling multiple closed loop mobile operators to become interoperable. In addition to offering many payment functions, Visa will utilize Fundamo to offer a prepaid card in emerging markets. At the same time, Visa also announced an alliance with Monitise, which provides mobile banking and payments technology to customize mobile applications and develop a suite of mobile applications. Earlier this year, Visa also announced a worldwide alliance with Vodafone to load its prepaid cards on Vodafone phones and develop a Vodafone-branded mobile proposition. Obviously transactions will flow over the Visa network.
- Visa seems to be technology-agnostic and supports NFC in many ways. It has licensed PayWave to the ISIS consortium and is working with Intel to ensure that its processors that contain NFC technology are PayWave compatible. It is also working with Oberthur to develop its own Trusted Service Manager (TSM) infrastructure – this TSM is compatible with other bank-developed TSMs.

- In late 2011, Visa announced its mobile wallet V.me, which incorporates click-to-buy functionality from its PlaySpan acquisition. Visa is working with both banks and large merchants to expand and accept V.me as an online payment option. For example, they are working with large bank issuers to have bank customers card information automatically loaded into the digital wallet from their online bank account. They recently announced such an initiative with PNC Bank and we expect more announcements in the near-term. On the merchant side, Visa is actively working to have large online merchants load V.me as a payment option on the merchants' website.

- Visa has also made an equity investment in Square, the fast-growing payments company that, among other things, allows smaller merchants to accept credit cards through a small square device attached to a merchant's mobile phone.

MasterCard

MasterCard is also trying to drive more traffic over its network and is committed to B2B

Similar to Visa, MasterCard's goal is to drive more traffic over its own network, regardless of the source of the traffic (traditional, e-commerce, m-commerce, etc.). It is committed to a business-to-business (B2B) model and has taken multiple actions to build out adjacent domains, in addition to its traditional markets.

- A key centerpiece of MasterCard's alternative payments initiative has been their digital wallet PayPass, similar to Visa's V.me. PayPass will allow a card holders credentials to be loaded on the web and used for online or Mobile Payments. The company is pursuing a white label approach which enables bank issuers to develop their own digital wallets that seamlessly link in to MasterCard's digital wallet. To leverage their digital wallet and grow mobile payments, MasterCard has entered into a venture with Google and a large bank issuer.

- From a prepaid card distribution standpoint, MasterCard is at the front-end of an expansive, multi-year relationship with Western Union. In our view, prepaid cards are increasingly likely to move into a mobile world – in parallel to the dominance of prepaid as a funding source in the telecom end-market.

- MasterCard has entered into an agreement with Telefónica to lead the development of mobile payments in Latin America. In addition, MasterCard recently announced an agreement with Britain's largest mobile phone operator, Everything Everywhere, to grow mobile payments in the UK and Europe.

- MasterCard has also acquired TruAxis, which should accelerate its efforts in the "targeted offers" arena.

American Express

American Express is entering new market segments and building out new geographies

American Express has invested almost $500 million in the past few years to acquire and build digital payment capabilities. Similar to Visa and MasterCard, American Express is also entering new market segments and building out new geographies. Engaging with social media is a key part of the strategy as well and the key manifestations of this strategy are listed below.

- With Launched Serve, their digital wallet and prepaid platform, card members can load their credentials on the web to be used for online and mobile payments. This is intended to be a scalable global commerce platform and is built off the technology from its 2009 acquisition of Revolution Money. Focusing on enabling partners (particularly telecom carriers) seems to be one way in which American Express is extending its payments solutions.

- Unique to American Express, they have actively pursued agreements with numerous social networks including Twitter, Facebook, foursquare and others, to effectively create a virtual currency with their rewards program.
- American Express launched a $100 million venture capital fund to invest in payments technology.
- The company is growing its global mobile effort agreements such as Lianlian Group that will help bring mobile payments to consumers in China. American Express also took an equity stake in Lianlian Group.
- American Express believes that because it operates a closed-loop network, it has an advantage in the "targeted offers" market adjacency because it has both card member financial data and transaction level data. They believe this richer data puts them at an advantage around couponing, offers and other initiatives.

PayPal

PayPal took an unconventional route and is attempting to be a disruptor in the market

PayPal is clearly attempting to be a disruptor in the market. It took an unconventional route to enabling mobile payments (1) by preferring to introduce a cloud-based solution (as opposed to NFC) for its mobile wallet; (2) by focusing on using the Automated Clearing House (ACH) as a means to load these wallets and (3) by introducing a different way to check out. It is also simultaneously building a significant off-line presence to complement its leadership status in online payments.

- PayPal has built on its successful mobile payment pilot at Home Depot to recently announce a nationwide rollout of the capability at Home Depot. Several other retailers have also now signed up. PayPal's Wallet primarily uses a WAP-based approach (cloud) for the transaction.
- PayPal supports carrier-direct billing through its acquisition of Zong.
- In the area of targeted offers, it plans on using technology based on its acquisition of Where.com (geo- or location-based offers); Milo (in-store inventory) and RedLaser (bar code scanner for comparison shopping).
- PayPal is enabling card acceptance at the merchant as well, with PayPal Here.

III. Targeted Offers & Data Ownership

How will the adjacent "Targeted Offers" market develop? Who owns the underlying data?

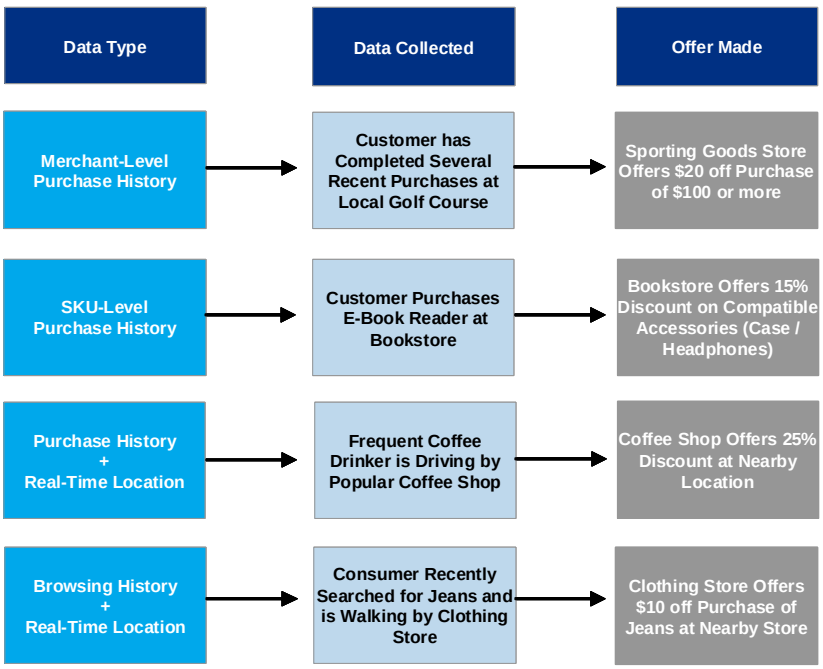
Given the rising importance of alternative offer- or advertising-based models, we believe it is important to answer a few basic questions including: What kinds of data are generated in a typical retail transaction? Which participant has access to what data? Who owns the data eventually?

In this section we attempt to answer these types of questions. Data ownership-related regulation is a separate issue and partly addressed in a subsequent section.

Given a bigger advertising industry, financial information from a transaction is seen as valuable and a generally untapped resource

When a purchase transaction is made in a physical store through an electronic (mostly card-based) form of payment, there is an array of data about that transaction, which is shared to varying degrees across multiple parties. At the most basic level, there is data related to who made the purchase, what was purchased, in what store, for how much and how it was paid for. Given a bigger advertising industry trend toward more tangible return on investments (ROIs) that are based on knowing more about targets, such financial information is seen as a valuable and a generally untapped resource by the relevant companies.

Figure 7. Examples of Targeted Offers Generated from Offline Purchase Transactions



Source: Citi Research

A target offer is an advertisement that is specifically designed for a consumer based on personal information collected about that person

Before getting deeper, we believe it would be useful to provide some background on what a targeted offer is. Essentially, this is an advertisement that is specifically designed for a consumer based on personal information collected about that person. It can include where they normally shop, what they normally buy, where they currently are or what their demographic profile suggests they may buy. This is similar to how online advertising works, with display ads often based on your recent search or browsing history. The vast amount of offline spending that occurs is a largely untapped market and can provide significantly meaningful information about what ads may be relevant for a consumer. Figure 7 above shows some examples of how a targeted offer may come about in different situations.

Ownership of data is a big question and is likely to be decided by the consumer and/ or regulation

The question of who "owns" the data is tricky - ownership of the data is likely decided by the consumer and/or regulation, but seeing which data is available to each participant is a good starting point.

- Access to the full array of data is primarily limited to private label credit card providers that serve as the issuer, network and merchant in a single transaction. Such providers are well-positioned to make targeted offers, though the scope of this offering is limited to singular programs.
- Card issuers (banks) may seem well-positioned given their direct access to consumers, but they lack SKU level data, which can be very useful. The scope of their information is also narrow in that they only know what is spent on their cards, but not about other issuers or about the use of cash-based spending.
- Merchants have the richest SKU-level data, but often lack direct access to consumers and have a narrow view of spending only at their stores.
- Card networks have the fullest view of broad payment trends given their vast volumes, but they lack direct access to consumers and to SKU-level data.

Of course, advanced analytics can help these and other participants (including newer participants such as technology and telecom companies) get an edge and the holy grail of "full SKU-level data" may not eventually be required. But because so few participants have access to the full spectrum of data in meaningful size, partnerships and sharing are likely to be the most impactful on a longer-term basis. Still, given the unknown value and prized potential of this data, we would anticipate partnerships to develop cautiously over a multi-year timeframe.

Suppose a participant has the right data – then what? Having consumer data is only one part of the equation. Using it effectively is equally important, if not more so. We believe eventually a consumer will get offers only if they opt-in. Once they opt-in, they can quickly get overwhelmed with a high volume of irrelevant offers and start treating all offers like spam, thereby diminishing its value. So it is really important to make context-sensitive and relevant offers to sustain consumer engagement.

Summary of Data Generated; Who Can Access What Data?

Figure 8 summarizes the key categories of data generated in an electronic payment transaction in an offline retail setting. We also have sub-sections which discuss each of these categories in greater detail and highlight some of the advantages and disadvantages of each party in the system.

Card Networks & Acquirers

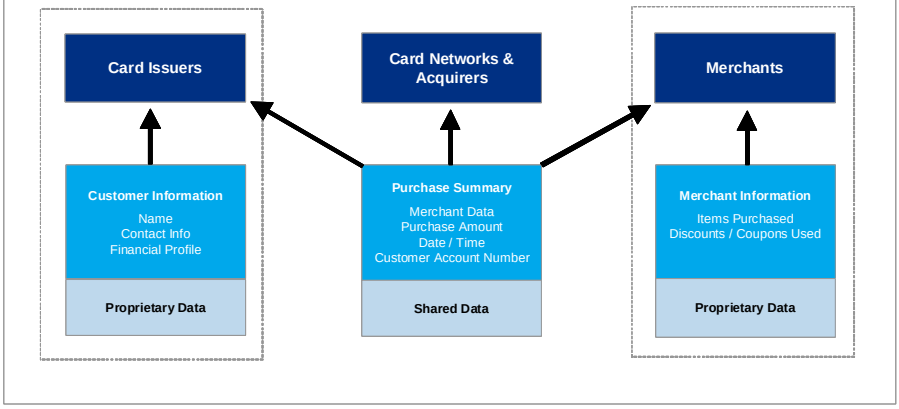
Sample Companies: **Visa, MasterCard, First Data, Vantiv, Global Payments, etc.**

Advantages: Volume of data collected is not limited to particular issuer or merchant, so can be significantly more voluminous than other players, particularly for Visa and MasterCard.

Disadvantages: (1) Limited direct access to consumer, as of now. (2) No visibility into SKU level purchase data. (3) Growing presence of e-commerce providers (like Amazon) that become the Merchant of Record limits the usefulness of purchase summary information.

Our Take: *We believe the networks (V and MA) can potentially monetize their vast troves of purchase information, but may need to form partnerships with their issuing partners or develop their own electronic wallets (V.me, PayPass) in order to gain direct access to consumers.*

Figure 8. Summary of Data Generated and Which Parties Have Access to What Information



Source: Citi Research

Card Issuers

Sample Companies: **American Express, Chase, Bank of America, Citi, etc.**

Advantages: (1) Direct access to consumer / Material information on their financial profiles. (2) Knowledge of consumer spending patterns down to merchant level.

Disadvantages: (1) No visibility into SKU level purchase data. (2) Data limited only to purchase made on their cards. (3) Growing presence of e-commerce providers (like Amazon) that become the Merchant of Record limits the usefulness of purchase summary information.

Our Take: *We believe card issuers are well-positioned to capitalize on their data given their direct access to consumers and usable purchase summary information. Issuers are experimenting with monetizing this data, e.g., American Express has a partnership with various social networks (Facebook, Twitter); third-party vendors like Cardlytics work with banks to make offers to their customers.*

Closed-loop vs. Open-loop – Does a closed-loop system like American Express have an advantage? This is an interesting question because theoretically a closed-loop system has access to network/acquirer data (i.e., data that cuts across merchants) and also issuer data (i.e., data on the consumer). This seems to be an advantage over participants that are just acquirers or just networks or just issuers. However, we also note that a closed-loop system still does not have access to merchant-data or SKU-level data. In other words, all these players seem to need information beyond what they already have and supporting our basic premise that either heightened partnerships or superlative analytics are required to make intelligent context-sensitive offers.

Merchants (Offline and Online)

Sample Companies: **Wal-Mart, Kroger, Walgreens, Home Depot, Amazon, etc.**

Advantages: Knowledge of what products were purchased and what coupons / discounts were used (response rate to advertisements).

Disadvantages: (1) No direct access to consumers unless part of a loyalty / private label program or an online merchant. (2) Data limited only to purchases made in their stores (including online).

Our Take: *Merchants hold the most detailed information about what actual products are purchased in their stores, which can potentially be valuable. However, they need to gain direct access to consumers in order to market to them either through partnerships or through their own loyalty programs. Data limited to purchases within their stores is a disadvantage, but the data they have is still useful. It remains to be seen what form of cooperation the merchant consortium MCX will enable in the future, but we doubt that it could extend to competing retail companies sharing information on their customers.*

Online vs. Offline Merchants: It is worth pointing out that e-commerce providers, like Amazon, are not currently playing on a level playing field relative to their offline peers. Online merchants have a distinct competitive advantage because they "know" their customers through a combination of browsing / search histories, wish lists, contact information and even payment information, in some cases. This level of detail is very difficult for offline merchants to attain, though partnerships with payment-related companies could help going forward.

Private Label Credit Cards Providers

Sample Companies: **GE, Citi, Capital One (HSBC), ADS, Chase, etc.**

Advantages: Significant details on data front provide a competitive advantage versus other players, including direct access to consumer and merchant data.

Disadvantages: (1) Only have access to purchase volume at a specific merchant. (2) Need permission to use this data and monetization benefits are unclear.

Our Take: *We believe private label card providers hold significant potential to offer relevant offers to loyal customers for specific merchants given the level of data and access they hold. However, the utility is currently limited to specific merchants and the direct benefits to the private label card providers could be limited to increased spending volume at a client since it is unclear if direct monetization is possible. That said, we suspect that retailers are exploring ways to potentially share this data across programs to make it more useful as part of their mobile payments initiative.*

Technology Providers

Sample Companies: **Google Wallet, ISIS, PayPal, Square, Groupon, Various Social Networks, Apple, Sybase (SAP), etc.**

Advantages: (1) Direct access to and interaction with the consumer. (2) Real-time location information and mobile web browsing histories (or app history) can be a differentiator in terms of deploying an analytics engine.

Disadvantages: (1) Unclear what usable information they have access to. (2) Small payment volumes on these programs currently limit the usefulness of anything they may have – will take time to build this up.

Our Take: *It is early days for many of these offerings, but the business model of these "payment" businesses is viable if the data they capture is accurate and usable. Given the limited volumes to date and potential necessary permissions from their partners to get access to the data, it will take time and much trial and error to figure this out. The power of the real-time location-based data may be a key differentiator of these offerings on a longer-term basis.*

We note that many of these providers can get more information by becoming the Merchant of Record in the payments value chain and thereby have a claim on purchase data, which they can then use for targeted offers.

IV. Ecosystem Evolution

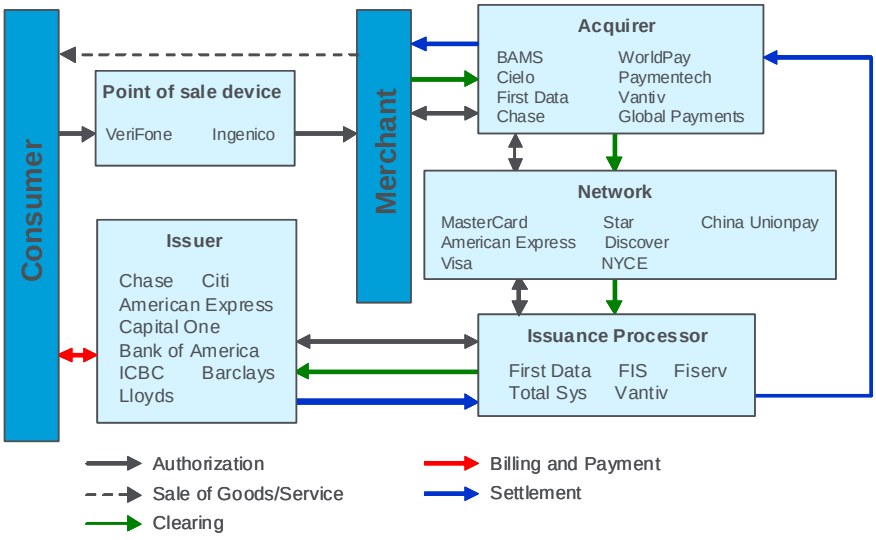
What will the Mobile Payments ecosystem look like?

In this section we discuss how the traditional payment ecosystem and process flow is affected by Mobile Payments. Mobility clearly complicates the picture because there are more steps, more roles and more role-players in the ecosystem.

We also highlight some of the newer role-players and provide details on how the payment transaction flow works based on different technology models.

A good starting point is to consider what the current traditional card payment ecosystem looks like and how it works. Figure 9 below illustrates this. Obviously, we are not presenting a comprehensive list of participants – just a well-known list of role-players that should help with gaining an understanding of the traditional system.

Figure 9. Traditional 4-Party Ecosystem and Process Flow



Source: Citi Research

Mobile Payments results in both new classes of participants and new players when it is introduced into a traditional retail transaction

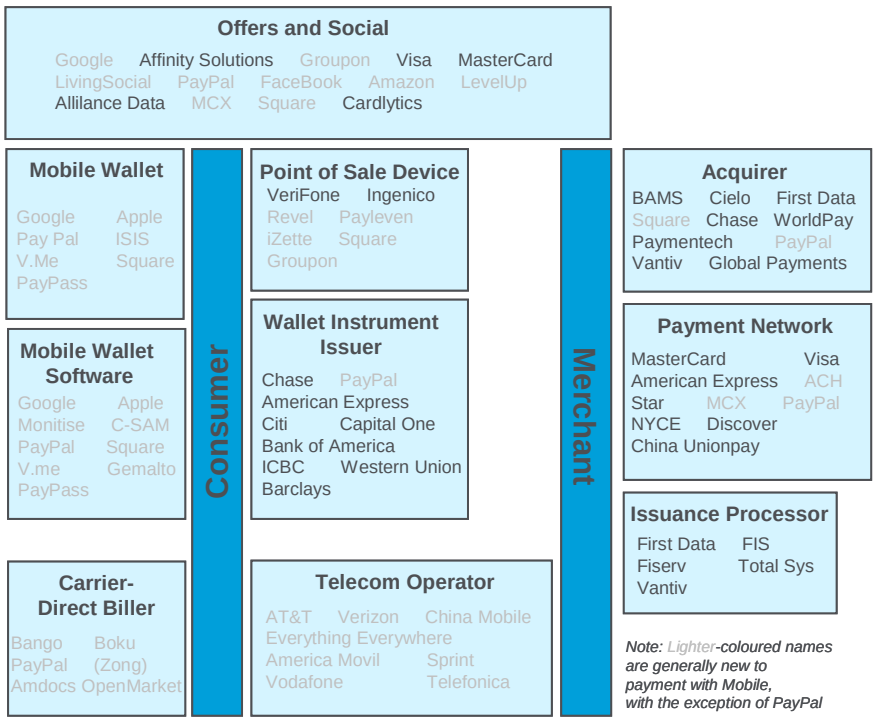
When Mobile Payments are introduced into the traditional retail POS process illustrated above, it results in a much more complex outcome. This is because, in addition to the traditional 4-party set-up – which includes the consumer, the merchant, the issuer and the acquirer – new classes of participants (roles) are introduced. Further, many new players are introduced into these roles, both in the new mobile-only roles and in the traditional issuer/ acquirer positions. Even more interestingly, there is a potential for new networks to be introduced. Figure 10 below illustrates our point – this is not a comprehensive list of participants but notice there are significantly more roles and role-players than before.

Mobile Payments creates new roles due to:

- The integration of social/commerce functionality into the purchase transaction; and
- Changes in how the purchase transaction itself is executed.

Figure 10 below provides an overarching picture of the different roles (new and traditional) and includes several representative role-players (again, new and traditional). Figure 10 does not show us the process flow, which depends on the type of purchase transaction. We found it easier to illustrate these using examples of various purchase transaction choices – NFC, Cloud, Carrier-Direct, QR Codes and SMS – to clarify how the underlying transaction works. These are found subsequently in Figures 11-16 below.

Figure 10. Emerging Mobile Payment Ecosystem – More Roles, More Role-Players



Source: Citi Research

Figure 10 above shows the following new roles.

- **Offers and Social –** This goes to our earlier point on the integration of "Social / Mobile / Local" in the new paradigm. It is also inclusive of the newer business models which rely more on targeted offers than on the traditional interchange model.
- **Mobile Wallet and Mobile Wallet Software –** We separated these subcategories primarily because the two functions do not have to be the same. Some mobile wallet initiatives are more about the brand – who will own the relationship with the consumer? – but there are clearly technology players that are happy to white-label their approach with better-known brands.
- **Telecom Operator –** Given the global promise of Mobile Payments depends at least partly on telecom operator penetration into markets that banks have been unable to penetrate economically, it is small wonder that most telecom operators have Mobile Payment initiatives. Most of these telecom operators do seem to favor an NFC alternative (with credential information stored on the phone's secure element) as their preferred means of doing retail POS transactions.

- **Carrier-Direct Billers –** This is an already-successful category of Mobile Payments wherein the transaction appears on the consumer's telecom bill. It can be potentially used as a retail POS solution but is mostly used to purchase phone-specific "stuff" such as in-game paraphernalia for mobile gaming.

Highlighting some of the newer role-players in Mobile Payments

New and existing players are increasing their offerings in the Mobile Payments

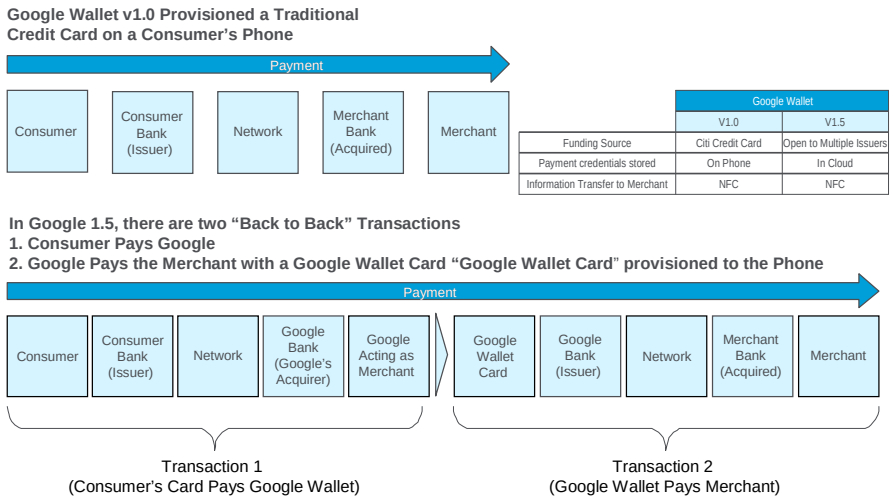
Beyond the above new roles, we also have new role-players in roles that existed in the traditional world. Clearly, the changing point-of-sale device market is a focal point in terms of recent news-flow. The list of companies that offer a smart-phone attachment ("dongle") to convert it into a payment acceptance device is alarmingly long and growing every day. Square led the charge, of course, but in here one finds a multitude of new and existing players such as NCR, VeriFone, iZettle, mPowa, Intuit, Groupon, Revel and payleven – we believe this last name was one of the first to enable the "dongle" to accept chip-and-pin transactions in Europe.

We emphasize that there are several players like PayPal and Square that can affect the merchant acquiring market. While PayPal historically acquired small merchants and Square is mostly focused on micro-merchants, recent partner announcements make it clear that they have bigger ambitions. In fact PayPal's strategy is summarized quite well in their recent earnings release…."PayPal's offline initiative follows a three-pronged approach: to solicit direct merchant relationships; to partner with Discover to access its 7 million retail locations in the U.S.; and use a direct and indirect approach to distribute its small business payment solution, PayPal Here, both domestically and internationally. "…this clearly implies heightened competition for merchant relationships. There is also a fear that eventually, the acquirer's "cut" of the merchant discount rate – the percentage of the transaction that merchants cumulatively pay issuers, acquirers and networks – could diminish. The growth of "no interchange" alternatives that rely on advertising- or offer-based business models support this notion that the traditional acquirer model could be under attack.

How Might an NFC Transaction Work? Example: Google Wallet

Figure 11 below describes the evolving process flow for NFC-based Google Wallet. Google Wallet started with a pure NFC-based transaction (we will call this Google Wallet v1.0) that followed the normal 4-party path of a traditional purchase transaction although it still offered integrated social/commerce capabilities. However, the narrow choice of issuers and the constraints of a single phone network phone network combined with a greater desire to control the data-flow associated with the transaction has led to what seems like a more inclusive approach, which we call Google Wallet v1.5. To be clear, both versions use NFC to transfer the relevant payment information to the merchant – the difference is in where the information is stored. In the later version, the information is stored in the cloud and the potential user has a better ability to opt-in.

Figure 11. Evolving Google Wallet Process Flow

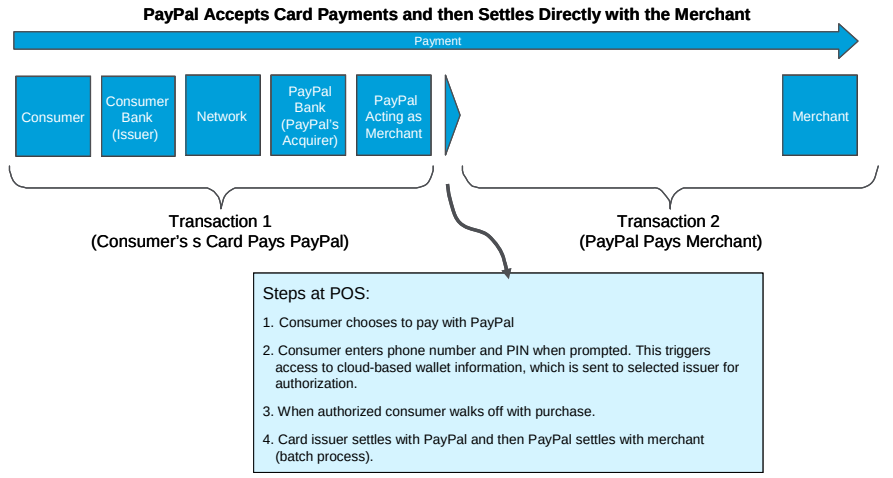


Source: Citi Research

How Might a Cloud-based Transaction Work? Example: PayPal

Cloud-based wallets do not require a merchant to make a major POS infrastructure investment. Of course, the merchant does have to ensure access to cloud-based information, which may imply non-POS investments are needed. Figure 12 provides a basic example of how PayPal's cloud-based system works.

Figure 12. PayPal Mobile (Digital) Payment Process Flow – Example of Cloud-based Mobile Payment



Source: Citi Research

There are a couple of points worth noting: (1) PayPal is always the merchant of record in a PayPal transaction. (2) The funding may occur via ACH or use a traditional card network, but the actual transactions happen on PayPal's own network or "rails".

Description of Cloud-Based Square Wallet

Square is an example of a cloud-based wallet

Square, which has received a lot of attention as a potential disruptor in the payments market, operates a model fairly similar to PayPal's model, in terms of payment flow, but there are key differences on the back-end.

On the front-end Square, like PayPal, is a third-party merchant aggregator. It acts as the "merchant of record" on behalf of its customers and then separately routes the funds to its merchants. It lacks the ability to process these transactions – Chase PaymenTech does Square's processing. One difference between Square and PayPal is the funding of the transaction on the consumer side. PayPal gives consumers multiple ways to fund their accounts, including cards, ACH (bank accounts) and cash (via MoneyPak or MoneyGram). Square, on the other hand, currently only funds transactions through traditional credit or debit cards. Also, Square's growth has largely been via word-of-mouth so far – it does not have a significant sales force to sign up merchants. Square also lacks meaningful ability to provide customer service to its clients – a factor that comes up more frequently in reviews of the service. These are not insurmountable obstacles and to be fair, it is worth discussing why Square has garnered so much attention.

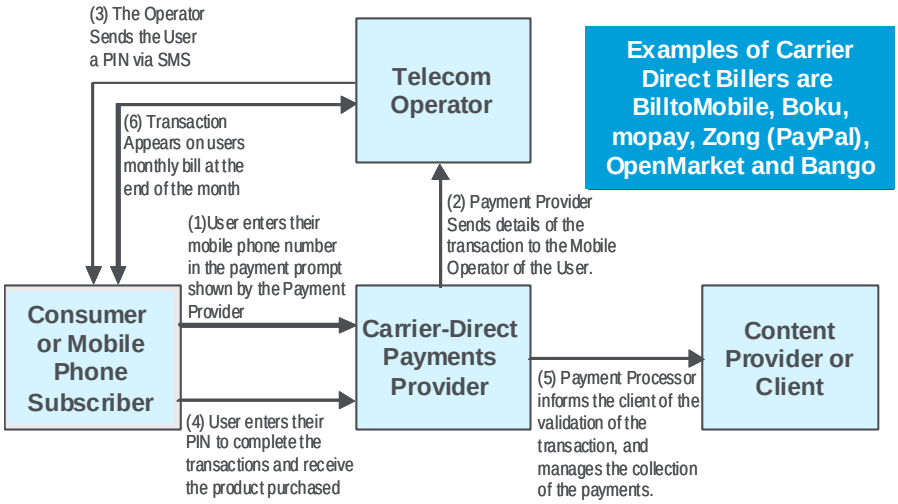
On the merchant side, the company has made progress attracting small merchants to its service by offering a simple pricing structure (2.75% for all transactions with the opportunity for volume discounts above $10,000 in charge volume) and allowing quick and easy signup with minimal hardware requirements (plastic dongle plugs into compatible smart-phones and tablets). This is clearly attractive to many of the smallest merchants, for whom the initial cost of making an investment in card acceptance infrastructure hitherto led to a decision to stay in a cash economy.

On the consumer side, Square's wallet application utilizes geo-fencing technology to detect when consumers are near a Square-enabled merchant – this allows them to build tabs prior to arriving and checkout using their name and picture, which shows up on the merchant's screen when that customer has entered the store. This is convenient for both consumers and merchants by potentially helping to minimize the time spent in the store – for example, a consumer can quickly pickup their lunch order rather than potentially walking out of the store because it was crowded.

How Might a Carrier-direct Transaction Work? Example: Boku

In Carrier Direct Billing, the purchase is charged to the consumer's phone bill. It does not require the use of credit / debit cards and bypasses both banks and credit card companies.

Figure 13. Boku Mobile Payment Process Flow – Example of Carrier Direct Billing Process Flow



Source: Citi Research

Figure 13 shows how it works. Note that the process uses two-factor authentication (in simple terms, a security check on two factors, in this case the fact of phone possession and the knowledge of the password) to ensure security.

Common use cases of this form of payments are smaller payments such as in-game purchases. Facebook recently introduced a facility called "Gifts", in which its users can use this method to send flowers or gifts to their friends on their birthdays or anniversaries.

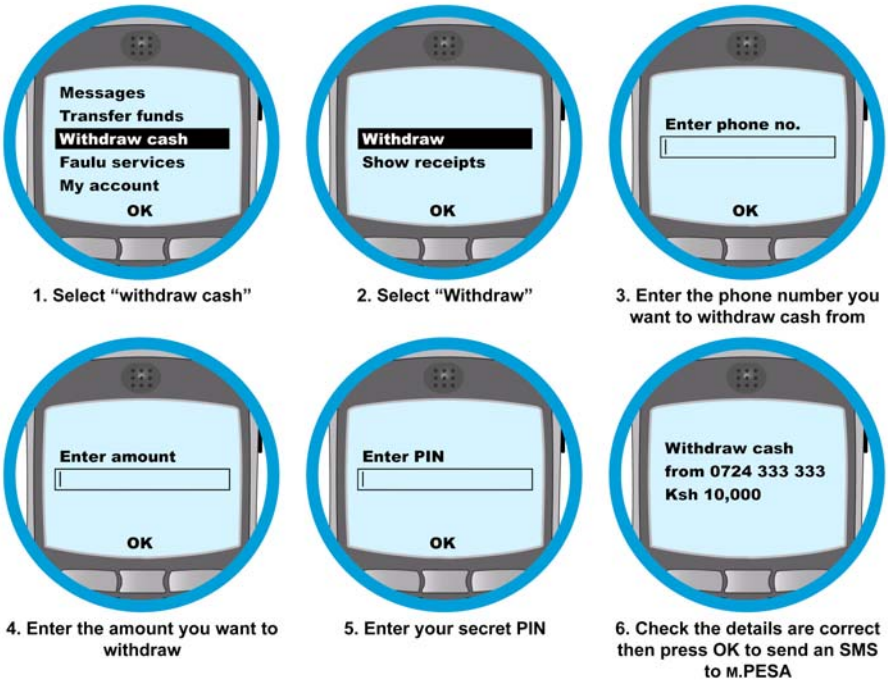
In a typical such transaction, the biller might keep 5% of the phone subscriber payment, while the telecom operator keeps 25%. The rest goes to the content provider or merchant.

How Might an SMS Transaction Work? Example: M-Pesa

M-PESA is the most successful SMS-type transaction service

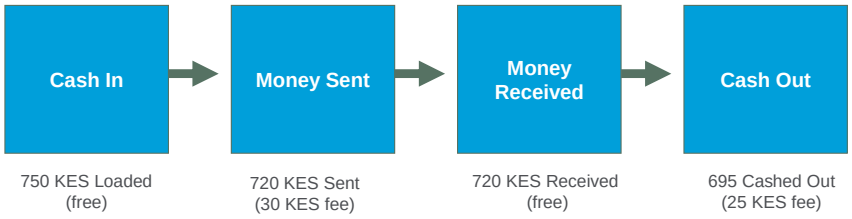
Using SMS-based Mobile Payments remains a widespread way to pay especially in emerging markets, due to the prevalence of feature phones. Figure 14 shows how the process works for M-PESA and Figure 15 illustrates the economics. Both figures are repeated from our original "Upwardly Mobile" report.

Figure 14. M-PESA Mobile Payment Process Flow – Example of SMS-Based Mobile Payment



Source: Citi Research

Figure 15. Economics of an M-PESA Payment



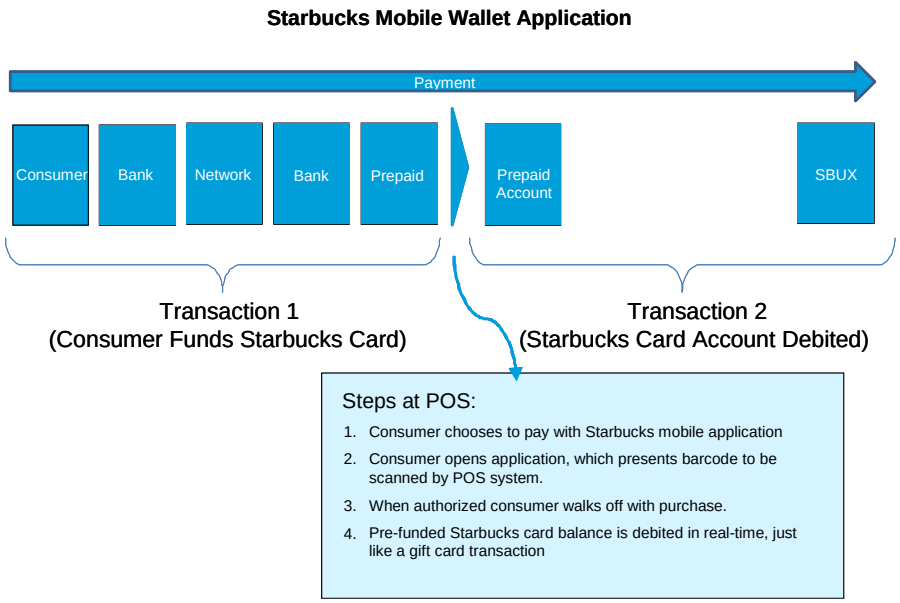
Source: Citi Research

How Might a QR Code Transaction Work? Example: Starbucks

Starbucks mobile wallet app is an example of a QR Code transaction

QR (quick response) codes are a form of barcodes that are being utilized in various mobile wallet initiatives to avoid the NFC-infrastructure delays. The most successful barcode based mobile wallet application is from Starbucks. As shown in the schematic below, the Starbucks system utilizes a traditional gift card funding mechanism where consumers pre-load a balance on their Starbucks card using a traditional credit or debit card. The balance on that account can then be used by scanning the barcode in store and the account is debited in real-time. There are other aspects to the mobile application, including loyalty rewards, transaction history, etc. that are aimed to drive repeat usage and interaction with consumers.

Figure 16. Starbucks Mobile Payment Process Flow – Example of Barcode-based Mobile Payment



Source: Citi Research

V. Technology Choice & Timeframes

Which technology is likely to win and become the global standard– will it be the early leader NFC (Near-Field Communications) or will cloud-based or other solutions win? When will the infrastructure be in place for widespread Mobile Payments?

The technology question has historically elicited an inordinate level of emotion, with strong arguments made for and against each type of enabling Mobile Payments technology. This passion seems to be tempered recently, maybe because industry participants now see an inevitable period of adjacent technology infrastructure rollouts.

Our belief is that eventually, technology is probably less important than the user interface and the ease of use, in terms of promoting consumer adoption. However, clearly certain technology choices imply a longer time-frame in terms of a full roll-out or implementation.

Technology Choices

The following list represents the range of technology choices available today to enable Mobile Payments.

- Near-Field Communication (NFC) was the presumed de facto standard as recently as 6 months ago. It allows a mobile device embedded with a NFC chip to send encrypted data to an NFC-enabled point-of-sale (POS) device. The first version of Google Wallet, ISIS and several pilots initiated by developed-country telecom operators use NFC technology. NFC devices often include a “secure element” which saves confidential data in an encrypted form – so, card and client information can be resident on the phone itself. NFC can also be used without a secure element – this has all of the convenience of "tap and pay" but security must be handled by an outside entity (i.e., in the cloud). The use (or lack thereof) of a secure element drives a lot of controversy because it is tied to the question of who controls the client relationship.

- Radio-Frequency Identification (RFID) is a similar technology to NFC and used in Japan and South Korea. It uses radio waves to transfer information from a RFID tag to a RFID reader. We do not discuss it further because even in Japan, there is a likely initiative to make it compatible with NFC.

- 2D Barcode or Quick Response (QR) Code technology uses two-dimensional barcodes to store unique information – typically an encrypted identifier of the user’s account. When the smart phone is placed in front of a scanner, this identifier is passed to the mobile payment system and then to the POS – initiating the payment transaction. LevelUp, Target and Starbucks (using mFoundry) are users of this method of payment.

- SMS technology is more useful in emerging markets since it can be used without smart phones. This technology uses text messages to transfer money. Kenya's M-Pesa uses SMS technology.

- Cloud-based technology uses the wireless internet to pass payment information from the consumer's phone to the merchant's POS servers, which then pushes information back to the consumer over a cellular and/or Wi-Fi network. PayPal uses this technology and it is also supported by the Google Wallet version introduced in Aug-2012.

- Carrier-Direct Billing – This is less of a technology choice and more of a process choice. We mention it here since it is also a way to make a mobile payment (and have the charge appear on the phone bill) but we discuss it further in the "Mobile Ecosystem" section.

Factors that Determine Timing of Infrastructure Rollout

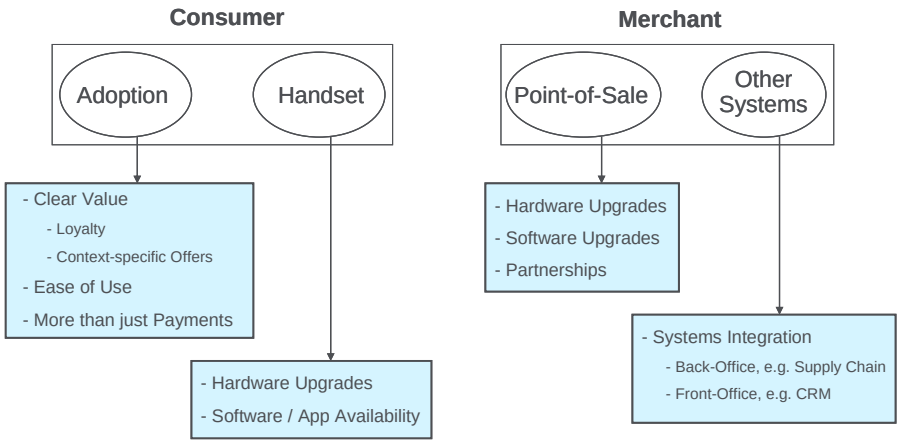
The question of infrastructure rollout has a merchant and consumer adoption aspect

Regardless of the specific technology, several milestones must likely be passed on both the consumer and merchant side on the road to widespread Mobile Payments adoption and they are illustrated in Figure 17 below. The question of infrastructure rollout has less to do with the consumer side of adoption in developed markets and instead is more based on the following points:

1. Changes that may be needed for the handset;
2. Changes at the POS; and
3. For multi-location retailers with a more sophisticated IT set-up, the Mobile Payments system needs to be integrated with other existing systems.

These three steps are not always needed, as explained after Figure 17 below.

Figure 17. What Needs to Happen for Mobile Payments Adoption in Developed Markets



Source: Citi Research

Note: The simplified picture above ignores, for now, complex “background” issues such as decisions on common standards, data privacy and data security.

The table below explains why none of the technologies offer a seamless and ready implementation path.

Figure 18. Regardless of Technology Choice, the Mobile Payment Path is Not Easy

	NFC	Cloud/ WAP	QR Codes	SMS	RFID
Handset Hardware Upgrade	Required. Software Upgrade May be Integrated	No	No	No	Required
Handset Softward Upgrade		Download App	Download App		Required
POS Hardware Upgrade	Required	No	Required. Software Upgrade May be Integrated	No	Required
POS Software Upgrade	Required	Required		Required	Required
Ecosystem Partnerships	Required	Required	Required	Required	Required
Systems Integration	Required	Required	Required	Required	Required
Marketing Rollouts	Required	Required	Required	Required	Required

Source: Citi Research

NFC Timeline

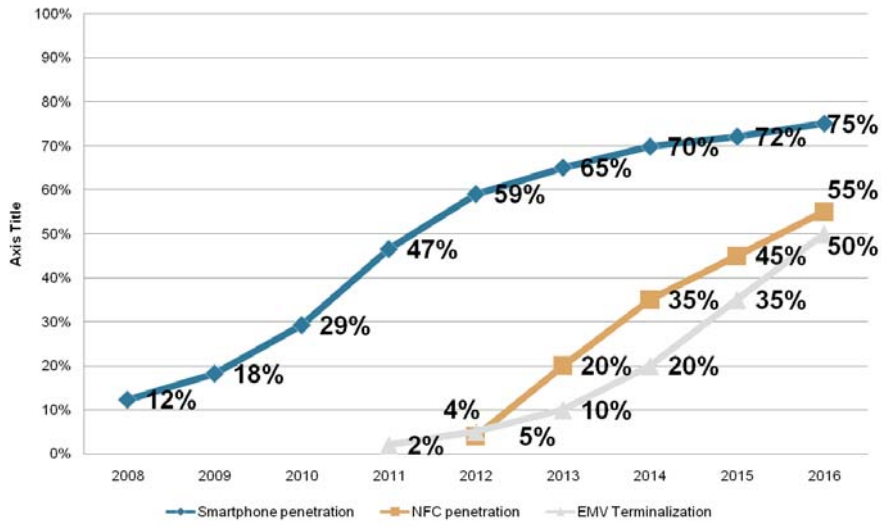
NFC remains the technology to beat in Mobile Payments…

Globally, NFC remains the Mobile Payment technology to beat, in terms of the number of pilot deployments and telecom operator and bank commitments. It has several advantages, including a strong pipeline of compatible phones / terminals, proven security and potential interoperability on a cross-border basis. Even Japan, which has an advanced RFID-based system, is taking steps to make its established system NFC-compatible. In the U.S., the initial version of Google Wallet and the upcoming ISIS deployment are examples of NFC deployments.

…but it has been losing momentum over the past six months

In spite of the above mentioned positioning, NFC does not have momentum in the market at the moment, especially not in the U.S. This is partly due to repeated delays at the telecom-driven Mobile Payment initiative, ISIS, and partly because the exclusive relationship the major U.S. telecom carriers have with ISIS impeded broader NFC-enabled phone availability and hurt the acceptance of the first version of Google Wallet. Lastly, the recent exclusion of NFC from Apple's iPhone 5 was a lost catalyst for NFC momentum, but patent submissions from Apple imply that they are still closely tracking the subject and its preference for global product uniformity can still favor NFC eventually.

Figure 19. Projected Adoption of NFC Phones and Terminals in the U.S.



Source: Mercator Advisory Group, Presentation at NACHA 2012

We believe material adoption of NFC can occur by 2015 in the US

Regardless, we still see a multi-year timeline for both handset and POS NFC upgrades. We believe material adoption of NFC can occur by 2015 in the U.S. The chart above shows a study by Mercator Advisory Group that expects NFC penetration of handsets to ramp to ~45% by 2015. The major card networks have all mandated the adoption of chip-based (EMV) cards in the U.S. by 2015 and EMV terminal penetration, which is a proxy for NFC, should ramp to ~35% in that same year in the US. The penetration rates are supportive of data recently disclosed by terminal manufacturer VeriFone. VeriFone has said that it has shipped over 1 million NFC-capable terminals in the past year (20-25% of its normal shipments) and EMV shipments in the US approached 30% in the past quarter. Given the normal 4-5 year replacement cycle for terminals, we believe Mercator's terminal projections seem reasonable. While those levels of penetration are clearly not representative of market saturation, we believe they are meaningful enough to declare the relevance

of mobile payments by 2015. However, it is important to sustain and grow these projected penetration levels because if the market perceives that NFC is losing momentum, then spending on NFC-capable phones and terminals will certainly fall short of these projections.

Cloud Timeline

Cloud-based solutions have emerged due to the slow pace of NFC adoption

Because of the slow pace of NFC adoption, the door has opened the door for alternative solutions. Cloud-based solutions tend not to require a hardware upgrade at the point-of-sale. Also a typical NFC conversation usually gives rise to a discussion on where the client data is stored – with telecom operators normally attempting to force the issue on storing such information securely on the handset so they can possibly control and charge for this information. In the case of a cloud-based solution, this discussion does not arise. Companies like PayPal and Square have successfully piloted cloud solutions, so we know it can work. One issue is whether the store signing up for a cloud-based solution has always-on broadband and / or Wi-Fi coverage – if it doesn't, it obviously implies a cost for the merchant to implement the cloud-based solution. Lastly, security and interoperability are issues as well.

Considering all the above factors, a cloud-based solution can have a quick time-to-market – perhaps as little as 12-24 months – and it certainly avoids the handset upgrade cycle issue one runs into with NFC.

QR Code Timeline

QR codes do not require new hardware on the consumer side, but merchants need to implement changes

QR codes typically do not require new hardware on the consumer side of the equation, but merchants do need to take steps to implement the new payment system. This includes a software upgrade in the case of cloud-based solutions and in the case of hardware-based solutions a QR code reader is required. The QR code that is being read is relatively easy to produce but a retailer-by-retailer roll-out of this technology can still take a few years. Starbucks, the poster child for QR code technology usage, piloted the solution for more than 15 months before spending another 8-12 months to roll out the technology. Of course, if this technology takes hold, an industry association would likely need to set up standards so the implemented technology can be interoperable and this process can itself take a couple of years to complete.

SMS Timeline

SMS is currently the most successful technology in terms of deployment track record and uptake

SMS is currently the most successful technology in terms of a track record of deployment and uptake in emerging markets. Kenya's M-Pesa is based on SMS messaging. Also, Citi's alliance with America Movil, Tran$fer, intends to be SMS-based, at least initially. Of course, while SMS has proved successful for person-to-person transfers and for small business payments, it is not clear if it can work at scale for large, multi-location retailers.

SMS-based payment technology is proven and it requires little set-up on either the user or the merchant end. However, even here regulatory changes need to be made, the program needs to be rolled out, an infrastructure for funding of accounts and reloads needs to be deployed and an appropriate IT backbone needs to be set up. This can mean that a rollout in any given country can take several months to a year.

VI. Global Standards & Regulation

Will a global Mobile Payment standard emerge to address Regulation, Security and Privacy Concerns?

For Mobile Payments to achieve widespread adoption, consumers and merchants have to trust the system. To build this trust, there needs to be at least country-level standards. Eventually to achieve greater ubiquity, portability and interoperability, we need to move towards regional, and eventually towards global standards.

This is not just about big issues such as data security and privacy. Rules are needed for normal operation and also to handle "day-to-day" exceptions.

The question to ask is whether we should be seeking a single global standard for Mobile Payments

It may take a while for a single global Mobile Payments standard to emerge. Indeed, the better preliminary question to ask may be whether seeking a single global standard is appropriate at this stage. After all, we do not have one uniform standard for telecom or handsets; economic and regulatory conditions are quite different from country to country, and so on.

Earlier in this report we discussed the competing technological standards that are emerging. Other broad areas that require at least local standards (to start with) include financial regulation, data security and privacy.

We believe consumer protection is important but determining the regulator is complicated

Why is regulation important? We believe consumers will care about whether they are protected from financial loss if their account is hacked or if a fraudulent transaction occurs. It will be important for a consumer to know what her recourse is, in such situations. Do the same consumer protection rules apply as in the case of traditional credit or debit card payments? Or should the consumer worry that the protections are more similar to those regulating their phone bill? In the U.S., federal rules tend to govern card-based transactions but generally state laws govern mobile phone bills. Depending on the parties involved, there are five financial regulatory agencies in the U.S. that could be involved in a financial transaction, including the Federal Reserve System (FRS), Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), the National Credit Union Association (NCUA) and the Consumer Financial Protection Bureau (CFPB). Also, the Federal Trade Commission (FTC) and the Federal Communications Commission (FCC) may be involved as it relates to consumer protection and the use of mobile phones.

No one regulatory group currently controls or writes regulation for the Mobile Payments industry

While there are no specific regulations tied to the Mobile Payments industry to date, current regulations and laws clearly do apply depending on the underlying payment methods used in a transaction (credit, debit, prepaid, ACH, etc.) and the customer type (e.g., consumer or corporate). It is worth noting that there are many industry participants that are held to different standards and have different levels of knowledge about the current regulatory environment. Banks and non-banks clearly have different rules. But even among financial institutions, there may be different rules for prepaid cards (which can be a central idea as far as the funding of Mobile Payments is concerned) and for regular credit and debit cards. As a result, we have a fairly complex and relatively uneven regulatory environment for this burgeoning industry.

We expect regulation to be a focal point as the industry grows

A July 2012 report from the Federal Reserve Banks of Boston and Atlanta said that recent meetings between regulatory agencies and industry stakeholders led to the conclusion that there wasn't any immediate need for additional regulation given the early stages of the industry at this time. Over time, we expect Mobile Payments to

be more of a focal point for regulators in the US as the industry grows, though it could be more reactionary than proactive based on current trends. It is our view that appropriate consumer protection regulation can clearly help the adoption of Mobile Payments. Additionally, we agree with a July 2012 report from the Federal Reserve Bank of Kansas City (authored by Fumiko Hayashi) that the combination of regulation and better mobile-specific technology such as dynamic authentication, multi-layered password protection and authentication by facial recognition can actually become a positive factor that helps consumer adoption rather than a vague consumer concern that the technology is less safe just because it is less proven.

Concerns about a Shadow Banking System

Our comments above address concerns that security, fraud and money laundering protections, once squarely in the domain of banks are now spread across mobile operators, application developers and others. While existing regulations cover some of these issues, many others are unclear. For example, if the credential to a mobile payment system is stolen, allowing a thief to make fraudulent purchases, it is unclear where liability will lie.

In another case, some mobile payments systems appear on a consumer's bills as the Payment System (e.g., PayPal), not the end merchant (e.g., Macy's). This is called the "Merchant of Record" model and prevents not just consumers but banks and regulators from getting a full picture of a consumer's behavior. As more payments system leverage the Merchant of Record Model, it may be increasingly difficult to detect fraud and money laundering.

VII. Mobile Wallet Attributes

What are the desirable attributes of a Mobile Wallet?

It is important to consider the desires of multiple industry participants and not just the end-user when thinking about the desirable attributes of a mobile wallet. After all, there are many mass adoption cases that were not born in a consumer opinion lab – so we have to consider whether merchants or banks have important ideas to offer.

A successful use case (solving a customer need) is a good start but factors like ubiquity, ease-of-use, security, convenience, interoperability and cost are also good attributes in a wish list.

In this section we discuss not just the broad-based / generic Mobile Wallet but also specific (and quite successful) use cases like transit, parking, person-to-person (P2P) dining and entertainment.

Desirable Mobile Wallet Attributes

This is a not a straightforward question because different attributes are desirable to different participants. For example, the most desirable thing for a consumer may be that the Mobile Wallet fulfills a need or creates a "wow!" experience – for a merchant, however, the most desirable factor might be the introduction of geo-fencing capabilities that provides a floor manager with an alert when a "preferred" customer walks in the door. Meanwhile, a bank issuer and a technology company may have their own list of desirable attributes. We realize there is a balance involved and so we list several attributes but understand that each one may be more valuable to some parties than others.

The first thing a mobile wallet application should do is solve an actual problem for the consumer

It may seem too simple to say this, but the first thing a mobile wallet application should do is to solve an actual problem for a consumer. Most consumers don't walk into a store and think about what type of payment they are going to use, they think about what they want to buy. Secondarily, the solution must use the strengths of the mobile phone, including the camera, the accelerometer, the location-tracking, etc. In other words, the smarter applications accommodate capabilities like enhanced security through dynamic authentication or authentication based on facial recognition; they support over-the-air provisioning; and they should work with other members of the ecosystem including advertisers.

Desirable attributes differ based on participants but a few characteristics are universal

Beyond what we've stated above, we note the following attributes that should be kept in mind is designing a mobile wallet application.

- Security – This is a necessary pre-condition to mobile wallet usage. A mobile wallet can be a rich source of information if hacked into – it has identity information, a rich concentration of funding sources and potentially, a lot of behavioral information based on offers and coupons that may be stored in the wallet. Clearly to promote widespread use, the wallet must be secure. Luckily, the mobile phone – even one that is not a smart phone – can have features such as multi-layer password protection and dynamic authentication that a mobile wallet application can use to make usage safer and more secure.

- Speed and Ease-of-use – Seconds matter, both to a consumer and to a retailer. The mobile wallet should be easy to bring up, should reduce the number of steps or clicks in the purchase process, and should have a clutter-free user interface.

- Ubiquity, or at least widespread availability – Clearly, this is not an "on-phone" attribute. But for a consumer to get into the habit of using the mobile wallet, it should be widely available. The only exception to this is if the mobile payment app provides an exceptional experience in niche circumstances – some such applications are described below. It can obviously be a multi-year process to get to a stage of widespread acceptance and so a related factor is interoperability with other Mobile Wallet systems.

- Convenience – Convenience can mean different things to different participants. For some users having a device- and network-agnostic wallet solution can spell convenience, while for others, convenience implies the wallet functionality is easy to install and use. Many consumers do not want a separate Mobile Payment account created – they would rather link an existing card that they might be using to collect rewards. For some users, it can mean offering multiple funding sources and over-the-air (OTA) provisioning of functionality, getting electronic tracking and receipts of actual transactions, or the ability to file offers and coupons and present them at the right time in the right context. Many of these features can actually co-exist.

- Provides an end-to end experience – This point is best illustrated with an example. The Starbucks application includes more than just payments, it provides a list of coffees, nearby locations and even allows you to share your favorite drinks. Rather than thinking of it as a payments application, Starbucks took a consumer-centric approach – pulling together wants from their Starbucks experience. This point ties in directly with our view that one of the key changes to the traditional model when transitioning to a successful Mobile Payment model is the need for integrated social / local / mobile commerce.

- Feature-rich – Just like the above point on "convenience" this one on "feature-rich" can mean different things to different users. In fact, the factors listed under other points in this section can be considered features, and having more of them accessible in an easy-to-use format can drive usage. But we are also looking for the ability to expand usage to newer services and products – so providing application programming interfaces (APIs) to quickly launch such services is also an attractive feature. Further, given how important the development of rewards programs was to engendering loyalty among card-holders, having some sort of loyalty program is crucial to adoption. Even better is the option to link a Mobile Payments reward program to a physical card reward program.

- Ability to work with other ecosystem partners – One of the key benefits of a mobile wallet is the ability to tie into a real-time offers engine. From a consumer's standpoint, they may look for context-specific and valuable offers – it can be annoying if pop-up offers come in the way of normal phone usage or if the offers are not relevant or too frequent.

- Cost – We would anticipate that most industry participants would adopt a business model that is based on interchange, a merchant fee or an advertiser fee. In other words, we would not expect that using a Mobile Wallet in and of itself costs the consumer anything.

Specific Use Cases for Niche Applications

While no mobile wallet has met the needs of consumers across a wide variety of use cases, there are a number of wallets (applications, really) that have gained adoption by focusing narrowly on a few key consumer pain points. This section describes some of these standouts.

- **Tabbedout**

  Tabbedout is a mobile application that allows consumers to create tabs and pay for meals at restaurants that have installed the company's POS software. With the application, consumers can start a restaurant tab at a restaurant with nearby locations prior to arriving. At arrival, they show the server a special code that identifies the tab they have created. Once the meal is complete, the consumer can close out the tab and pay through the application. The application also allows the tab to be split among various users and incorporates a tipping functionality as well. Tabbedout recently extended the application to bowling lanes through a deal with bowling alley operator, Lucky Strike.

- **Parkmobile**

  Parkmobile makes the act of parking in a paid space easier for both consumers and parking providers. Through a mobile application, the consumer creates an account that stores both vehicle and payment information. Upon arriving at a Parkmobile parking spot, the consumer enters the parking spot ID number and selects how long he/she wishes to park. That amount is automatically charged to the card on file. The consumer can also receive alerts that their parking meter is about to expire and choose to add more money/time to the meter remotely.

- **C-SAM MobileCity Solutions**

  C-SAM's MobileCity offering allows local governments to interact with consumers on a range of municipal services through a single, downloadable mobile application. For instance, a consumer could look up a bus route, track when the bus will arrive at his/her stop in real-time, purchase a bus ticket through the mobile phone prior to boarding, and then scan the ticket through the use of 2D barcode validation when the bus arrives. Other services that MobileCity can offer include parking, coupons, security (911 services) and utility/tax payments, among others.

- **popmoney**

  popmoney is a P2P payment service owned and operated by Fiserv that enables individuals to make bank account-to-bank account money transfers. Individuals can send money to friends, family, or small businesses (e.g., a landscaper) using popmoney's mobile payment apps (Apple & Android), online at popmoney.com, or through their mobile and online banking portals if they bank through a participating popmoney financial institution. To send money, the sender (who obviously has a popmoney account or an account with a popmoney-using bank institution) provides the recipients email address, mobile number, or bank account number, and the amount of money to send. The receiver is notified via email or text that the money is available to be deposited in their bank account. Users can also request money owed to them via text or email address. Bank settlement of funds is generally 2-3 days, however, Fiserv expects to launch real-time P2P payments in the near future.

VIII. The Holy Grail: Consumer Adoption

What will drive consumer adoption?

This is a "trillion dollar question", given the potential size ascribed to the eventual market opportunity.

We remain believers in the multi-year adoption of mobile payments. Consumers do adopt new technology when they see value – so we need killer apps. There are already niche applications that have traction. A large number of banks are getting involved, not just the major banks. This is a good thing for ensuring adoption will be widespread when it happens.

It is, of course, possible to get diametrically opposite views on the questions we've posed. We take a measured view and believe that Mobile Payments will be an integral part of how we live and conduct business in the future. Do we know exactly what the future might look like? To be honest, the answer is No.

Why, then, are we so confident? We mention several factors to support our view.

It has happened before, i.e., Consumers adopt when they see value

Consumer will adopt when they see value

There are multiple successful examples of Mobile Payments achieving a high level of penetration. Kenya and Japan are examples that we cited and described in detail in our previous report, "Upwardly Mobile". But right here, in the U.S., there is a highly successful example – Starbucks. It provides us a lesson in what it might take for Mobile Payments to take hold. Starbucks improved upon the experience of purchasing a cup of coffee by using the power of mobile to improve the social / local / commerce aspects of the transaction.

Behavioral Change is happening already, due to niche apps

Behavioral changes are already happening as applications start to see success and new offerings are being introduced

We note that a rising class of applications such as Tabbedout, LevelUp, popmoney and Parkmobile are at least carving out a niche for themselves. These are all social / local applications that improve the consumer's experience. As this class of applications rises, it should facilitate an important behavioral change. In the consumer's mind, it should begin to introduce and strengthen the idea that the mobile phone can be a payment device. These applications can currently be used in certain urban locations only – however, their availability should spread to other locations as well, over time.

If we go back to the Starbucks example, we note the following. Following the success of Starbucks, we have seen Dunkin' Donuts also introduce its own mobile application and that also has good traction, in our view. So, it is quite possible that certain actions become quite associated with mobile payments – in effect becoming the "killer app" that furthers usage. In other countries, we have seen person-to-person (P2P) payments and transit be the killer app and we would not under-emphasize the importance of such transitions in the early going for Mobile Payments.

Important to include Market Participants Beyond Just the Big Banks

Every large U.S. bank has a Mobile Payment initiative. But cumulatively that is ~35% of total account holders in the U.S. We note that every major financial / bank processor has got in on the act. Fiserv started the process with its acquisition of CashEdge and introduction of ZashPay – it has merged this on the popmoney brand, which over 1,700 U.S. banks have already signed up for. The growth of this B2B2C channel (ultimately targeted to the consumer, using the bank channel) is crucial in terms of getting to the ~65% of Americans that do not bank with a major money-center bank. FIS' PayNet offering and Vantiv's recent offering for mobile wallet also get to the same market. Converting regular payments such as rent to a Mobile Payment is crucial to building the resume, so to speak, for Mobile.

Pulling It All Together

Throughout this report, we have focused on questions such as

- Required build-up of Mobile Payments infrastructure;
- Increased clarity on Mobile Payment business / economic models; and
- Behavioral changes as various alternative solutions develop.

The answers to these questions also imply a consumer adoption path. The choice of technology may not matter to the eventual "use case" but it matters to the time-line. It seems relatively clear to us that a lack of relevant infrastructure as an obstacle to consumer adoption should dissipate over the next 3 years – a process that can be hastened by future industry participants like Apple. The focus then shifts to the evolution of the mobile wallet itself. When this happens, our opinion is it accelerates the pace of change.

Measured expectations are important, but generally we feel there is a strong 3-5 year case to be made for Mobile Payments becoming an integral part of how we live and transact.

Appendix 1 - Major Announcements since our "Upwardly Mobile" Report in March-2012

This section contains a chronological list of specific news items and press releases by category, i.e., there are separate lists for major card networks; banks and processors; major telecom companies; technology and internet companies; merchants; and other niche vendors. We also have a brief section on Regulatory Announcements.

Card Networks

MasterCard

Nov 8th – MasterCard and ING tested a hybrid online and Mobile Payment system designed to offer a consistent user experience and security whether a shopper is presenting a merchant with a physical card or making a remote eCommerce or mCommerce transaction using an NFC phone.

Oct 22nd – MasterCard announced it will facilitate mobile payments in Poland, in collaboration with telecommunication companies, T-Mobile and Orange. MasterCard will act as a partner for each company. This announcement follows similar deals MasterCard has made this year with Vodafone in Italy and Turkcell in Turkey.

Sep 25th – French telecom operator, SFR, is linking up with MasterCard to launch a contactless co-branded prepaid card according to reports. The NFC card will be connected to users' mobile phone bill rather than a bank account. Priced at EUR14.90 a year, the card is targeted at the estimated 7 million people in France who do not have bank cards. Customers will not have to open a bank account and fund can be loaded with cash, credit card by bank transfers. The contactless card can be used at PayPass terminals in-store, at traditional POS terminals and for card-to-card transfers between friends and family. The card will come with a mobile app that provides real-time transaction data on balances and withdrawals.

Sep 20th – Western Union and MasterCard today announced that all cardholders with MasterCard enabled prepaid cards issued by any bank in the US can now reload their cards at more than 45,000 Western Union Agent locations in the United States, making it easier and more convenient for more people to add funds to their prepaid accounts. MasterCard now has the largest open reload network in the US with over 100,000 locations.

Sep 17th – MasterCard launched the mobile MasterCard PayPass user interface software development kit for Android and BlackBerry OS 7 mobile operating systems. The new toolkit allows issuers, mobile network operators and third party developers to build mobile applications that enable consumers to use the PayPass Tap-and-Go contactless payments from their smartphones.

Sep 7th – MasterCard announced the acquisition of Truaxis, Inc., a provider of credit and debit card-linked offers to consumers through merchants and financial institutions. The integration of the Truaxis platform with the MasterCard network will allow for real-time offer delivery coupled with advanced analytics to ensure consumers get more meaningful offers

Aug 27th - Everything Everywhere, owner of the Orange and T-Mobile brands in the UK, has signed an exclusive five year partnership deal with MasterCard, to develop

mobile and digital payment solutions for its 27 million UK customers. The exclusive deal between the payments network and the UK's largest mobile network operator will see Everything Everywhere subscribers being offered a co-branded prepaid NFC payments product and a service allowing small businesses to accept payments using mobile devices.

May 17th - C-SAM and MasterCard announced a joint initiative to offer a white-label mobile wallet solution based on C-SAM's flexible Mobile Transaction Platform (MTP) integrated with MasterCard's pre-paid platform, offers, PayPass Wallet Services and rich informational services. This is targeted towards emerging market telcos, which get a NFC solution that comes pre-packaged with prepaid instance issuance, TSM integration and coupon redemption at the point of sale.

May 7th – MasterCard announced PayPass Wallet Services, a new global offering for banks, merchants and partners that enables their customers to make purchases in stores or online or via mobile. PayPass Wallet Services has three distinct components — PayPass Acceptance Network (PayPass Online and PayPass Contactless), PayPass Wallet and PayPass API to make it easier to connect other wallets into the PayPass Online acceptance network. American Airlines and Barnes & Noble will be among the first merchant partners to incorporate the PayPass Online checkout button on their websites, and American will integrate PayPass Wallet into its mobile application.

Visa and Visa Europe

Oct 24th – BBVA will be the first financial institution to launch the V.me digital wallet in Spain, with a trial set for November ahead of a full rollout next year.

Oct 14th – Visa Inc. is expanding availability of its new "electronic wallet" through partnerships announced with PNC Financial Services Group Inc. and 1-800-FLOWERS.COM Inc.

Sep 20th – Movida, the mobile payments joint venture between Visa and Monitise will go live in Oct-2012 with India's second-largest private lender, HDFC Bank. Visa said even though it is starting up with one bank, it is in talks with other lenders to grow the network of banks as the solution is designed for inter-bank operability.

Sep 7th – Neiman Marcus, Inc. is working with Visa Inc. to test a new offers program that delivers real-time offers from Neiman Marcus directly to the mobile phones of Neiman Marcus customers who enroll their eligible Visa account in nmbuzz.

May 7th – Visa launched the beta version of its V.me mobile wallet in conjunction with Rakuten Buy-com as the trial online merchant.

Apr 30th – Visa Europe announced that its new digital wallet service, V.me by Visa, will launch to an initial group of consumers in the UK, Spain and France in autumn 2012. WorldPay is the development partner.

Banks and Processors

Nov 8th – ICICI Bank and Vodafone will launch 'm-pesa', in Eastern India. It involves a mobile money account with ICICI Bank and a mobile wallet issued by Mobile Commerce Solutions, a 100 per cent subsidiary of Vodafone India. Customers can deposit and withdraw cash from designated outlets, transfer money to any mobile phone or bank account in India, purchase mobile recharge and pay utility bills.

Sep 27th – Bank of America, in conjunction with Paydiant, is testing a technology that lets a customer to pay at a store register by scanning an image with a smart-phone (both Android and iOS). No merchant-side hardware changes are required.

Sep 17th – Atos Worldline is launching a Visa- and MasterCard-compliant NFC mobile wallet, to let users pay for goods at contactless payment locations via their mobile phones or by keying in PIN codes directly on the phone. The solution has been designed to facilitate cloud payments and NFC transaction services.

Sep 13th – Payments provider Fiserv has introduced its new SpotPay mobile card reader service that will enable the merchant to use a smart phone or tablet to swipe any credit card. With this, the company hopes to partner with banks to exclusively distribute this service to small businesses and also expects to give strong competition to Square's card reader and others in the payment market.

Sep 13th – Total System is introducing its NFC capabilities in North America, the first step in its planned launch of a payment solution, in collaboration with CIBC. The TSYS NFC Payment Solution enables real-time mobile account creation, mobile device identification, and supports generating the EMV data needed for provisioning a mobile device. The TSYS NFC Payment Solution will work with any Trusted Service Manager (TSM) selected by an issuer.

Sep 12th – US financial institutions, JPMorgan Chase, Bank of America, Wells Fargo (which use clearXchange) and Citigroup (which uses PopMoney) are collaborating to link their digital payment systems to allow more consumers to easily transfer money with mobile phones messages and email instead of cash and checks.

Aug 30th – Garanti Bank will launch mobile payments at large retail chains in Romania, using QR code technology from Swedish company Seamless.

Aug 9th – Citibank's Mexican unit Banamex has selected US-based electronic payment services provider VeriFone Systems for the deployment of contactless payment services in Mexico City.

Jul 11th – Canada's banking sector is preparing to launch virtual wallets as early as this fall that will allow consumers to hold all of their credit and debit cards from any financial institution, and use them to make purchases online and through their cellphones at cash registers.

May 16th – CIBC and Rogers Communications are partnering to launch Canada's first joint mobile payment solution, allowing Canadians to pay with their CIBC credit card at the point-of-sale using NFC-enabled smart phones.

Apr 23rd – Citi and America Movil named Gemalto as the technology provider for their Tran$fer mobile payment venture in Latin America.

Telecom Companies

Oct 23rd – Vodafone is expanding the reach of its M-Pesa mobile money platform, by entering into a remittance hub for cross-border cash transfers involving 35 countries. The SMS-based service allows users to be paid, and pay, using their mobile phones.

Oct 22nd – ISIS, the mobile commerce joint venture created by AT&T, T-Mobile USA and Verizon Wireless, made its mobile wallet available in Austin and Salt Lake City.

Oct 2nd – Telefónica O2 Germany is adding MasterCard PayPass stickers to the mPass service it operates with Vodafone and Deutsche Telekom, allowing users of

the mcommerce and ecommerce payments service to also use it to make purchases in stores. mPass uses SMS notifications to allow customers to make online purchases with their mobile phone, without sharing their bank or card details with the merchant. Customers can use their mPass account as a stored value card and top it up with funds from their bank account as required, or they can choose to have each payment debited directly from their bank account on an individual basis.

Sep 5th – UK-based mobile communication providers O2, Vodafone and communications company Everything Everywhere, have received clearance from European regulators to form a mobile payment joint venture. Features will include a cross-carrier mobile payments platform, a mobile marketing platform and a mobile wallet that will allow payments and loyalty tracking. NFC and online purchases are also set to be part of the agreement.

Sep 5th – Bharti Airtel has entered into an agreement with South African Financial Services Group, Sanlam, for the distribution of insurance and health funding products. The service will be available in seven African countries – Kenya, Ghana, Tanzania, Zambia, Uganda, Malawi and Nigeria.

Aug 25th – SingTel is launching NFC-based payments in Singapore in partnership with EZ-Link, to enable its customers to make cashless payments by tapping supported handsets at NFC-enabled terminals at over 20,000 points of sale, including taxis, supermarkets and fast food chains.

Aug 14th – Deutsche Telekom commissioned Wirecard AG as technical service provider for mobile payment to implement its payment strategy. Wirecard's role will include putting in place the technical processes for issuing the Telekom MasterCard, supporting Deutsche Telekom in processing payments and also covers the planned launch of Deutsche Telekom's Mobile Wallet in 2013.

Aug 7th – MTN expects its Mobile Money Service to record about 13.5 million transactions worth over GHC 300 million in 2012, which represent over 265% growth in the value transacted in 2009-11.

Jul 25th – payVia announced direct carrier billing agreements with Sprint and T-Mobile USA. Competitors include Boku, eBay (Zong), Bango, Netsize, Fortumo and boxPAY.

Jul 20th – TRAVIK, aka Sixpack, the would-be joint venture between Dutch telcos KPN and Vodafone Netherlands, and banks ING, Rabobank and ABN Amro, has announced that it will officially disband. Possible reasons include the growing availability of trusted service manager (TSM) products and services, which rendered its original plan of establishing one national TSM for NFC services obsolete as well as the European Commission's ongoing investigation.

July 12th – China Mobile Ltd, the world's biggest mobile operator by subscriber base, said that it has developed the first TD-SCDMA 3G mobile phone supporting NFC technology.

Jul 5th – Telefónica has struck global direct-to-bill deals with Facebook, Google, Microsoft and RIM, enabling users to pay for content through their mobile phone bills. The European roll-out has begun and Telefónica plans to have it live in 14 of its operating businesses, through its digital unit, by the end of the year.

Jul 2nd – Deutsche Telekom is teaming with MasterCard to bring NFC mobile payments to Europe. The service will first be available to customers in Poland in Q3, and will launch in Germany soon after, initially with a trial of phone tags and cards

before the introduction of a mobile wallet next year. The SIM-based service will utilize MasterCard's subsidiary ClickandBuy.

Jun 28th – Orange, France's leading mobile operator with over 27 million subscribers, announced national rollout of a SIM-based NFC solution from Gemalto, to enable NFC-readiness for mass deployment of mobile contactless services.

Jun 26th – Chinese bank card provider China UnionPay along with China Mobile Ltd, the state-owned telecommunications company, is creating a mobile payment business using NFC technologies. The new venture could become the largest NFC mobile payment scheme in the world given the scale of the Chinese market and the fact that China UnionPay is the only bank card available in China.

Jun 26th – Sweden's four largest wireless network operators, Telia, Tele2, Telenor and 3 are launching WyWallet, a mobile wallet service based on Accumulate's mobile financial services platform, Mobile Everywhere.

May 29th – PayOne announced a direct carrier billing relationship with T-Mobile US.

May 14th – American Express will make American Express' U.S. Consumer, OPEN Small Business and Serve Cards available in the Isis Mobile Wallet.

May 3rd – BOKU announced a direct mobile billing agreement with Sprint and Deutsche Telekom.

Technology & Internet Companies

Large Technology Companies

Apple

Oct 17th – Apple is reportedly making changes to its point-of-sale system to support Passbook payments at the its retail locations, allowing iOS 6 users a new way to pay for purchases at retail stores by Passbook integration into Apple's iPod Touch EasyPay system allowing those devices the ability to scan Passbook barcodes.

Oct 1st – Valpak Direct Marketing Systems, Inc., a leader in local print and digital coupons, has enhanced its iOS app, enabling consumers to now add their favorite local coupons from Valpak to the new iOS 6 Passbook.

Sep 24th – American Express is integrating with Apple's new mobile wallet app, Passbook, enabling cardholders to view transactions on their iPhones. Passbook, a feature of Apple's newly released iOS 6, is a mobile wallet that allows iPhone and iPod touch users to keep frequently used cards at their fingertips. Also, Starbucks is planning to integrate with Apple's Passbook allowing iPhone 5 and iOS 6 users to make payments with the new Passbook app, similar to the current gift card coffee payment options on the iPhone.

Sep 20th – Target Corp. has announced a support for the feature that will allow users to keep Target-store coupons in their Passbook apps once they've downloaded Target's own, Passbook-compatible app.

Sep 12th – Apple released the iPhone 5, with a host of new hardware and software features, but no NFC support.

Jul 27th – Apple Inc will buy fingerprint sensor technology developer AuthenTec Inc for about $356 million. AuthenTec's fingerprint technology, used in mobile phones in

Japan for authentication of mobile payments, could help Apple bring those services to markets such as the United States.

Jun 11th – Apple announced its Passbook wallet app, which can be used to hold "boarding passes, movie tickets, retail coupons, loyalty cards, and more", which are referred to as passes. The app uses 2D barcode technology to present passes to the merchant, merchants can update things like "available balance" and "current points" in the background and geolocation technology is used for relevancy within the Passbook app.

Facebook

Sep 27th - Facebook is rolling out a service called Gifts which lets users send chocolate, coffee, socks and other real-life presents to one another. Facebook Gifts launched the service to a subset of U.S. users and will expand in coming months. The app is available on Facebook's website or on Android mobile phones and is integrated with an event notification service.

Sep 24th – US mobile payments and analytics company Bango has completed its integration with global social network Facebook, providing Facebook mobile web carrier billing in Germany, the UK and the US. This enables Facebook's mobile web users to purchase digital content without the use of SMS messages or credit cards. Instead, users pay on their phones, without the need to register personal details.

Sep 20th – Facebook offers has been free to date, but in coming weeks Facebook will require merchants to pay at least $5 on related ads to promote each Facebook Offer to a targeted audience of fans and friends of fans. The cost will vary based on the size of a company's Facebook pages based on number of likes.

Jun 6th – Facebook began rolling out a new mobile payments system that reduces the number of steps users must take to complete a purchase from seven to two. The "low-friction carrier billing" is available to the majority of wireless carriers in the U.S. and U.K. as well as in more than 60 countries around the world.

Google

Nov 2nd – Google upgraded the integration of its mobile wallet application with online. As a result, on websites that accept Google Wallet, users will no longer need to enter their credit or debit card number, billing address or other payment information as the data is already stored in the application.

Oct 8th – Google entered the credit card market in the UK, by launching AdWords, a program that allows users to pay for advertising expenditure though a Google credit card. The UK launch follows a pilot in the US, involving around 14,000 businesses. The search engine giant is collaborating with Barclaycard in the UK and Comentity Capital Bank in the US to issue the Google AdWords Business Credit cards which are from MasterCard. The cards which will not have annual fees can be used only for AdWords advertising purchases

Sep 13th – Credit union service organization, PSCU, is partnering with Google to offer its credit unions the Google Wallet. When cardholders of the six participating PSCU credit unions add their cards to Google Wallet they will see an image of their credit union's card.

Sep 13th - Barclaycard US is allowing its cardholders in the US to save their card to Google Wallet, which will enable them to shop online wherever the 'Google Wallet Buy' button is available or in-person using the Google Wallet mobile app.

Cardholders can save their card to Google Wallet through a click-to-add process and then select it as their default payment choice.

Sep 11th – Google will stop supporting prepaid cards for Google Wallet and phase them out over the next few months. Google recently changed how its mobile app stores payment cards, effectively moving payment card information from the device to its cloud, and allowing customers to use almost any credit or debit card.

Aug 16th – Discover announced that it is partnering with Google to allow its card members to save their credit card directly into Google Wallet.

Aug 1st – Google announced a new version of the Google Wallet mobile app that draws on card data stored in the cloud. This change in its technical approach enables it to support all credit and debit cards and to stores these cards on Google servers, instead of in the secure storage area on the phone. A wallet ID (virtual card number) is stored in the secure storage area of the phone, and this is used to facilitate transactions at the point of sale. Google instantly charges the selected credit or debit card.

Jul 1st – Google introduced Save to Wallet. Customers will be able to save special offers and coupons found on various sites right inside the Google Wallet, and use them later, where applicable.

Jun 27th – Google Wallet launched support for recurring subscription payments and has begun automatically assigning the lower of two fees for processing payments. Subscriptions will allow developers to support users in buying in-game currencies or access to online content.

Apr 5th – Google acquired payments technology company TxVia, which has supported the management of more than 100 million accounts in the prepaid card segment.

Microsoft

Jun 20th – Microsoft used its Windows Phone Developer Summit to announce Windows Phone 8, which the company said would include NFC "Tap to Pay"support and a native wallet for payment cards, loyalty and membership cards and offers.

PayPal

Sep 7th – PayPal is coming up with a mobile payments application optimized for Microsoft's Windows Phone operating system. This free app enables users to send money to friends using their bank or PayPal account as a funding source.

Aug 22nd – PayPal announced an extension of its offline strategy by teaming up with Discover to bring PayPal to more than 7 million merchant locations in the U.S.

Aug 17th – PayPal is testing an m-payments deal with McDonald's that will enable customers to place orders using the fast-food chain's smartphone app and make purchases using PayPal. This is currently running in 30 of McDonald's French restaurant outlets, with the firm saying the technology could be available "within the next 24 months or so". PayPal already has similar deals with 15 major retailers including Home Depot and Toys R Us.

Aug 9th - Brazilian mobile operator Vivo and PayPal announced a service for making mobile payments without the need for a data plan or internet access. PayPal plans to extend the service to countries such as Russia, China and India. In order to make payments for products and services via the Vivo/PayPal service, both the customer

and service provider (seller) must have a credit card and be registered on PayPal. The supplier/seller pays a fee of 5.4%-6.4% of the value of the service or product, while the client who sends the payment pays BRL 1 to Vivo.

Jul 18th – PayPal acquired Card.io, a developer of technology for using mobile phone cameras to scan credit cards and capture relevant information. PayPal is already using the technology from Card.io in PayPal Here, its mobile payment technology for small businesses and casual sellers that it unveiled in March.

Jul 16th – PayPal announced that consumers with Android devices can pay at Starbucks using its payment service.

Jul 6th – Malaysia Airlines announced a new partnership with payment processor PayPal. The mobile checkout solution from PayPal has been integrated with the SITA mobile ticketing system which is used by more than 500 airlines worldwide.

May 24th – PayPal announced 15 new national retailers for its offline payment and shopping solutions, including Abercrombie & Fitch, Advance Auto Parts, Aéropostale, American Eagle Outfitters, Barnes & Noble, Foot Locker, Guitar Center, Jamba Juice, JC Penney, Jos. A. Bank Clothiers, Nine West, Office Depot, Rooms To Go, Tiger Direct and Toys “R” Us.

Mobile POS Companies

Nov 6th – VeriFone will provide managed payment services to Glob Taxi Company of Warsaw, Poland, and its fleet of approximately 500 vehicles.

Oct 4th – LevelUp announced that it has integrated with three of the top ten POS systems, MICROS, POSitouch, and Dinerware. The objective is to enable merchants to track campaign data within their POS systems.

Oct 3rd – payleven launched a dongle-based system in Europe, distinguishing itself by combining an iOS or Android app with a chip-and-PIN dongle that links to a phone or tablet via Bluetooth, enabling merchants to accept card payments. Merchants in the UK, Germany, Italy, the Netherlands, Poland and Brazil can start registering for the device later in October. Users will be charged a transaction fee of 2.95% plus the equivalent of seven pence. Visa Europe insists on full chip-and-PIN functionality in Europe, which had reportedly caused rivals iZettle and mPowa to stop processing swipe transactions on their technology.

Sep 20th – US-based mobile payments start-up Square secured US$200 million in series D funding round, online media outlet techcrunch.com reports. According to the source, investors participating in the round include Citi Ventures, Rizvi Traverse Management and Starbucks.

Sep 19th – Groupon launched GrouponPayments, a mobile point-of-sale service touted as enabling Groupon merchants to accept credit cards. It lets merchants turn their smartphones into mobile credit card terminals using a payment dongle and an app. With the app, Groupon merchants will be able to accept all credit cards and pay only 1.8% of the transaction amount plus a $0.15 transaction fee.

Sep 6th – LevelUp announced that its next generation countertop units will extend support to NFC technology in addition to QR codes. The new NFC-accepting hardware will be available to merchants at no charge and merchants will still have zero interchange fees for transactions routed through LevelUp.

Aug 29th – Square's credit card readers will be sold at AT&T's 1,000 stores making them more accessible.

Aug 27th – Starting August 2012, Square started to offer flat monthly pricing which allows the merchant to pay one low, monthly price for credit card swipes less than or equal to $400. With Square monthly pricing, all payment cards Square accepts are covered under the same low subscription fee. If user types in the card information manually, the fee is still 3.5% + 15¢.

Aug 21st – Swedish mobile point-of-sale company iZettle will release a solution in Sweden to let small businesses use Android smart phones to process credit card transactions. The company said it plans to expand Android support across its entire European footprint soon. iZettle offers its customers in the Nordic countries (and a limited trial in the U.K.) a solution that can handle transactions using either magnetic stripe or EMV chip credit cards.

Aug 21st – Revel Systems, a provider of iPad Point-of-Sale (POS) solutions is releasing a solution designed specifically for supermarkets and grocery stores. The Grocery POS system incorporates integration with Dwolla, a payment platform that charges no fees for transactions under USD10 and USD.025 per transaction for any amount over USD10, with no service agreement or cancellation fees for the stories. LevelUp's payment platform is also a supported plug-in.

Aug 21st – Stitch Labs is taking advantage of VeriFone's SAIL Mobile POS open payment platform and integrate it with its online solution.

Aug 21st – McDonald's selected (VeriFone) Point's PAYBOX Services offering to process payments for its GoMcDo pre-order service in France.

Aug 8th – Starbucks will partner with Square to enable Starbucks customers to use Square's payer application, Pay with Square, which they can download onto their iPhone or Android device. Square can then process the customers' credit and debit card transactions at around 7,000 participating Starbucks stores. Customers will be able to use Square Directory and find nearby Starbucks stores and other local Square businesses from within a variety of Starbucks digital platforms.

Jul 30th – J .C. Penney hopes to get rid of cashiers and cash registers by 2014, and instead have salespeople use iPod Touch devices to check out customers, or self-checkout lanes. It has opted for a VeriFone solution.

Jul 18th – NCR unveiled promotions for it's recently launched Square-like mobile POS, which is branded NCR Silver. Features include the ability to run email-marketing campaigns and perform customer data analysis.

Jul 12th – LevelUp announced it is switching its revenue source from payment processing fees (interchange model) to a 35% cut of the marketing spend required to drive the purchase.

Jul 8th – Prizm Payments, an India-based payments company, is expected to roll out a dongle-based payment service. This is a limited test at 200 of Prizm's 30,000 merchant locations for traditional payments.

Jun 28th – European card-reader attachment provider mPowa announced it's U.S. launch. While its product resembles Square, its selling point is its merchant integration and infrastructure. mPowa charges a 0.25% fee for each credit and debit card payment processed and offers a web-based merchant dashboard for account

management to monitor payments. mPowa also can handle EMV chip cards, whereas most U.S.-based mobile card readers do not.

Jun 28th – Revel Systems, an iPad point-of-sale company will introduce a new hardware product called Revel Router to allow shops to run their POS through an Apple iPad and forgo the need for an ISP-provided Internet connection to work.

May 16th – Cardlytics announced “Cardlytics for Credit” which enables national retailers and financial institutions to effectively use transaction marketing to targeted at their credit card customers by mining combined checking / debit and credit information and using geo-targeting and real-time alerts.

May 8th – 99Bill Corporation announced the official launch of its new mobile payment product 99Bill Card Reader. The patented solution supports both iOS and Android platforms.

May 8th – VeriFone introduced SAIL, which offers a free app and card reader and flat rate plans of 2.7% for lower volumes or a 1.95% transaction rate with a monthly $9.95 subscription fee for higher volume users.

Merchants

Oct 1st – MCX said it had signed up several new members. In addition to Gap and Bed Bath, they include Dunkin' Brands Group Inc, Dillards Inc and convenience store operator Sheetz Inc. The group has 21 publicly traded members so far. The founders of MCX hope the burgeoning membership, including some big-name retailers, could give mobile payment the critical mass it needs to take off.

At a retail industry conference on October 1st, MCX explained its vision of a mobile payment solution that addresses a number of consumer-use cases including payments, discounts, promotions, and marketing while minimizing the need for merchants to invest in new technology and point of sale equipment. The MCX platform will also take a "hands-off" approach to retailer's transaction and customer data. Walmart's Payments Head, Mike Cook, indicated they that see no reason to add another player such as Google Wallet, Square, Isis (or NFC in general) to Walmart transactions.

Aug 15th – A group of 14 merchants announced a joint venture called Merchant Customer Exchange (MCX) to offer mobile payments. The group includes Wal-Mart Stores Inc., Best Buy Co. and Target Corp., 7-Eleven Inc., Alon Brands Inc., CVS Caremark Corp., Darden Restaurants Inc., the HMSHost unit of Autogrill Spa, Hy-Vee Inc., Lowe's Cos., Publix Super Markets Inc., Royal Dutch Shell PLC, Sears Holdings Corp. and Sunoco Inc.

Other (Niche) Vendors

Oct 10th – Groupon is rolling out its own payments processing software, Breadcrumb, to restaurant partners in the US as the firm continues its push beyond daily deals. The POS software enables restaurants to manage orders and process payments via an iPad app, and is being trialed with 100 partners. Breadcrumb is the product of Groupon’s purchase of a startup in May, marking the firm’s continued attempts at expansion after its poor post-IPO performance.

Oct 4th – Jumio's Netswipe technology is being used by Travelocity now. Subscribers use their smart phone's camera to transmit their credit card information and the entire transaction can be apparently completed in just 5 seconds.

Oct 3rd – NXP shipped 100 million of its PN544 NFC controllers and indicated that NFC will now come to many new tablets, laptops, speakers and headsets enabling secure payments, mobile ticketing, NFC tag use cases or the pairing of applications across multiple form-factors.

Oct 1st – Gemalto closed the acquisition of Ericsson Internet Payment Exchange (IPX), with the exception of operations in United States. IPX is a leading mobile payment and messaging platform and connects more than 1,000 customers to more than 120 mobile network operators. IPX also operates payment platforms as a white label service for various operators. As part of the transaction, Gemalto is also acquiring Ericsson's trusted service manager activity.

Sep 28th – MoneyGram partnered with Dutch digital security provider Gemalto to allow mobile money transfers to any of its 284,000 global locations.

Sep 25th – Gemalto is expanding its mobile payment software solution to include the Western Union Money Transfer service.

Sep 7th – The Hong Kong Monetary Authority is planning to launch an electronic bill system by the next of next year. The plan also includes developing an e-cheque system and formulating an interoperable NFC mobile payment infrastructure.

Aug 14th – Parkmobile USA is launching a new NFC-enabled mobile parking service in Birmingham, Michigan to allow motorists to pay for parking via their mobile phones. Customers can add more time to a meter from their phones and receive text message alert to alert them when the meter expiration time is pending. The mobile app is available on iPhone, Android and Blackberry devices.

Apr 10th – Intuit acquired AisleBuyer, which offers software applications that simplify the dining, retail and grocery-shopping experiences.

Regulation

Sep 24th – Canadian regulators are taking steps towards addressing issues related to mobile payments. Canada's Minister of State (Finance) Ted Menzies announced that the country's Code of Conduct for the Credit and Debit Card Industry will be expanded to include mobile payments. As a part of the announcement, Menzies also released the proposed Addendum to the Code for public consultation. Canada's Code of Conduct for the Credit and Debit Card Industry is designed to make the costs of credit and debit cards clear to both consumers and merchants.

Sep 17th – The PCI Security Standards Council has issued new guidelines on mobile payment acceptance security. The new guidance, developed by a council task force, focuses on two areas: best practices for securing payment transactions and guidelines for securing the supporting mobile application platform environment. The main recommendations are to Implement secure coding best practices, Eliminate unnecessary third-party access and privilege escalation and Create the ability to remotely disable payment applications.

Sep 5th – EMVCo, the EMV standards body collectively owned by American Express, JCB, MasterCard and Visa, has signed a collaboration agreement with the NFC Forum, a nonprofit industry association that advances the use of NFC technology. They have agreed to work together to establish a framework to synchronize NFC Forum and EMVCo specifications, test plans, test tools, laboratory accreditations and the management of contactless product certification.

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