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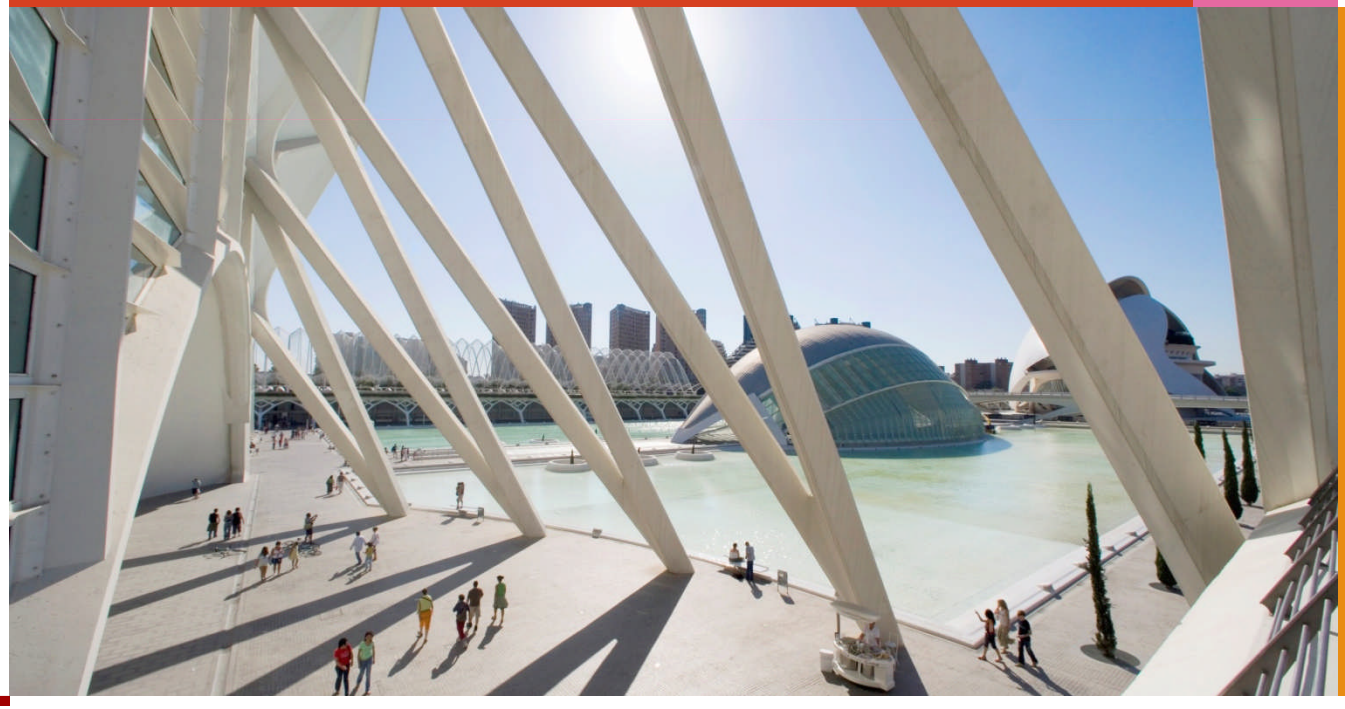
Dialing up a Storm:

How Mobile Payments Will Create the Most Significant Revenue Opportunities of the Decade for Financial Institutions



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Section 1

Point of view

Point of view

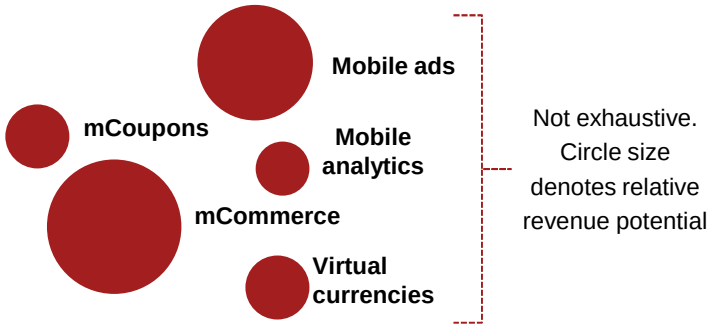
Changes to the payments ecosystem from the advent of mobile services put more than $20 billion in play for financial services industry participants—through both new revenue opportunities and potential loss mitigation. Inaction is no longer an option.

Threats

- Disintermediation of traditional processors by alternative players
- Erosion of brand equity and customer loyalty to alternative players
- Loss of interchange revenue from steering to ACH through mobile
- Migration of balances and bank fees from traditional accounts to stored value mobile wallets
- Attrition of customers due to lack of mobile offerings

Opportunities

- Conversion of small ticket cash transactions to mobile payments
- New acquisition tool through increased access to the emerging affluent, new to credit and un(der)-banked
- New mobile ecosystem roles such as Trusted Service Manager (TSM)
- New interchange/fee revenue from new mobile spend
- New mobile value-added services, including:



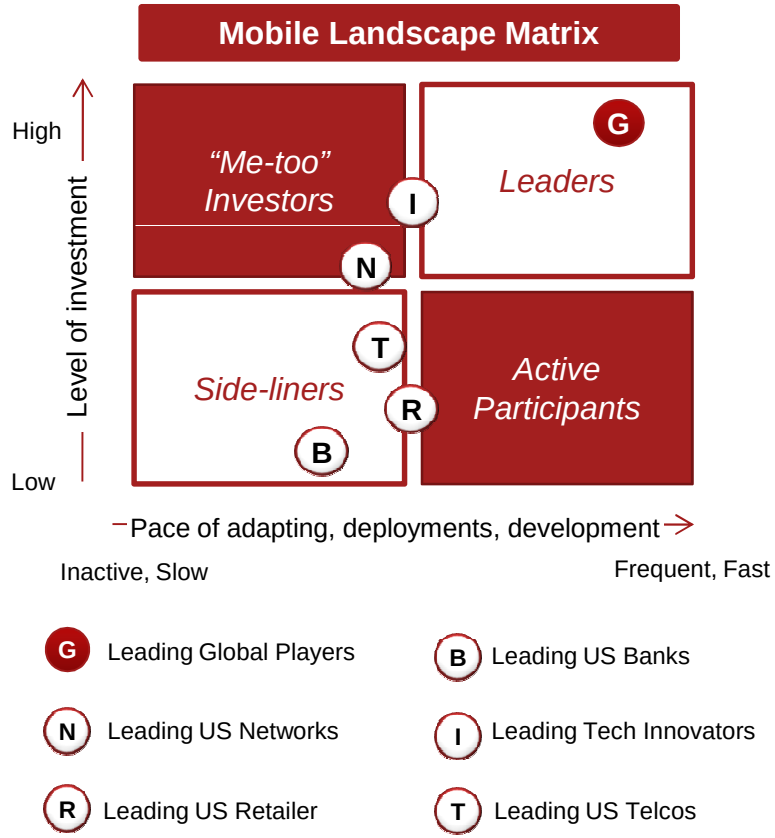
Potential value at stake: Up to $20 billion in annual revenue[1]

[1] Based on PwC analysis.

Point of view

Financial institutions (FIs) have been cautious entrants into this space, leaving the door wide open for a leader to emerge and gain significant first mover advantages.

Opportunity exists for both traditional and non-traditional industry players capable of offering a compelling, bi-directional value proposition and a meaningful integration platform.



Announcements have been made…

- Big players including American Express , Visa, MasterCard, ISIS (partnership formed between AT&T, T-Mobile, Verizon, Barclaycard and Discover), and Google have made announcements of their "open" mobile wallets to be deployed in 2011

However, there is…

- No end-to-end solution proposed by FIs that maximizes the value extraction opportunities along the value chain
- Lack of a concise plan that resolves hurdles such as terminalization, merchant value proposition and consumer value proposition
- Lack of clarity and understanding of how the solutions will work in the broader ecosystem
- Low level of collaboration across players leading to stalling of standardization and openness of platforms

Point of view

The emerging race is resulting in new business models forming. We believe the future is open and financial institutions should align with open platforms to thrive—a closed system cannot leverage the wide variety of parties required to move the ecosystem forward.

Business Model Considerations

What business model best aligns with our goals to ensure success? How do we gain this alignment?

					
	Bank-network	**Collaborative**	**Innovator**	**Retailer**	**Mobile operator**
Model participants	▪ Banks/issuers ▪ Association/ network	▪ Mobile Network Operators (MNOs) ▪ Banks/issuers ▪ Association/ network	▪ Alternative solution providers	▪ Retailers ▪ Stand-alone merchants	▪ Mobile Network Operators (MNOs)
Description	Builds on existing network and deploys mobile payment applications or devices to customers, via bank partners	Collaboration among banks, mobile operators, existing payment networks and other stake-holders in the mobile value chain	Technology-based solution that leverages existing and complementary mobile assets to develop mobile payment capabilities	Merchants create independent, closed-loop payment applications	Mobile operator acts independently to deploy mobile payment applications and value added services

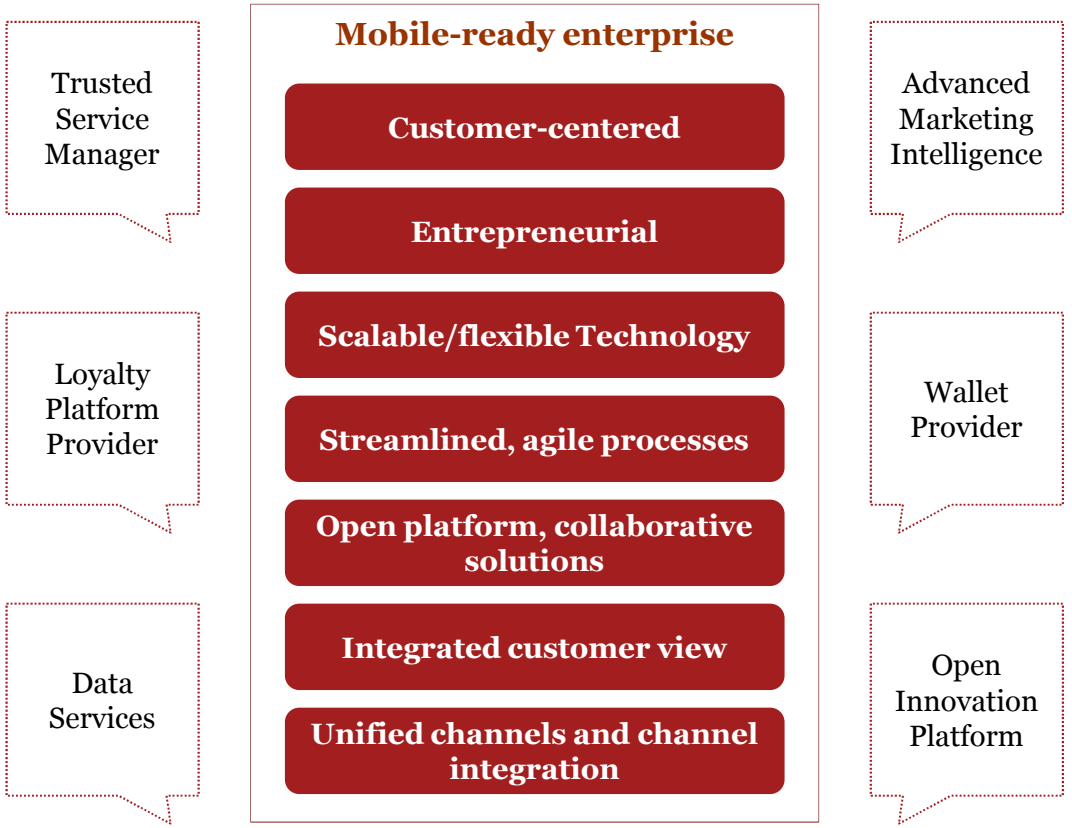
The collaborative model poses the most complexity but also holds the most promise for delivering an end-to-end mobile payments solution to the ecosystem.

Point of view

For financial institutions to succeed, there are organizational DNA changes that will be required to deliver the right operating model. This will enable them to play new roles and deliver new services in an open, collaborative, and fast-paced ecosystem.

Operating Model Considerations

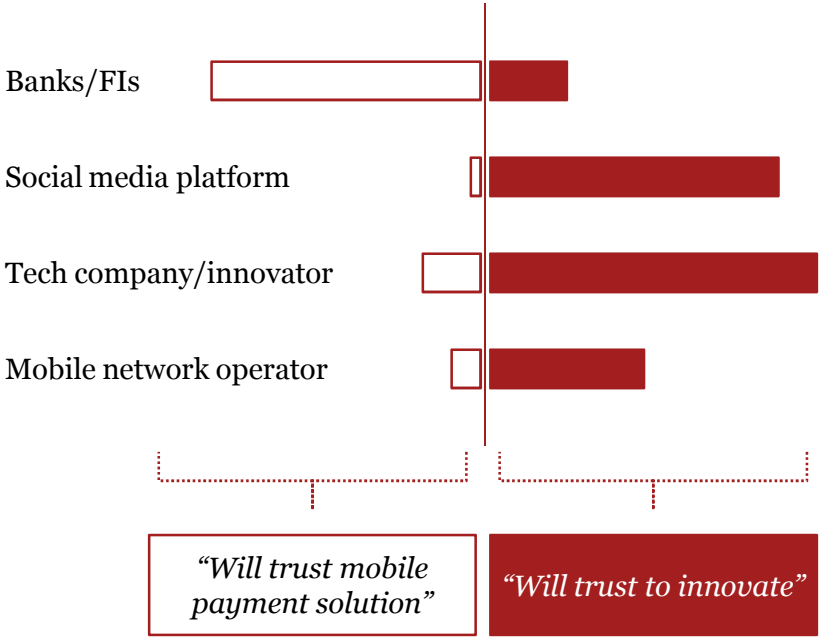
How do we operate within our chosen business model? What organizational changes are required to play differentiating roles?



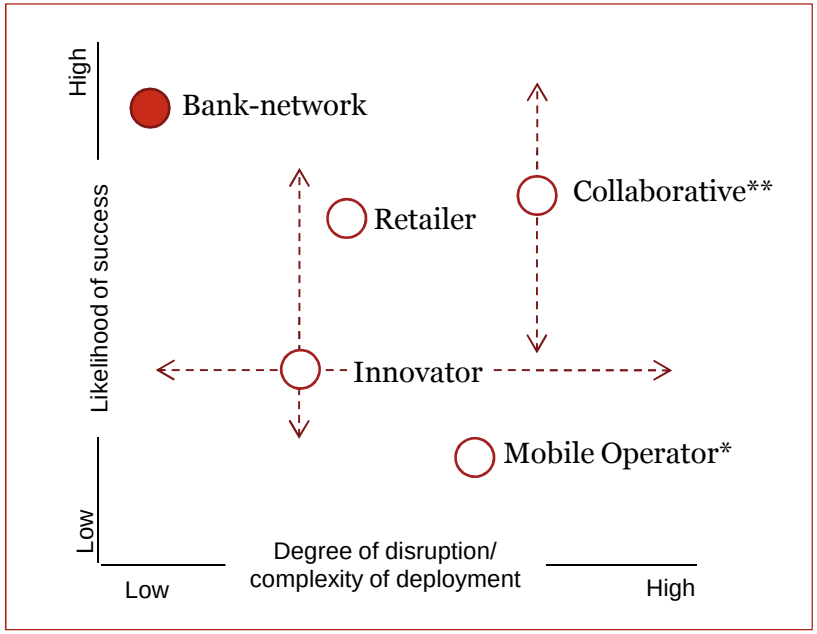
Point of view

The question for most observers remains, "*Who will be the winner in the emerging space?*" Traditional players currently have an early lead; however, if they do not keep up with the fast pace of change, tech innovators and collaborators will prevail.

Consumer Sentiments[1]



Emerging Models Success[1]



* US-centric threat matrix; emerging markets will have mobile operators ranked higher | ** Success will largely be based on tactics/implementation design

Rather than adopt a wait-and-see stance, financial institutions need to **start defining model-agnostic "defend and extend" mobile strategies** in order to protect their current revenue stream and position themselves to innovate the next wave of digital transactions.

[1] Based on PwC survey and analysis.

Section 2

Current situation

Current situation

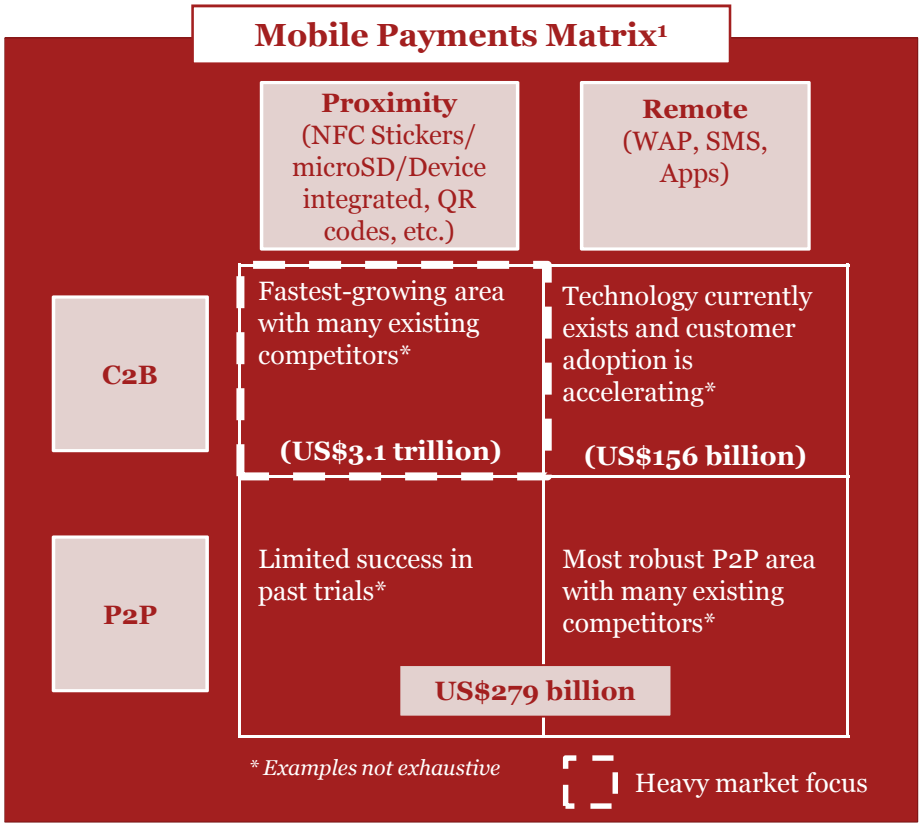
Current landscape, developments, and drivers

While mobile operators, financial services firms, and retailers have been evaluating the feasibility of mobile payments since early 2000, recent developments on both the supply and demand side are prompting the key players in the value chain to get serious about its potential. Sitting on the sidelines is no longer an option.

Current situation

The mobile payments space can be broadly categorized by the intersection of channels, technologies and the underlying consumer interactions that drive commerce. Going forward, we expect the emerging C2B-Proximity market to hold the most potential.

Consumer-to-Business (C2B) and Peer-to-Peer (P2P) channels allow mobile payment users to transact in one of two ways: proximity or remotely. Proximity payments require the mobile payment user to be physically present for payment and usually requires NFC or a similar technology. Conversely, remote payments enable a person to send funds to either a business or individual through his/her phone over a mobile network.



Definition

Form	Description
NFC	Near Field Communication (NFC) is a technology that enables devices to perform safe, contactless transactions, access digital content, and/or connect electronic devices
QR Code	A Quick Response Barcode (QR code) is a specific matrix barcode readable by dedicated QR barcode readers and camera phones; the information encoded can be text, URL or other forms of data
WAP	Wireless Application Protocol (WAP) is commonly used for web browsing on small mobile devices such as cell phones
SMS	Mobile payments initiated by Short Message Service (SMS) allow funds to be transferred from a registered account or a mobile wallet

[1] Based on PwC analysis.

Current situation

The ubiquity of mobile payments is becoming a reality and is threatening financial institutions' control of payments. Financial institutions need to recognize opportunities and threats to craft strategies that will defend and grow their current value streams.

Mobile finally makes a breakthrough

Although mobile payments have long been heralded to be growing within the US, the necessary or enabling infrastructure and technology have not existed until recently. Significant innovation has filled the void.

Forecasts predict significant volume increases

Mobile payment volumes have been forecasted to be as high as $250 billion in 2015, with a CAGR of up to 70% between 2010-2015.[1] We expect that mobile payment volumes could capture 10% of today's small value transactions[1] (transaction <$25).

Convergence of growth factors

On the supply side, favorable factors include mobile phone penetration rates, smartphone market share and advanced mobile capabilities such as real-time and improved personalized interactions. On the demand side, similar trends are being noticed—heightened consumer adoption, increased comfort with technology (further fueled by the growing mobile-native Gens X and Y) and increased appetite of merchants for cheaper, alternative payment solutions.

Increased investment by progressive industry leaders

These movements have not gone unnoticed by the players in the market as investments in mobile payments development are estimated to have exceeded $1 billion over the last year alone. This level of investment made by industry leaders across industries (payments, advertising, marketing, and telecommunications) has ushered in unprecedented adoption and functionality.

$250B

In mobile payments purchase volume by 2015[1]

$200B

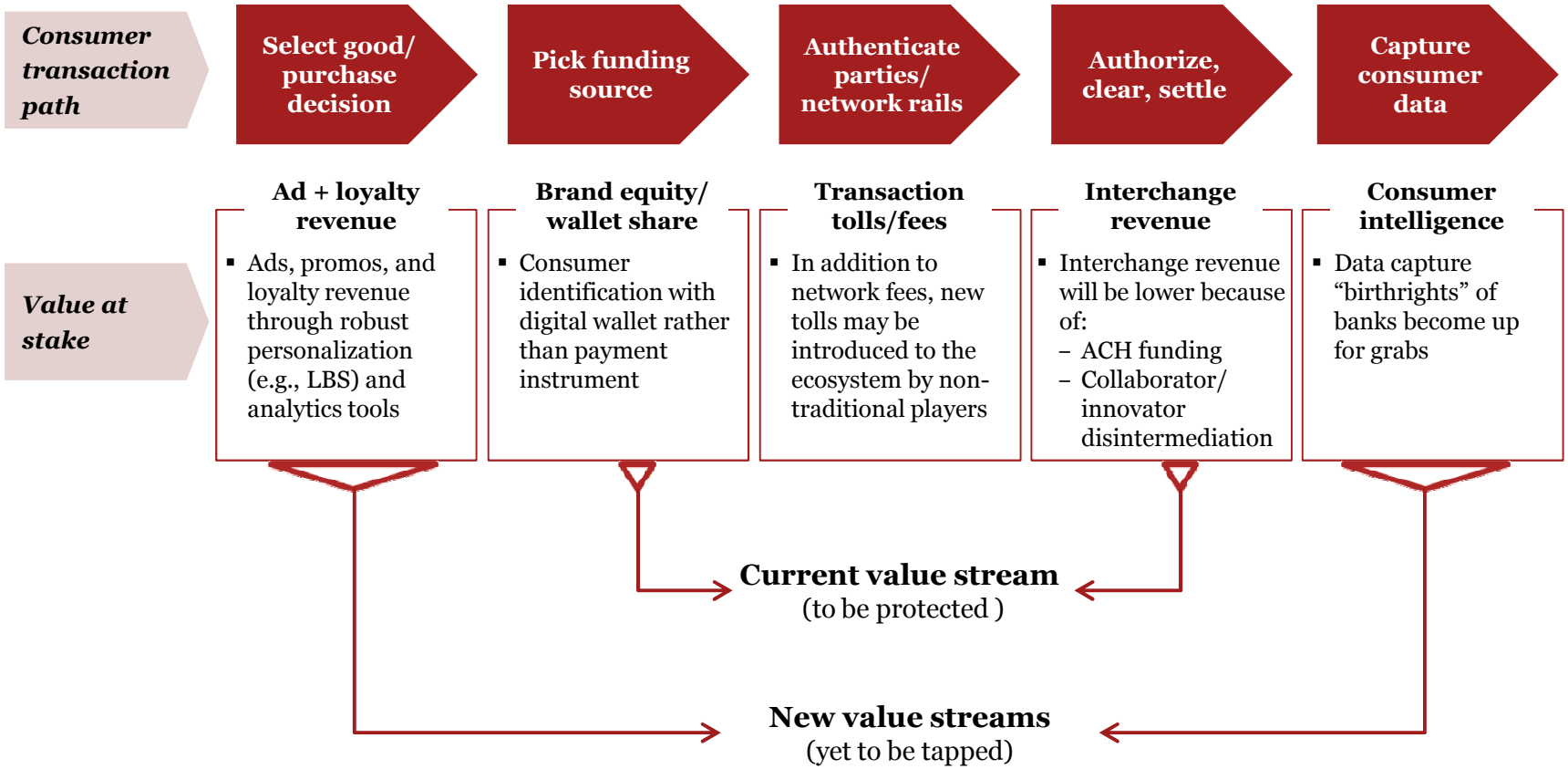
10% of the $2 trillion in small ticket transactions could move to mobile[1]

[1] Based on PwC analysis.

Current situation

Financial institutions need to create "defend and extend" mobile strategies in order to protect their current revenue stream as well as capture customer value (increased spend and revenue, increased brand loyalty and customer satisfaction, etc.).

Estimated value at stake for financial institutions is up $20 billion, with new value streams showing the potential to be even more profitable than current value streams.[1]



[1] Based on PwC analysis.

Current situation

Mobile presents financial services players an opportunity to grow volumes by converting historically cash payments to mobile, delivering mobile value-added services, and engaging in other value streams previously non-existent and out of reach.

Small ticket transactions

(<$25 transactions)

Cash is still preferred over cards when making small payments

$2 trillion

In small-ticket transactions in the United States in 2010 [1]

~10%

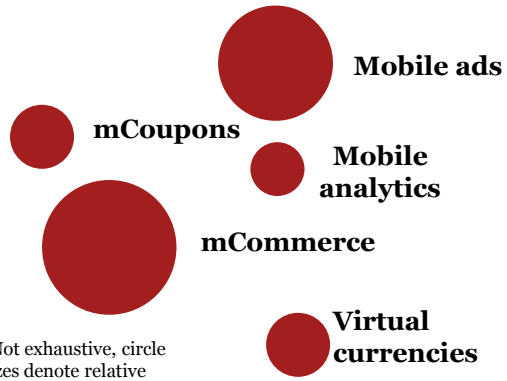
Of small-ticket transactions will be contactless in the next 3 years [2]

Mobile purchases and value added services* [2]

Up to

$250 billion

in estimated mobile spend and value added services in in 2015



*Not exhaustive, circle sizes denote relative revenue

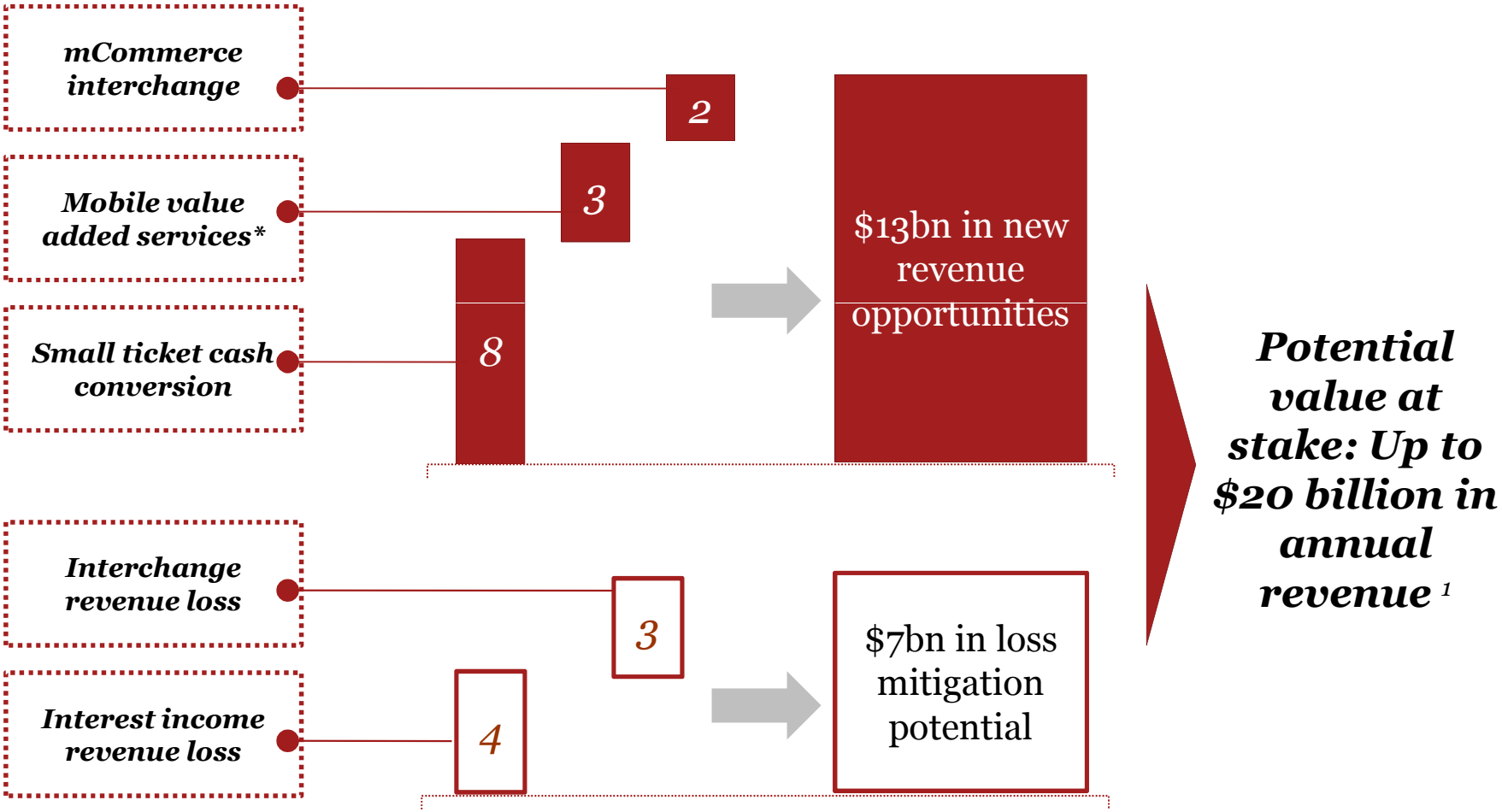
Other value streams

- Increased wallet share through ability to steer
- Accelerates access to customer transaction information
- A new powerful acquisition tool for banks, especially in un(der)-banked regions
- Ability to act as TSM
- Enhanced brand ownership

[1] S. Ezell, "Contactless Mobile Payments, Information Technology and Innovation Foundation," 2009.
[2] Based on PwC analysis.

Current situation

Changes to the payments ecosystem from the advent of mobile services could put more than $20 billion in play for financial services industry participants—through both new revenue opportunities and potential loss mitigation in the next 5 years.



* Mobile value added services that can be provided by financial institutions

[1] Based on PwC analysis.

Current situation

The "always on" and "always with me" mobile consumer behaviors enable firms to maintain constant customer interaction in ways that transcend all other channels.

Mobile devices allow for an enriched customer experience through an enhanced level of interactivity. Three key mobile capabilities independently and collectively benefit customers and payment participants:

Communication

- Mobile communication is no longer simply voice; it's voice *and text*. With information available at key decision points, mobile delivers the ability to impact behaviors, for example, the ability to:
  - Communicate a customer's credit line increase at the point of sale (POS) based on previous positive behavior
  - Proactively provide alerts and reminders in real-time such as fraud alerts; secure customers will be more likely to make mobile payments

TXT

+

Content delivery

- The mobile device provides a platform for content delivery *and storage,* enabling customers to receive, store and retrieve information on-demand in situations such as:
  - A retailer can send a purchase receipt to a customer who can store it in his/her phone for future purchase return
  - A retailer can send a digital loyalty discount certificate to a customer to use towards a future purchase

RSS

+

Location monitoring

- The mobile device's context and location awareness applications can provide *real-time information* to consumers to influence purchase, spending or financial behaviors such as:
  - Retailers or merchants sending discount offers to consumers when near locations where those products are available

GPS

Current situation

Current forces in the marketplace are driving unprecedented change in the payments ecosystem. As consumer demand rises and payment behaviors change, inaction is no longer an option.

While mobile operators, financial services firms, and retailers have been evaluating the feasibility of m-payments since early 2000, developments on both the supply and demand side are prompting the key players in the value chain to get serious about its potential.

Consumer and market sophistication

- Mobile innovation is driving customer preferences and demand—customers are beginning to demand and expect advanced mobile capabilities e.g. voice recognition and contextual awareness from all service interactions
- The coming of age of the mobile native and tech savvy Generation X and Y will redefine what customer satisfaction means

Competitive innovation

- Non-traditional players such as Google and Starbucks are investing heavily in mobile payments
- Traditional industry players such as Visa and MasterCard are expanding their offerings to maintain market share
- New partnerships such as ISIS, a partnership between telcos and financial institutions, also increase the pressure for innovation

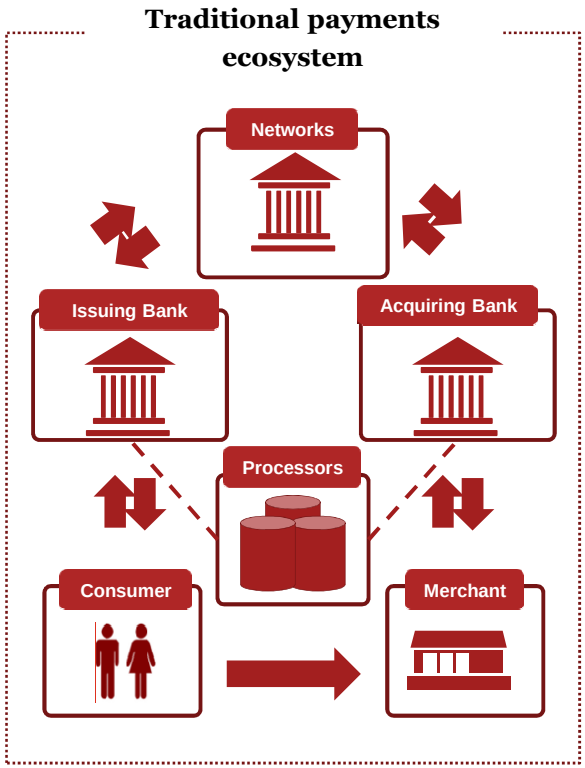
Evolving infrastructure

- Rapid evolution and expansion of mobile hardware/software and NFC-enabled (near field communication) POS systems
  - Mobile phone penetration
  - Smart phone penetration
  - Tablet emergence
  - Device advancements

Current situation

These forces are introducing new stakeholders into the ecosystem that have their eyes set on displacing traditional players. Financial institutions need to rethink current strategies in order to defend their position in the payments value chain.

The traditional payment ecosystem, best characterized by its dependence on physical cards, bank, and payment network domination, is being penetrated by non-traditional players.



	Who they are
Device manufacturer	Companies that research, develop and manufacture mobile phones based on consumer demand and technical innovation
Mobile network operators (MNOs)	Mobile phone companies that sell NFC or other payment-enabled phones
Value-added service providers	Companies that provide additional mobile services such as couponing, loyalty, advertising, etc.
Software/application developers	Companies that create mobile payment applications that will be pre-loaded or downloaded to the consumer's mobile device
Alternative solutions providers	Companies with strong brand presence and known for developing consumer-friendly mobile applications
Trusted service managers (TSM)	Independent third parties responsible for provisioning the consumer's financial information (credit, debit, etc.) to the mobile device

Current situation

While various technology for mobile payments exists, Near Field Communication (NFC) is being considered the solution of the future, with QR codes bridging the current gap.

Organizations should start considering the investments that need to be made to enable usage of these technologies across their core consumer base as well as the impact on systems, processes, and marketing.

Near Field Communication (NFC)

- Around since 2003, NFC is a subset of the ISO RFID standard. It is a short range, low power, wireless technology used to read and/or write data between devices at distances no greater than 3-5 inches (distance varies based on the power of the reader)
- Advantages: Open standard, simple payment experience, more secure
- Disadvantages: High cost for mass adoption (few smartphones have NFC to date, most merchants do not have NFC in POS machines), more players are involved with mobile NFC contactless payments (e.g. TSMs, MNOs)

Quick Response Bar-Codes (QR Codes)

- Alternative solution providers are looking to use barcodes to conduct payments—bypassing NFC technology
- The technology is already popular in Japan and South Korea
- Advantages: Open standard, low barriers for production, low cost, fast production, all smartphone users can use QR codes
- Disadvantages: Requires image capture, cumbersome payment experience, less secure

Current situation

With the introduction of NFC into the payments value chain, the role of the Trusted Service Manager (TSM) is critical to ensuring mobile payments are handled in a secure manner.

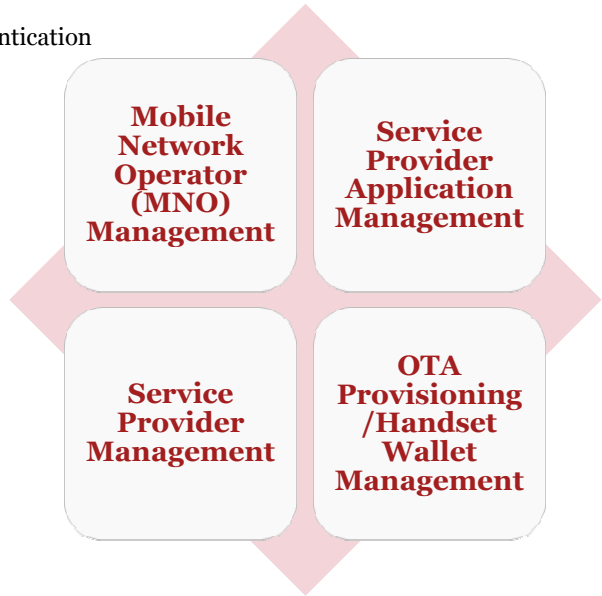
Trusted service manager roles [1]

MNO Management

- Contractual relationship
- Secure connection
- Business rules and authentication
- Billing, reporting, and reconciliation
- User registration

Service Provider Management

- Contractual relationship
- Secure connection
- Data preparation/ data staging
- Business rules and authentication
- Billing, reporting, and reconciliation
- User registration



Service Provider App Management

- Chip data preparation
- Application key management
- Service Provider, application, and end-customer lifecycle management
- Fraud/security management
- End-customer support

Over-the-Air (OTA) Provisioning/Handset Wallet Management

- OTA provisioning
- OTA post-issuance/content delivery
- Chip management
- Wallet management
- Handset management
- Security element key management
- MNO, handset, and end-customer lifecycle management
- Fraud/security management
- End-customer support

Why is a TSM required?

i. Any application that requires your personal information, such as a credit, debit or other payment application, requires special handling; the application and your personal information must be stored in the handset's secure element and not in the standard handset memory

ii. The TSM plays a key role in securely interfacing with a financial institution's secure data environment and ensuring that all required secure data-handling processes are in place

iii. The TSM plays a key role in validating that the mobile subscriber is securely identified, is a valid customer of a given service provider, and has permission to receive a given payment application

TSM addresses one of the biggest challenges to realizing simple, transparent mobile payments within the mobile commerce ecosystem: bringing multi-account services to different mobile NFC devices accessed through a variety of proprietary networks.

[1]First Data, "Trusted Service Manager: The Key to Accelerating Mobile Commerce," 2009.

Current situation

Implications for financial institutions

Mobile is bringing changes to commerce that will inevitably impact the transaction path as we know it today – creating both opportunities and threats. Financial institutions need to create "defend and extend" mobile strategies in order to protect their current revenue stream as well as capture new value.

Current situation

With mobile payments delivering innovation that will change the retail point of sale experience, financial institutions (FIs) may be disintermediated unless they act now.

Innovations in the retail space

- **Secure Vault Payments** allows consumers to pay by logging into their password-protected online bank account
- **AisleBuyer** allows consumers to receive information on products and perform comparison shopping in the store and check-out through their mobile app
- **Square** allows merchants to accept credit card payments and manage transactions with a mobile phone or tablet
- **ChargeAnywhere** turns NFC-enabled phones into POS machines

Implications for FIs

- Possibility of merchants steering customers away to a preferred and cheaper payment form
- Technological solutions can now bypass credit card networks and leverage ACH for payments
- Impact on acquirer businesses as merchants demand simple pricing and new value-added services
- Leveraging consumers' mobile devices as mini-POS devices through apps means consumers and merchants have multiple payment choices
- Merchant-funded and personalized rewards offerings will become an integral part of in-store purchases. This can reduce the consumer incentives to use loyalty programs offered by financial institutions

Current situation

The advent of mobile also introduces new privacy, fraud and compliance risks that further complicate the security needs of current players.

- Multiple providers may have ***different or immature information security controls*** that are regulated differently.
- Different providers may use ***conflicting privacy policies to handle sensitive customer information***.
- ***Anonymity of transactions is a serious risk***, yet the ability to increase layering of transactions and reap the rewards is greatly enhanced.

Information risk imperatives

Privacy

- Protecting customer's sensitive information from exposure to unintended third party
- Preventing identity impersonation from lost or stolen mobile devices or device credentials
- Preventing account takeover or identity impersonation from credentials harvested via keyloggers or other malware

Fraud

- Prevent money laundering and terrorism financing from use of compromised accounts
- Prevent investment fraud from compromised bank accounts
- Prevent smurfing (splitting of large financial transactions into smaller transactions)
- Prevent disguising mobile transaction totals, origins, and destinations

Compliance

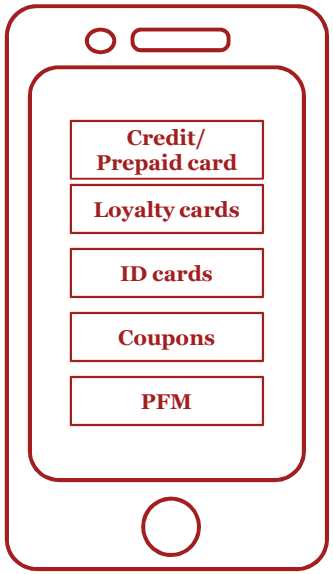
- Anti-Money Laundering Act
- Know Your Customer (e.g. USA Patriot Act)
- Combating terrorism finance
- SEC, FTC, and FFIEC scrutiny
- May be incorporated into the proposed Consumer Protection Act

Current situation

Several players are deploying mobile wallet solutions. Mobile wallets provide a single medium that captures the value streams of interest to participants and also protects them from emerging threats.

A mobile wallet is the technology-driven evolution of the traditional physical wallet we carry today. It holds value (access to cash and other payment sources) and provides a digital form of identification for our physical selves.

- A mobile wallet is a progression of the physical wallet we carry today, but in a digital form.
- It combines the functionalities of "e" (online) and "m" (mobile) wallets.
- Four key capabilities help define a mobile wallet:
  - Linking to other payment sources (bank accounts, cards, loyalty programs, coupons)
  - Holding value or currency
  - Funding commerce in both the physical (offline) and virtual (online) environments
  - Enabling management by multiple digital devices (e.g. PC, mobile, tablets, PDAs)



Current situation

While the opportunities, threats, and consumer experience impacts are the current focus, financial institutions should start preparing for other possible systemic implications.

- ***Emergence of alternative payment networks***: The integration of technological advancements such as cloud-based networks that can enable cloud-based processing.

- ***Regulatory concerns***: Because of the recent economic downturn, regulatory concerns will continue to be at the forefront of the financial services industry for the foreseeable future. While mobile regulation has not yet been determined, once mPayments become mainstream, regulators will weigh in.

- ***Consumer ownership***: As industry players begin to expand services, consumers will have multiple loyalty relationships. For example, Visa will begin to own customer relationships and banks will operate mobile money platforms.

- ***Intensified competition***: Enhanced cross-border viability/competitiveness on international payment networks (particularly those emerging out of the EU since they are already tackling jurisdictional issues and can more easily enter the US as an add-on in the future).

- ***New business models***: Perhaps the most glaring implication of mobile payments will be the emergence of new business models that are created to adapt to both market types (developed and emerging) and organizational structure (collaborative, bank network model, etc.).

Current situation

Hurdles to mobile payments adoption

While there are hurdles to mobile payments adoption, current advancements in the market and learnings from global players demonstrates critical lessons on how they can be overcome. Innovative players will adapt, test, learn, and adopt.

Current situation

Three key hurdles stand in the way of widespread mobile payments adoption, made even more complex by the two-sided nature of payments. Unidirectional product designs and solutions that financial institutions have grown used to will not work in this new world.

The two-sided nature of the payments landscape complicates the hurdles to adoption, because of the unavoidable chicken-and-egg conundrum–merchants will not adopt because there is no consumer adoption, consumers will not adopt because of lack of merchant acceptance.

Value proposition

No consensus on a compelling consumer value proposition for mobile payments as well as the lack of a merchant value proposition to make the investment or switch

Terminal penetration[2]

Merchants need to upgrade their POS terminals in order to accept mobile payments. Today, only 2%-3%[1] of merchant locations accept contactless payments.

Handset enablement[2]

While NFC has been touted as the winning solution for mobile payments, NFC-capable phones remain less than 1% of the market

The majority of the population still use feature phones, limiting the possibilities of mobile payments delivery

In addition, other hurdles exist that will need to be addressed:

- Payment processing efficiencies
- Security
- Regulatory compliance
- Access to funds/credit
- Provisioning
- Complexity of deployment

[1] K. Foster, E. Meijer, S. Schuh, and M. A. Zabek , "The 2008 Survey of Consumer Payment Choice. Federal Reserve Bank of Boston Public Policy Discussion Paper No. 09-10," 2009.
[2] Based on PwC mobile payments analysis.

Current situation

While the market is not close to attaining ubiquity, significant steps are being taken by the forerunners in the industry to overcome known hurdles.

Customer value proposition

Starbucks

is the first mPayment and loyalty-based application in the US (6,800 company-operated stores and over 1,000 Target locations)

3 million

customers have loaded money in Starbucks application[1]

21%

year-over-year increase in prepaid funds since the introduction of the mobile application in 2009

Terminal penetration

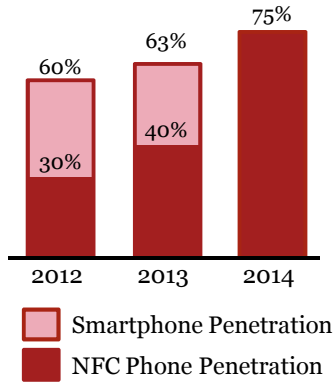
Verifone

to include NFC in all POS terminals.[2] Also lowering cost of adding NFC to POS terminal from $100 to $30-$35

Charge Anywhere

New mobile payment software that can transform Google's Nexus S smartphone into an NFC terminal[3]

Handset enablement[4]



Rapid adoption and availability of QR codes as "bridge" technology

Google

"Android 2.3 will support NFC"
– Eric Schmidt, Google Chairman

[1] Starbucks Annual Meeting of Shareholders, 2011.
[2] Near Field Communications World, "Verifone to include NFC in all new POS terminals," 2011.
[3] ReadWriteWeb, "CHARGE Anywhere Makes Nexus S an NFC Terminal," 2011.
[4] PwC Team Analysis – based on publicly available device release announcements.

Current situation

In addition, critical lessons on driving adoption can be learned from global predecessors in the mobile payments space that have been successful in overcoming known hurdles.

Customer value proposition

- Customer choice helped adoption; in Japan, three payment options were provided to customers – Prepaid, Credit and Direct-to-bill[2]
- Partnering with widely adopted player channels (mass transit, dominant retail chains) is critical for fast paced adoption[1]
- Loyalty coupons, offers, and incentives drive uptake

Terminal penetration

- Terminalization concerns were largely resolved through subsidized NFC terminals. NTT DOCOMO set aside $22 million to subsidize small merchants. In exchange, merchants paid a small fee for each NFC-related transaction[2]
- A critical factor in the development of mobile payments ecosystem in Japan was DOCOMO's decision not to seek exclusive rights for FeliCa[2]

Handset enablement

- NTT Docomo deployed a series of strategies to tackle handset enablement, for example:
  - Key carriers convinced the device manufacturers to embed FeliCa chips to ensure interoperability[1]
  - QR Codes were widely used as means of coupon delivery to mobile phones—driving adoption
  - Over the air account activation by dialing a 3-digit short code provided by the network operator to enroll the user in the entry level direct-to-bill account[2]

[1] S. Ezell, "Contactless Mobile Payments, Information Technology and Innovation Foundation," 2009.
[2] M. Crowe, M. Rysman, J. Stavins, "Mobile Payments in the United States at Retail POS: Current Market and Future Prospects, Federal Reserve Bank of Boston," 2010.

Section 3

Competitive intelligence

Competitive intelligence

In the US, the emerging mobile payments war has resulted in at least five distinct business models that are being formed in order to assess the financial, operational, and experience impacts to participants and consumers.

					
	Bank-network	**Collaborative**	**Innovator**	**Retailer**	**Mobile operator**
Model participants	▪ Banks/issuers ▪ Association/ network	▪ Mobile Network Operators (MNOs) ▪ Banks/issuers ▪ Association/ network	▪ Alternative solution provider	▪ Retailers ▪ Stand-alone merchants	▪ Mobile Network Operators (MNOs)
Description	Payment network builds upon existing network and deploys mobile payment applications or devices to customers, via bank partners, and ensures merchants have the required point-of-sale (POS) acceptance capability	Collaborators foster coordination among banks, mobile operators, existing payment networks and other stakeholders in the mobile value chain, including a potential trusted third party to manage and deploy mobile applications	Technology-based solutions leverage existing and complementary mobile assets to develop a digital wallet and related mobile payment capabilities	Merchants create independent, closed-loop payment applications that are interoperable with existing POS technology	Mobile operator acts independently to deploy mobile payment applications and value added services through the mobile device as a “bill to mobile” or digital wallet payment solution

Competitive intelligence
Bank-network model

Model overview	▪ Payment network distributes mobile wallet through bank/issuer partners ▪ Wallet will be open to all networks and financial institutions and allow for cross-channel payments (e-commerce, P2P, social) ▪ Value added services such as merchant offers will be included
Strengths/opportunities	▪ Model is closely aligned to existing business rules for traditional payments with the added benefit of additional revenue streams for the network operator ▪ Ability to scale quickly through existing bank/issuer relationships ▪ Opportunity to increase brand awareness to end-consumers
Weaknesses/threats	▪ Payment network will need to be able to quickly respond to consumer demands while also managing other stakeholder relationships (merchants, banks, issuers) ▪ Limited experience in developing and managing consumer-facing applications ▪ Lack of MNO relationship may limit ability to distribute wallet
Overall assessment	▪ Payment network builds upon existing network, reputation, and relationships. The hurdle is to deploy mobile payment applications and near field communication (NFC) mobile phones—a capability with limited experience

Competitive intelligence

U.S. case study: Bank-network model – ***Visa****

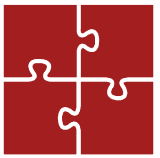
Case overview	▪ In May 2011, Visa announced its plans to launch a mobile wallet which would be open to all financial institutions and payment networks ▪ The wallet will be distributed through its bank partners; 14 were signed up at the time of the announcement ▪ The multi-platform digital wallet can be used for e-commerce, m-commerce and mobile contactless transactions and includes mobile payment, NFC and coupon capabilities.[1]
Strengths/opportunities	▪ Largest payment brand ▪ Ready merchant availability: Existing 150,000+ merchants who accept PayWave, its contactless platform, will not need a new reader ▪ Protects existing revenue streams while creating opportunities for new ones (such as advertising) ▪ Current global initiatives and acquisitions – for example, the acquisition of Fundamo in South Africa–will provide critical experience that can be leveraged in the US
Weaknesses/threats	▪ Visa will need to prove it can quickly respond to consumer demands for payment features while balancing demands from its merchant and bank community ▪ Lack of an MNO relationship (all four leading MNOs have already established other partnerships) may slow down efforts
Overall assessment	▪ Because of its brand strength, merchant network, and customer base, Visa has a likelihood of success in the ecosystem ▪ The wallet model in the US will progressively become more collaborative as Visa opens up its platforms and builds relationships with other players in the value chain

**Information based on publicly available data as of September 2011*

[1] NFC World, "Visa unveils mobile wallet plans," 2011.

Competitive intelligence

Collaborative model

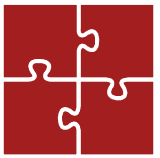


Model overview	▪ MNO partners with payment network, bank/issuer or alternative solution developer ▪ Wallet pre-loaded onto handset via mobile operating system developer or through MNO
Strengths/opportunities	▪ Potentially large customer base from onset because of customer base each partner brings to the partnership ▪ Strong brand identity by wallet providers can stimulate consumer demand ▪ Each partner allowed to focus on their own strengths to benefit ecosystem as a whole
Weaknesses/threats	▪ Many players within one collaboration will make technical integration difficult ▪ Inability to quickly resolve customer issues because of complex environment can lead to poor customer experience, decreased usage and decreased revenues
Overall assessment	▪ While all key players exist, giving this model a high likelihood of success, the technical and operational integration between all players will be challenging

Competitive intelligence

U.S. case study: Collaborative model – ***Google Wallet****

(w/Citi, MasterCard, Sprint and First Data)



Case overview	▪ Google announced it is teaming up with MasterCard, Citigroup, Sprint and VeriFone. Holders of Citi cards can pay through an mPayments application developed for the Android phone ▪ Google committed to release a new Android OS with NFC in 2011 ▪ Other major players in the financial services space are expected to also become part of the program
Strengths/opportunities	▪ Already owns payment processing model for online payments (Google Checkout) ▪ Android phones have overtaken iPhones in number sold (in 2010) ▪ Strong mobile ad presence and customer data mining capabilities; Google has the capital to subsidize NFC-enabled POS devices ▪ First Data's industry leading processing and merchant distribution capabilities is a significant add
Weaknesses/threats	▪ Payments experience not as mature as other players ▪ Customer privacy concerns surrounding the release of Google Buzz may taint other Google products
Overall assessment	▪ Google could leverage its existing payments capabilities through Google Checkout to enter the mPayments scene as a digital wallet provider ▪ Google will leverage its NFC-enabled phones and tracking abilities to improve customer analytics and advertising which they can sell to businesses

**Information based on publicly available data as of September 2011*

Competitive intelligence
Innovator model

Model overview	▪ Non-financial firm leverages existing technology and existing internal assets to develop mobile payment solutions
Strengths/opportunities	▪ Potential to quickly scale because of large existing customer base (e.g. Apple iTunes has 160 million users linked with payment information, Facebook has 250 million mobile users—Facebook-mobile device users are twice as active as non-Facebook mobile users) ▪ Strong consumer adoption and consumer comfort with existing payment assets (Facebook credits, account links on iTunes) ▪ Merchants pay lower fees compared to traditional payment methods
Weaknesses/threats	▪ Lack of experience within the payments industry relative to traditional players ▪ Customer trust with financial instruments has been lower for new entrants into the payments space
Overall assessment	▪ Unlike traditional players who have “card-emulation” requirements, innovators can ignore the status quo. However, innovators without collaboration lack significant merchant or consumer adoption

Competitive intelligence

U.S. case study: Innovator model – ***Secure Vault Payments (SVP)****

Case overview	▪ Sponsored by NACHA, SVP allows consumers to pay at a merchant website by logging in with their bank credentials (bank login ID and bank password). This process is facilitated through ACH and eliminates the need for payment networks (e.g. Visa/MasterCard) ▪ SVP has announced a mobile application that will rely on QR codes to interact with users' handsets. Once a user scans the quick response (QR) code for SVP displayed on a bill or screen, the handset will take the user to an authentication page
Strengths/opportunities	▪ Merchants pay a lower fee compared to traditional payment methods ▪ No additional sign-up process for consumers, bank online login ID and password will suffice ▪ Merchants/billers receive immediate authorization of guaranteed ACH payments, funds typically settle the next day ▪ Not subject to PCI compliance–merchants do not need to store/protect info
Weaknesses/threats	▪ Works only with online banking customer segments ▪ Interchange revenue cannibalization for issuers may deter uptake ▪ Currently low merchant/bank adoption rate (US Bank biggest adopter to date)
Overall assessment	▪ SVP can pose a threat to payment networks and issuer interchange revenue once its network effects strengthen

**Information based on publicly available data as of September 2011*

Competitive intelligence
U.S. case study: Retailer model – ***Starbucks****

Case overview	▪ Starbucks uses a smartphone application to generate a barcode to reload balances, pay for purchases, track spend, and award loyalty stars
Strengths/opportunities	▪ High merchant adoption: Closed-loop model allows Starbucks to roll out acceptance hardware to 6,800+ stores ▪ Low customer risk: Prepaid nature lowers consumer risk in cases of theft or fraud ▪ Familiarity: Process piggy-backs on existing prepaid function that customers are familiar with ▪ Loyalty: The Starbucks app allows for higher penetration of its loyalty program
Weaknesses/threats	▪ Eligible purchases are limited to Starbucks products and locations
Overall assessment	▪ Integration of prepaid cards with smartphone applications will provide consumers with higher value and convenience ▪ Other merchants adopt the "Starbucks model"—leading to multiple independent systems and the possibility of a merchant aggregator with non-compete big box retailers (e.g. imagine Starbucks, Target, McDonalds and AMC aggregator as a private label app), which could steer customers towards alternate funding sources

**Information based on publicly available data as of September 2011*

Competitive intelligence

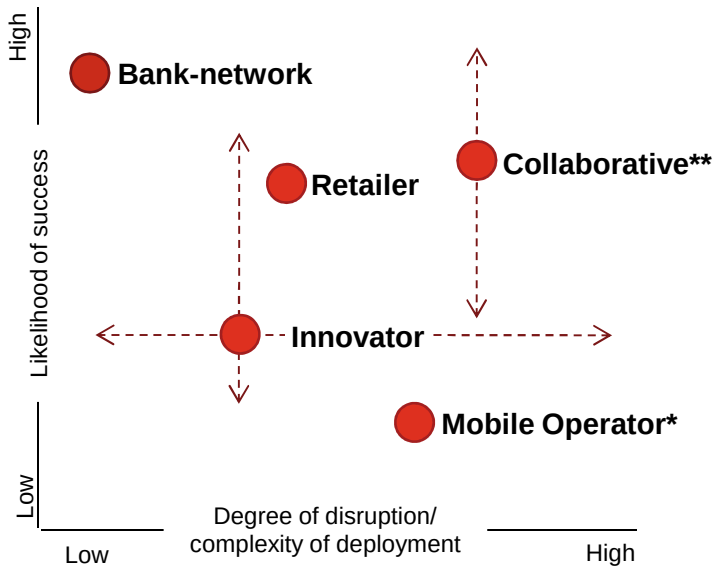
Mobile operator model

Model overview	▪ Acting independently, the mobile operator develops and deploys a mobile wallet solution that can be used for retail POS purchases and/or direct mobile billing
Strengths/opportunities	▪ Mobile payments platform can be used to reduce customer churn ▪ Existing customer base provides large potential target for mobile wallet uptake
Weaknesses/threats	▪ Consumers may not want another financial account ▪ Lack of experience in financial services and payments, particularly financial risk management ▪ Mobile operators would need to develop merchant relationships that currently do not exist today
Overall assessment	▪ While a solo venture from an MNO makes sense in the context of an unbanked market, the long-term viability of an MNO in a developed market is harder to justify

Competitive intelligence

While the bank-network and collaborative models have the highest likelihood of success, players should build model-agnostic strategies that position them for success in any model rather than wait for the winning model to emerge and risk losing out on potential benefits.

Emerging threat matrix



Possible models

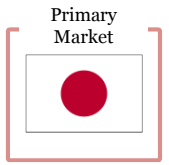
Model name	Overall assessment
Bank-network	Payment network builds upon existing network, reputation, and relationships. The hurdle is to deploy mobile payment applications and NFC mobile phones
Collaborative	While all key players exist, giving this model a high likelihood of success, the technical integration between all players will be challenging
Retailer	In the short-term, only well-capitalized merchants can create independent closed-loop payment applications
Innovator	Unlike traditional players who have "card-emulation" requirements, innovators can ignore the status quo. However, innovators without collaboration lack significant merchant or consumer adoption
Mobile operator	Low cost of entry and high consumer adoption potential; however, will require integration with payment processors for acceptance

The bank-network model may currently be predominant, but at the end of the day if banks are too slow to keep up with the fast pace of change, collaborators may take the lead. To succeed, banks will need to be collaborative with partners who both understand the mobile space and are able to keep up with the pace of change.

* US-centric threat matrix, emerging markets will have mobile operators ranked higher ** Success will largely be based on tactics/implementation design

Competitive intelligence

Global Case study: NTT DoCoMo*



NTT DoCoMo, the forerunner of mobile payments in Japan, is a significant player in the mobile space because of its early investments, strategic partnerships, and current penetration in the Japanese market.

Initiative overview	▪ In 2003, Sony, JR East, and DoCoMo established a joint venture called FeliCa Networks which acts as a TSM and collects license fees from other mobile operators who use FeliCa ▪ In 2004, NTT DoCoMo introduced the technology, selling mobile phones enabled with FeliCa and including an "e-wallet" application preloaded on each phone ▪ In 2006, NTT DoCoMo launched the iD/DCMX platform for mobile credit card transactions
Strength/opportunity	▪ DoCoMo holds a 50%+ market share in mobile services ▪ Partnership with JR East, Japan's largest railway, led to quick uptake with mass-transit users ▪ Opened up platform for 3rd party applications ▪ DoCoMo set aside ¥20 billion ($22 million) to subsidize small merchants' installation of NFC-enabled readers/writers ▪ Loyalty coupons, offers and incentives drive uptake ▪ Customer choice helped adoption—3 payment options were provided to customers—Prepaid, Credit and Direct-to-bill, with easy over the air account activation by dialing a three-digit code
Weakness/threat	▪ Because FeliCa is a proprietary closed-standard, different electronic money (digital cash) systems are not interoperable, requiring merchants to deploy proprietary POS reader terminals to accept different electronic money systems. ▪ Going forward as DoCoMo tries to expand its technology internationally, it will have difficulty working with other already established standards
Overall assessment	▪ While the success of DoCoMo is largely due to its environment, US financial institutions can adopt many lessons from the company. Players seeking to penetrate global markets also will need to establish an interoperable and open system to compete against firms like NTT

**Information based on publicly available data as of September 2011*

Competitive intelligence

Global Case study: M-PESA*

Primary Market

M-PESA, popular in Africa because of its ability to reach out to the un-banked and under-banked, offers both P2P and small purchases via text.

Initiative overview	▪ M-PESA allows consumers in Kenya to send money to one another through text–P2P ▪ M-PESA also includes merchants in the process as "agents," allowing consumers to withdraw cash at agent locations; no charge for depositing, but a sliding tariff is levied on e-cash sent and withdrawn
Strength/opportunity	▪ Works with low-tech mobile devices. Only SMS functionality required ▪ Targets areas with poor banking infrastructure where cash is the only payment alternative ▪ Signed an agreement with Western Union to facilitate cross-border money transfer ▪ Rapidly growing agent network and consumer adoption ▪ Parent company, Safaricom, controlled ~80% of the Kenya mobile phone market
Weakness/threat	▪ M-PESA will have difficulty in areas with well-established banking structures without collaborating with existing players in the market
Overall assessment	▪ While M-PESA is already experiencing resounding success in Africa, the future of M-PESA is intimately interconnected with its ability to expand to other countries through strategic partnerships (such as Western Union). This expansion will allow for growth in its existing consumer base and allow additional opportunities for new revenue streams

**Information based on publicly available data as of September 2011*

Competitive intelligence

Global Case study: MTN, Standard Bank*

Primary Market

Whereas M-PESA has succeeded with unbanked markets, MTN is gaining market share in areas where banking penetration is high.	
Initiative overview	▪ Similar to M-PESA, MTN MobileMoney is a mobile-operator led model. The difference lies with MTN's additional offering—MTN has a partnership with Standard Bank to offer comprehensive banking services
Strength/opportunity	▪ MTN MobileMoney services are available for both bank account holders and non-bank account holders—widening their customers to both high- and low-end segments
Weakness/threat	▪ Because of their joint venture, MTN does not have full control over the banking services offered
Overall assessment	▪ For markets where banking penetration is high, MTN has shown that a joint venture between MNOs and banks demonstrates a high value proposition to consumers. The trend in more developed markets is a convergence between MNOs and financial institutions

**Information based on publicly available data as of September 2011*

Competitive intelligence

Global Case study: Mobile payments in Nice, France*

Primary Market

France's mobile network operators and banks, along with Visa and MasterCard, the local transport operator, the city council, and others took part in Europe's first pre-commercial NFC pilot under the Cityzi brand.

Initiative overview	▪ Officially launched in May 2010, this project was coordinated by the Association Francaise pour le Sans Contact Mobile (AFSCM) and brought together mobile network operators Orange, Bouyges Telecome and SFR plus the Nice region's public transport operator Veolia and French banks Credit Mutuel, Societe Generale, and BNP Paribas
Strength/opportunity	▪ The pilot's strengths are due to the collaboration of a national mobile association, mobile network operators and banks. By partnering with the regional public transport operator, the pilot provides a compelling value proposition by providing a platform and location for mobile payments use
Weakness/threat	▪ Successful trials have occurred where mass transit is popular. The transition from mass transit to widespread merchant adoption remains to be seen in most countries
Overall assessment	▪ Although rolled out in a very small area, the pilot was critical in showing that localized rollouts were important to gain consumer trust and establish a strong value proposition within the consumer consciousness

**Information based on publicly available data as of September 2011*

Competitive intelligence

Successful mobile payments deployments require a compelling driving force.

- ***"Casting vote" and/or "Collective good" developments***: Safaricom's M-PESA owns more than 80% of the market. NTT, which owns more than 50% of the market, subsidized POS machines. In less consolidated markets, market leader(s) may need to make significant investments to attain critical mass.

- ***Bi-directional value offering***: Most innovations and developments deliver value to only one side of the equation—with payments being a two-sided industry, value must be delivered to both sides of the equation, simultaneously, to mitigate the chicken-and-egg conundrum.

- ***Regulatory intervention***: Where there is regulatory pressure to deploy the innovation or service, which in essence forces "casting vote" or "collective good" developments. A less prescriptive variant of regulatory intervention could be attained when an association or union of key parties put forward proposals and guidelines likely to be adopted. For example, the European Payments Council (EPC), which represents the European banking industry, has released a draft version of guidelines it hopes will give the use of NFC (Near Field Communications) for payments a boost.

- ***"Glass-empty" innovation***: In this scenario, the service offering is not merely a "nice-to-have" but an actual vacuum is being filled – services or products are extended to unreached market segments such as Square with small merchants and M-PESA with unbanked markets in Kenya.

Section 4

A framework for response

A framework for response

Preparing for success

Success in the ecosystem will require organizational DNA changes that will enable traditional participants to play new roles and deliver new services in an open, collaborative, and fast-paced ecosystem.

A framework for response

The emerging "mobile payments race" will result in new business and operating models leading to a fresh set of business questions being asked in the space–making a wrong call will be costly.

Business Model

What business model best aligns with our goals to ensure success? How do we gain this alignment?

	Bank-network	Collaborative	Innovator	Retailer	Mobile operator
Model participants	▪ Banks/issuers ▪ Association/ network	▪ Mobile Network Operators (MNOs) ▪ Banks/issuers ▪ Association/ network	▪ Alternative solution providers	▪ Retailers ▪ Stand-alone merchants	▪ MNOs

Operating Model

How do we operate within our chosen business model? What organizational changes are required to play differentiating roles?

Trusted Service Manager | Loyalty Platform Provider | Data Services | Advanced Marketing Intelligence | Merchant Aggregator | Wallet Provider | Open Innovation Platform

Mobile Ready Enterprise: Customer-centered, Entrepreneurial, Scalable/Flexible Technology, Streamlined Agile Processes, Open Collaborative, Integrated Customer View, Unified channels

A framework for response

Players need to recognize that for mobile payments to succeed, the future will need to be open and as such should align with solutions that are open and collaborative. A closed system cannot leverage a wide variety of firms to move forward.

The most successful mobile payments offering will meet 5 foundational tenets of openness and have the real estate to deliver value added services to the consumer.

5 foundational principles

mPayment offerings should be open to all…

1. **Networks/brands** e.g. Visa, MasterCard, China Union Pay, American Express
2. **Issuers** e.g. Bank of America, Chase, Capital One
3. **Operating systems** e.g. Droid, iOS, Blackberry
4. **Funding source** e.g. ACH, Debit, Credit, Prepaid
5. **Devices** e.g. HTC, Nokia, Motorola

Sample value added components

Wallet should be enabled to handle some of the following…

- *Loyalty/rewards management*
- *Location aware offerings*
- *Merchant advertising*
- *Money Movement e.g. P2P, Bill Pay, Transfers*
- *Identity verification*
- *Transit cards*
- *Social media integration*
- *Purchase confirmation/receipting*
- *Store of value*

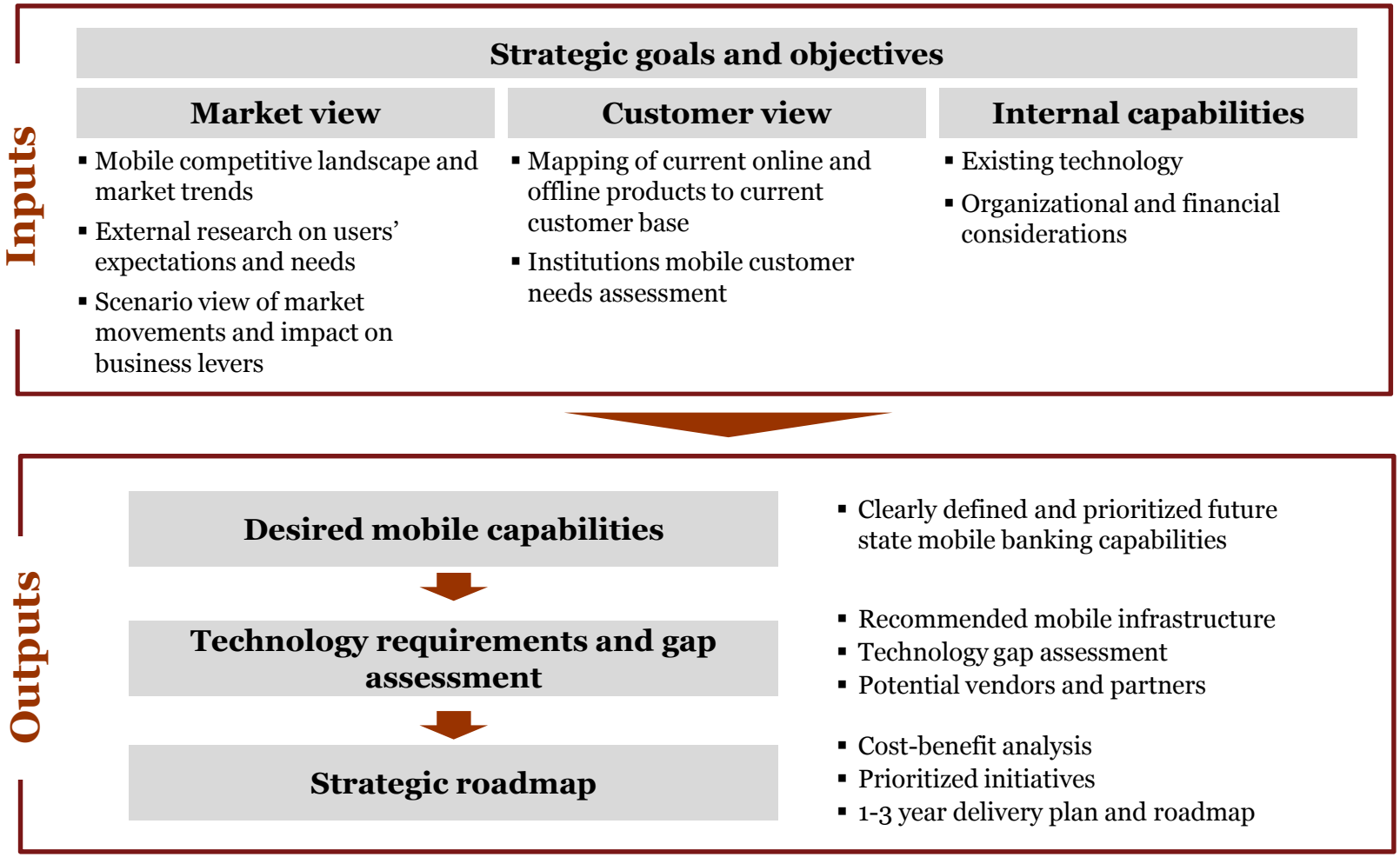
A framework for response

In addition to being open, several key success factors need to be considered as mobile payment offerings are being rolled out. The extent of adopting these factors will be highly correlated with the extent of success and adoption.

Success factor	Description
Breadth and convenience in end-use utility	▪ Must retain the functionality and usefulness of physical wallets from identity to payments to cash in/out ▪ Also provide new functionality which takes advantage of the internet (instant balance checks, price comparisons, etc.)
Virtual and physical availability and acceptance	▪ Transcends all components of payments from P2P, retail point of sale (POS) to e/m-commerce ▪ Contributes to displacement in the everyday use of cash and checks with the same payment source availability as physical wallets provide today
Cost advantage	▪ Maintains lower transaction cost advantage of alternative payment networks when possible for consumers and merchants ▪ Competitive transaction processing prices when existing network rails are used (debit or credit)
Security	▪ Maintains security of personal banking information and privacy protection ▪ Transactions encrypted with application level authentication ▪ Compliance with industry standard for secure transactions (PCI, DSS)
Interoperability/ standardization	▪ Standardization across mobile payment technologies will be critical to enabling the physical acceptance of digital wallets ▪ Interoperability across provider solutions (mobile, financial institutions, networks) will be necessary to drive mass market adoption
Compliance	▪ Must comply with a broad set of international and local regulations to maximize global acceptance

A framework for response

Approach should consider external and internal drivers in business and technology to arrive at the strategic roadmap



A framework for response

A segmentation of the population with regards to propensity to adopt mobile services and value to bank should be performed to estimate the market demand for mobile payments

c — Low Potential

Do not force it, very unlikely to see value in any mobile offering

a — High Value

Will churn if mobile needs are not met but will grow in value with mobile engagement; perfect for up-sell/cross-sell

d — Low Value

Unlikely to benefit from mobile

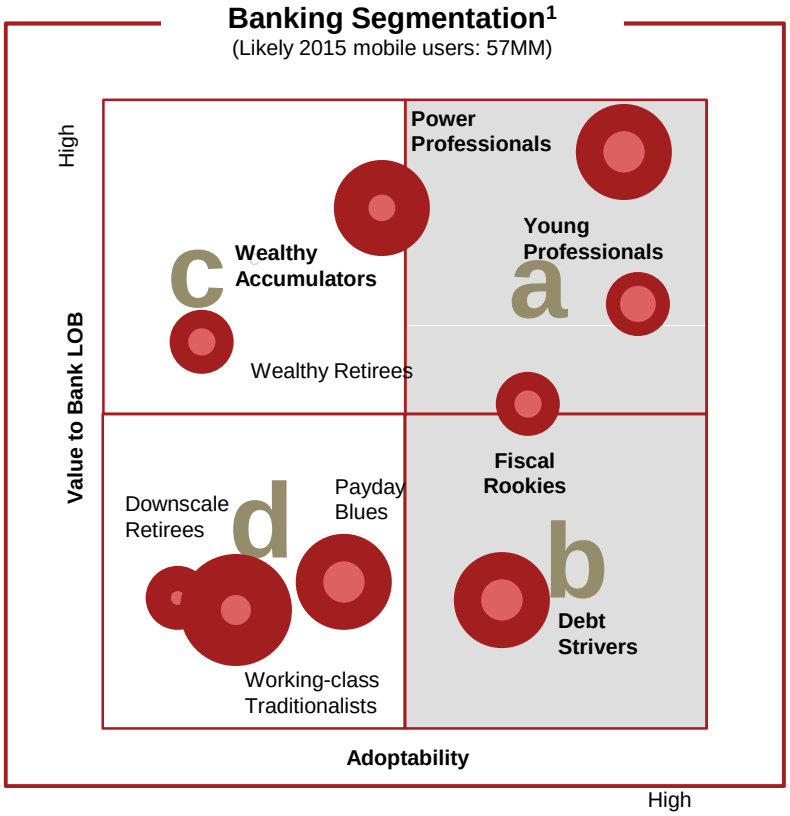
b — High Potential

Can be coached into financial adulthood with plenty of cross-sell, engage early and keep loyal using mobile

Key

Target Profiles

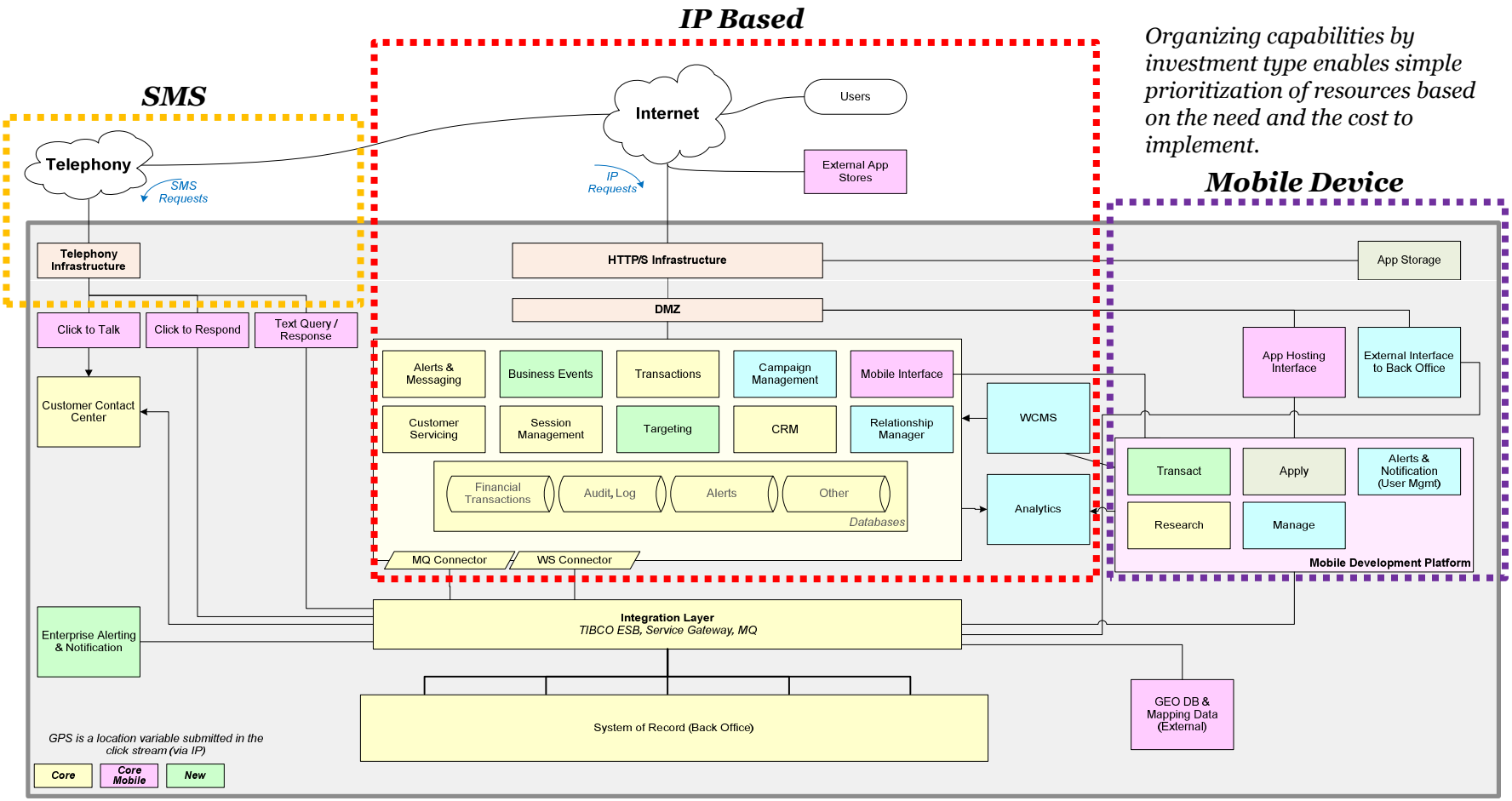
- US population size
- Likely 2015 mobile users



[1] Based on PwC analysis.

A framework for response

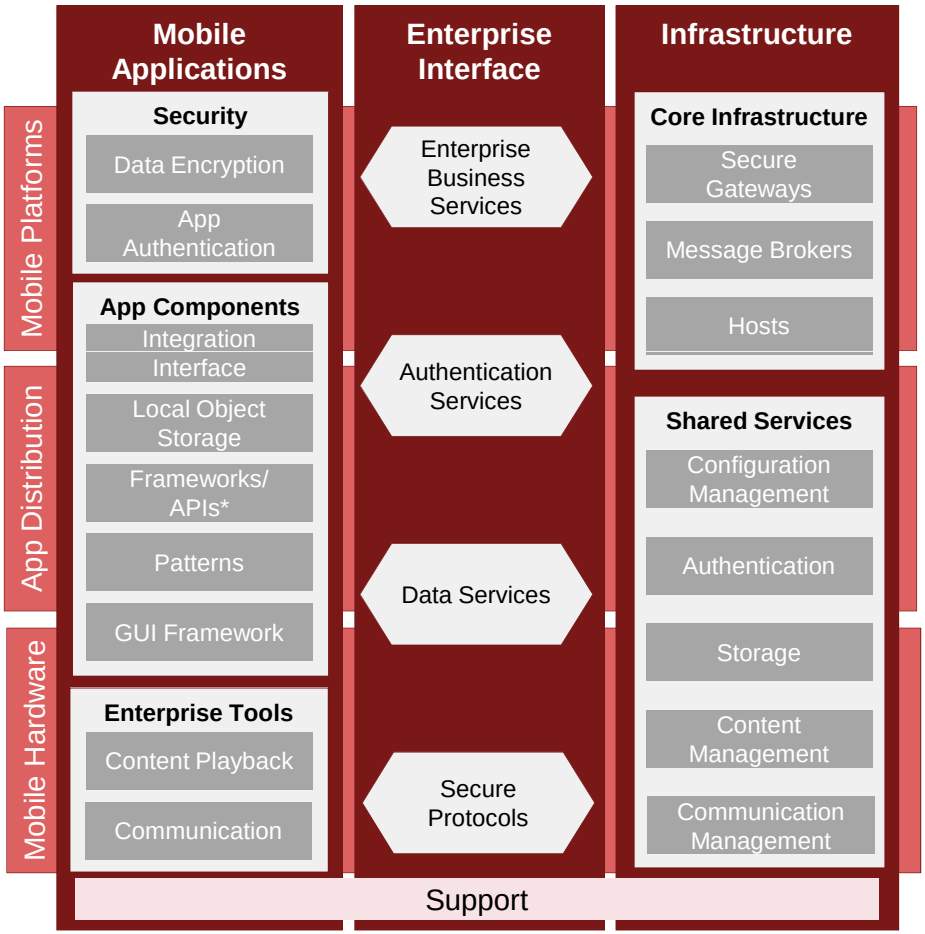
A clear view of the technology landscape (current state and future state) is critical to understanding what has already been created, what platforms are aligned to the business capabilities, and which platforms may require additional investment.



Organizing capabilities by investment type enables simple prioritization of resources based on the need and the cost to implement.

A framework for response

Development frameworks and infrastructure must be tailored to address the challenges presented by mobile.



*Application Programming Interfaces

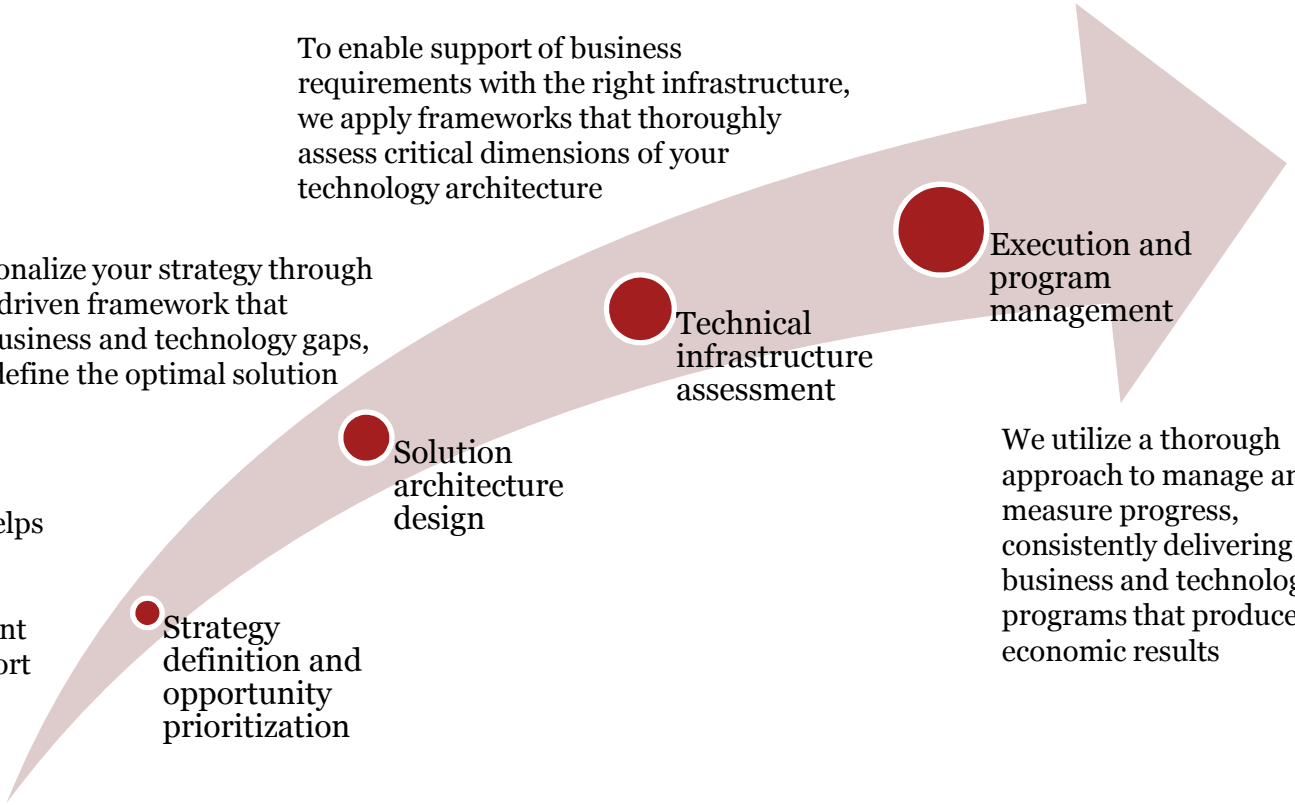
- Define and develop reusable application components that enable rapid mobile development across supported devices and operating systems
- Adopt mobile software that offers solutions to securely manage firm content, media, and communications
- Take advantage of secure interfaces that provide access to existing enterprise business services, security resources, and assets
- Improve core infrastructure components to better serve, secure, and support mobile applications
- Deploy shared infrastructure services that will facilitate mobile platform and application management and support

Section 5

How PwC can help

How PwC can help

PwC has helped a number of industry players address critical questions and develop competitive responses that will help them succeed in the mobile ecosystem.



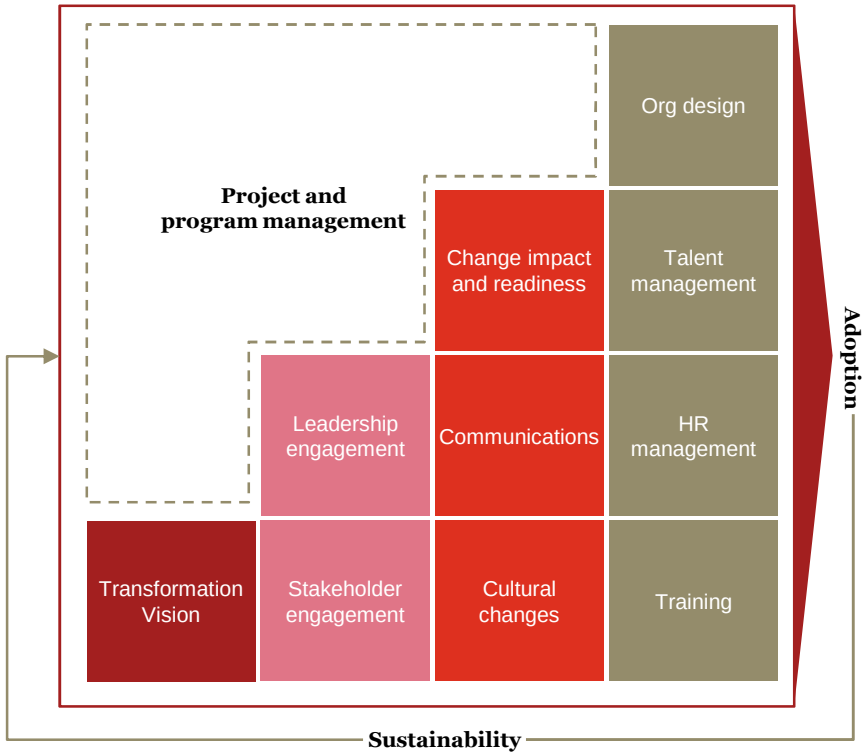
How PwC can help
Client needs and issues

Client needs	Issues we help clients address
Strategy definition and opportunity prioritization	▪ Developing a mission statement addressing the major functions and operations that the mobile program will address ▪ Articulating an inspirational, forward-thinking vision of what the program wants to achieve ▪ Defining the top priorities/objectives that would achieve the vision, tracked by performance indicators that collectively support goal attainment ▪ Developing the roadmap that describes how the business plans to achieve the objectives and what actions will be enabled
Solution architecture design	▪ Identifying gaps in mobile business capabilities by assessing the current business architecture against market trends and leading practices in the industry ▪ Identifying gaps in mobile technology capabilities by assessing servicing, information, infrastructure, and integration needs ▪ Performing analysis of build vs. buy vs. partner models ▪ Analyzing expected return on investment and developing the business case ▪ Developing the target operating model, including: future state business processes, data flows, and dependencies; future organization structure and governance impacts; and regulatory framework ▪ Identifying quick wins and long-term implementation roadmap
Technical infrastructure assessment	▪ Defining infrastructure changes needed to support real-time mobile transactions ▪ Assessing the ability of technical architecture to support mobile transactions across multiple dimensions, including the application, data, and operating system levels ▪ Measuring the adaptability, scalability, portability, and reliability of the system architecture, among other characteristics
Execution and program management	▪ Establishing a Program Management Office (PMO) to oversee project planning, execution, and monitoring ▪ Developing project governance structures and procedures ▪ Implementing pilot program, capturing feedback, and refining mobile product features/strategy to address feedback ▪ Measuring and reporting on mobile program cost and benefits ▪ Identifying potential program risks and developing response strategies

How PwC can help

Among the key distinguishing characteristics of PwC is the depth and breadth of our experience and a client-based approach that helps deliver sustainable changes.

Extensive experience	We have designed and assisted with the implementation of new business and operating models for several leading financial services firms . We have extensive experience addressing the development and challenges of mobile payments with leading financial services institutions in the industry.
Industry focus	Our seasoned team of professionals brings deep industry experience and can uncover key operational risks and market opportunities in the asset management sector.
Deep operations, finance, and IT experience	Our team includes customer impact, strategy, operations, finance, regulatory, and technology specialists. These specialists provide insight on product design and channel strategy trends, as well as how companies are integrating them into their back-office business processes and infrastructure.
Tailored, integrated approach	We tailor our approach and deliverables to your needs based on your strategic goals, your current operating model, and the details of the business case for change.
A single point of contact	Our dedicated financial services team provides a single point of contact that can quickly mobilize the appropriate resources to assist you with your needs.
Global presence	We have a financial services presence in over 25 countries, allowing us to add significant value to companies considering cross-border market solutions.
Solution-based approach	Organizations have many choices with respect to addressing the risk, accounting, and operations issues related to mobile payments. We provide a tailored approach to address these issues in a sustainable fashion for your organization.



How PwC can help

What makes PwC's Financial Services practice distinctive

Integrated global network	PwC's Financial Services practice consists of more than 34,000 industry-dedicated professionals worldwide, including more than 4,500 in the United States. They serve large and multinational banks, insurance companies, investment managers, broker-dealers, hedge funds, and payments organizations. The US Financial Services practice is part of the PwC global network, which has clients in more than 150 countries.
Extensive industry experience and resources	PwC serves more of the biggest and most complex financial services companies than any other firm. We understand from personal experience the wide variety of business issues that affect the industry, and we apply our knowledge to our clients' individual circumstances. Moreover, our large, integrated global network of industry-dedicated resources enables us to apply this knowledge on our clients' behalf whenever and wherever they need it.
Multidisciplinary problem solving	The critical issues financial services companies face today affect their entire business. Addressing these complexities requires both breadth and depth, and PwC service teams include specialists in risk management, compliance, technology, business operations, finance, change and program management, data and business analytics, economics and analysis, internal audit, tax, forensics, and investigations.
Practical insight into critical issues	In addition to working directly with clients, our practice professionals and Financial Services Institute (FSI) regularly produce client surveys, white papers, and points of view on the critical issues that face the industry. These publications—as well as the events we stage—provide clients new intelligence, perspective, and analysis on the trends that affect them.
Focus on relationships	PwC's size, financial stability, and 150-year history all contribute to our long-term view of client relationships. We help clients translate strategy into action by helping them address their challenges in finance, tax, human resources, operations, technology, and risk and compliance.

How PwC can help

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Appendix

Select qualifications

Select qualifications

Mobile payments strategy—Leading US financial services company

Issues	The client viewed mobile payments as both an opportunity and threat to their core card business. They desired an understanding of the existing space to not only defend current market share, but also carve out a specific niche and create new value. The client was also concerned with its ability to quickly and effectively deploy mPayment products. PwC was engaged to provide recommendations on which threats to mitigate, which opportunities to pursue, which population segments offer greatest value, and how to make current infrastructure more agile and relevant to the evolving mPayment space.
Approach	PwC evaluated key best practices in the industry to isolate trends and identify potential future-state scenarios (open platform, MNO-based, etc.). PwC provided counsel on threats/opportunities and which mobile payment value added services they should pursue.
Benefits	PwC identified US population segments that would be of greatest value and relevance for the client's mPayment goals, and provided a number of infrastructure improvements to achieve competitive agility. By the end of the engagement, the client began implementing several of the recommendations, engaging partners and mobilizing internal resources.

Select qualifications

Mobile payments strategy—Leading US financial services firm

Issues	Client's current mBanking offerings were lagging behind competition. The client was seeking to transform itself into a "thin branch" banking model, and was concerned with current infrastructure, vendor relationships, and delivery capabilities. To catch up with the market and begin progression towards the "thin branch" model, the client desired an understanding of which mBanking features they should build and why. To improve infrastructure and delivery, the client desired a clear assessment of the current state and recommendations for achieving future state goals.
Approach	PwC was engaged by the client's digital team to create a mobile banking strategy that included infrastructure and customer segmentation recommendations. PwC developed an mBanking landscape overview which defined baseline functionalities, key players and consumer adoption trends. They conducted a comprehensive gap analysis of current offerings; provided competitive "parity" and differentiated recommendations. Also, PwC identified US population segments that would be of greatest value and relevance for the client's mBanking pursuits.
Benefits	PwC defined critical milestones towards enabling a successful "thin branch" model, including a comprehensive list of required features and potential future use cases. The team also helped to develop a current state assessment that identified opportunities across systems, processes, security, vendors, and delivery.

Select qualifications

Mobile application security assessment—Financial services organization

Issues	The client had developed a mobile banking application that customers could use to execute banking transactions from their smartphone. The client recognized the additional risks posed by the new mobile application platform versus the standard banking web application, specifically the risk of sensitive or personally identifiable information being "left behind" by the application within the smartphone.
Approach	PwC worked closely with the client's team to develop a mobile application testing methodology that included a full scope of penetration testing activities. This methodology took into account the various attack vectors facing the mobile application and included testing the application's security from the perspective of using the application with a standard browser and from the perspective of using the application from the mobile device itself. Additionally, PwC developed a mobile application security questionnaire and solicited feedback from leading organizations within the client's industry. Using these results, PwC was able to benchmark the client's mobile security practices against their industry peers and identify the mobile security practices of leading organizations.
Benefits	Our engagement identified several ways in which the client could improve their mobile application security practices to address the additional risks posed by the new mobile application platform. The results of the benchmarking assessment allowed the client to identify strengths and weaknesses within their mobile security practices and initiate process improvements.

Select qualifications

Multi-channel integration strategy—Major China retail bank

Issues	Client's siloed operating model and lack of integration across physical and digital channels have sub-optimized service and sales opportunities, creating a disjointed customer banking experience. With a heavy reliance on traditional channels (i.e., the branch) for growth, the bank was also lagging in digital channel capabilities, investment, and customer uptake. The client was seeking an integrated multi-channel strategy to establish a 360-degree view of the customer, and enable the bank to serve customers seamlessly and personally, anytime, anywhere. The bank was looking to shift its strategic emphasis from physical to digital channels, and build a multi-dimensional customer acquisition and servicing model for future growth.
Approach	PwC was engaged by the bank to develop the integrated multi-channel strategy that included 1) channel capability and optimization recommendations, 2) data integration requirements, and 3) customer segmentation and migration opportunities to drive future e-channel adoption. PwC conducted a rapid current state assessment to identify key capability gaps and integration needs (across the organization, technology, and processes) to support a future-state and cross-channel sales and servicing model. The team also conducted high-level prioritization of these gaps and formed a strategic roadmap to guide implementation and execution of the strategy.
Benefits	PwC played a key role in aligning the broader organization on the need for an integrated multi-channel strategy, and the need to deliver on the future vision of being number one in customer service. PwC defined critical milestones for the strategy, including a comprehensive set of integration requirements both multi-channel and channel specific, to deliver a superior and seamless customer banking experience.

Select qualifications

Digital wallet strategy and execution—Global payment network/association

Issues	The digital and mobile payments opportunity continues to rapidly evolve and grow. In an effort to capitalize on this opportunity and defend against a rising number of threats, the client is pursuing the development of a digital wallet product that can transcend web, mobile, and physical payment capabilities. The decision to build, deploy, and maintain a major business-to-consumer (B2C) product is a first for the client. Further, the client is entering a digital competitive arena where time-to-deployment and ability to quickly adapt are critical factors for success. The client is seeking to implement the necessary infrastructure and operations that can not only successfully deploy B2C products but also adapt to the constantly changing needs of the market.
Approach	PwC was engaged by the client to provide thought leadership and critical thinking on the product strategy as well as structuring the supporting infrastructure. This included designing and implementing the necessary governance, communication, and tools that would comprise a best-in-class program office. It also involved developing a release management infrastructure built on agile development methodology principles. PwC was also engaged by the client to define and optimize existing processes that will allow the program and broader organization to become more efficient and quickly adapt to the market. This involved a traditional current state/future state gap analysis exercise across those existing processes that posed the biggest risk to the program's success.
Benefits	PwC designed and implemented best-in-class processes and tools that allowed the program to maintain visibility and control on its product releases as well as understand broader impacts to the organization. This involved establishing effective communication channels with senior leadership, actively identifying/resolving critical issues and risks, and clearly describing and maintaining oversight on milestones, deliverables, and dependencies across key stakeholders and work tracks. The process optimization effort allowed the organization to minimize overall program risk and better adapt to market changes by improving the client's effectiveness in three key areas: on-boarding of new resources, sourcing and managing finances, and establishing/operating agile development environments.

Select qualifications

Mobile payments acceptance market assessment and go-to-market strategy—Leading US payments processor

Issues	The mobile payments opportunity continues to rapidly evolve and grow. In an effort to capitalize on this opportunity, the client was presented with an opportunity by a leading telecom company to take a revolutionary mobile Point of Sale (POS) device to market. The client was seeking to understand the total offering opportunity (market size) for this greenfield product and develop a go-to-market strategy that would allow them to capture the opportunity potential by examining sales and distribution channels and operational models. The decision to build, deploy, and maintain a mobile POS product was a first for the client. Further, the client is entering a digital competitive arena where time-to-deployment and ability to quickly adapt are critical factors for success. Additionally, the client was seeking guidance around the operating model design and launch of the pilot in selected industries.
Approach	PwC was engaged by the client to provide thought leadership and critical thinking on product readiness, market sizing, go-to-market strategy and operating model design. Product readiness included understanding the value proposition of the product and outlining differentiating factors from competitors that give the client a prime opportunity to take immediate and lasting market share. Market sizing included an estimation of the potential number of merchants willing to accept a mobile POS product that involved two broad filters: firstly, the different industries' propensity to adopt and secondly, the percentage of merchants who will not consider buying the tablet due to its low utility to them. Go-to-market strategy included outlining the sales/distribution channels that needed to be scaled in specific geographies.
Benefits	PwC conducted a product readiness assessment that allowed management to understand the specific gaps in application storefront, product variants by merchant segment, and pricing and monetization strategy. Market sizing helped the client understand the total addressable market for the mobile POS product. Additionally, PwC outlined various mechanisms that will enable an increase of the client's penetration levels from 10% to 30%. Go-to-market strategy outlined a segment-specific strategy (small, medium, and national) for how the client's sales channels in specific geographies across 18+ industries will need to be scaled (organically and inorganically) to increase speed to market. Operating design recommended the agile test and learn operating structure that included a governance model, roles description, guiding principles and an appropriate level of operational scalability based on market demand.

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"Dialing up a Storm: How Mobile Payments Will Create the Most Significant Revenue Opportunities of the Decade for Financial Institutions," PwC FS Viewpoint, October 2011.
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