Evolving Mobile Payments Landscape: An MPIW Update

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Disclaimer: The views expressed in this presentation are those of the presenter and do not necessarily reflect the views of the Federal Reserve Bank of Boston or the Federal Reserve System.
Agenda

• Introduction
• Fed Boston Role in Mobile Payments
  – Applied Industry Research / Multi-faceted industry analysis
  – Mobile Payments Industry Workgroup
  – Mobile Payment Risk Analysis via Mobile Security Subgroup
  – International Standards Development
• MPIW and Mobile Payment Evolution/Trends
• Future Plans
Fed’s Role in Payments

• System
  – To ensure integrity, accessibility and efficiency of the payment system

• Payment Strategies
  – Support development of safe, secure and open mobile/digital payment ecosystem
    • Industry analysis, research, standards development,
    • Outreach locally and nationally to banking/payments community
    • Reports and briefings related to mobile/digital payment trends
Mobile Payments Industry Workgroup (MPIW)

Traditional Payment Organizations

- Financial institutions
- Merchants
- Card networks
- Clearing/settlement organizations
- Third party processors
- Online payment providers
- Payment trade associations
- U.S. Treasury

Mobile Technology Providers

- Mobile Network Operators (MNOs)
- Handset/OS manufacturers
- Chip-manufacturers
- Mobile solution providers
- Wireless trade association
- Smart Card Alliance
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tr>
<td>January 2010</td>
<td>First meeting of the MPIW in Atlanta</td>
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| March 2011  | Developed initial framework for successful U.S. retail mobile payment ecosystem  
Published *Mobile Payments in the U.S.*                                                                                                                                                                    |
| April 2012  | Met with federal/state regulators. Analyzed potential mobile risks to payments system and regulatory oversight gaps  
Published *U.S. Regulatory Landscape for Mobile Payments* (July 2012)                                                                                                                                  |
| September 2012 | Met with retailers and start-ups to understand their perspective on mobile payment opportunities and challenges.  
Published *Summary of Mobile Payments Industry Workgroup (MPIW) Meeting with Merchants and Mobile Payment Start-ups*                                                                                   |
| January 2013| Met with mobile security experts to learn their perspectives on key mobile payment risks and formed security sub-workgroup to analyze vulnerabilities, threats, authentication, and mitigations across use cases  
Published updated version of *Mobile Payments in the U.S.*  
Published meeting summary *The Future of Mobile Security: Understanding the Risk Environment for Mobile Payments* (October 2013)                           |
| June 2013   | Met to discuss security and technical considerations with device and POS terminal providers.  
Published meeting summary *Technology and Security Considerations for Mobile Contactless Payments at the Point-of-Sale in the U.S.* (November 2013) |
| November 2013 | Meet to discuss challenges to consumer adoption and strategies for achieving scale  
*Meeting summary available soon*                                                                                                                                                                           |
Evolution from Mobile Banking to Mobile Payments

- Online Banking
- Basic Mobile Banking - Alerts
- Advanced Mobile Banking – Bill Pay, Funds Transfer, Alerts
- P2P m-RDC (Remote Deposit Capture)
- Remote Payments via App, Mobile Browser
- 2D Barcode Prepaid Access
- Wallet Cloud NFC
  - Mobile Banking
  - Mobile Digital Payments
Mobile Payments Evolution

2006-08
- Remote Payments
- SMS “Text to Buy” & Mobile Browser
- Mobile App Stores
- Contactless Cards

2009-10
- Mobile Browser
- Proliferation of Mobile App Payments
- First Mobile Card Acceptance

2011
- QR Codes
- NFC Mobile Wallet
- Prepaid

2012
- Mobile Card Acceptance
- Prepaid /Mobile Bank
- NFC Mobile Wallet
- Cloud-based Digital Wallets

2013
- Merchant Apps
- Google “Moonshots”
- Handset Innovations
MPIW Identified Many Challenges

- Slow consumer adoption
- Limited venues for mobile payment use
- Fragmentation with diverse nonbank businesses
- Multiple stakeholders
- Uncertain business models
- Ownership of customer data
- Security and privacy concerns
- Lack of interoperability and standards
- Lack of regulatory direction
Dynamic, Rapidly Evolving Mobile Payments Landscape

Barriers to Adoption of Mobile Payments in the U.S.

- Complex regulatory structure
- Unclear value-added services
- Perception that mobile is less secure
- Strong U.S. banking & payments infrastructure
- Fragmented U.S. mobile payments market
- Competing technologies: NFC, Cloud, QR
- Large, diverse geography & consumer demographics
The Landscape has Changed for the MPIW...

2010
- Focus was on NFC
- Focus on individual channels
- Limited non-bank involvement
- No wallet discussion really
- Early discussion of value-added services
- Not enough NFC phones/terminals
- Little active merchant involvement
- Some focus on security, but little on privacy

2013
- Now NFC, Cloud, QR Code
- Channel convergence
- Increasing role of non-banks
- Wallet developments
- Data monetization role increased (coupons, loyalty, etc.)
- Increased smartphone adoption/mobile apps explode
- Merchant involvement
- Increased focus on security and privacy
- More regulatory interest
- Impact of EMV migration
2013 Mobile Landscape Findings

- Fragmentation
- Convergence
- New Non-Bank Entrants/Multiple Stakeholders
- New Relationships/Partnerships
- Unresolved Security & Privacy Concerns
- Data Monetization
- Need for Regulatory Clarity
Fragmented Mobile Landscape
Channel Convergence
(The OmniChannel)
New Non-Bank Entrants/Multiple Stakeholders

- Mobile payment vendors and other providers come from diverse backgrounds, ranging from financial services to telecom and IT solutions.
- Success requires traditional payment system and mobile industry/non-bank cooperation and collaboration for standards, security requirements, customer service and support, use of consumer data, etc.
Non-Banks - Merchants Role

- Over 7M merchants in U.S.
- 1.1M retail; 750,000 food, lodging and entertainment

- 7 of top 14 US merchants; 19 of top 100
- 40+ U.S. merchants
- Barcode, cloud-based mobile app to pay at participating retail/grocery stores, restaurants, gas stations
- ACH network?
- Merchant deals, loyalty programs
New Relationships/Partnerships

• Mobile Device = Dynamic Marketplace
• American Express is pushing "one-tweet shopping" through a recent partnership with Twitter
• Level Up + NCR + Heartland Payments
• Square + Starbucks / Square + Intuit
• ARM + Gemalto + G&D = Trustonic
• Boku + U.S. Cellular
• Xoom + Vesta
• Google + Verifone

Partnerships Provide The “Muscle” In The Mobile Payments War
Unresolved Security & Privacy Issues

• Mobile ecosystem progress hinges on trust and transparency
• Payments data is exposed in new and complex ways creating new opportunities for compromise
• Data monetization heightens privacy risks
• Use of Location-Based Services
• Malicious Mobile Apps
• Who owns the customer…better yet, who owns the customer’s data?

• As more people use their mobile phones to make payments, transaction programs will become a central part of big data collection.

• Merchants can track bill payment habits, credit records, transaction history and more by allowing customers to use apps to complete transactions.

It’s not about the payment…
IT’S ALL ABOUT THE DATA!
No one authority or law regulates payments or governs m-commerce.
Updated Principles for Successful Mobile Payments Implementation

- Fundamentally the original principles established by MPIW still hold true
- New principles address significant changes to mobile payments industry in last 3 years and reflect current mobile ecosystem
  - New participants, technologies, and services
  - Learning what works and what does not
  - Influence of merchants on cost structure of mobile payments
  - Gaining better understanding of consumer demands, security requirements, and risks associated with nonbanks
  - Recognition that transparent value-added services help motivate consumer adoption of mobile payments
Updated Strategic Principles

• Technology platform expanded to support convergence across multiple platforms including NFC and cloud-based mobile payments.

• Open mobile wallet concept expanded to include both mobile and digital wallets.

• Establish a ubiquitous platform for mobile payments that uses existing clearing and settlement channel and rails but allow for new rails.

• Mobile Security – Dynamic data authentication (DDA) to secure NFC-enabled card-based mobile transactions; and security such as tokenization for cloud-based mobile payments.
# Convergence of Mobile Payment Platforms

## NFC
- Secure Element to store payment credentials
- TSM to manage provisioning

## QR Codes
- Cloud-based mobile app

## Cloud
- Cloud-based mobile app
- Payment credentials stored or accessed (tokenization) in cloud

## Issuance
- Secure Element to store payment credentials
- TSM to manage provisioning
- Cloud-based mobile app

## Consumer Device Capabilities
- 9 of top 10 OEMs support NFC
- 2-way wireless communication
- Only requires data connection
- Not device dependent

## Acceptance
- Standards based
- Acceptance growing in developed countries
- EMV may lead to further adoption
- Fragmented; many solutions
- No standards
- Security concerns
- Requires fast wireless connection
- Fragmented
- No standards
- New customer experience
- Security concerns
- Requires fast wireless connection
Updated Strategic Principles

• Understand the roles and associated risks of nonbanks in the mobile payments ecosystem.

• Neutral Trusted Service Managers (TSMs) should oversee the provision of shared security elements in an NFC mobile phone solution.

• Develop and adopt globally interoperable U.S. standards for efficient and secure use of mobile device and mobile payment transaction; and a certification process for mobile payment methods and applications. Standards should be platform-agnostic and leverage existing standards where possible.

• Continued regulatory clarity that also addresses non-banks and data privacy.
Open Mobile/Digital Wallet

• Wallets should be open and ubiquitous, work on most mobile phones, operating systems and payment networks, be accepted at most merchants across multiple platforms, and allow funding by traditional payment methods

  ▪ Early mobile wallet implementations and adoption disappointing
  ▪ Too many technology choices confusing consumers
  ▪ Most mobile wallets incentivizing consumers with merchant deals and loyalty programs
  ▪ Banks slow to embrace wallet partnerships, fearing loss of customer ownership and competition with merchants and other nonbanks
Opportunities for ACH?

• P2P Considerations
• Merchants looking for low-cost solutions
• Other?

ACH Is Next Frontier for Mobile Phones
by Daniel Wolfe, American Banker
APR 8, 2010
Global Interoperable Standards Platform

- U.S. standards and industry certification need to ensure global interoperability, security, and efficiency of mobile device, payment process, and technology

- NFC and secure element follow established guidelines endorsed by ISO and NFC industry groups (e.g., Smart Card Alliance, NFC Forum, GSMA, and Mobey Forum)

- U.S. mobile contactless payments employing chip security and NFC technology are based on ISO 14443

- ANSI X9 Mirror Group working with ISO to develop broader mobile payment technical standard (ISO 12812)

- No standards for cloud and QR code mobile payments

- Current efforts are fragmented and need coordination to identify gaps and potential changes
Multiple agencies govern mobile commerce/payments
- FRS, FDIC, OCC, NCUA and CFPB
- FCC oversees mobile carrier standards and competition
- FTC looks at consumer protection & identity fraud more broadly

Regulations and laws applicable to underlying payment methods (credit, debit, prepaid, ACH) govern mobile payments

Mobile carriers and alternative payment providers are less familiar with banking laws for consumer protection and privacy, KYC, BSA/data security, money transmission, risk compliance

U.S. regulations are fragmented with different consumer protections, disclosure requirements, and error resolution provisions
Industry Perspective on Mobile Regulation

• MPIW met with bank regulators, FTC & FCC in April 2012 (and we plan to meet again in 2014)
• Key concerns – consumer protection, privacy, and data security
• Consumer ‘awareness before engagement’
• Important for nonbanks offering mobile services to understand how to protect consumers, but for now banks still liable
• General consensus – still too soon to regulate
• Focus on education and communication between industry and agencies
• Industry stakeholders want to be involved when need for mobile regulation arises
Focus on Mobile Security via Mobile Security Subgroup

• **Objectives**
  – Document and evaluate security options in the end-to-end mobile payments ecosystem

• **Use Case Development**
  – For proximity and/or remote mobile payments
  – NFC, Cloud, QR Code, Hybrid Models

• **Deliverables**
  – Documentation of use cases, with evaluation of risks and recommended actions
  – Actions may include mitigating actions by those in the ecosystem, awareness, risk acceptance, or referral to appropriate bodies to take action
Standards – X9/ISO 12812
Core Banking - Mobile Financial Services

ISO Structure - Technical Committee (TC) 68 - Financial Services
• Covers standards for banking, securities & other financial services
• Subcommittee SC7 Core Banking: WG10 and ANSI X9AB Mirror Group

ISO 12812 Goals:
• Build international vision based on common terminology and basic principles for the design and operation of MFS
• Define components and interfaces, and roles necessary to operate MFS for identified use cases
• Identify existing standards on which MFS should be based, and possible gaps

MFS standardization would enable:
• Interoperability between different components
• Consumer choice among devices or services and ability for multiple FIs on same device
• Consumer portability between devices
• Secure environment
ISO 12812 Standard

Part 1: General Framework
Part 2: Security and Data Protection for Mobile Financial Services
Part 3: Financial Application Management
Part 4: Mobile Person-to-Person
Part 5: Person to Business Payments
• Editors are developing revised drafts now under review by the Mirror Group between now and January
• WG is recommending to SC7 that all parts be submitted to a CD ballot regardless of the success/failure of the previous CD ballot
• All five parts will be balloted simultaneously (Part 6 will be dropped, relevant content will be re-directed/incorporated to other parts)
• Assumption that all parts will be produced as International Standards as originally planned
Next Steps

• Conference calls will be held between the delivery of the committee drafts and the preparation of CD ballot to discuss any comments that may arise within the WG

• Potential in-person meeting in January to conduct final review before the parts are subjected to a CD ballot

• Provide CD drafts for balloting on or before February 15, 2014

• CD ballots completed by May 15, 2014

• DIS drafts completed by September 15, 2014
Next Steps for Payment Strategies & MPIW

• **Identify Future Goals of MPIW**
  – Long-term vision and 3-year plan
    • Re-assess mobile direction, business models, risks, and expectations for consumer adoption
    • Continue to Educate, Build Awareness and Monitor Trends
    • Continued Analysis
    • Industry Guidelines/Recommendations

• **MPIW Security Workgroup**
  – Ongoing work to define security issues across various use cases – NFC, cloud, QR code – identify threats, vulnerabilities, mitigations
  – Develop guidelines and recommendations to secure mobile payments and educate users

• **Standards Development (via X9/ISO)**
• **Research on the Un/Underbanked**
Questions

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