

OVERVIEW OF MOBILE PAYMENT LANDSCAPE

NEACH FORUM

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Agenda

- Overview of Mobile Payments Landscape
- Challenges
- Mobile Payments Industry Workgroup
- Key Takeaways

Mobile Definitions



- **MOBILE PAYMENT**: Use mobile phone for proximity (point of sale/POS) or remote purchases, transit, digital content, P2P money transfer, online goods and services. Funded via credit or debit card, prepaid account, bank account, charge to mobile phone bill.

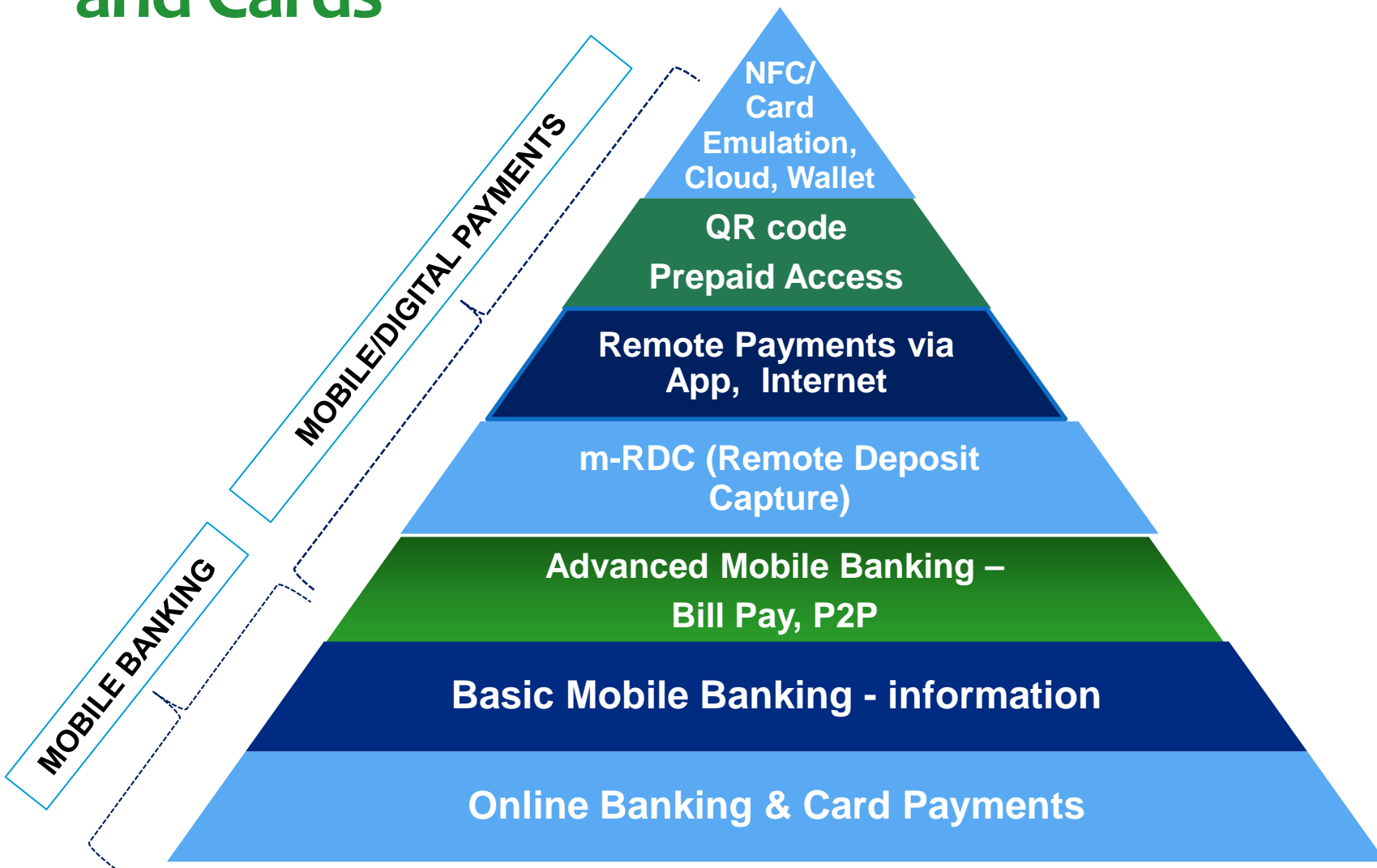


- **NEAR FIELD COMMUNICATION (NFC)**: Standards-based wireless radio communication to exchange data between devices a few centimeters apart (e.g., mobile phone and merchant POS terminal).
- **SECURE ELEMENT (SE)**: Tamper-resistant, encrypted smart chip in mobile phone to store and manage access to customer account credentials for NFC/contactless payments.
- **HOST CARD EMULATION (HCE)**: Software representing smart card. Eliminates need for secure element. Routes NFC communications through mobile phone's host processor and stores and transmits payment card credentials via cloud.

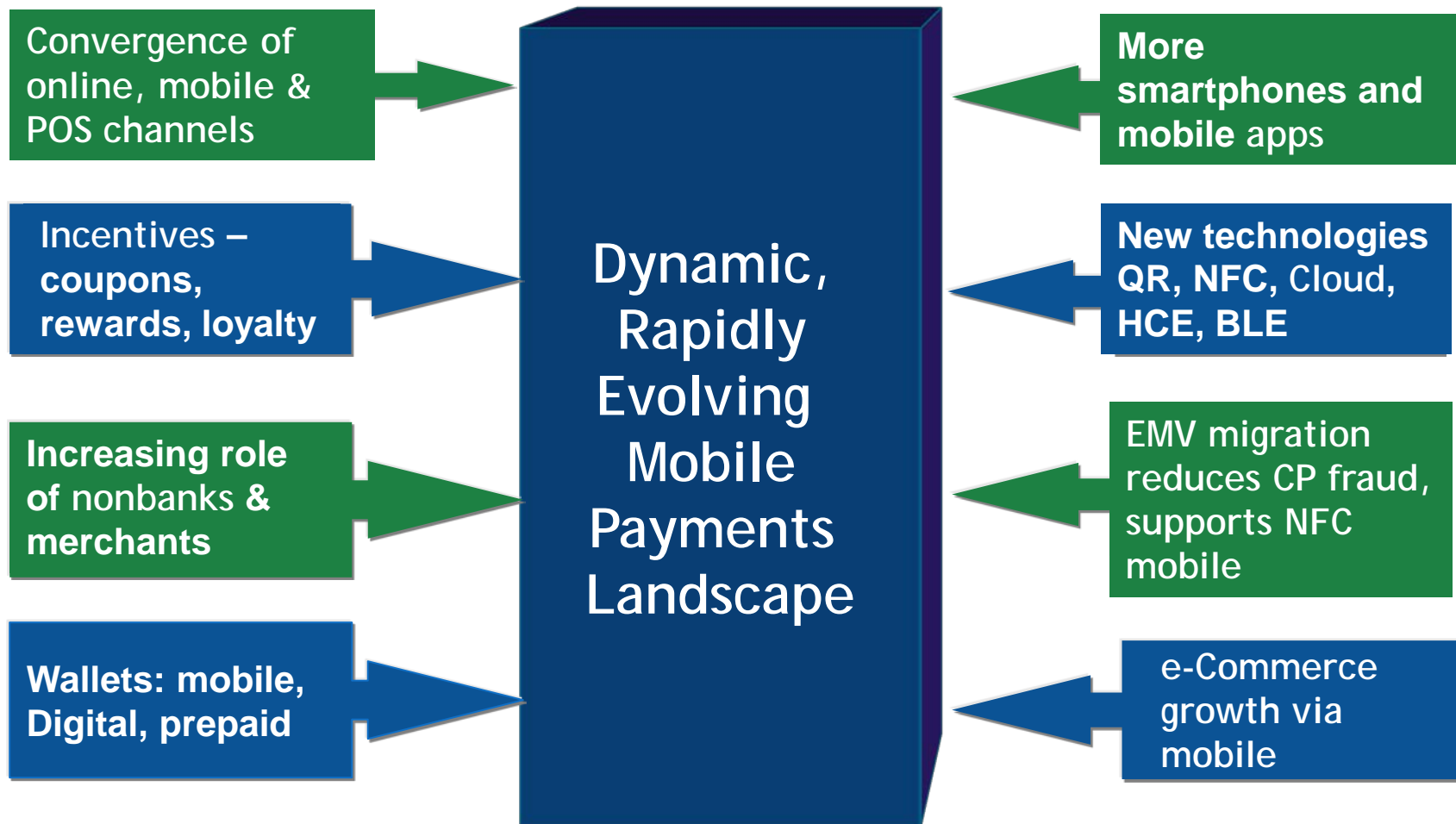


- **CLOUD**: Remote server that stores mobile payment credentials. Payments initiated from mobile app, QR code, or NFC/HCE.

Mobile Payment Roots in Online Banking and Cards

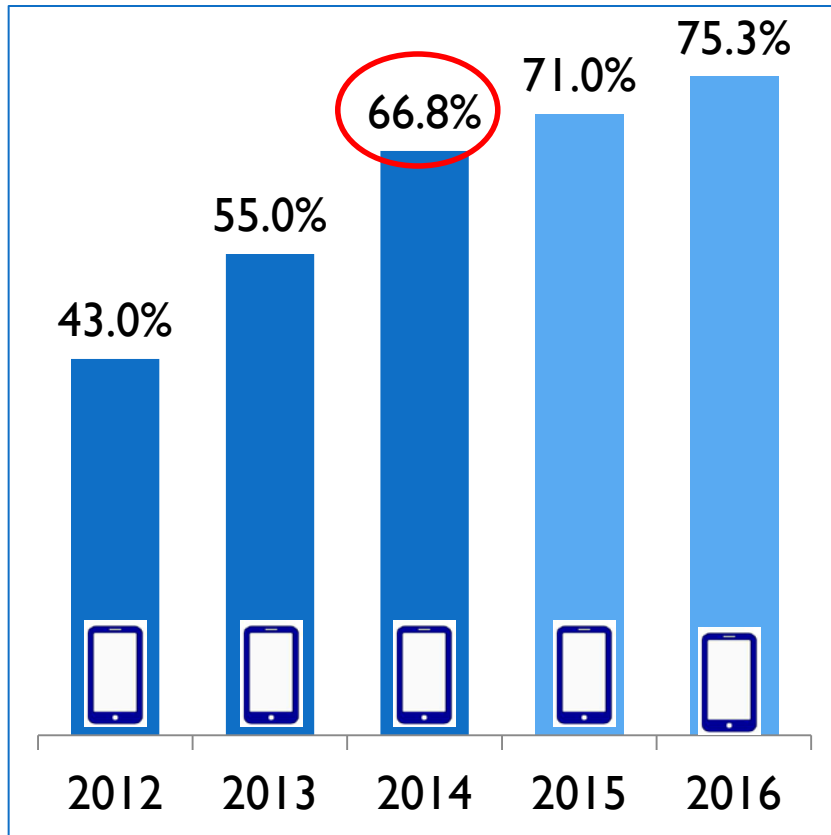


Drivers of U.S. Mobile Payment Adoption



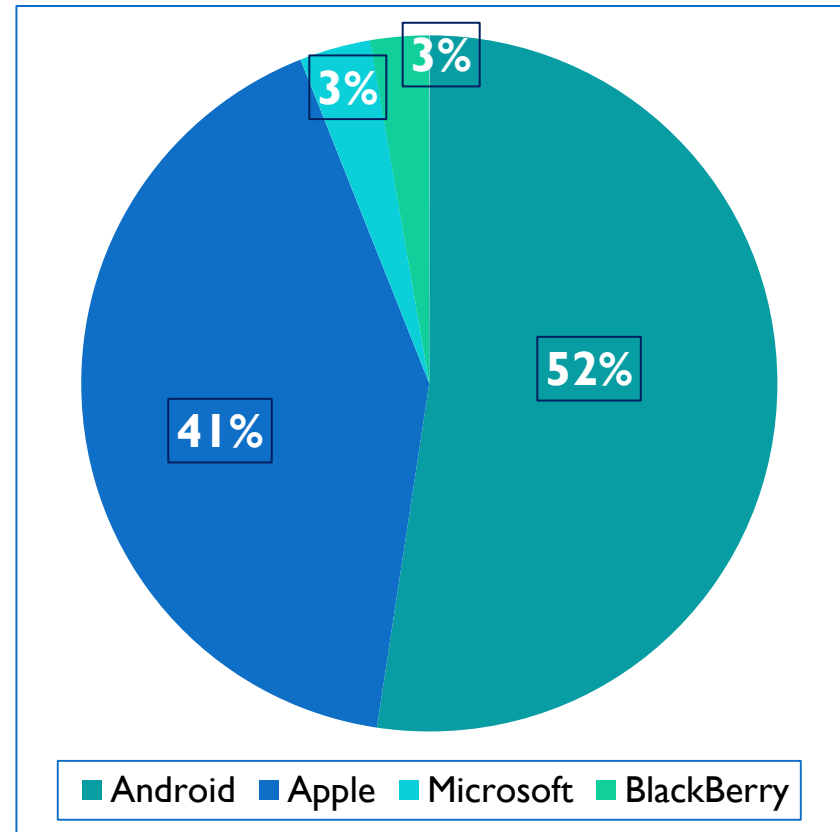
Smartphone Ownership is Rising

U.S Smartphone Penetration



Percent of mobile phone users. Actual 2012-2014, comScore. Forecast 2015-2016, eMarketer, March 2014

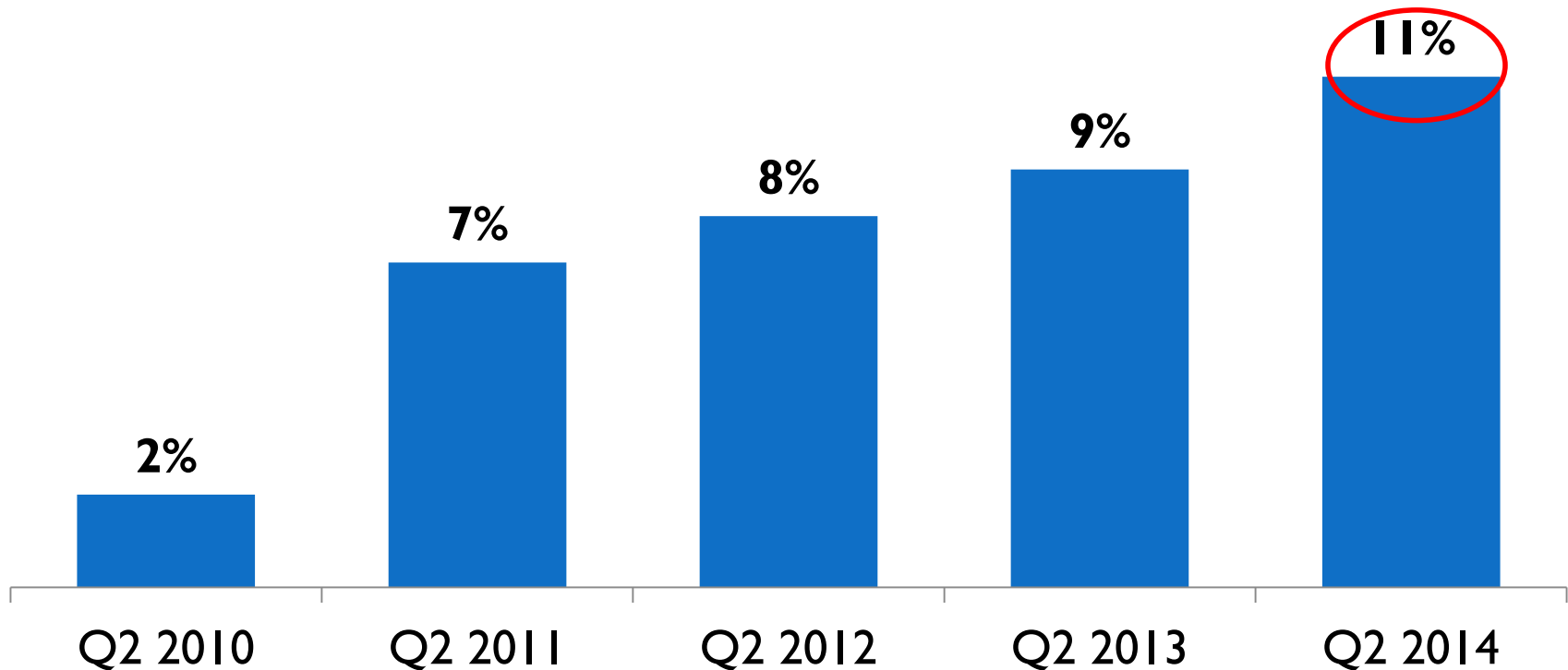
Smartphone Market Share by Operation System



Source: comScore MobiLens, August 2014

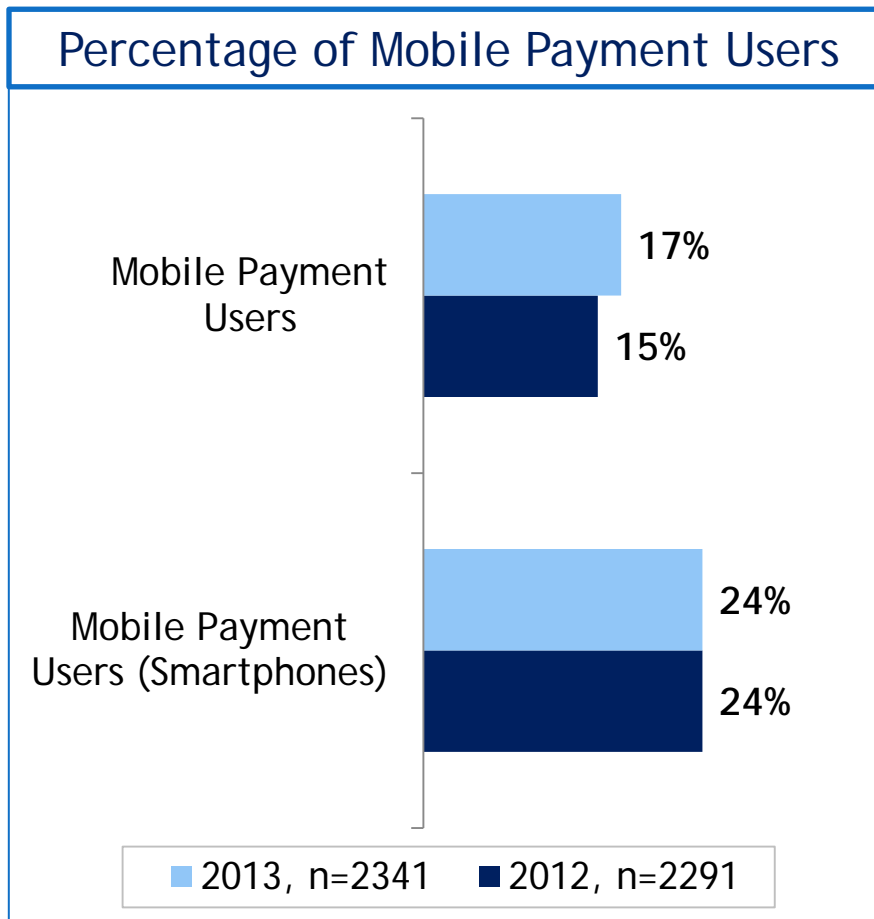
Increasing Use of Mobile Phones for Internet Purchases

Percentage of retail e-commerce dollars spent via mobile device



Source: comScore E-commerce Measurement, August 2014

Consumer Adoption of Mobile Payments Slowly Increasing



- Ubiquity of mobile phone is changing how consumers access and pay
- 2/3rds of mobile payment users paid a bill online
- 17% of smartphone users made POS mobile payment
 - 39% QR code
 - 14% NFC tap at terminal
- Unclear value and security concerns limit adoption

Source: Federal Reserve Board, "Consumers and Mobile Financial Services," March 2014

Nonbanks Strongly Influencing Mobile Payments Ecosystem

- Diverse businesses and industries
 - MNOs, start-ups, and technology solution providers
 - Merchants and online payment providers
- Easy market entry for start-ups
- Creating new relationships/partnerships with banks and other businesses
- Raising concerns related to security, consumer protection, data privacy, knowledge of payment regulations
- Need for enhanced vendor risk management programs

Mobile Payment Developments

2006-2008

Remote Payments - SMS & Internet



Mobile App Stores



Contactless Cards



Direct Carrier Billing

2009-2010

Mobile Browser



First Mobile Card Acceptance/ mPOS



Proliferation of Mobile Apps

2011

QR Codes



NFC + SE Mobile Wallet



Prepaid

AmEx



2012

mPOS



NFC Mobile Wallet



Cloud Digital Wallet



Prepaid Bank Account



Mobile Bank Account



2013-2014

Merchant Apps



NFC + Host Card Emulation (HCE)



Beacon BLE



NFC iPhone case & NFC Apple Pay



Challenges to U.S. Mobile Payment Adoption

Competing technologies impact merchant decisions

Nonbanks cause disintermediation

Fragmented market confuses consumers

EMV migration distraction







Low merchant acceptance

Data security and privacy







Lack of standards & interoperability

Complex regulatory structure

Different Types of Wallets Offered

Wallet Provider	Features
	<ul style="list-style-type: none"> • Host Card Emulation (HCE) replaces secure element • NFC to tap & pay at point of sale • Load any credit/debit account • Credentials stored in cloud
	<ul style="list-style-type: none"> • JV between AT&T, Verizon and T-Mobile • NFC with secure element/SIM card to store payment credentials • Includes AmEx Serve prepaid account
	<ul style="list-style-type: none"> • Mobile phone number & PIN at POS to access PayPal account to pay • Payment credentials stored in cloud
	<ul style="list-style-type: none"> • Cloud-based for mobile and online purchases; not POS • Customer can link Visa & other card accounts
 	<ul style="list-style-type: none"> • Top U.S. merchants; mobile app and QR code to pay at participating retail/grocery stores, restaurants, gas stations






Other Mobile Solution Disruptors

	<ul style="list-style-type: none"> • Closed-loop prepaid account • Reload capability & rewards • 10M+ mobile app users, 5M mobile trans/week • 14% of in-store U.S. transactions from mobile
	<ul style="list-style-type: none"> • Small merchant white label mobile network • Link credit/debit to mobile app to get unique QR code • 1M+ users; 5K+ merchants
 <p>Apple®</p>  <p>Passbook</p>  <p>Apple Pay</p>	<ul style="list-style-type: none"> • iTunes digital wallet (575m active accounts, 1.2m mobile apps) • Passbook - cloud-based digital wallet to aggregate merchant QR codes, loyalty, gift cards, movie tickets, boarding passes. • <i>Apple Pay announced 9/9/14! Mobile NFC, Secure Element, link cards through iTunes</i>
 <p>Square</p>	<ul style="list-style-type: none"> • Small merchant model with mobile app & plug-in device to accept credit/debit cards, replace cash and check • As merchant acquirer assumes liability, charge-backs • Customer model - restaurant pre-order, pre-pay

What Consumers Want in a Wallet

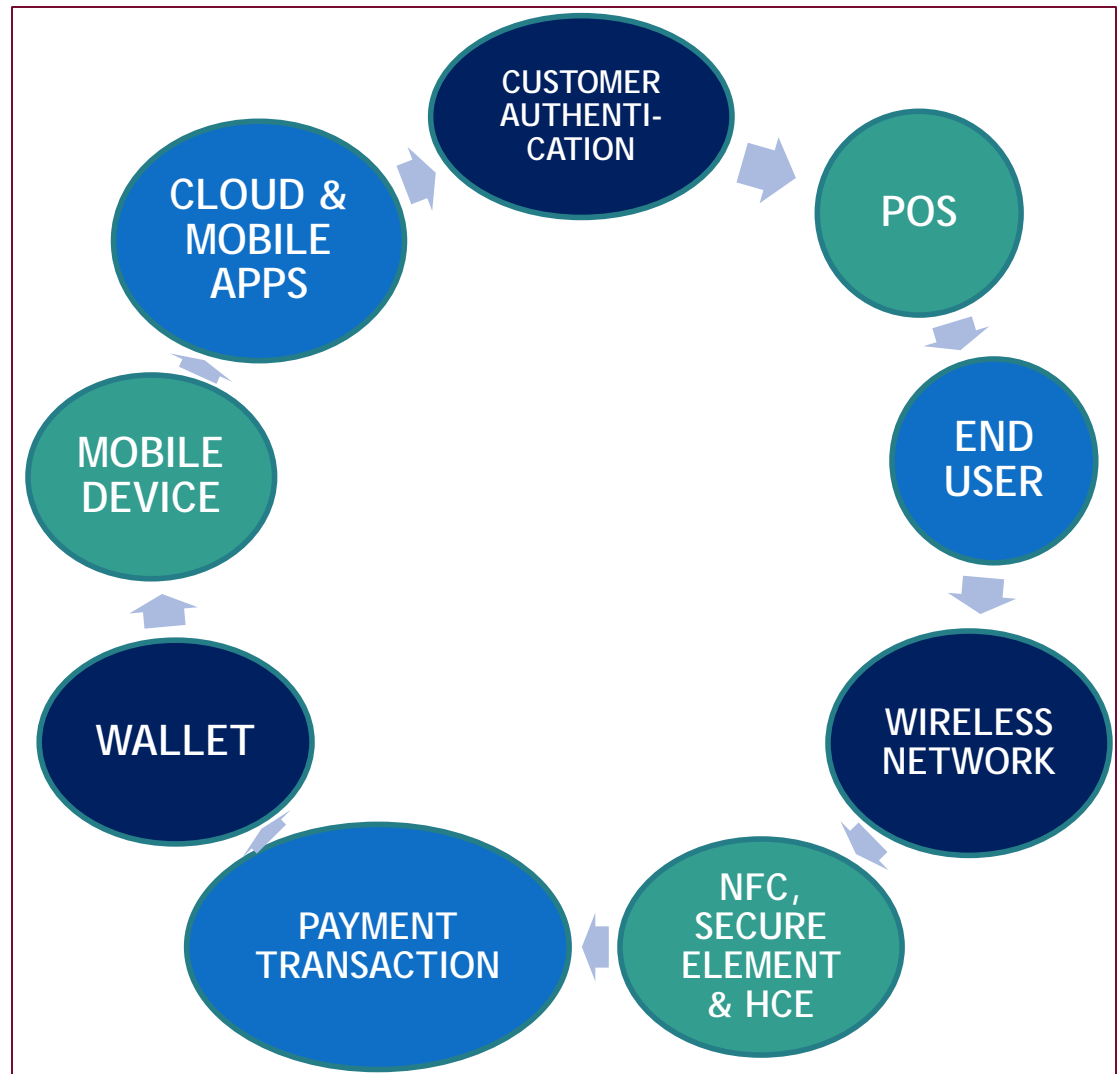
• Pay using loyalty points	30%
• Store merchant loyalty/rewards cards in mobile wallet	28%
• Make small purchases with mobile QR code	27%
• Mobile P2P Transfers	26%
• Pay for purchase with debit, credit or prepaid card account linked to mobile/digital wallet	25%
• Set up prepaid account for small purchases, automatically reload from debit or credit card	22%

Prepaid Mobile Banking Solutions Gain Traction

 	<ul style="list-style-type: none"> • FDIC-insured GPR prepaid account and plastic card • Mobile app: New account open, direct deposit, alerts, bill pay, P2P, mRDC, ATM access, cash reload at Walmart; savings
	<ul style="list-style-type: none"> • FDIC-insured GPR prepaid account card • Mobile app <ul style="list-style-type: none"> • Alerts, mobile RDC, direct deposit, cash reloads/withdrawals at Chase ATMs & branches
 	<ul style="list-style-type: none"> • FDIC-insured branchless mobile bank account • Open new account, alerts, mRDC, P2P, bill pay, direct deposit, ATM network, PFM, savings • Cash deposits at some retail/convenience stores

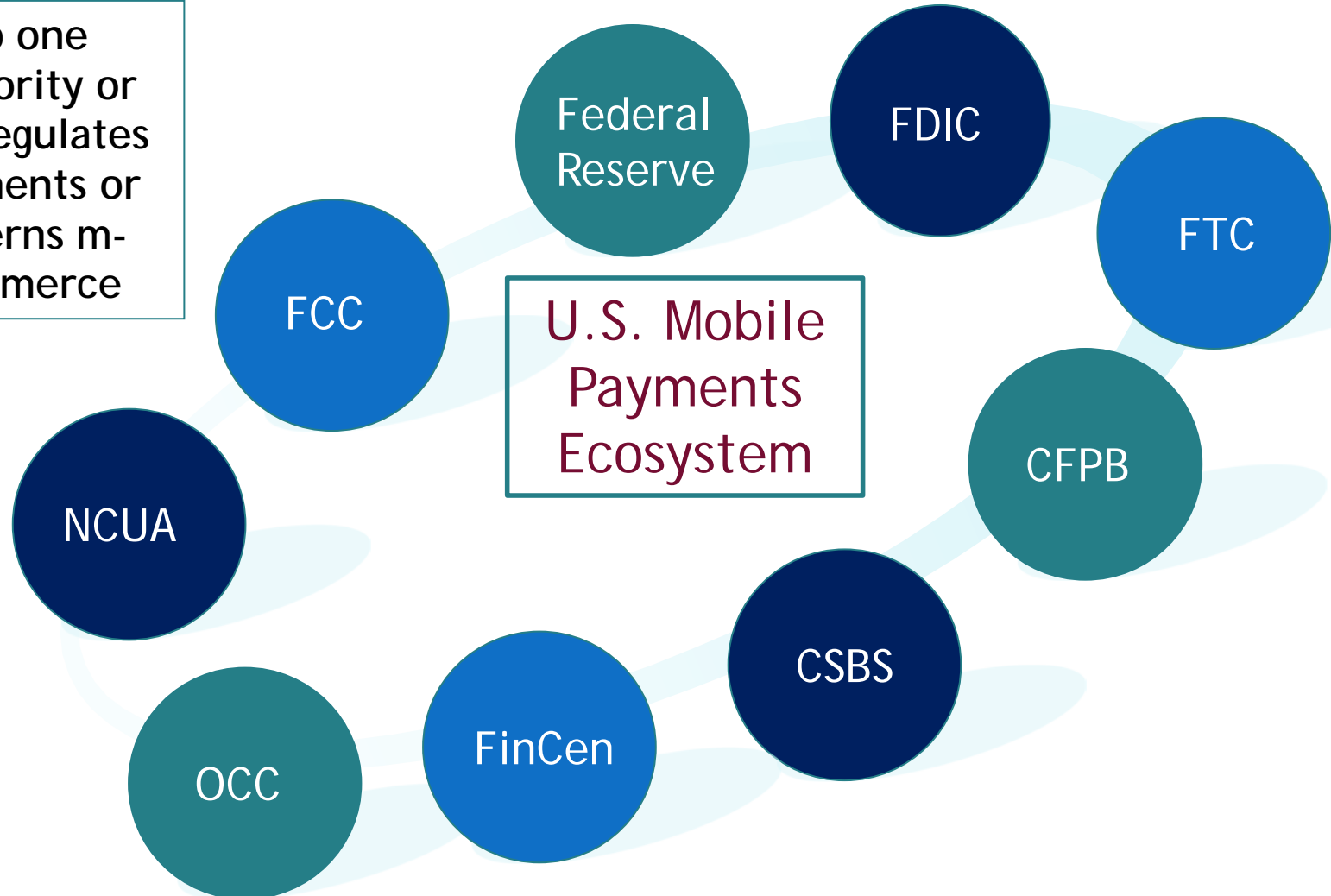
Multiple Points of Risk Create Security Challenge

- Progress requires trust, transparency & cooperation
- Convergence of mobile platforms and multiple parties
- Lines of responsibility and liability blurred
- New opportunities for compromise
 - Data breach
 - Data monetization vs. privacy
 - Use of location-based services
 - Malicious mobile apps



Complex U.S. Regulatory System

No one authority or law regulates payments or governs m-commerce



Mobile Payments Industry Workgroup

Represents major U.S. mobile payment stakeholders

- Financial institutions
- Merchants and card networks
- Clearing/settlement organizations
- Payment processors
- Online payment providers
- Payment trade associations

- U.S. Treasury
- Mobile network operators
- Handset/OS manufacturers
- Chip makers
- Mobile solution providers
- Mobile carrier trade association

PRINCIPLES FOR SUCCESSFUL RETAIL MOBILE PAYMENTS ADOPTION

- Interoperability between mobile & digital platforms
- Open/ubiquitous wallets
- Existing clearing/settlement channels, open to new rails
- NFC/Cloud security solutions

- Globally interoperable, technology-agnostic U.S. standards
- Understand roles/risks of nonbanks
- Regulatory clarity

MPIW Activity 2014-2015

- Monitor mobile industry trends to assess impacts of EMV, HCE, tokenization, and nonbank solutions
- MPIW Security workgroup
 - Analyzing mobile payment use cases and associated risks
- MPIW Tokenization subgroup
 - Stakeholder assessment of industry tokenization projects
- Identify gaps and potential need for broad mobile payment industry standards (informed through Fed ISO/X9 participation)
- Keep abreast of regulatory developments

Industry points that support New England FI survey results

- Share concerns about security related to consumer adoption
- FIs recognize market fragmentation is a barrier to adoption
- FIs recognize need for collaboration and partnerships with nonbanks to implement mobile payments as important