Evolving Mobile Payments Landscape

SWACHA Executive Leadership Payments Summit

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Agenda

- Mobile Payment Trends
- Mobile Banking Landscape
- Mobile Payment Initiatives
- Challenges and Risks
- Long-term Vision

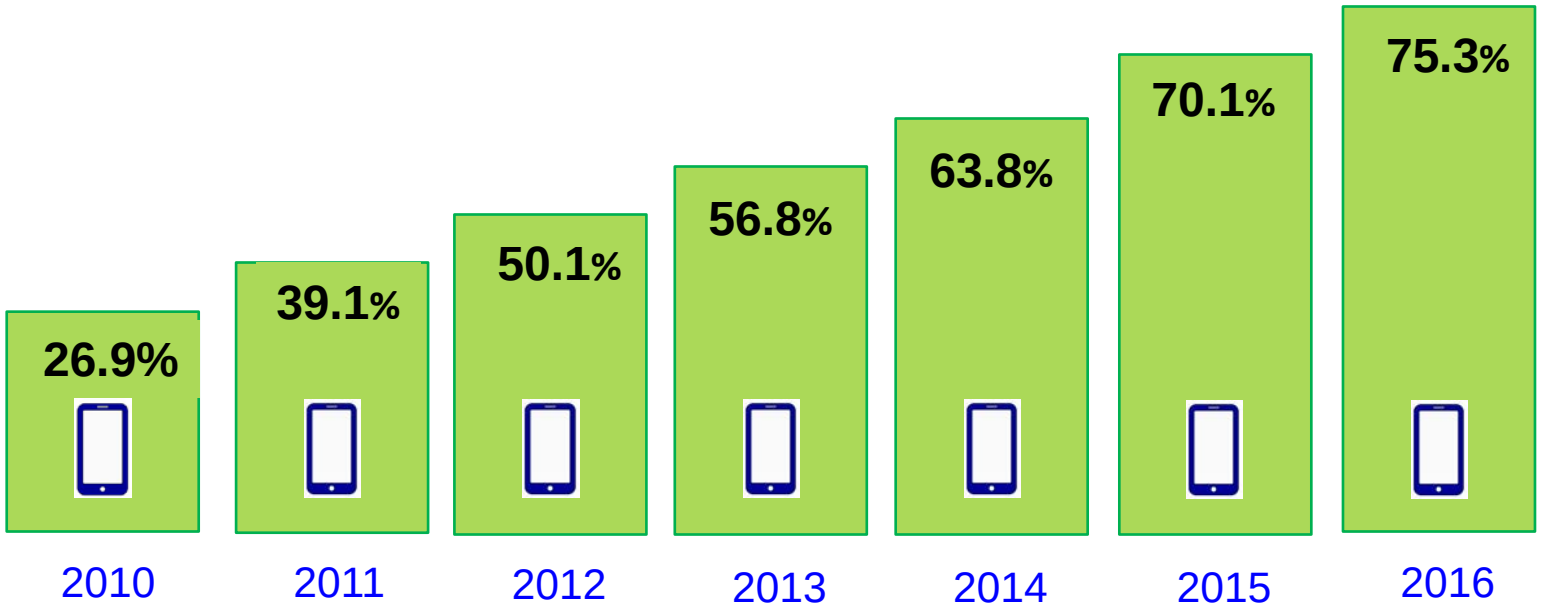
Drivers of U.S. Emerging/Mobile Payments Landscape

- Convergence of online, mobile and POS payment channels
- Rapid growth in smartphones and mobile apps
- Incentives: mobile discounts, coupons, and rewards
- Non-banks: Google, PayPal, Apple, Square, MNOs, start-ups
- Active merchant involvement
- Competing technologies: NFC, cloud, barcode, ACH
- EMV migration
- Wallet developments

U.S. Smartphone Ownership Continues to Rise

Need smartphone to make contactless mobile payments, download apps and access web, and receive mobile coupons, discounts

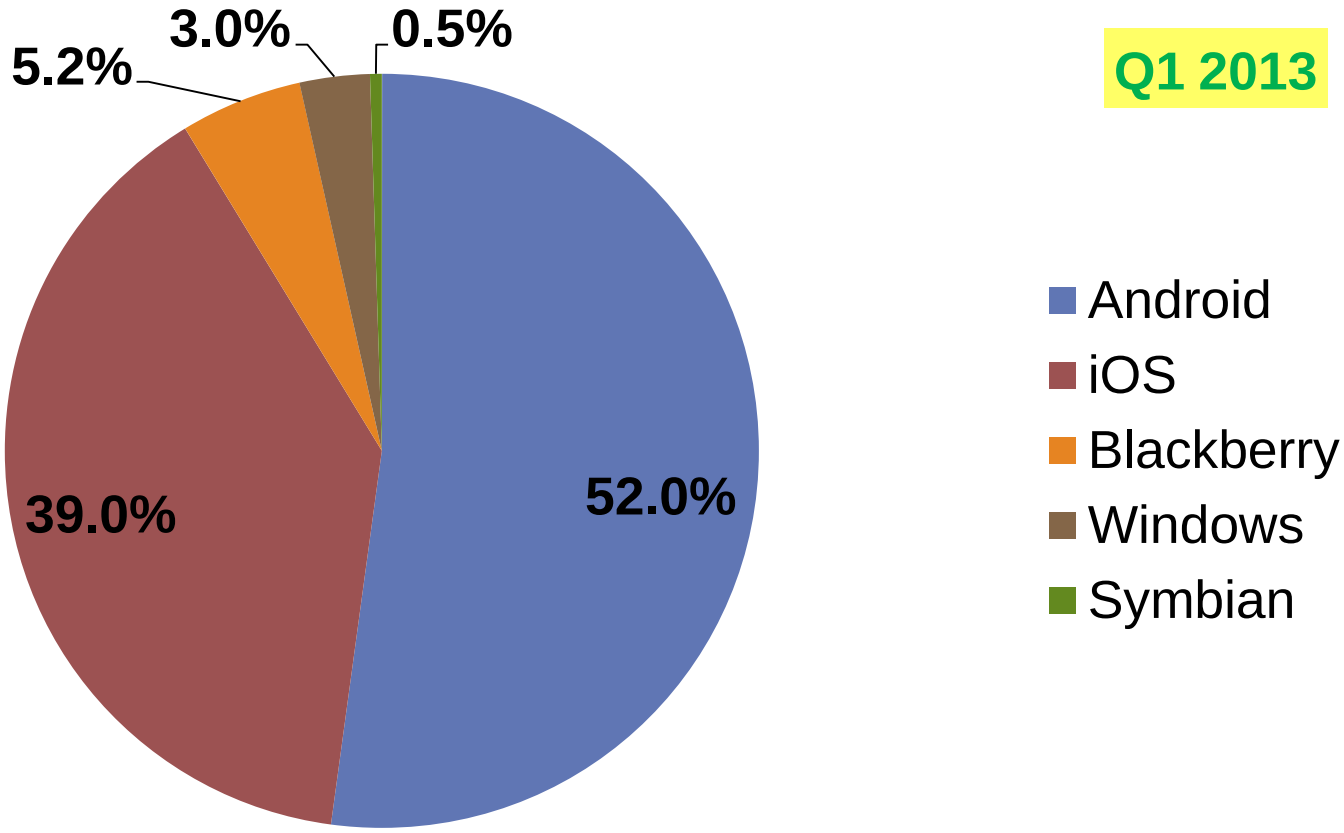
U.S. Smartphone Penetration



Percent of mobile phone users, Source: eMarketer, March 2013

Google dominates U.S. smartphone market share

Will it change if Apple adds NFC for mobile payments?

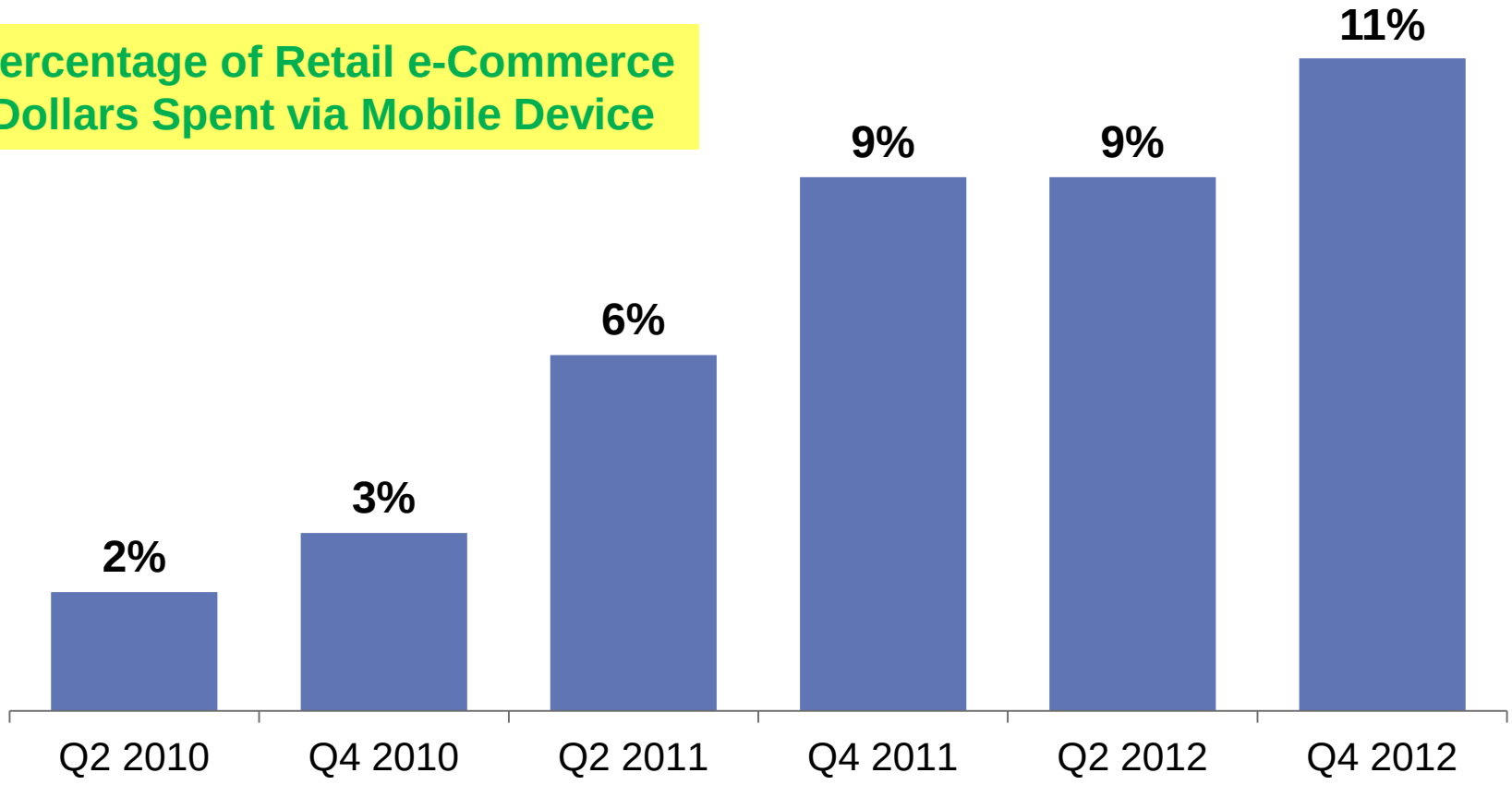


*By operating systems. Source: comScore, March 2013

Use of mobile phone for e-Commerce is growing

Consumers buying more smartphones, using mobile apps and being incented by coupons, discounts and rewards

Percentage of Retail e-Commerce Dollars Spent via Mobile Device



Source: comScore, December 2012

Mobile Banking vs. Mobile Payment

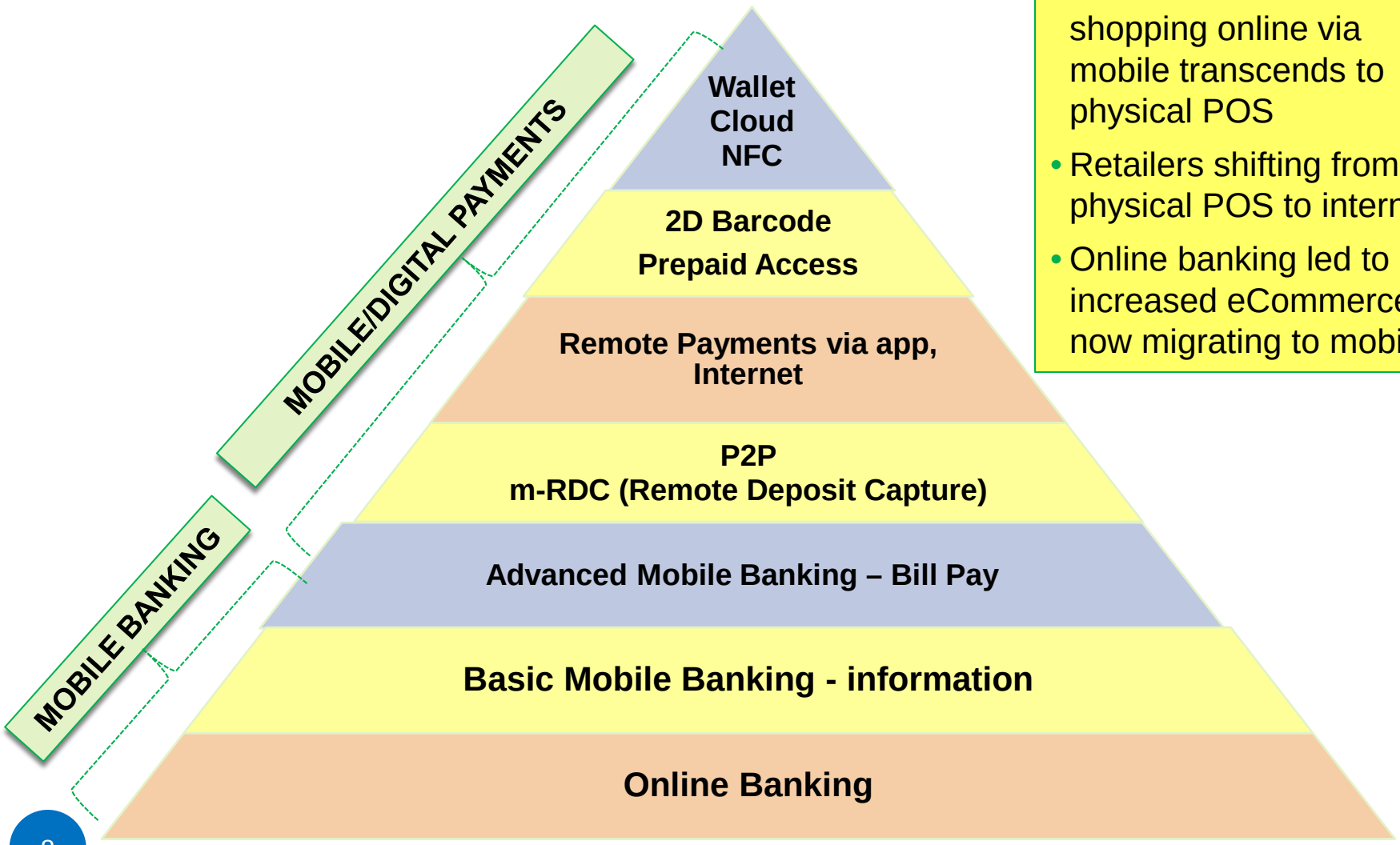
Mobile Banking

- Mobile device connects to FI to view account or credit card balances, transfer funds between accounts, pay bills, receive account alerts, locate ATMs

Mobile Payment

- Mobile device used to pay at POS or Internet for goods, services or digital content, transit, P2P. Payment initiated via SMS, browser, mobile app, NFC chip, barcode or cloud technology. Payment may be funded via a credit or debit card, bank account, charge to a phone bill, or a prepaid account

Evolution from Mobile Banking to Mobile Payments

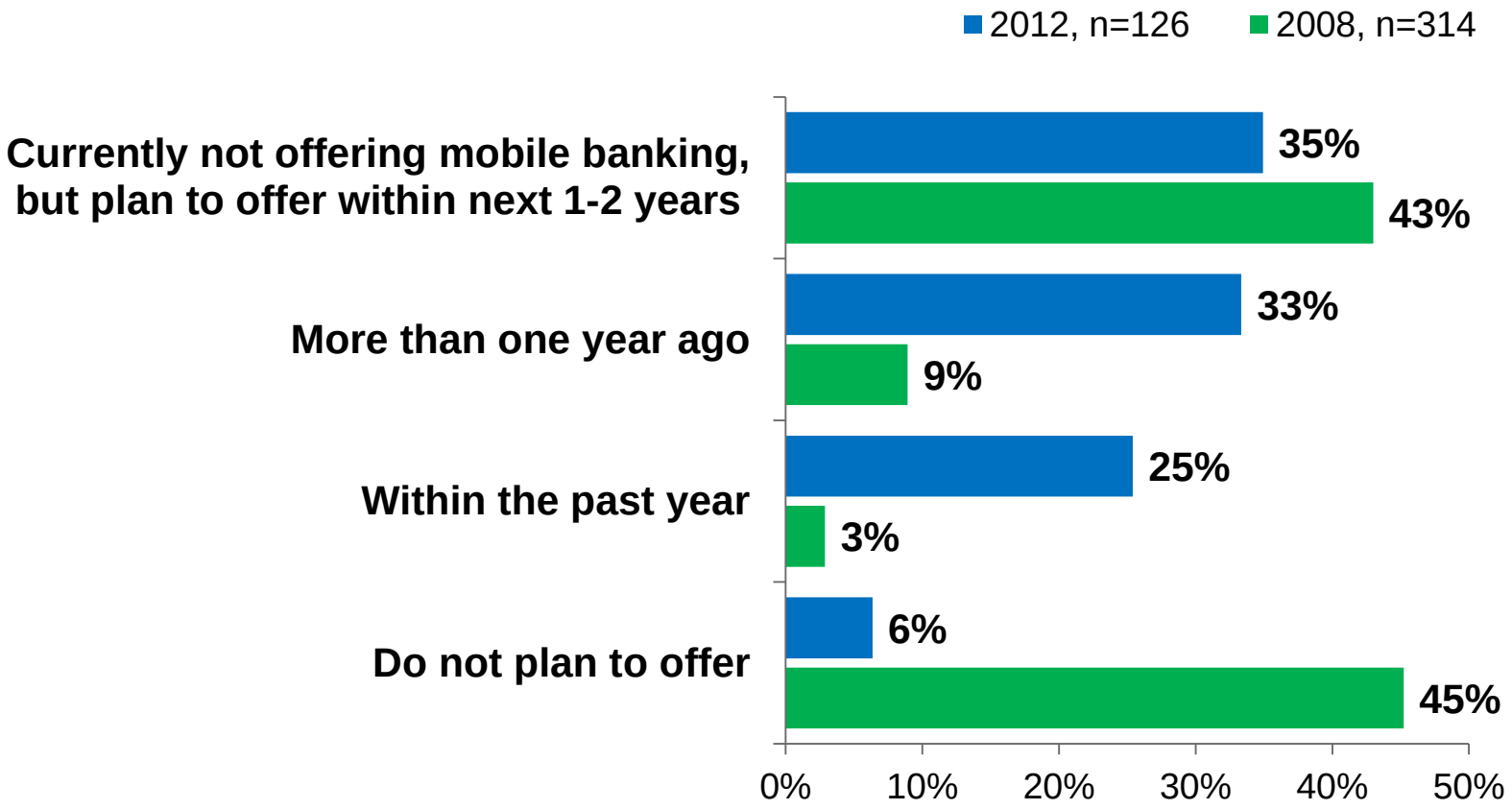


- Customer comfort shopping online via mobile transcends to physical POS
- Retailers shifting from physical POS to internet
- Online banking led to increased eCommerce—now migrating to mobile

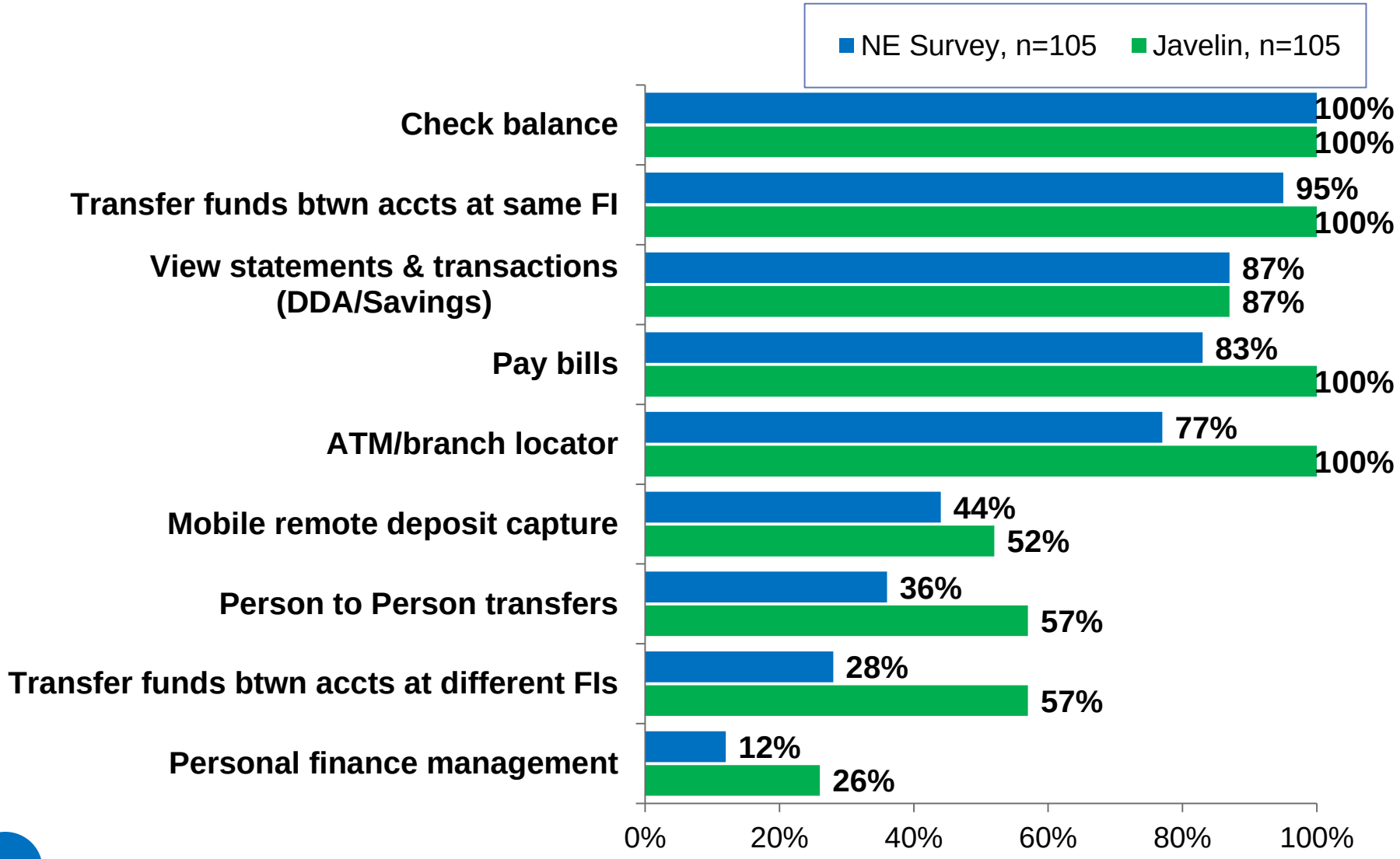
Mobile Banking Landscape

Who offers Mobile Banking in New England? Results from NE Mobile Survey

Over Half of FI Respondents Offer Mobile Banking



Mobile Banking features offered by New England FIs vs. Top U.S. Banks



Source: Javelin Research & Strategy, October 2012

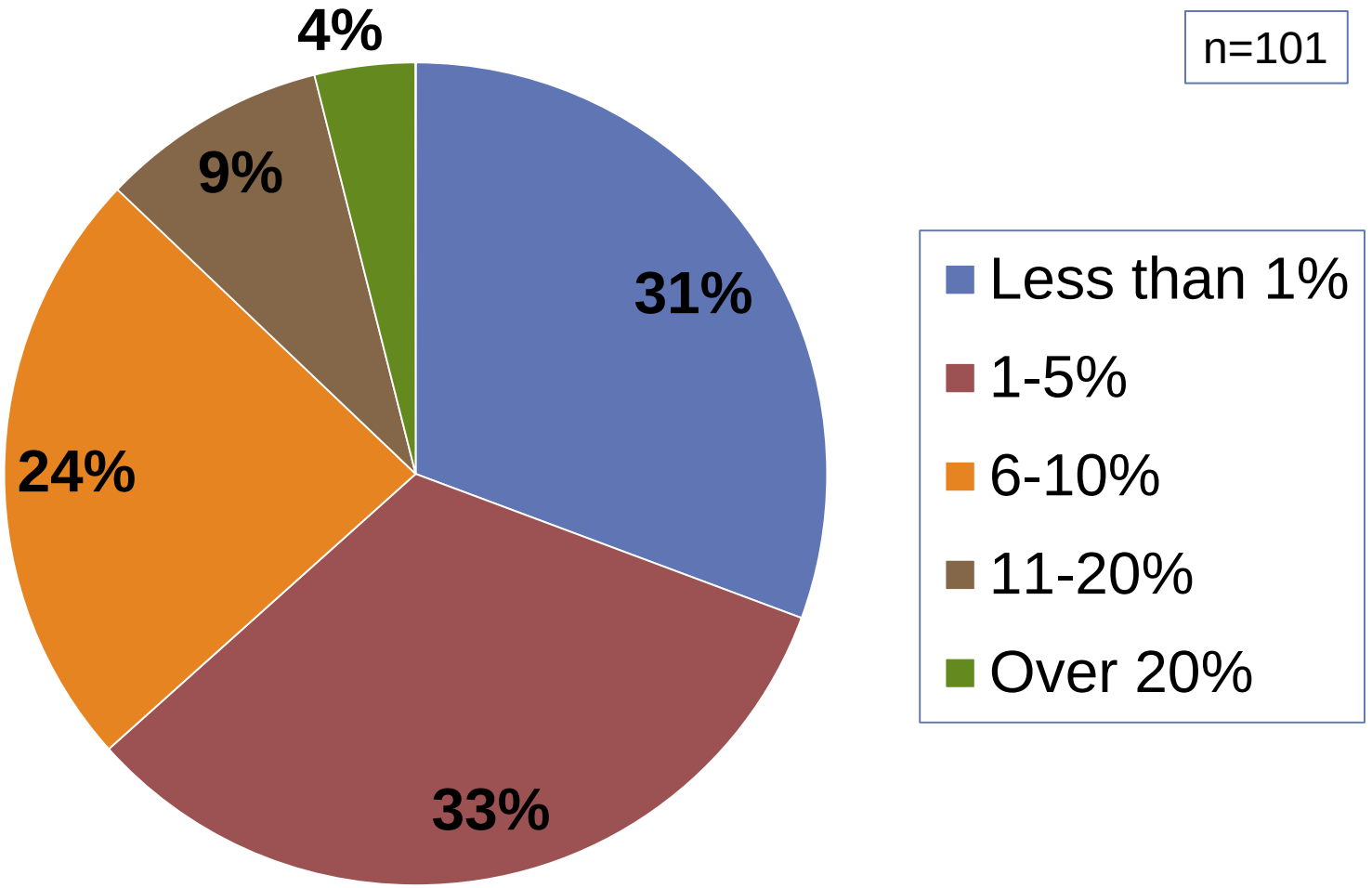
How do customers use mobile banking?

Using your mobile phone, have you done any of the following in the past 12 months?

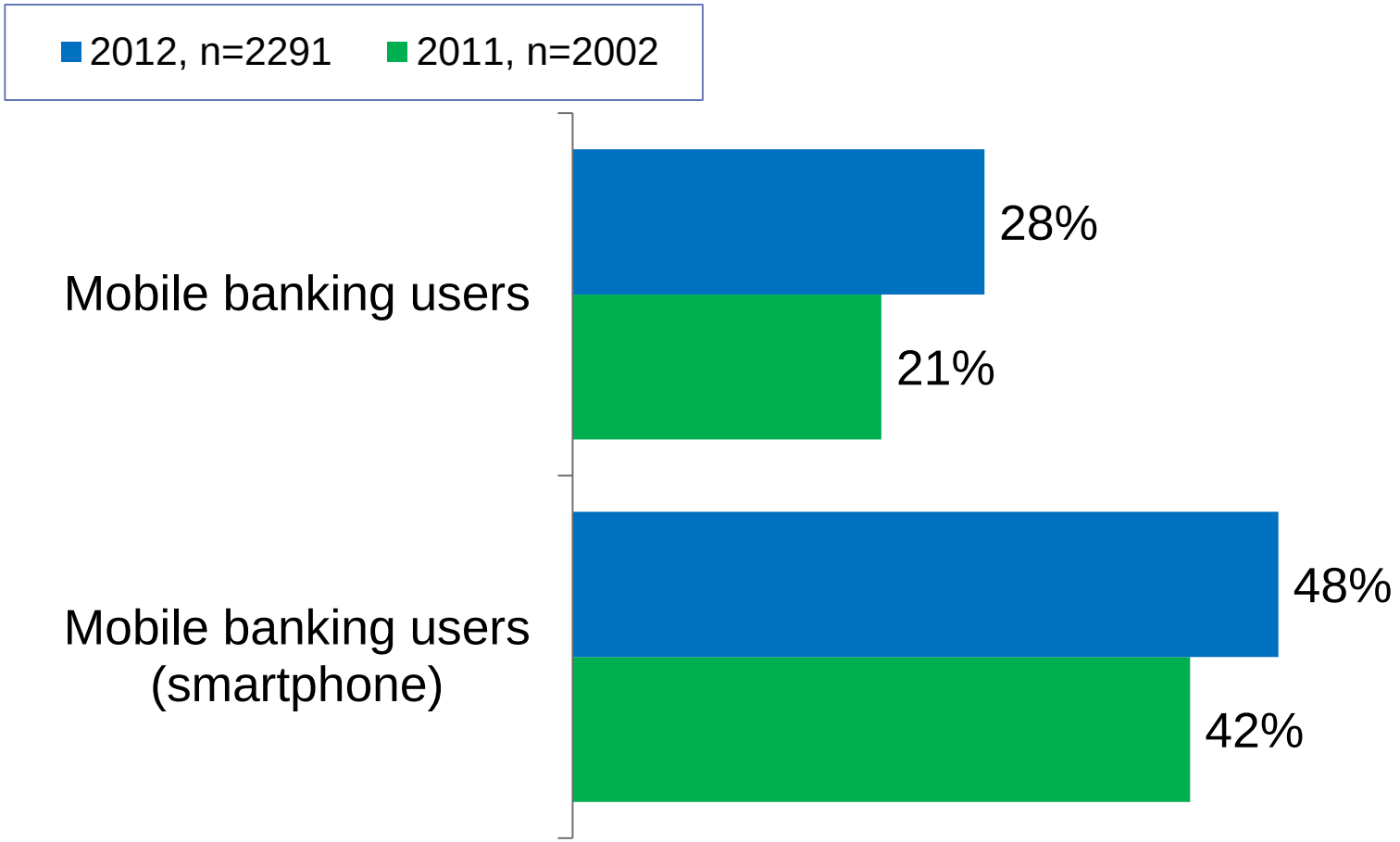
	2011 n=372	2012 n=571
❑ Checked account balance/recent transaction	90%	87%
❑ Transferred money between accounts	42%	53%
❑ Downloaded your bank's mobile banking app	48%	49%
❑ Received a text message alert from your bank	33%	29%
❑ Made a bill payment using banking website or app	26%	27%
❑ Located the closest in-network ATM for your bank	21%	24%
❑ Deposited a check using mobile phone camera	11%	21%
❑ Other	4%	6%

Source: Board of Governors of the Federal Reserve System, "Consumers and Mobile Financial Services," March 2013

Customer adoption of mobile banking in New England is low



Nationally more consumers use mobile banking



Source: Board of Governors of the Federal Reserve System, "Consumers and Mobile Financial Services," March 2013

P2P Opportunity for Banks & Nonbanks

- Replace checks & cash for personal & casual business payments
- ACH Network
- Bank models
  - ClearXchange, Fiserv, FIS
- Card networks
  - MC MoneySend, Visa v.me, Amex Serve
- Nonbanks
  - PayPal, Western Union, Dwolla
  - **NEW: Square, Google**
- Issues
  - Business case – will customers pay?
  - Not real-time
  - Money laundering

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Mobile Remote Deposit Capture is a value-added service

- Mobile app & smartphone camera electronically deposit check image at FI
- Immediate availability
- Banks and nonbanks offer to small businesses and consumers
  - 64% of top 25 U.S. banks offer mRDC
  - 1 in 4 mobile bankers reports using mRDC in past 90 days
  - Nonbanks include PayPal, Amex Bluebird, Chexar, Plastyc

Fraud Controls

- Multi-factor authentication
- Encrypted transmission
- Dollar limit on daily deposits
- KYC, customer due diligence
- Monitor frequency of use
- Detection of duplicates, double posting

Source: Javelin Strategy & Research, March 2013

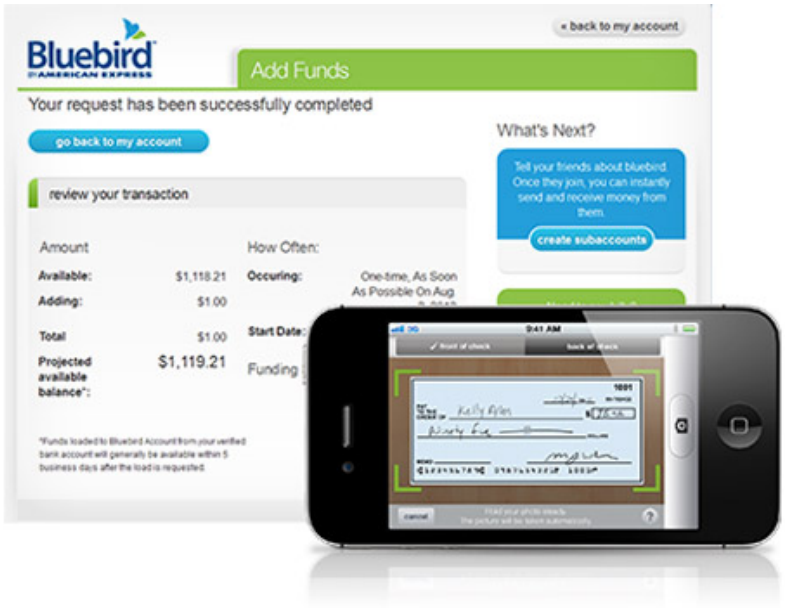
Mobile Prepaid Opportunities include mRDC

- 13% of consumers use prepaid products
  - Many are underbanked & unbanked

Unbanked
- 59% have a mobile phone
- 50 % of which are smartphones

Underbanked
- 90 % have a mobile phone
- 56 %of which are smartphones

- Prepaid products with mRDC
  - American Express Bluebird
  - Visa & Chexar
    - RushCard, AccountNow
  - Plastyc
    - UPside, iBankUP



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Sources: Board of Governors of the Federal Reserve System, "Consumers and Mobile Financial Services," March 2013; Javelin Strategy & Research, March 2013

Mobile Payment Initiatives

Expanded mobile payment platforms…

	NFC	QR Codes	Cloud
			
Issuance	• TSM and Secure Element ecosystem • Payment credentials stored in Secure Element	• Cloud-based mobile app	• Cloud-based mobile app • Payment credentials stored in cloud
Consumer Device Capabilities	• 9 of top 10 OEMs support NFC • 2-way wireless communication	• Only requires data connection • Not device dependent	• Only requires data connection • Not device dependent
Acceptance	• Standards based • Acceptance growing in select developed countries • EMV standards further pushing adoption	• Fragmented – no standards; many solutions available • Potential security issues • Requires speedy wireless connection	• Fragmented – no standards • New customer experience • Potential security issues • Requires speedy wireless connection
Trans. Type	Card present	Card Not Present	Card Not Present

Created new mobile and digital payment opportunities…

Venue/Location	Technology	Services
Remote Internet mCommerce	SMS text Internet browser Direct carrier billing	Online donations Online purchases Ticketing Digital content
	Mobile app Cloud	P2P, remittances Public transit & parking Taxi & car service Loyalty/marketing
Proximity Point-of-sale (POS) Transportation	NFC QR code	Quick service restaurants Convenience/drug stores Retailers Vending machines

Generating industry innovations…

2006 - 2008

Remote Payments via SMS & Internet

- PayPal 'Text to Buy'
- Amazon 'Text Buy It'

Mobile App Stores

- Apple App store
- Android Market

Contactless Cards

- Visa payWave
- MC paypass

2009 - 2010

Browser Mobile Payments

- Amazon

First Mobile Card Acceptance

- Square

2011

QR Code

- Starbucks
- LevelUp

NFC Mobile Wallet

- Google Wallet

Prepaid

- Amex Serve

2012

Mobile Card Acceptance

- PayPal Here

Prepaid

- Green Dot Gobank
- Amex Bluebird

NFC Mobile Wallet

- Isis Wallet

Cloud-based Digital Wallet

- Apple Passbook
- PayPal In-store
- Visa V.me

2013 …

Merchant Apps

- MCX

Other ?

and creating current fragmented U.S. mobile payments landscape

Mobile & digital wallets can provide added value to payments

Mobile (NFC) Wallet

Application stored in secure element in mobile phone that controls access to payment credentials (e.g., credit/debit cards, bank account, coupons, rewards, transit tickets)

Digital Wallet

Application stored in mobile phone to access payment credentials in cloud. Payment credentials accessed via mobile app, phone number and PIN, or physical card.

Mobile NFC wallets off to slow start

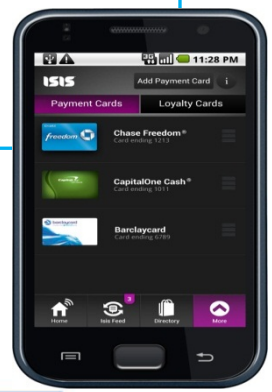
Google wallet

- Launched September 2011 with Citi MasterCard
- Sprint only MNO partner
- Embedded NFC
- Hybrid NFC/Cloud model supports all major credit/debit cards—stores credentials in cloud not on phone

Sprint

ISIS

- Launched 4Q 2012 Austin, TX, Salt Lake City & UTAH Transit
  - 10,000 merchant locations
- Supported by 3 MNOs
  - AT&T, T-mobile, Verizon
- Barclaycard, Capital One, Chase
- NFC with credentials stored in SIM secure element on phone
- Reloadable virtual prepaid card
- Use with all major
- credit/debit cards



Both wallets offer merchant deals, loyalty programs and wallet security with passwords & remote disable if lost or stolen

PayPal Expands its digital wallet

- Overall Market
  - 50M+ active U.S. PayPal accounts (2012)
  - 9 million online PayPal merchants
- POS *PayPal In-store*
  - Use PayPal for POS purchases
  - Enter mobile # and PIN at POS terminal
  - Access PayPal account in cloud
  - Home Depot, 20+ other retailers
- POS and Discover (2Q2013)
  - Uses Discover Network with PayPal issued card at POS merchants that accept Discover
- Merchant card acceptance
  - *PayPal Here* plug-in reader

Starbucks prepaid mobile app with QR code is feature-rich

Check Starbucks prepaid account balance

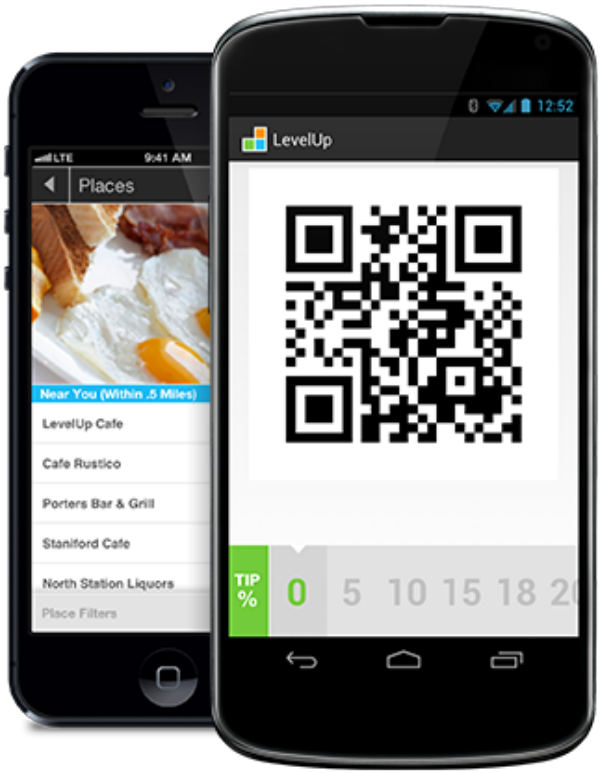
Reload funds via online, mobile app, or in-store

Pay for in-store purchases with QR code

Track & redeem Starbucks loyalty rewards

Open QR code mobile solution for merchants

- Cloud-based
- Linked to credit/debit card
- 1 million+ users
- 5000+ mostly small merchants
- 10 major cities
- Loyalty program
- Location-based offers
- Partnerships
  - Heartland Payment Systems
  - NCR



Apple digital wallet not ready for POS payments

iTunes

- One of the biggest online credit card subscribers
- 435M+ active accounts
- 700,000+ apps
  - Average customer has 100 apps
- Credit card/billing info stored in cloud digital wallet
- Mobile payments app

Passbook

- Aggregates QR codes from retailer loyalty cards, gift cards & coupons, boarding passes, movie tickets
- More efficient tracking of loyalty cards, rewards
- Not a payment wallet

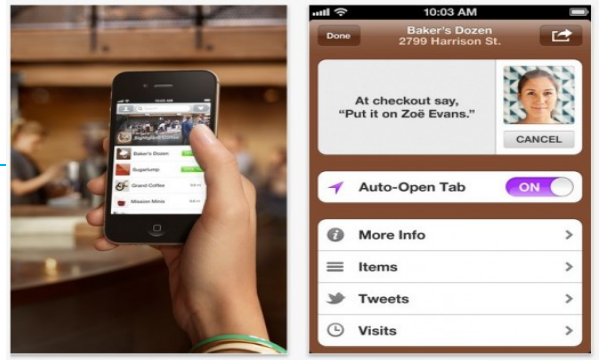
Square offers payment solutions for mobile POS and consumer

Credit Card Acceptance

- Mobile app & plug-in device for small/micro POS merchants to accept credit/sig debit car
- Payment provider is merchant acquirer, assumes liability, handles charge-backs
- Merchant incentive: lower fees, cash/check replacement
- Competitors: Intuit GoPay, ROAM Data, PayPal Here

Pay with Square

- Link credit card to register
- Mobile phone not needed at check-out
- With GPS open tab when customer walks into store
- At checkout, name & photo appear on register; cashier confirms customer photo to complete sale



Direct Carrier Billing Alternative to Traditional Mobile Solutions

- Intermediaries between internet merchant and mobile carrier to handle payment to merchant and bill to mobile carrier
- Payment charged to consumer's monthly mobile phone bill
- More common in other countries (South Korea)
- U.S. small value, low risk digital content, online donations
- Potential Issues
  - Bypasses traditional payment process and settlement
  - Mobile carrier is extending credit
  - If purchase value increases or shifts to physical POS
- Controls
  - Dollar limits on purchases to protect against unauthorized use
  - User parameters to control how, when and by whom they are charged
  - Fraud management and monitoring

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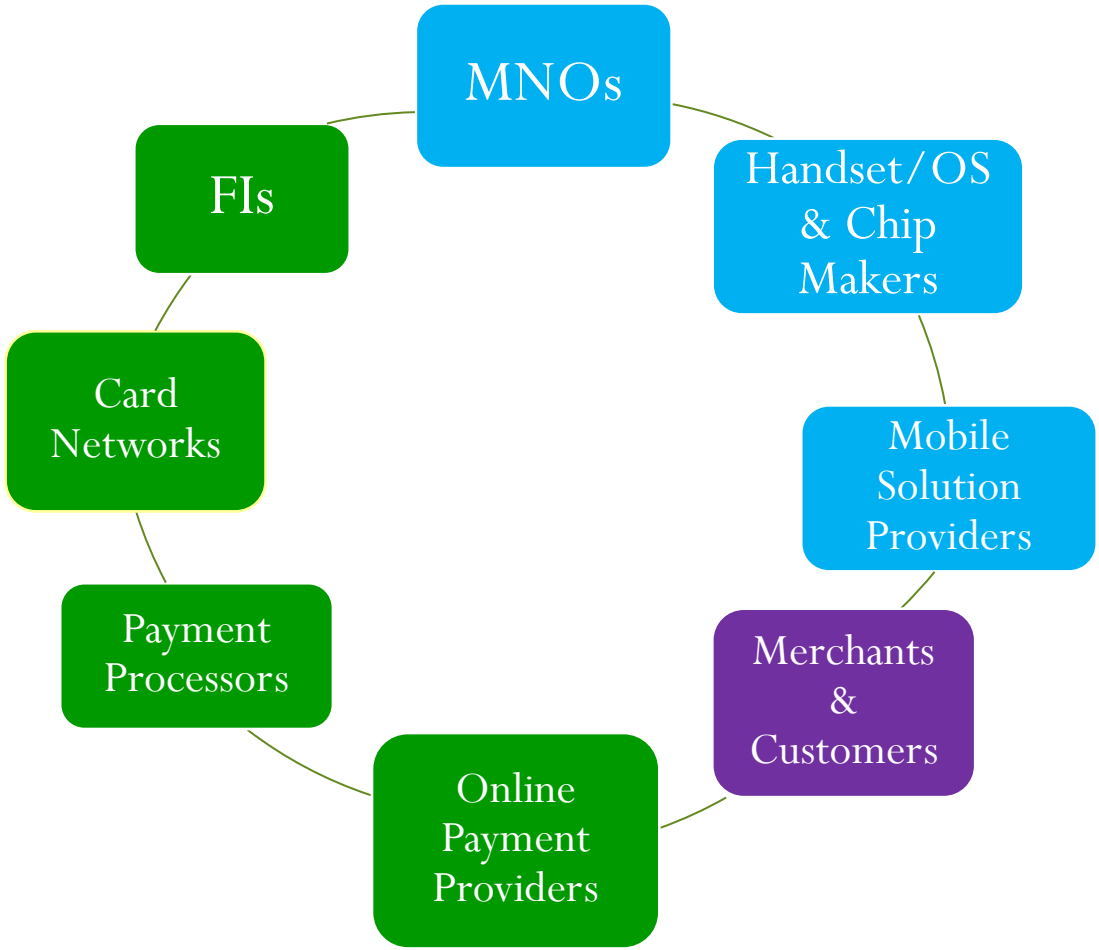
Mobile Payment Industry Challenges & Risks

Mobile Payment Industry Challenges

Low consumer demand, unclear value proposition	Multiple stakeholders	Security and privacy concerns
Not enough NFC-enabled phones	Uncertain business model between MNOs and Banks	Lack of standards for interoperability
Weak merchant business case	Ownership of Customer Data	Lack of regulatory direction

Multiple stakeholders in mobile ecosystem make collaboration challenging

- 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.



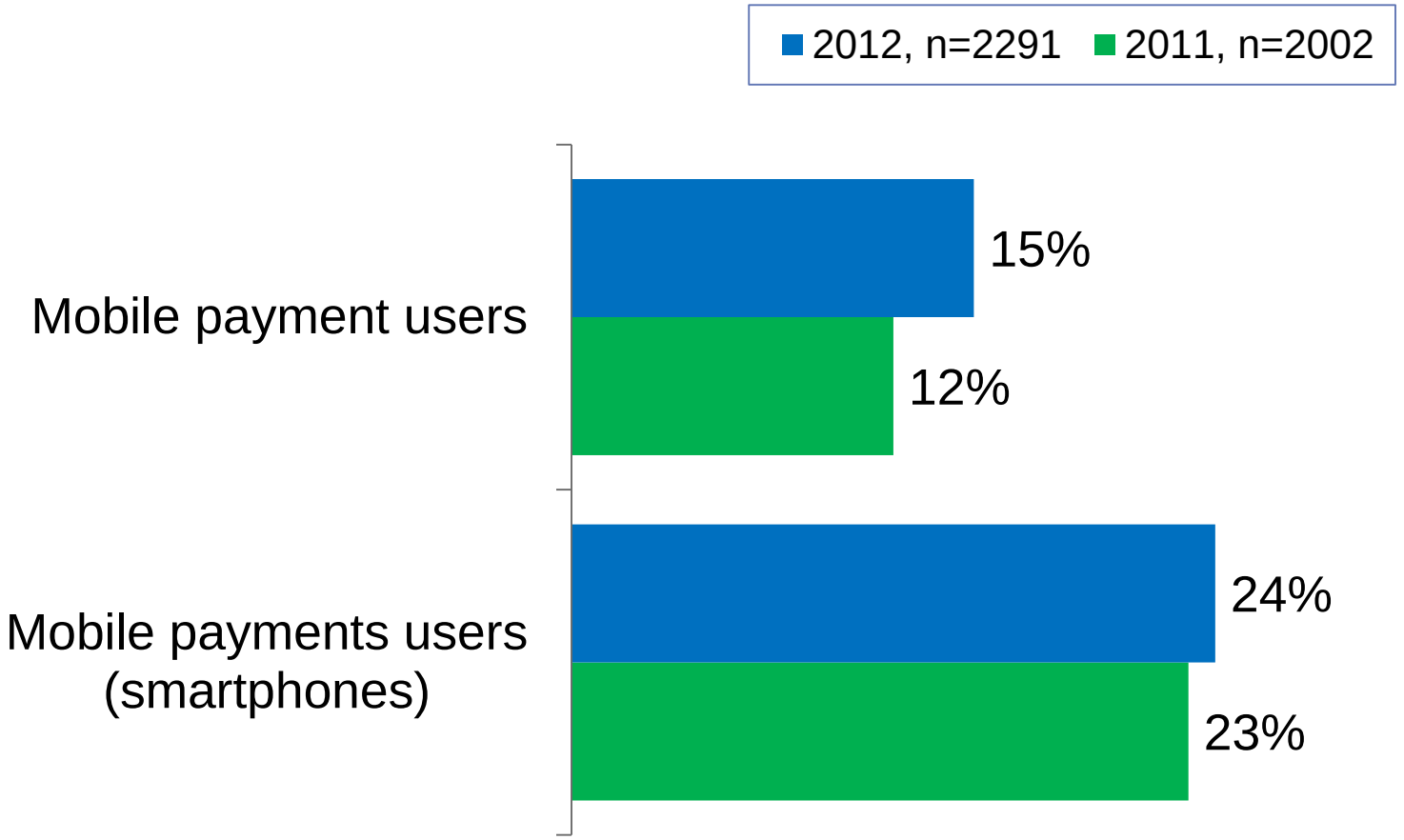
Merchants powerful force behind mobile payments

MCX MERCHANT CUSTOMER EXCHANGE

- 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

Consumer demand for mobile payments is low, but adoption is increasing slowly



Source: Board of Governors of the Federal Reserve System, "Consumers and Mobile Financial Services," March 2013

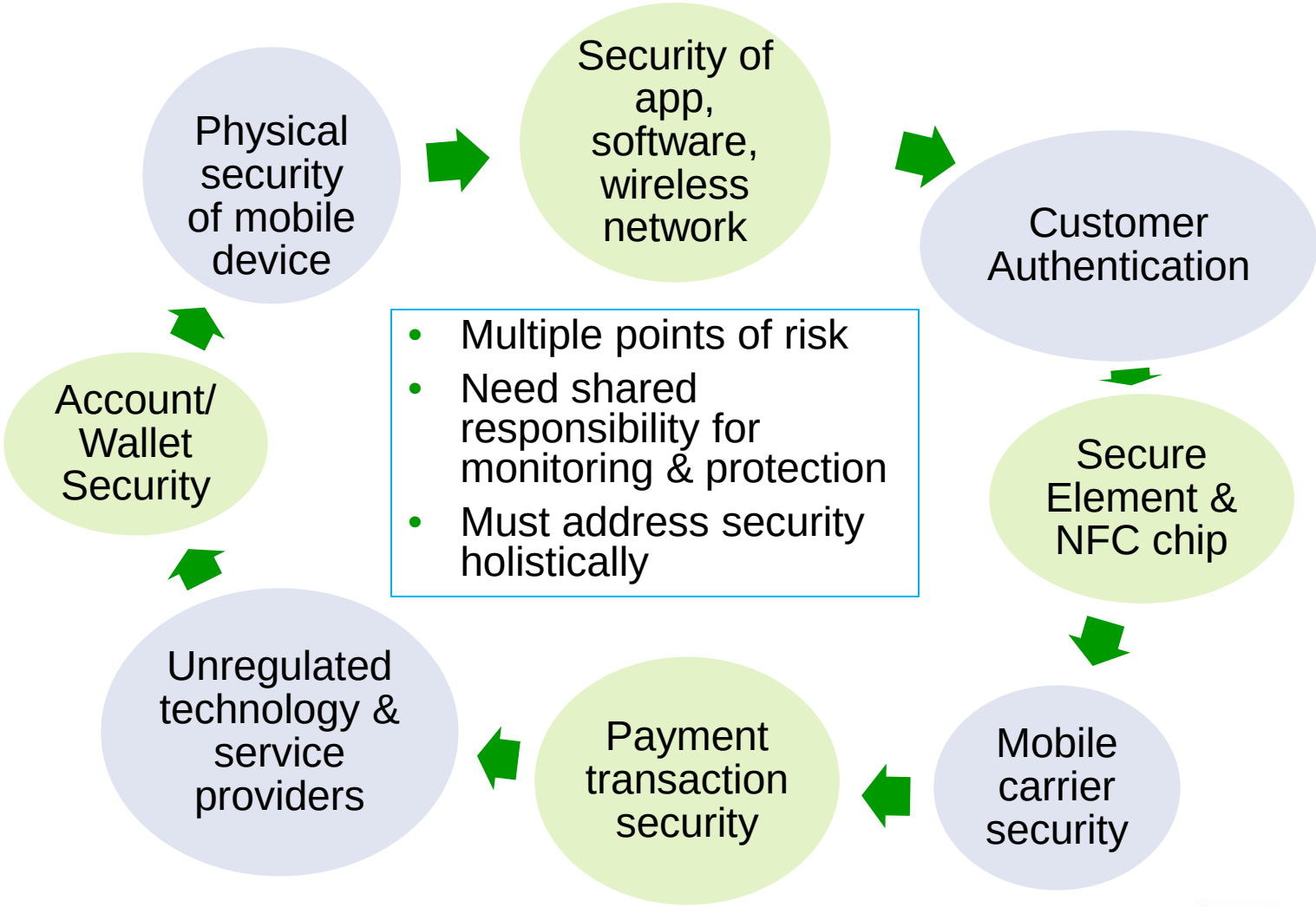
Most mobile payments made today are NOT for POS purchases

Mobile used more for bill pay, online purchases and money transfer

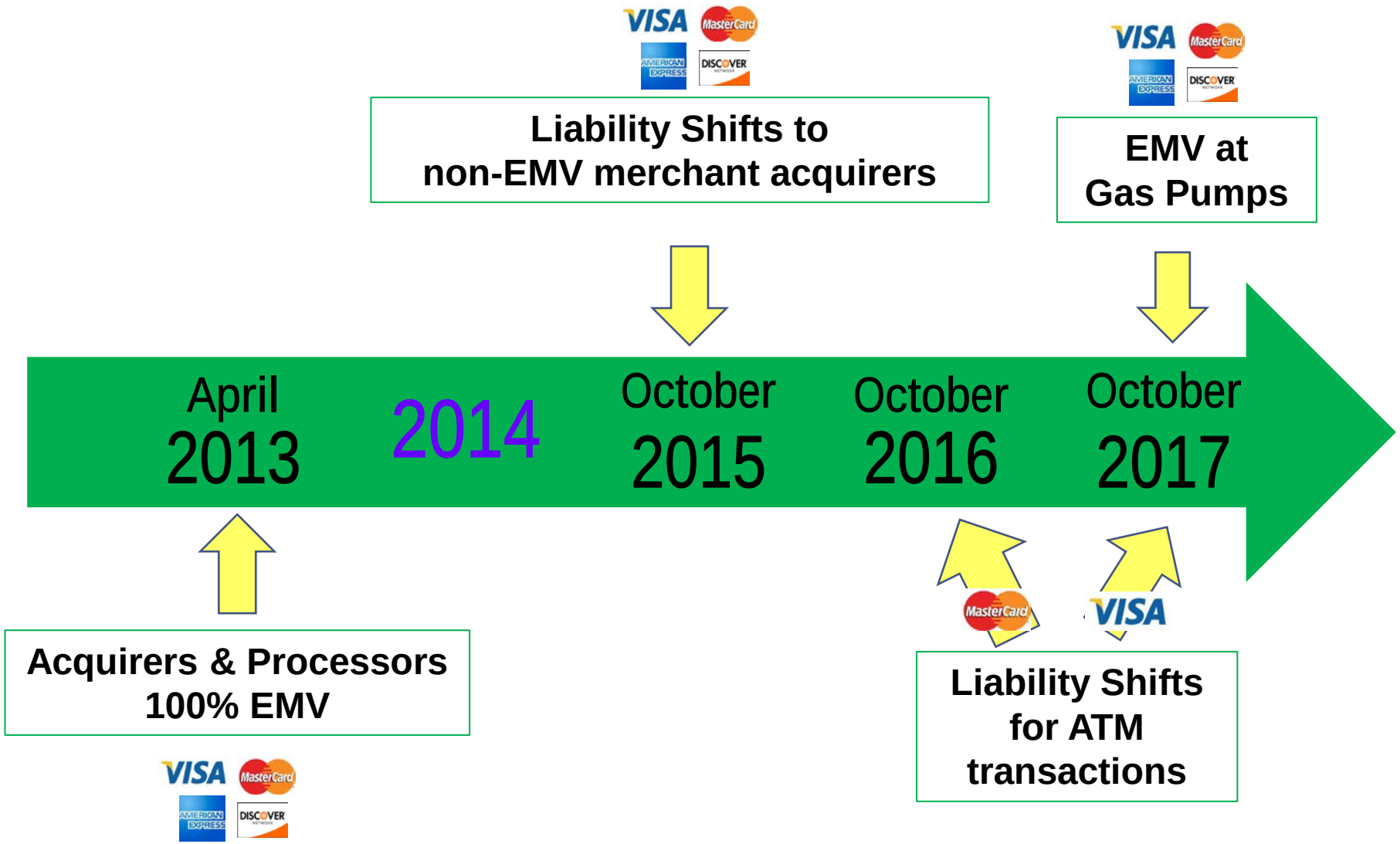
Using your mobile phone, have you done any of the following in the past 12 months?	2011	2012
❑ Used your mobile phone's web browser to make a mobile payment	23%	42%
❑ Made an online purchase	36%	35%
❑ Transferred money to another person's bank, credit card or PayPal account	21%	30%
❑ Received money from another person using my mobile phone	8%	15%
❑ Scanned a QR code to make a mobile payment	1%	9%
❑ Used a text message to make a mobile payment	16%	8%
❑ Waved or tapped mobile phone at POS to pay for purchase	2%	6%

Source: Board of Governors of the Federal Reserve System, "Consumers and Mobile Financial Services," March 2013

Security and privacy concerns hinder implementation and adoption



U.S. migration to EMV is a distraction



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Mobile phone can make payments safer

- Users notice mobile phone is missing 4-8 times sooner than their wallet
- Users almost never leave home without mobile phone; 25-30% leave home without a wallet
- Alerts and responses can be communicated anytime, any place
- Mobile phones have built-in protections
  - Phone has unique number (MSISDN) that registers it to mobile service provider to help locate and identify phone
- Consumer tools protect phone
  - Consumer selected pass code/PIN
  - Remote deactivation/wipe
- Payment credentials on mobile can be encrypted and dynamically generated

Regulatory coordination is needed for clarity of coverage and liability

- No one law or governing authority oversees m-commerce – potential gaps
  - Fed, FDIC, OCC, NCUA, FTC and FCC and CFPB all involved
  - 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 less familiar with banking laws for consumer protection and privacy, KYC, BSA/data protection, money transmission, risk compliance

Industry Perspective of Mobile Regulation

- Fed and Mobile Payments Industry Workgroup met with bank regulators, FTC, and FCC in April 2012 to discuss regulatory clarity
- Primary concerns – consumer protection, privacy and data security
- Consumer 'awareness before engagement'
- Important for non-banks and new companies offering mobile services to understand how to protect consumers, but for now banks still liable
- General consensus – still too early in mobile payments evolution to regulate
- Focus on education and communication between industry and agencies
- Industry stakeholders want to be involved, in the loop, when need for mobile regulation arises

Long-term vision for successful U.S. mobile payment ecosystem

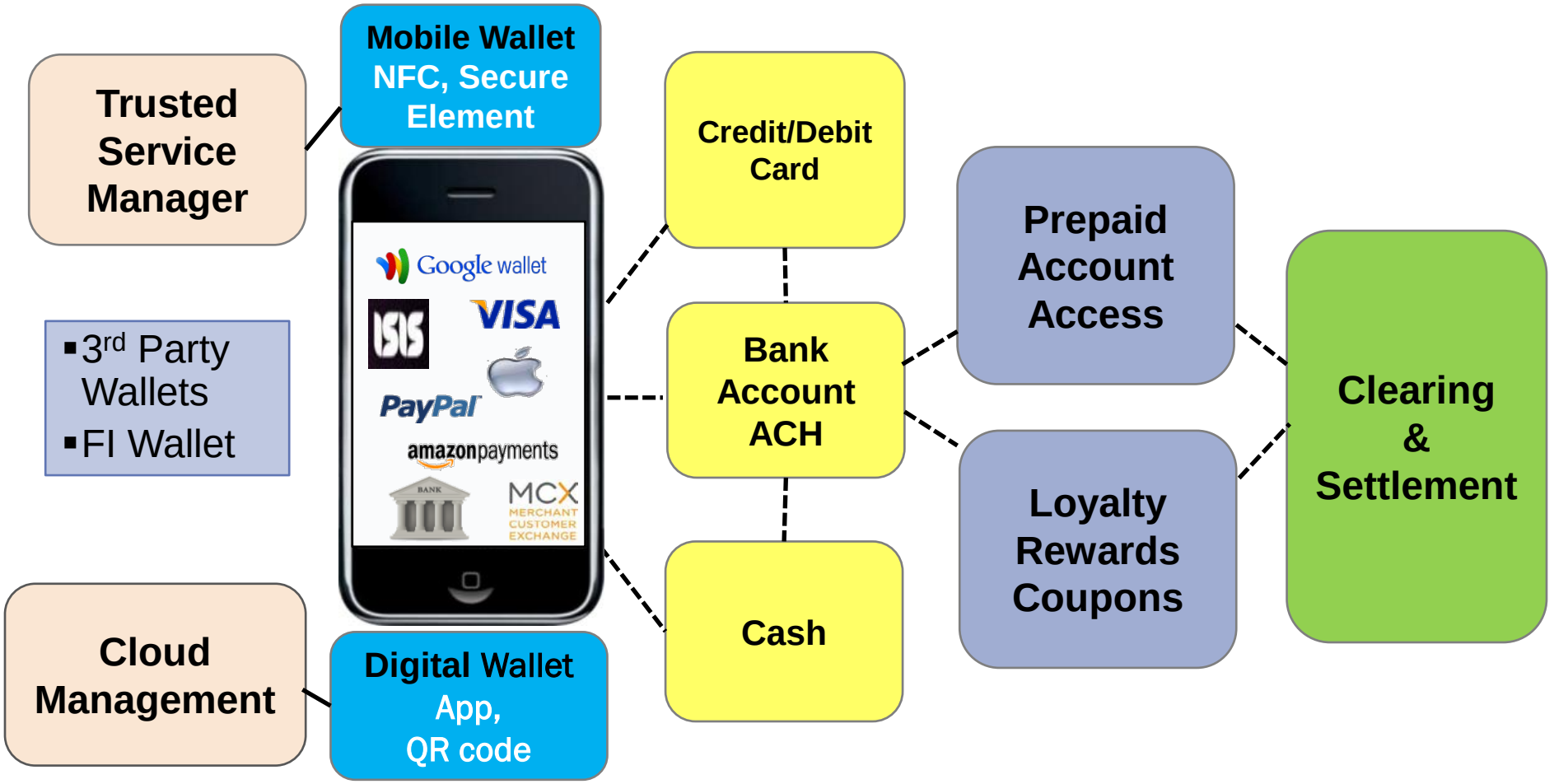
Mobile Payment Ecosystem Today

- MNOs partnering with FIs, card networks, and technology companies
- Smartphone manufacturers increasing number of NFC-enabled phones
- Competition increasing as payment processors and alternative payment providers introduce more mobile solutions
- Payment card and ACH networks pursuing multiple mobile payment initiatives, including prepaid, P2P, and transit
- Merchants experimenting with different mobile solutions and joining forces to develop merchant-centric platform
- MPIW continues to collaborate on addressing mobile payment barriers related to security, standards and regulatory requirements

Long-term Vision

- Mobile platform will be safe, interoperable, and accessible ubiquitously on any mobile device, and ideally with any bank, merchant, or network
- Mobile and digital wallets will co-exist, leveraging the best of both models and used in competing and complementary venues
- True channel convergence will exist, as consumers and merchants utilize multiple channels to optimize payment experience
- Strong risk management efforts will be in place to minimize fraud and protect consumer privacy

What convergence of wallets might look like



Conclusion

- Non-banks will continue to play strong and disruptive roles in innovation and implementation of mobile payments
- No one industry will dominate
- More mobile stakeholder partnerships
- Collaboration will evolve to address security, fraud, and education
- Consumer adoption will depend on convenience, security and incremental value – basically everything

What can the Federal Reserve do?

- Continue to facilitate MPIW
- Communicate with other regulators
- Participate in industry standards and security workgroups
- Monitor consumer payment trends
- Identify potential barriers to adoption and education needs
- Other??

Questions?

Thank you.

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http://www.bostonfed.org/bankinfo/payment-strategies/index.htm