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The Evolution of **Digital** and **Mobile Wallets**

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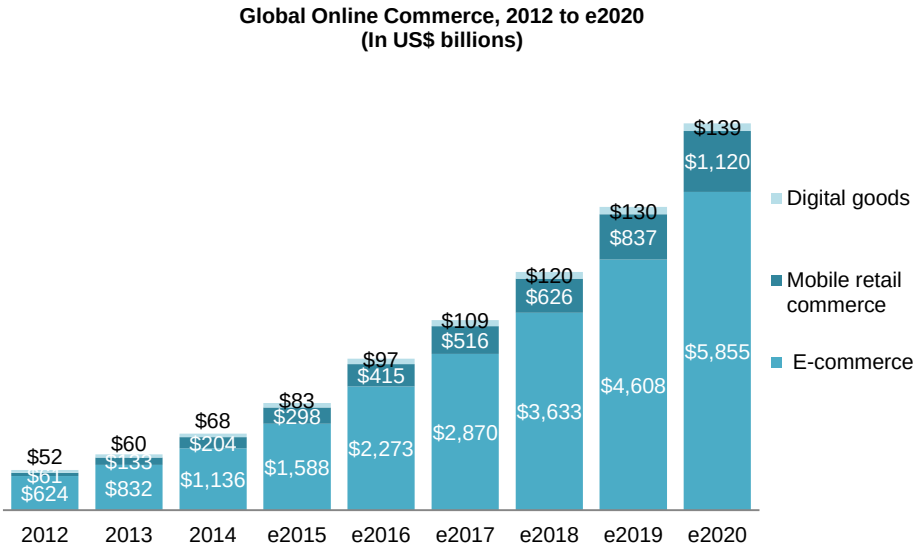
THE DIGITAL WALLET: INTRODUCTION

Commerce is going mobile. In 2014, smartphones became the dominant internet access tool around the world, replacing desktop and laptop computers, and by 2020, there will be 2.6 billion connected smartphones in the world.[1] Metcalf's law, the law that "the value of a telecommunications network is proportional to the square of the number of connected users of the system," has never had a more powerful example than the growth of the smartphone. With every new smartphone user, the potential for interconnectivity through chat apps such as WeChat and social media such as Facebook and Snapchat increases exponentially, and it's changing the fabric of global society. Along with the social change enabled by mobile, commerce is being impacted at the same pace. E-commerce is growing at a rate of 32% (Figure 1).

Figure 1: Global Online Commerce Forecast



Source: Aite Group analysis

A large part of this growth originates from mobile commerce. In North America and Europe combined, online sales initiated by mobile devices grew by 58% between 2014 and 2015, compared to just 3% for desktop-initiated commerce.[2] In emerging markets, the importance of mobile commerce is even higher, as the mobile network is the primary infrastructure for online commerce.

While the growth of mobile online commerce has been rapid, use of a smartphone for purchases at a physical point of sale (POS) is nascent, and the growth rate is much slower than that of mobile online. This is logical, since the smartphone already "lives" in the virtual world. Its

1. "The Ericsson Mobility Report," accessed April 27, 2016, http://www.ericsson.com/mobility-report.
2. Centre for Retail Research, accessed June 14, 2016 http://www.retailresearch.org/mobileretailing.php.

transition into a device for POS usage is complicated by a lack of accepting terminals, conflicting protocols, and limited distribution of payment-enabled phones. All of these factors are changing quickly, however, and the growth rate for physical-world payments is increasing.

In Europe, for example, the acceptance and usage of contactless card payments has quickly accelerated. Visa reported in May 2016 that one in five in-person Visa-processed card payments is now contactless.[3] MasterCard and Visa have set compliance dates for all POS terminals to accept contactless payments by January 2020 at the latest. Mobile proximity payments use the same standards as contactless cards, using the near-field communication (NFC) and EMV standards. As two in three phones will be NFC-enabled by 2018, this means that acceptance for mobile proximity payments will become ubiquitous in the near future.

DEFINING THE DIGITAL WALLET

The digital wallet is the engine of mobile commerce. Without a digital wallet, consumers need to enter a wealth of information into a form constrained by the smartphone's screen size. While the mobile wallet space for in-store payments has only emerged with the launch of Apple Pay in the autumn of 2014 (soon followed by Google's Android Pay and Samsung Pay), the concept of a digital wallet has been in-market since the early days of online commerce.

PayPal created a digital wallet to support the first major online marketplace, eBay. While PayPal attempted to broaden the offering's appeal outside of eBay for several years, the concept of storing payment information with an online provider to enable purchases outside of eBay initially didn't catch on. Amazon 1-Click emerged in 2006, raising the bar in terms of user experience (UX) and expanding merchant and customer vision of the digital wallet's capabilities. Since then, other digital and mobile wallets have emerged, and there is now a variety of different approaches to online and mobile proximity payments, all falling under the general description of "digital wallet."

A digital wallet is a software application with the following base functionality:

- It offers secure enrollment of the user (application download, identity check) and secure provisioning of credentials (e.g., user ID and password for wallet access).
- It offers the ability for the user to securely provision and store customer-identity information (e.g., email address), payment information (e.g., credit card data), and shipping address details. The user can preselect a payment method within the wallet application to execute commerce transactions (i.e., pay merchants online, in-app, or in-store).
- The funding of the wallet payment may come from a debit or credit card, prepaid card, bank account, e-money account, virtual currency, or any other store of value.

3. "Europeans 'Touched To Pay' Three Billion Times In The Last 12 Months," Visa Europe, accessed 11 May, 2016, https://www.visaeurope.com/newsroom/news/european_used_contactless_3_billion_times_last_year.

Digital wallets often have many more functions, including person-to-person (P2P) payments and other payment methods, balance-inquiry and reporting functions, support of loyalty programs (rewards, coupons), and other functions (Figure 2).

The terms "mobile wallet" and "e-wallet" are specific implementations of the digital wallet for the mobile device and for the desktop/browser environment, respectively (Figure 2).

Figure 2: Functions of the Digital Wallet

Interaction alternatives	Information Access	Security, Payment and Financial Services	Shopping	Customer Relationship Building
Social media	Web/App Search	In-store/Proximity-NFC	Promotions, digital coupons	Loyalty program
Text Message	Mapping-Directions	In-app/Mobile web	Ticketing – entertainment, travel, sports events	Targeted advertising
Email	In-store navigation, product discovery	Access control-security-account management, Identity storage (National ID cards, etc.)	Transport-parking, transit tolls	Location based marketing
Voice	Shopping companion-price comparison, product information, shopping lists	Mobile banking, financial services, P2P payments	Gift cards, vouchers	

Source: Aite Group

DIGITAL WALLET DELIVERY TECHNOLOGIES

While there are several different ways to classify the different digital wallets, viewing them as different executions of specific delivery technologies may help to clarify the space. Digital wallets can use NFC, optical/QR codes, digital (online)-only transactions, and text-message-based transactions. Some digital wallets combine delivery alternatives, but they generally have a primary delivery approach.

describes the different types of wallets.

Table A: Wallet Types by Delivery Technology

Technology	Description	Examples	Use cases	Strengths	Limitations
NFC	Tokenized wallet incorporating a secure element either embedded in the device or using host card emulation (HCE) in the cloud	Apple Pay, Android Pay, Samsung Pay, RBC/Capital One financial institution wallet	In-store mobile proximity Mobile web (HTML5) In-app	Elegant, low-friction UX Flexible, easily integrated into global payments ecosystem Very secure	Physical-world usage limited to NFC-capable POS terminals
Optical/QR code	Uses QR or bar code generated by either the merchant's POS or the customer's device	WeChat Wallet, Starbucks mobile payment, Chase Pay, Walmart Pay	In-store mobile proximity	Simple application Broad distribution of QR/bar code readers with merchants	Optical read can be difficult in bright light No incremental security functionality Does not leverage global payments ecosystem
Digital only	Wallet designed for use online with limited application in the physical-world	Alipay, Paytm, PayPal, Pay with Amazon, ICICI Pockets	Online/in-app payments in designated marketplaces Online payments with merchants offering the wallet for payment Limited physical-world access using either text/QR/bar code or plastic card	Simple to install/use, device (smartphone) agnostic	Usage limited to participating merchants and marketplaces Limited physical-world capability
Text based	SMS-based payment platform with mobile phone functioning both as sending device and POS terminal	M-Pesa, MTN Mobile Money, Tigo, Orange Money	P2P funds transfer, mobile current account, consumer-to-business physical-world purchases	Does not require a smartphone, works with any device that can deliver SMS No payment ecosystem required to implement	Closed-loop platform, not integrated with payment networks Limited to no interoperability between schemes

Source: Aite Group

ECONOMICS AND GROWTH POTENTIAL

In terms of economics, mobile wallets tend to be an enabler of commerce rather than a stand-alone revenue generator for organizations that offer them. For retail financial institutions, the value rests with the potential to increase transaction volume for their payment cards by ensuring that the financial institution's card is top of wallet within the mobile offering. An additional benefit is the potential to increase customer retention by increasing the connection between the customer and his or her financial institution. Depending upon the ecosystem, wallet providers can generate revenue by taking a commission on sales made through the wallet. For instance, in the United States, Apple Pay charges 0.15% of the payment value to issuers for transactions handled through the wallet. Marketplace wallet providers, such as Alipay, charge merchants an upfront fee to participate in the marketplace, along with a commission on each sale. Others, such as Baidu Wallet, make their money through search and display advertising on their platform.

With the growth rate of mobile and online commerce, the plethora of smartphones, and the variety of approaches being taken to deliver a digital wallet, it's clear that the space is going to grow rapidly in virtually every corner of the globe.

The question therefore is not "will digital wallets succeed?" but "what's the evolutionary path for digital wallets?"

THE EVOLUTION OF DIGITAL WALLETS

The combination of widespread internet access, increased bandwidth, and devices that can capitalize on that bandwidth to deliver a new customer experience is driving the explosion in wallet development and customer usage. And while physical-world mobile wallets and online digital wallets are currently on separate but parallel development paths, it is inevitable that the lines between the two will blur and hybrid payment tools using online and mobile will emerge. It's impossible to predict the path of development with certainty, but there are a few signposts and landmarks that can guide the vision. The following is a discussion of the possible evolutionary paths for different types of digital wallets.

ONLINE ACCEPTANCE MODELS

Table B describes the major payment acceptance alternatives in the online/mobile space. Mobile money payment alternatives such as M-Pesa are not included, as that is a distinct ecosystem that requires its own analysis.

Table B: Mobile Online Payment Acceptance Alternatives

Online payment type	Description	Example	Strengths	Limitations
Pure in-app payment	Payment capability embedded in an app, generally incorporated into online/mobile games and other digital offerings	Purchasing a song on iTunes, Candy Crush Saga upgrades	The most frictionless payment alternative Contextual, immediately relevant Integrated reporting	Platform takes a percentage of the transaction (30% in most cases) Limited to specific platform/OS Generally focused on smaller transaction value Generally limited to digital goods
Account-on-file	Customer provides the merchant with payment credentials that are stored on a secure server for use when customer makes a purchase	Amazon.com 1-Click, Kohl's Checkout, Booking.com	Convenient for the customer, simplifies and accelerates subsequent purchases Creates stickiness for the merchant site Provides merchant with richer data for CRM	Can only be used at a single site/app Card-not-present (CNP) security concerns for merchant Customer security concerns

Online payment type	Description	Example	Strengths	Limitations
Open/ public buy button	Similar to Amazon 1-Click but allows customers to enter data once and then use it at multiple sites/apps	Visa Checkout, Masterpass, PayPal, Amazon Buy Now, Yandex.Money, Alipay	Straightforward data entry and management process Works on any platform offering the button Excellent UX	Limited set of merchants using each button Multiple button options on a site adds clutter and complicates purchase decision Each buy button has its own provisioning process Separate user ID/pins for each button
Card data entry	One-time entry of card data for a purchase, generally used for customers who choose not to register a card with the merchant	Last-resort payment alternative at most merchants (e.g., Kohl's and others)	Simple for the merchant Easily understood by consumers Common data sets across different merchants (customer doesn't need to learn anything new)	Cumbersome data entry process, particularly on mobile devices Customer concern with security when entering card data Amount of data entry creates opportunity for error and the need to repeat the process, exposing merchant to cart abandonment

Source: Aite Group

REDUCING FRICTION: SIMPLE IS BETTER

The evolutionary path for all wallet technologies will be driven by the desire to reduce friction in the transaction to minimize cart abandonment and optimize customer satisfaction. While online and mobile commerce sites will continue to offer a default account-on-file payment mechanism, the trend will be toward variations on one-click buy, either through a proprietary buy button in the app or on the site or through a third party, such as PayPal. In either case, the digital wallet delivered is different from the traditional wallet model in which the customer can choose from an array of payment alternatives. For buy buttons, only one payment alternative is generally available so that the purchase process is simple, clean, and fast. Some in-app alternatives, such

as Uber's app, offer a limited choice of payment types (e.g., "business" or "personal"). But in general, simple is better.

Along with the continued simplification of digital wallets to reduce friction, the transaction will become plumbing in many cases, whereby the payment is embedded in the overall transaction. Uber is a good example of a transaction process in which the payment has functionally vanished. Once the customer arrives at his or her destination, the Uber driver closes out the trip and Uber sends the receipt for the trip to the customer via email or text. The payment is handled automatically, requiring no effort from either the driver or the customer, a huge reduction in the friction previously encountered in paying for a taxi with a card, or even cash.

What's really interesting is what happens to the customer experience once the payment piece is integrated into other activities. With payments out of the way, the entire commerce process and customer experience can be reimagined, resulting in very new and different ways to do business.

ACCEPTANCE OF MOBILE WALLETS

Mobile wallets are finally getting traction after years of effort by players across the ecosystem. NFC penetration in merchant POS terminals and the leading mobile device manufacturers' integration of NFC functionality were the two catalysts for the development of the space. While the launch of NFC-enabled mobile wallets creates the opportunity for ubiquitous payment capabilities across merchants, closed-loop payment platforms, such as Starbucks' mobile payment capability, have been around for several years and have served as proofs of concept for the broader mobile wallet offering.

Banks, device manufacturers or original equipment manufacturers (OEMs), mobile network operators (MNOs), merchants, and third-party providers are all competing in this fast-evolving space. Several alternative approaches to mobile wallets have emerged as shown in Table C.

Table C: Mobile Wallet Alternatives

Brand	Category	Technology	Opportunity	Risks
Apple Pay	OS wallet—device secure element	Embedded secure element, NFC	Elegant, low-friction UX, significant distribution	Slow takeup, dependent on NFC distribution on merchant terminals
Android Pay	OS wallet—cloud secure element	HCE, secure element in the cloud, NFC	Low-friction UX, dominant distribution, device agnostic	Slow takeup, dependent on NFC distribution on merchant terminals
Samsung Pay	Device wallet	Secure element in the device, NFC and mag-stripe emulation	Mag-stripe emulation plus NFC	Competes with Android Pay, MNOs not promoting it

Brand	Category	Technology	Opportunity	Risks
RBC Wallet	Bank wallet integrated into mobile banking platform	HCE, secure element in the cloud, NFC	Frictionless onboarding, immediate linkage to mobile banking	Competes with OS wallets (will be offered in parallel)
Walmart Pay	Retailer wallet	Optical/QR code, integrated loyalty/promotion	Owned by leading retailer	Limited payment options, very late to market
MobilePay	Bank wallet (by Danske Bank in Northern Europe)	NFC, QR code, Bluetooth Low Energy (BLE)	Can be used by consumers from all banks, multiple use cases including P2P	Merchant has to bank with Danske Bank, so restricted to specific markets
Seqr	Third-party wallet in Europe and North America (by Seamless)	NFC, QR code, transaction completed online and in real time	Lower cost for merchant due to use of ACH payment	Payment brand unfamiliar to consumers, building a network from scratch in competition with established brands
Yepex	Third-party wallet (Yellow Pepper) in Latin America	HCE, NFC, QR code, BLE	Cooperation with local payment networks, using existing infrastructure	Slow takeup due to required change in customer behavior
Osaifu-Keitai	MNO wallet (NTT Docomo) in Japan	FeliCa standard	Comprehensive offering including online, loyalty, ticketing	Differing standard incompatible with other NFC, limited to Japan
Vodafone Wallet	MNO wallet	NFC, MNO-issued chip (UICC) as secure element	Large subscriber base	Consumer to request new chip (UICC), competes with device wallets

Source: Aite Group

Apple and Samsung make use of a secure element in the mobile device itself to secure the payment credentials. An advantage of this approach is that the mobile wallet can be used when it is not connected to a network. MNO wallets use a special NFC-enabled network chip (UICC) as the secure element; one of the drawbacks to this approach is that the consumer has to apply for

a new chip for their smartphone when subscribing to the wallet. Also, the provisioning of the payment application by the financial institution/issuer to this UICC is complex, requiring one or more trusted service managers to manage this on behalf of all the parties in the NFC ecosystem.

Wallet providers that do not have control over the device often make use of HCE, which enables storage of payment credentials in the cloud. It is only available on the Android platform, however.

Banks can now choose to develop their own digital wallets deploying a white-labeled solution from a third-party provider. Banks may also decide not to offer their own wallet but just make their cards available to third-party wallets such as Apple Pay. Although this is certainly the strategy that requires the least investment, the bank also incurs the risk of losing brand visibility (losing the top-of-wallet position in the wallet's suite of cards and/or becoming the secondary brand after the digital wallet's brand), getting disconnected from the customer, and missing opportunities for innovation and new revenue streams.

Danske Bank took a different course when the bank decided to launch an innovative mobile payment service as part of the bank's digital strategy. MobilePay was launched in Denmark in May 2013, originally as a P2P mobile payment service. Three years later, MobilePay has more than 3 million customers or over 50% of the Danish population, making 485,000 transactions per day (May 2016 figures). The MobilePay wallet now supports P2P, payments to merchants (web, in-app, and in-store), e-receipt management, loyalty, and most recently e-invoicing.

Yellow Pepper has introduced its Yepex mobile wallet in Colombia and Mexico, working together with the local payment networks to drive customer adoption.

Retailers like Walmart and Starbucks have developed their own wallet solutions to leverage their loyal customer bases. Other merchants may choose to work with third-party providers like Seamless, which is now present in 16 countries (Europe and North America).

In Japan, NTT Docomo has a mobile wallet in the market since 2004. Osaifu-Keitai was one of the first initiatives to realize the vision of replacing the leather wallet with a digital equivalent. The mobile wallet would not only allow users to make cashless and plasticless payments at the point of sale but also enable them to digitize receipts, loyalty cards, ID cards, public transport tickets, and much more. In fact, all these functions are supported by Osaifu-Keitai today. What's more, it also supports online payments on the web.

EVOLUTION OF THE MOBILE WALLET SPACE

While the two primary delivery offerings in the mobile wallet space, NFC and closed loop, will lead the category in terms of distribution and usage, several different flavors will provide customers with an array of potentially confusing alternatives that may create indecision and slow implementation. Fortunately, NFC is becoming increasingly prevalent with the world's merchants, and it will be the de facto standard for third-party wallets designed to carry network-based credit and debit cards such as Visa and MasterCard. Closed-loop wallets will be built into retailer apps, and technology platforms will range widely from optical/QR-code-based platforms to NFC and BLE beacon-based payment platforms.

There are several possible evolutionary paths that mobile wallets could follow, but all of them will include the integration of online and physical-world transactions. There are open issues regarding the potential for loyalty and promotion in the wallet as well as which technological platforms will thrive going forward.

THE BLENDED DIGITAL/MOBILE WALLET

Apple Pay and Android Pay also offer the ability for consumers to use their mobile wallet to purchase goods and services in the online space and within apps. For use cases related to making online purchases using a mobile device, this is a logical progression, but the mobile wallet's high security, incorporating tokenization along with two-factor authentication and biometrics, makes an in-app or online transaction done through a mobile wallet possibly the most secure payment technology available today. Increasingly, mobile wallets will drive online/mobile commerce, and it's possible that the increased usage of mobile wallets online will in fact drive increased usage for physical-world payments.

While more problematic, e-wallets are beginning to provide physical-world payment capabilities. PayPal is offering a mobile POS platform for small to midsize merchants with the ability to accept PayPal along with traditional card payments. It has also recently acquired a company called Paydiant that offers an optically based POS platform with PayPal embedded. It is also possible, if not likely, that digital wallets, such as PayPal and Pay with Amazon, could be incorporated into the NFC digital wallets as a payment alternative, which would allow participating digital wallets full access to physical-world payment technologies. One example is the cooperation between Vodafone and PayPal, whereby the latter is offered as a payment option in the Vodafone Wallet.

REGIONAL DIFFERENCES

The digital wallet world is dividing along geographic lines based on the relative sophistication of the payment ecosystem in different markets. Fully developed markets such as North America and Europe are moving to NFC and in-app capabilities that can be supported by the consistent availability of 4G mobile bandwidth and sophisticated retail POS. In China and India, the mobile wallet is mainly used online to shop on marketplaces like Alipay, Tenpay, and Paytm.

In developing countries where very little payment infrastructure has been in place, completely new payment platforms have been developed to capitalize on the ubiquity of basic mobile devices that can use text-based payments. In many cases, these payment platforms have been developed and are being managed by MNOs rather than traditional financial institutions and payment processors. The best known example is M-Pesa, operated by Vodafone and its subsidiaries. Vodafone's M-Pesa mobile money transfer and payment service is the leading mobile money product in the world. It has more than 20 million active users across Africa, the Middle East, Asia, and (Eastern) Europe. With services like M-Pesa, financial services become available to the 2.5 billion people that have limited access to financial services.

WALLET ECONOMICS

Up to now, wallet business cases have been supportive of other economic value. For instance, Apple Pay charges a nominal fee to issuers for each transaction, but its intent is not to make money on the usage of Apple Pay. Instead, it wishes to add more value to the Apple product offering and increase the likelihood that a customer will continue to purchase Apple hardware and remain in the Apple ecosystem. Digital wallet providers generally charge merchants a transaction fee, but they do not charge directly for the wallet itself.

In the online space, digital wallets help merchants to convert more customer digital shopping carts to actual sales by providing a seamless checkout experience. As there are no extra costs involved, online merchants have a clear economic case to use digital wallets.

Amazon has recognized that the loyalty of its customers can be valuable to other merchants. With Amazon Payments, consumers can use their Amazon wallets to pay on merchant websites that have contracted with Amazon Payments.

For proximity payments, the business case depends on value added services. To make mobile wallets attractive for consumers and merchants, they should offer value-added services like rewards, coupons, and targeted advertisements.

Going forward, the business case for wallets will continue to be embedded in other aspects of the provider's business. It's very difficult for a digital wallet to provide sufficient value to act as a stand-alone profit center.

One exception is Paysafe Group, which reports separately on its digital wallet business. Paysafe Group is a global provider of payment solutions in e-commerce, online gambling, and online gaming verticals. The company's Skrill and Neteller wallet offerings provide merchants with more than 100 payment options and 40 currencies. In 2015, Paysafe's Digital Wallet business had reported revenue of US$159.1 million, 78% higher than 2014's US$89.6 million; this growth was driven by the Skrill acquisition. On a pro forma constant currency basis, digital wallets saw 17% year-on-year revenue growth. Digital Wallet contributed 29% of Paysafe Group's second-half 2015 pro forma fee revenue.

For companies such as Paysafe, PayPal, Alipay and others, digital wallets are core business. With their comprehensive offering, they are able to support merchants dealing with the complexities of doing business globally.

PROVIDER STRATEGIES

Each participant in the mobile wallet value chain has different priorities and requirements from the technology. Financial institutions have received less attention in the early days of wallet evolution than did the technology providers and retailers. HCE is changing the equation by providing financial institutions with the capability to offer customers a proprietary, financial-institution-branded wallet in direct competition with the OS- and device-based wallets. The following is a SWOT (strengths, weaknesses, opportunities, threats) analysis for the different participants in the mobile/digital wallet ecosystem. In many cases, several alternatives are available to different categories (e.g., retailers, retail financial institutions), and in those cases each alternative is described independently.

Table D offers the SWOT analysis for retailer financial institutions or issuers offering a proprietary wallet (e.g., RBC Wallet).

Table D: Retail Financial Institution/Issuer Proprietary Wallet

Strengths	Weaknesses	Opportunities	Threats
Control over product and customer experience	Security requirements may inhibit UX—some financial institutions are discussing implementation of additional security for proprietary wallet transactions	Adds value to customer relationship—keeps transactions "in-house"	OEM wallets already in place and simpler for customers
Integration with the financial institution's online financial data to add value to customer relationship	Significant incremental product-management requirements	Potential for differentiation—may be short-term but could provide opportunities to reward customer behavior and build additional capabilities	Competitive differentiation may be short-lived as other financial institutions bring wallets online
	Stand-alone offering—no third-party marketing support		

Source: Aite Group

Table E offers the SWOT analysis for issuers offering an OS/OEM wallet, such as Apple Pay.

Table E: Retail Financial Institution/Issuer OS/OEM Wallet

Strengths	Weaknesses	Opportunities	Threats
Simple to implement/administer	Lessened opportunity to reinforce financial institution brand—OS/OEM wallet provider may get dominant visibility	Reinforces financial institution brand as technology innovator, particularly with millennials	OS/OEM brand may dominate
Marketing support from OS/OEM provider	Dependent on wallet provider for customer experience	Critical mass already building and will continue to grow	No differentiation from other issuers
	Risk of not being top of wallet with other financial institution/ issuer cards in the wallet		

Source: Aite Group

Table F analyzes the possibility of a retailer offering a proprietary wallet (e.g., Walmart Pay).

Table F: Retailer Proprietary Wallet

Strengths	Weaknesses	Opportunities	Threats
Control over product and experience	Limited to specific merchants, not ubiquitous	Reinforces retailer brand	OS/OEM wallets have significant head start
Can integrate promotion/loyalty into offering	Extensive product development/ implementation investment	Can offer enhanced customer experience at point of sale	Question whether customers will use multiple wallets
	Customer needs to open retailer app to activate		

Source: Aite Group

Table G presents the case for retailers offering an OS/OEM wallet, such as Apple Pay.

Table G: Retailer OS/OEM Wallet

Strengths	Weaknesses	Opportunities	Threats
Simple to implement/ administer	Lessened opportunity to reinforce retailer brand	Reinforces retailer brand as technology innovator	OS/OEM brand may dominate
Marketing support from OS/OEM provider	Dependent on wallet provider for customer experience	Critical mass already building and will continue to grow	Limited differentiation from other retailers

Strengths	Weaknesses	Opportunities	Threats
	Limited/no ability to incorporate retailer loyalty/promotion		

Source: Aite Group

Table H considers the possibility of online merchants offering a proprietary wallet, which is essentially the card-on-file functionality that already resides on nearly every merchant site.

Table H: Online Merchant Proprietary Wallet

Strengths	Weaknesses	Opportunities	Threats
Control the commerce experience	Requires customer onboarding (card on file)	Lower cost	Third-party UX may be superior
Access to customer data	Limited to single merchant, not leveraged across merchants' categories	Can incorporate promotion/loyalty into the experience	Risk of competitive incursion from every other wallet
Keep customer in the merchant's online environment	Program administration extensive	Control the shopping cart	
	Increased risk of fraud/data theft		

Source: Aite Group

Finally, Table I analyzes online merchants accepting third-party wallets, such as PayPal.

Table I: Online Merchant Third-Party Wallet

Strengths	Weaknesses	Opportunities	Threats
Customer experience (one-click buy)	Lack of control of the experience	Fast and easy to implement for merchants	Competitive incursion from OS/OEM providers whose wallets can be used for online purchases
Lowers cart abandonment rate	May not have access to customer data		
	Multiple providers on the same site can confuse customers and increase cart abandonment		

Source: Aite Group

THE WAY FORWARD FOR DIGITAL WALLET PROVIDERS

FINANCIAL INSTITUTIONS

Mobile and digital wallets provide financial institutions with opportunities to deepen customer relationships, improve customer retention, position their payment cards as top of wallet, and protect their customers and the institution from fraud. Given the evolution of the space, it is no longer a question of whether a financial institution has a wallet strategy but is instead a matter of what the strategy incorporates and how that strategy is implemented. For mobile wallets in the physical world, the alternatives are to offer one or more of the existing OS/OEM wallets, Apple Pay, Android Pay, Samsung Pay, etc., offering a proprietary financial-institution-branded wallet, or providing customers with both alternatives.

Depending on the institution's position, any of these alternatives could be appropriate. For major financial institutions with very well-known brands, a branded wallet creates value for their loyal customers and provides additional marketing opportunities, positioning the institution as a leader in the technological evolution of the space. For smaller or regional financial institutions, a proprietary wallet strategy should center on customer retention and value proposition enhancement. The integration of the wallet into a financial institution's mobile banking app can enhance the UX by simplifying onboarding (the wallet can be automatically provisioned by the financial institution) and by increasing messaging opportunities with the customer. With any proprietary financial institution wallet, it is essential that the UX at the point of sale is as frictionless as possible. Additional security requirements or other processes that add friction to the transaction could result in customer rejection of the wallet and migration to an alternative with less friction, possibly at another institution.

Whether they decide to deliver a proprietary wallet or not, financial institutions should offer customers the ability to use the third-party OS wallets (Apple Pay and Android Pay) and possibly the OEM wallets (Samsung Pay, LG Pay, etc.). These wallets are already moving toward critical mass and will be the preferred choice for a large segment of the customer base. If the institution's payment cards are well-positioned and are the customer's first payment choice, there is little risk that offering a payment card in a third-party wallet could result in disintermediation.

For pure digital wallets, the space is almost entirely controlled by either the online merchants or the third-party wallet providers such as PayPal or Amazon Payments. Financial institutions should work to ensure that their payment card is top of wallet and the preferred card for online use. Several new technologies are being introduced to help ensure the security of online transactions, and offering a more secure online transaction could position an institution well for the online payment space.

CARD NETWORKS

The global card networks are rolling out several digital wallet initiatives. The first pillar of their strategy is to enable card issuers to offer digital wallet services to their customers (in a business-to-business-to consumer model). Examples follow:

- **White labeling:** Offer (smaller) banks that do not want to invest in their own wallet a turnkey solution. Visa, for instance, recently announced its Visa Digital Commerce App as a white-labeled solution. According to the company's website, "issuers provide their branding and select the specific features to deploy, including tokenized contactless payments, fingerprint authentication, card controls, alerts, account balance, transaction history and more."[4]
- **Acceptance:** Connect issuer-branded wallets (via application program interface, or API) to the acceptance network provided by the card networks. MasterCard's API Wallet strategy enables a bank-branded wallet to connect to the Masterpass acceptance network and get access to checkout, fraud detection, authentication, and other services.
- **Digital enablement:** Provide tokenization services to bank and third-party digital wallets. The card's primary account number is replaced with an alternate card number called a token, and the token is then delivered to the mobile device through a process called digitization.

The second pillar is the delivery of digital wallet services to consumers, to enable online commerce. Examples are Visa Checkout, Masterpass, and Amex Express Checkout.

Visa Europe's V.me wallet was retired from the market in 2015, to be replaced by Visa Checkout (live in 16 countries and expanding to six more markets this year). Masterpass launched in 2013 and is now available in 33 markets globally. Both wallets are brand-agnostic and can contain cards from multiple brands.[5]

MOBILE NETWORK OPERATORS

MNOs have been very successful at providing mobile money solutions in developing markets without a banking infrastructure for the common people (e.g., M-Pesa). In mature markets, MNOs have focused on (NFC-based) mobile proximity payments, but there are only a few successful examples (Japan, South Korea, and Singapore).

Although major MNOs possess a well-known brand, customer loyalty in their highly competitive markets is low. Adding mobile proximity payments to the proposition will not change this competitive dynamic in any significant way. The use case for proximity payments is just not good

4. "Visa debuts new mobile app for U.S. issuers," Visa, accessed July 27, 216, https://usa.visa.com/visa-everywhere/innovation/visa-digital-commerce-app.html.
5. Note: merchants that accept Masterpass or Visa Checkout must accept MasterCard or Visa cards, respectively.

enough to convince customers to sign up, especially as that requires a new NFC-enabled chip to be issued to the customer. Having to face the strong competition from the "Pays," their future success is questionable.

NEW ENTRANTS

The global rollout of contactless payments by the card networks is good news for Apple Pay, Android Pay, and others. It can be expected that mobile proximity payment usage will accelerate quickly.

However, the fastest growth for the "Pays" may come through a different channel: in-app payments. Apple, for instance, reported that payment volume within apps more than doubled in the second half of 2015 as compared to the first half of the year. Google announced at its I/O developer conference in May 2016 that several major app players, such as Airbnb, Ticketmaster, and Uber, have added Android Pay to the in-app checkout, and they have recently begun aggressive U.S. marketing of the in-app capability.

The two channels, in-store and in-app, will reinforce each other in the use of mobile payments. In-store payments provide the visibility of the payment method, making people familiar with the brand and the payment experience. When shopping online, consumers will recognize the brand and be more inclined to use one of the Pays than a competing payment method.

The Pays' wallets will enable merchants to integrate payments over online and offline mobile channels. Consumers will be able to store all their receipts in one place, and receive and redeem rewards, discounts, and other loyalty benefits.

The last step will be for the Pays to move to the browser environment. Apple will enable Apple Pay for Safari in the fall of 2016, but that is a small segment of the overall desktop and mobile browser market. Inclusion of all browsers will support merchants implementing an omnichannel strategy.

MERCHANT STRATEGIES

Starbucks was an early adopter of digital wallets and mobile proximity payments, and it proved that the proposition worked for its customers. With its strong brand and loyal customer base, the coffee seller was successful in launching the star example of a mobile payments implementation.

The question is if Starbucks would make the same decision today. There is a high probability that the company would have chosen to add third-party wallets to its own app, enabling payments but not developing its own payment application. Indeed, Starbucks in the U.K. accepts Apple Pay and Android Pay.

Starbucks is a rare example of merchant success. Many retailer initiatives have failed to deliver, as shown by the recent failure of MCX in the U.S. (CurrentC wallet).

There may be merchants that are able to launch their own digital wallet solutions and include payment. Still, we believe that the vast majority of merchants will choose to implement third-party wallets for payments.

KEY TAKEAWAYS

- The digital wallet is the engine of mobile commerce. Without a digital wallet, consumers need to enter a wealth of information into a form constrained by the size of the smartphone screen.
- Physical-world mobile wallets are nascent but will grow steadily, particularly in developing markets.
- Use of mobile wallets like Apple Pay will be accelerated as they are used to enable in-app and online payments
- Mobile wallets will follow two separate evolutionary paths—general-purpose wallets using NFC for connectivity, and proprietary, retailer-based wallets using a variety of technologies, including optical/QR code and BLE beacons.
- Financial institutions need to have a mobile wallet capability to stay competitive. Whether they opt for a proprietary, branded wallet depends upon their overall branding strategy and their customer value proposition.
- In any case, financial institutions should offer their customers the ability to use one or more of the OS/OEM wallets available on the market.
- For digital wallets, financial institutions should work to deliver a payment product that increases their customers' sense of safety and security when shopping online.

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