



Mobile proximity payment

5 things retailers should know





After years of false starts, several mobile proximity payment solutions are available for customers in retail. Which to choose?

Smartphones have become a key element of a consumer journey, and for about a decade, we have been wondering whether they will soon replace money and cards in stores. Over the last few years, the mobile payments market has been developing fast, and today it is fragmented and various in its offer. On the consumer side, adoption has been low across solutions. There is much uncertainty over the offers that will prevail in the future. In this intricate landscape, it is difficult for retailers to understand what the options are and what is in it for them.

Retailers need to make a decision on the mobile payment solution to adopt and support, based on the relative ease of adoption and use for customers and on the ease of implementation for the retailer. To add value for customers and increase adoption, retailers need to consider other mobile services alongside offering mobile payments, and their impact on customer experience.

We have developed this 5-point guide for retailers who wish to embrace the emerging technologies in regards to payment services and want to understand the current situation and the implications of expected future developments.

5 things retailers should know about mobile proximity payment

01

Mobile proximity payment is an intricate and growing market

02

Technology and ecosystem configuration define the offer

03

European offer is going through change and is waiting for tech giants to shake competition

04

Retailers need to consider their and customers' perspective in order to make a choice

05

Customer experience and added value to consumers is key for success



01 Mobile proximity payment is an intricate and growing market

In store, payments via smartphone are referred to as “Mobile Proximity Payment” (MPP). Today Near Field Communication (NFC) is the predominant proximity technology. It consists of a small antenna within a smartphone that allows bi-directional communication with NFC readers (contactless POS) to perform contactless payment transactions. Its adoption is favoured by the growing NFC-enabled smartphone base and by the already established underlying POS infrastructure, the same that supports contactless credit/debit cards.

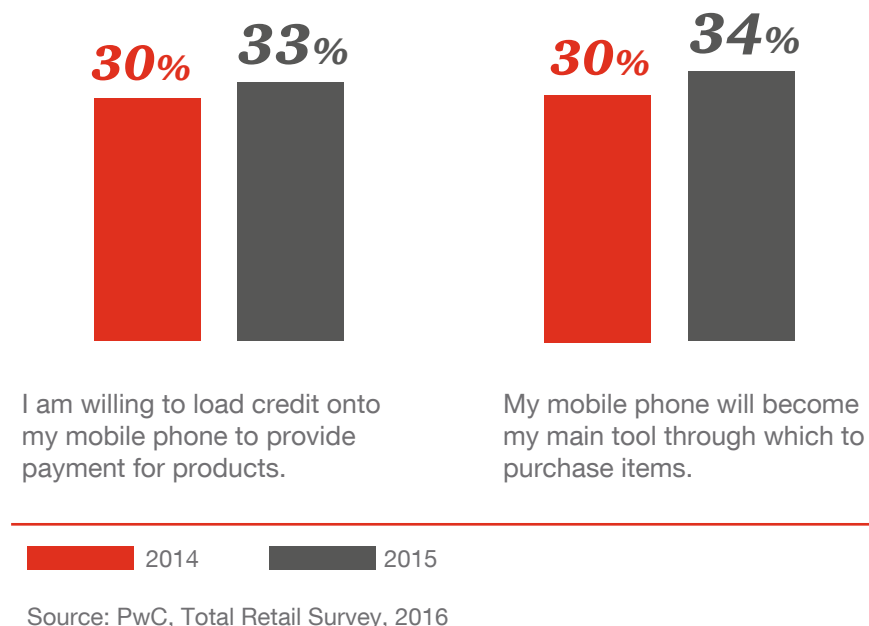
Alongside NFC, Person-to-person (P2P) technology allows consumers to transfer funds from their bank accounts to other accounts on the same platform through the Internet. Although P2P qualifies as remote payment, some providers have extended their offer to in-store payments, called Person-to-Business (P2B). Quick Response code (QR-code) is a technology initially developed as a mobile advertising tool that has recently been extended to both remote and proximity mobile payment. It is based on a two-dimensional barcode in which information is encoded to perform contactless transactions through a code-reader on the smartphone.

MPP technologies

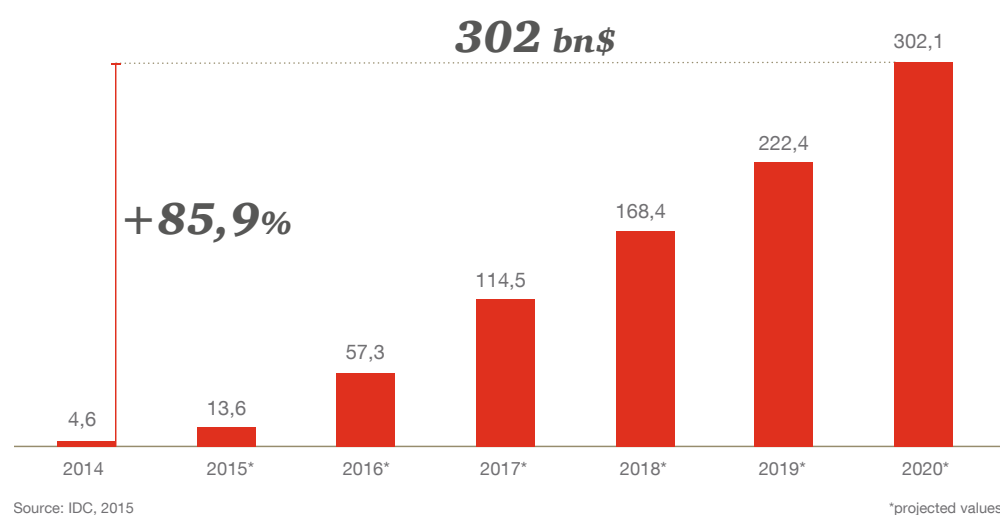
	How it works	Pros	Cons
NFC	Merchants enter the amount to be paid. Customers approach their smartphone to the reader (max 7-10cm). Depending on the case, consumers may need to enter a PIN, use their fingerprint or other authentication to validate the transaction.	Quick and easy user experience . It leverages existing infrastructure .	The existing infrastructure is still developing (NFC POS Smartphones).
P2P	Customers establish a secure account with a trusted third-party vendor, designating their bank account or credit card information to transfer and accept funds . Using the third-party App, customers can send money to the merchant’s account. Users are generally identified by their email address or mobile number.	Wider potential reach .	Greater effort and longer purchase time than a swipe.
QR code	Case A: merchants enter the payment amount. Customers open the App and display a QR Code generated for the transaction . Merchants scan the QR Code, and the amount is deducted from the customer’s wallet. Case B: customers open the App and scan the QR Code displayed by merchants. This enables the App to identify the merchant. Customers then add the amount and complete the payment.	Wider potential reach .	Greater effort and longer purchase time than a swipe.

Mobile proximity payment, especially NFC, has been growing worldwide, though it still accounts for a tiny part of both in-store and mobile payments. In 2014, the transaction volume in the global MPP market was valued at \$4.6 billion and it is expected to exceed \$300 billion by 2020, with a 5-year CAGR of 85.9%. This growth rate will be driven not only by NFC, which is being used by both the major OS manufacturers - Apple and Google - but also by the spread of contactless infrastructure worldwide. On the other hand, QR-code is expected to remain a niche method and will account for only \$9,3 billion of the transactions by 2020 with a 17,9% 5-year CAGR. The future of P2B is uncertain, but it may become an interesting alternative.

MPP worldwide 2014-2020 (bn \$)



MPP worldwide 2014-2020 (bn \$)



The transaction volume in the global MPP market is expected to exceed \$300 billion by 2020





Given the infrastructure readiness, it's all in the hands of consumers. In 2014, 11% of consumers in France, Germany, Spain and the UK tried MPP at least once¹, though the proportion of regular users was significantly lower. In 2014, 28% of consumers in the EU7 were interested in paying with card through a mobile phone². The PwC's Total Retail 2016 report also shows that 33% of customers are willing to load credit onto their mobile phone to provide payment for products, and that 34% think that smartphones will become their main purchasing tool. Among the different things smartphones are used for in retail (compare and research products, access coupons and promotional codes, access confirmation email to pick up product purchased online, etc.), 20% of customers declared having used it for payments.

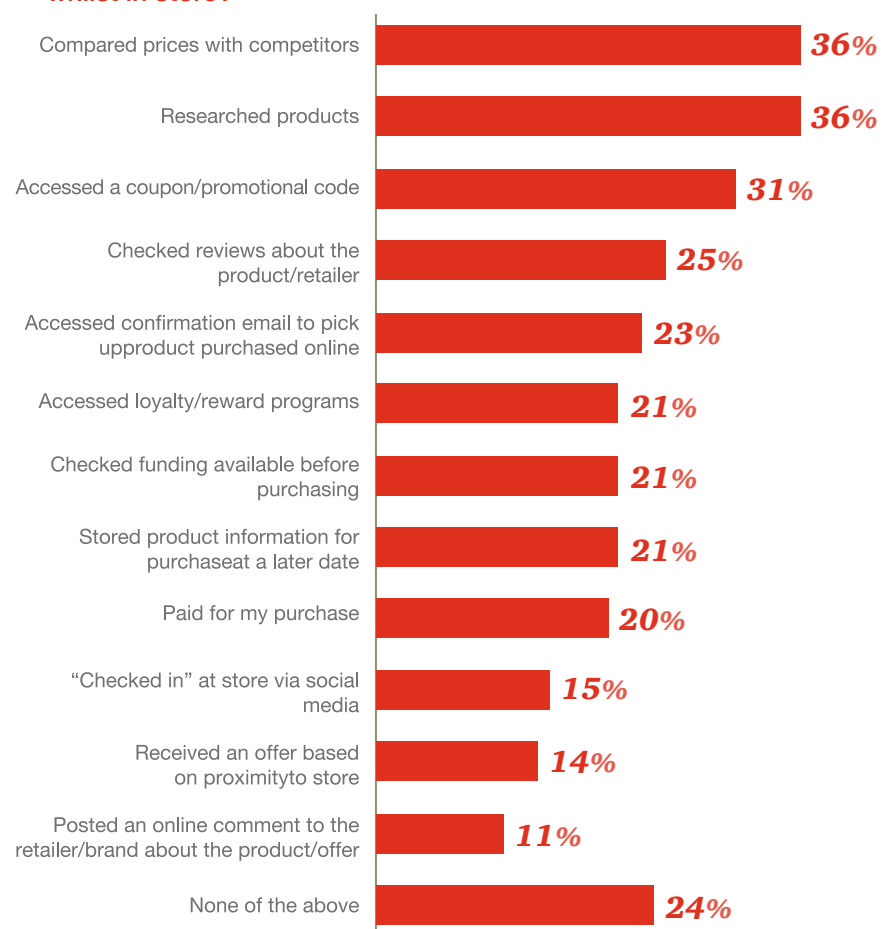
The results of the research suggest that loyalty programs, targeted promotions, and an up-to-date mobile websites are not enough to meet customer expectations around mobile service offerings. To enrich customer journeys, retailers need to offer mobile payment solutions, along with a number of other mobile-based services.

¹ Source: Forrester, 2015

² Source: IDC, 2015

The mobile phone is increasingly being used for purchasing

Q: Which of the following have you done using your mobile/smartphone whilst in store?



Base: 22,618
Source: PwC, Total Retail Survey, 2016



02 Technology and ecosystem configuration define the offer

Even though the MPP market is very complex, it is an opportunity for many players. In order to understand the MPP implications for retailers and their customers, it is useful to consider how technology and value chain influence the features of different payment options. Ultimately, this affects the user experience, the potential customers reach, and the implementation barriers that retailers face.

When using MPP, customers provide their payment credentials, allowing them to be stored and retrieved each time they need to pay, and the security of this information is critical for users. In NFC, payment credentials can be stored in a Secure Element, which is located either in a SIM card or in a chip embedded in the device (eSE; for example Apple Pay). Alternatively, Android has implemented HCE technology (Host Card Emulation) whereby credentials are securely managed by a software, often with the aid of tokenisation, which is the process that substitutes the card payment credentials - a 16-digit PAN (Permanent Account Number) and CVV (Card Verification Value) - with a surrogate value called 'token'. This way, the actual credentials are not communicated to the POS. In P2B and QR-code solutions, payment credentials are stored in the remote data center of the service provider and retrieved for payment when users log into their accounts.

Technology frameworks for MPP

Device-based



SIM card-based SE

Secure Element within the SIM card.



Embedded SE

Secure Element embedded in the mobile handset hardware by the manufacturer.

Software host-based



HCE

HCE implements security measures in the so-called "software host" in the operating system of the mobile phone or device, without need of additional hardware. It can be made safer by tokenization.

Cloud-based



Cloud

Credentials of consumers' payment cards are stored in the service provider's secure database in a remote data center. When consumers want to pay for something, they log into their account and the transaction is authorized.

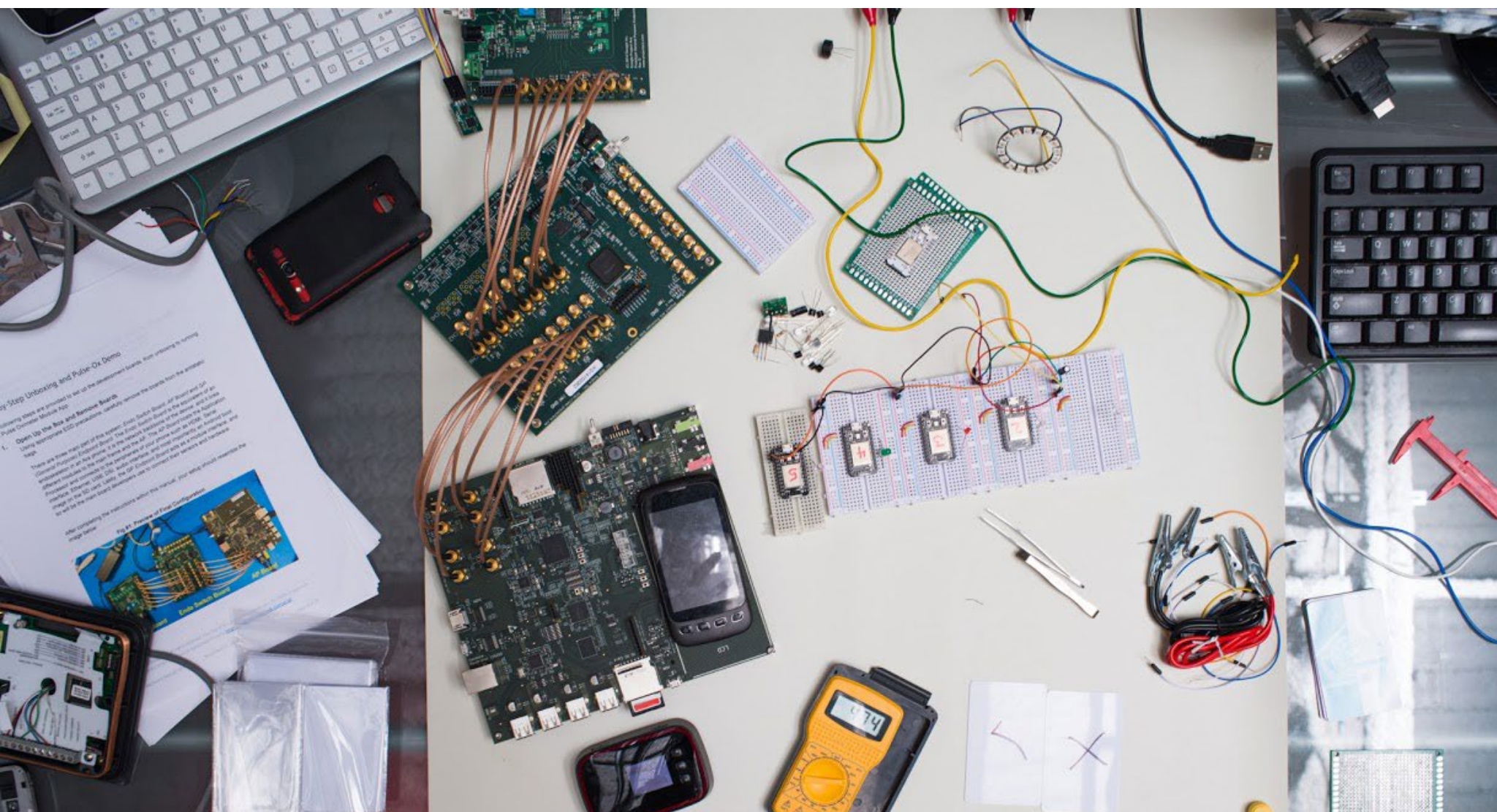
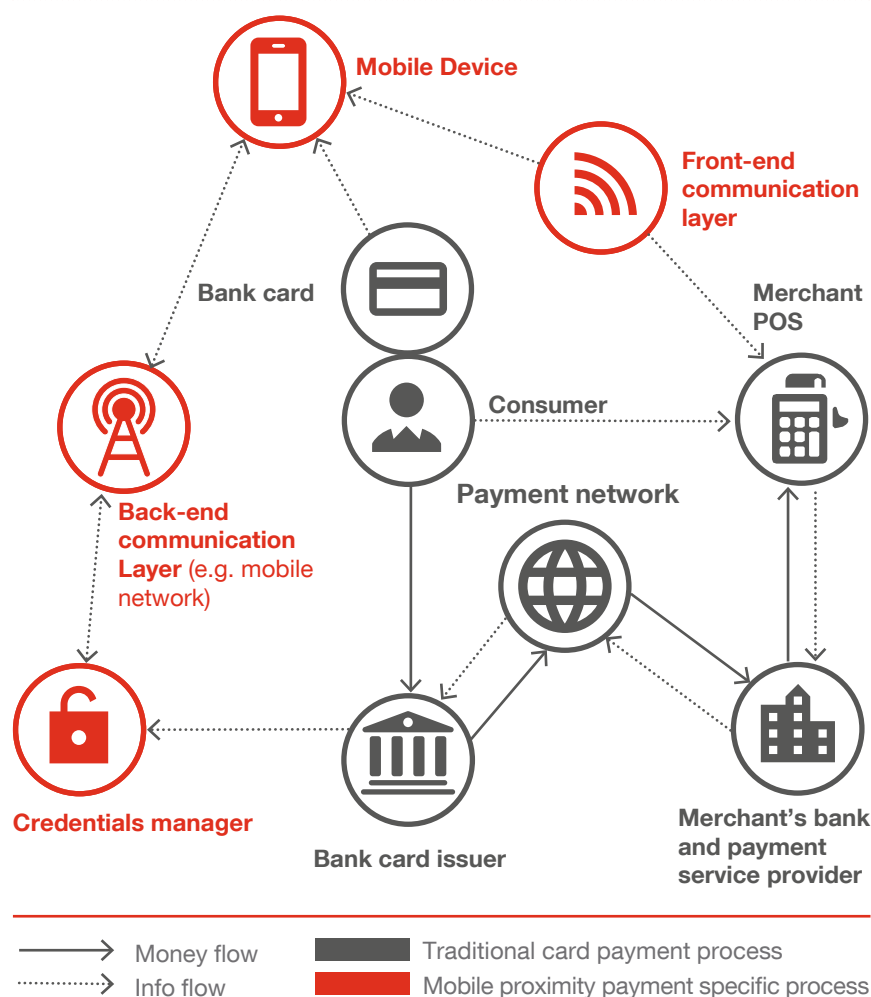
Technology and value chain influence the features of different payment options, which affect the user experience, the potential customers reach, and the implementation barriers.

In addition to the perceived security, the technological framework also has an impact on the value chain of each offer. Credentials can be managed by different players, but often it is necessary to stipulate agreements or partnerships with financial institutions, for example the issuers that authorise the storage and use of card credentials via the MPP application. From a provider point of view, there are four different business models.

Where the Secure Element is stored on the SIM card, Telcos have a central role: they can oversee the whole payment process (Telco-Centric configuration), or they can rent the SE space to a financial institution (Telco-Bank-Collaborative configuration). With eSE and HCE solutions the involvement of Telcos is not needed, and the two possible configurations are Bank-Centric, whereby the service is run entirely by the bank, or Collaborative-Independent-Provider, in which a technology supplier partners with a financial institution to offer a collaborative payment option.

Note that while NFC and QR-code solutions leverage the existing card payment circuits, P2P often relies on independent ecosystems, of which both sender and receiver need to be part in order to transfer funds to one another.

Technology frameworks for MPP





03 European offer is going through change and is waiting for tech giants to shake competition

The European MPP landscape is undergoing a period of rapid change, and there is much uncertainty over the technologies and the solutions that will prevail. Among all the possible technology frameworks for MPP, NFC currently seems to be the favourite - at least on the supply side - because it leverages the existing contactless infrastructure and the increasingly popular NFC-enabled smartphones. SIM-based NFC has long been the choice of Telcos and banks. The model, however, has had little success in terms of user adoption, and the complexity of relationships with Telcos has led banks to lose interest in this framework. The recent introduction of HCE or Cloud technologies has encouraged banks to develop Bank-centric solutions as complementary services to mobile banking. These should enhance user experience, expand the potential reach and be easier to adopt, as they do not require NFC-enabled SIM cards.

In response, Telcos have started developing services independently, such as Orange Cash. At the same time, some retailers have developed their own white label solutions, for instance Auchan's QR-code-based Flash'n Pay. Another example of a non-NFC payment app is Paym (UK), that allows to make P2P and P2B money transfers.

One major trend in 2015 was the diffusion of cross-border solutions and some European players followed an internationalisation strategy. In 2015, Vodafone declared the willingness to standardize Vodafone Wallet across countries. The Spanish bank BBVA did the same for its BBVA Wallet in Spain, USA, Mexico, Chile and Turkey. boon., developed by Wirecard in partnership with MasterCard, is another international example of a NFC service available in Germany, the Netherlands, Austria, Belgium, Spain and Ireland since the end of 2015.

Some of the MPP offers in EU

Orange Cash

SIM-based NFC, Telco-centric - France

Launched in France in October 2015, Orange Cash is a prepaid mobile payment solution developed by the mobile operator Orange in partnership with Visa. Together with payment, it offers incentives, cash-back and information on transaction.

Flash'n Pay

QR Code, Independent Collaborative Providers - France

Flash'n Pay is Auchan's mobile payment service. Based on QR code technology, it also provides digital coupons and customized shopping tips based on customer's habits.

PAYM - P2B

Collaborative Independent Providers - UK

P2P and P2B service launched in April 2014 by Payment UK, allows customer to transfer money by entering the recipient's phone number.

Vodafone Mobile Wallet

SIM-based NFC, Collaborative Independent Provider - International

Vodafone Wallet allows Vodafone customers to pay contactless with their Visa or MasterCard. It also allows to pay for public transport, redeem digital coupons and virtualise loyalty cards.

BBVA Wallet

HCE NFC, Bank-centric - Spain

BBVA was the first bank in Europe to offer a mobile payment service based on HCE technology. BBVA Wallet also allows to redeems rewards, keep track of debit and credit card payments and get instant transaction alerts.

boon.

HCE NFC, Independent Collaborative Providers - Germany

boon. is a NFC payment service developed by Wirecard in partnership with MasterCard. It is based on a virtual prepaid MasterCard that can be topped up with a bank transfer or via credit card. Each payment requires a PIN.

Another factor contributing to the internationalisation of competition is the introduction of offerings by some big international players. Apple launched Apple Pay in USA in 2014 and extended it to Australia, Canada and the UK in 2015; Samsung Pay was launched in South Korea and USA in 2015; Android Pay will soon extend its services outside USA; and other players like LG and Microsoft are expected to enter the European market soon.

Currently, MPP services available in Europe share a lack of adoption among users. None seems to have gained significant commercial success, and the main challenges for providers are clearly on the user experience, communication effectiveness and offering concrete benefits. The entry of big companies such as Apple and Google in the European market creates additional uncertainty over the future of the MPP landscape. When tech giants will enter the European market, they will be a pull for adoption because of their international reach, their large customer base, and the driving power of their brands. In addition, most of their wallet apps offer many additional services, such as loyalty, couponing and ticketing, which are attractive for consumers as they provide added value.

The entry of Apple, Samsung and Google in the European market could have two opposite consequences for merchants. On the one hand, the market shift to the adoption of their wallets is a possibility - especially if most banks allow their cards to be compatible with those wallets. This could lead to market consolidation, making it easier for retailers to manage relationships and partnerships with fewer players. There would be opportunities for integrating communication and services, and thus increasing adoption leveraging on the image of tech giants. However, the power of the tech giants could result in lower bargaining power of retailers in potential partnerships. On the other hand, the entry of these players in the market could result in further fragmentation, with only some users shifting to the new app. Although this would give more power to retailers in potential partnerships, they would also have to deal with a wider range of options.

Tech giants offer proximity payment

Apple Pay

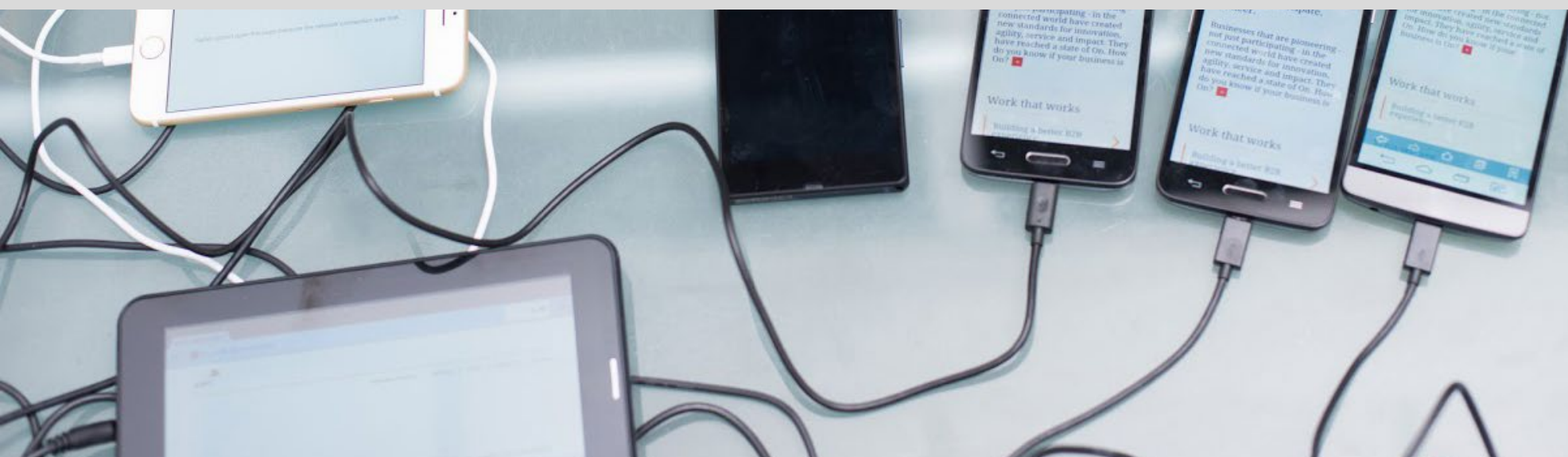
Apple Pay is integrated into a Wallet app that includes both proximity and remote payment options, as well as other additional services. It is currently the only NFC payment service suitable for Apple devices (from iPhone 6 and 6Plus). Apple charges a fee to banks for each transactions.

Samsung Pay

Samsung Pay integrates NFC with MST (Magnetic Secure Transmission, emulating the magnetic stripe of non-contactless cards). Samsung does not charge banks any fee.

Android Pay

Android Pay, like Apple Pay, integrates both proximity and remote payment options, as well as some additional services. Google does not charge any fee.





04 Retailers need to consider their and customers' perspective in order to make a choice

What are the opportunities for retailers in this intricate situation? In order to shed light on the numerous options available, retailers need to take into account the technology framework and the ecosystem, as well as customers' perspective, and offer a service that proves to be appealing and easy to use.

At the same time, they cannot underestimate the effort implementation requires in terms of time and resources. These two dimensions are represented by ease adoption and use (customer perspective) and ease of implementation (retailer perspective).

Impact of technologies on ease adoption and use and ease of implementation

		CUSTOMER				MERCHANT			
		Available Ecosystems	Network Reach	Device Reach	Infrastructure Readiness	Purchase Speed	Impact on Infrastructure	Impact on Operations	Compatibility of Data
NFC-BASED	SIM-BASED	T-B Collaborative (Telco Centric)	Limited Limitations on both telco and bank choice	Limited Only some NFC smartphones are compatible					
	eSE	Collaborative	Good Limitations on bank choice	Good Apple and Samsung new generation devices are enabled for payment service	Generally High Progressive spread of the enabling infrastructure	High Similar to contactless card payments	Unaffected Infrastructure needed consists mainly in contactless POS*	Unaffected Cashier activities are similar to contactless card transactions	High Transaction report is similar to any card payment
	HCE	Bank Centric T-B Collaborative Collaborative	Good Limitations on bank choice	Limited Currently, only Android-NFC smartphones are compatible					
CLOUD-BASED	QR	Collaborative	Boundless No limitations on telco or bank choice		Variable According to the infrastructure required by the specific solution	Generally Low Additional steps compared to contactless card payments	Variable According to the infrastructure required by the specific solution	Generally Significant According to the payment process of the solution	Variable According to the specific solution implemented
	P2P	Collaborative		Boundless All devices are compatible					

* NFC mobile payments employ the same infrastructure developed for contactless card payments. Thus, costs related to the infrastructure are not considered incremental



Ease of adoption and use can be measured by a set of variables evaluating two different aspects: first, how easy it is to gain knowledge, device and permission necessary to start paying with a MPP app; second, how convenient, intuitive and effortless it is to use MPP on a daily basis.

This dimension is thus influenced by various factors, such as network reach and device reach, which assesses how easy it is to subscribe to a MPP service. Barriers to adoption increase when the technology is supported only by a limited number of banks or Telcos or by a combination of them.

The same effect is expected when retail infrastructures that support a specific technology are not widespread (or well promoted). Variables such as the number of steps needed to complete a payment affect the ease of daily use, which in turn influences the customer experience.

Ease of implementation can be measured by a set of variables that take into account the most significant barriers and incentives retailers face when opting for a specific solution, evaluating its impact on infrastructure and organisation capabilities. This dimension can be assessed through various factors. For instance, impact on infrastructure is affected by the size of the initial investment, and by other related costs (e.g. maintenance costs, dismissal costs, etc.). Services also have an impact on cashier and back-office operations: examples are longer checkout times, when you need to complete more steps to buy or in case of occasional transactions, and back-end processes redesign due to transaction output incompatibility with current systems.

It is essential for retailers to have a deep understanding of the specific options available in the market. The framework developed uses a set of variables to evaluate services. It can be applied across countries, and easily updated when new offers arise. In brief, the approach consists in a preliminary research on the MPP solutions available in the country. Each is then rated on all variables. Each variable is weighted according to its relative importance to the retailer's tactical and strategic goals, and then aggregated into the two dimensions. Finally, two synthetic values are obtained, one for the customer's ease of adoption and use, and one for the retailer's ease of implementation. The output of the analysis is the MPSA Matrix (Mobile Payment Service Accessibility Matrix), whereby the axes represent the two synthetic values. The MPSA Matrix visually helps identifying which options are preferred (see the Deep Dive section on the Italian market for an example). Note that the evaluation depends on the industry, the retailer and its characteristics, especially with regards to digital readiness.

Advantages and disadvantages of each solution depend on the retail context. NFC is based on widely accepted standards and the enabling infrastructure is already well established. These features make it suitable for the mass-market. On the other hand, non-NFC services do not have a solid and widespread acceptance base amongst retailers, and rely on ad-hoc infrastructures. These are suitable for limited contexts. An example is Auchan's Flash'n Pay QR-code solution. The main advantages for the retailer are a direct communication channel with the customer and the availability of consumer data gathered throughout the payment process.

Never forget data

If a third party provides MPP service, there may be some effort, in terms of negotiation, to obtain transaction and customer data. If obtaining information is unfeasible, retailer may consider a **white label** solution, whereby data would be directly available.

The access to a great variety and quantity of information can provide an enhanced view on the customer purchase process and increase the amount and the effectiveness of touch points, but it also requires efforts in managing data and in dealing with privacy and security.

Therefore, when choosing services, retailers should take into consideration the benefits arising from being able to read and interpret information on transactions but also the effort that data management requires.

MPSA Matrix for an Italian fashion retailer

From 2011 to date, a multitude of MPP services has been introduced in Italy. Just like other European countries, there are not significant data on MPP transactions yet, but diffusion is expected within the next three years. Today, the majority of solutions available in Italy are based on SIM-based NFC technology: YouPass by BNL, Move&Pay by Intesa Sanpaolo, Mediolanum Wallet, UBI Pay, Poste Mobile, TIM Wallet, and Vodafone Wallet. Since the introduction of HCE, financial institutions have started working on bank-centric offers.

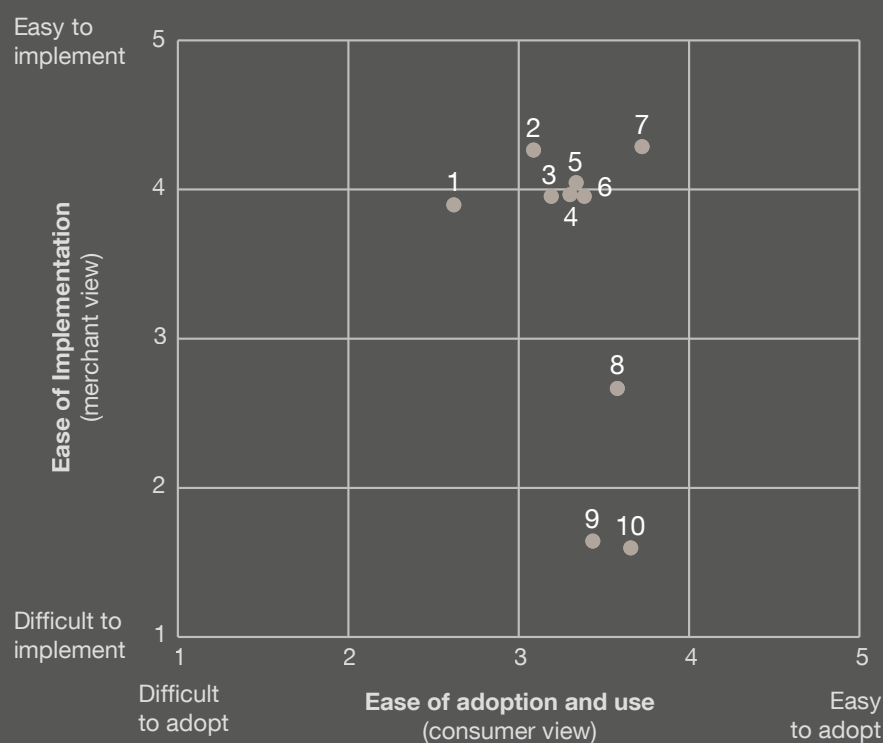
PAYGO by Intesa Sanpaolo and Unicredit Mobile Plus-Tap&Go* by Unicredit were recently launched, while other HCE and Cloud-based offers are expected in 2016. Non-NFC solutions for payment in retail are still limited to local experiments. Startups like Satispay, 2Pay and Powatag are offering P2B or QR services.

The Italian offer has been analysed for a fast-fashion retailer - already equipped with NFC-enabled POS - and results are represented using the MPSA Matrix.

On the merchant side, ease of implementation is still strongly influenced more by the technology than by the specific features of a service, mostly because of the great disparity between technologies in terms of infrastructure development effort. This, together with the infrastructure readiness for NFC technology, explains the predominant role that NFC has, and the little differentiation among scores.

On the consumer side, differentiation is less correlated to the enabling technology. Instead, a great role is played by the variables that have impact on user experience and ease of adoption.

MPSA Matrix - Italy



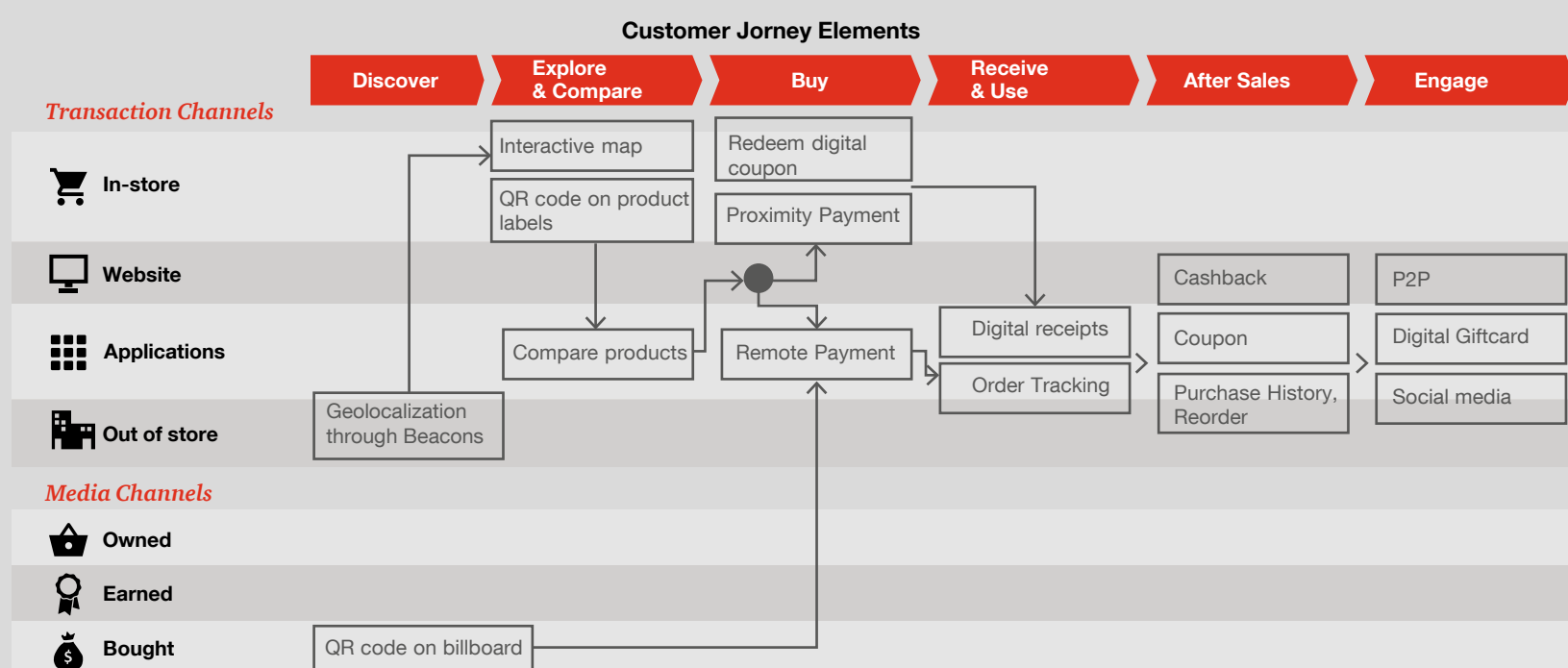
- | | | |
|----------------|----------------|--------------|
| 1. UBIPay | 5. Mediolanum | 8. POWATAG |
| 2. YouPass BNL | 6. Postemobile | 9. 2pay |
| 3. Vodafone | 7. PayGo | 10. Satispay |
| 4. TIMWallet | | |

05 Customer experience and added value to consumers is key for success

Regardless of the option chosen by retailers, the main issue in the MPP landscape is customer engagement. Customers can be reluctant to change their habits especially when it comes to payment, and demand appealing solutions that are easy to adopt and provide tangible benefits. They need something that goes beyond simple payment and integrates services that add value to their shopping experiences.

In this regard, wallets allows customers to access a wide range of services using the same mobile app and to safely store loyalty and payment information from a single account. In the future, mobile wallets will play an important part in customer experience by contributing to bringing together experiences in both the physical and digital channels. Before implementing a mobile service such as wallets, retailers need to consider the impact it will have on customer experience, and they can do so through customer journey mapping.

An example of customer journey



We take as example the customer journey of Sarah, customer of a high-end fashion retailer, and see through customer journey mapping how a mobile wallet that includes proximity payment affects the phases of her journey.

While waiting for the metro to work, Sarah sees a billboard advertising her favourite brand and, scanning the QR code on the board via her wallet app, she can access to information on the new collection. In her lunch break, while strolling in the high street, geolocation by the store sends her a targeted offer based on her previous searches and activities, and a recommendation engine suggests her the products she will love. Once in store, an interactive map and a mobile catalogue navigate her to the products she is looking for.

QR codes on the labels tell her which colours and sizes are available, and if her size is not in stock at the moment, she can quickly order it. At the till, she pays by MPP, redeems the digital coupon she received and gets a digital receipt on her wallet. The wallet also keeps track of her purchases, so that she can re-order some items and receive coupons based on her preferences. Back at the office, happy of her purchase, she shares a pic of her new shirt. She also decides to send a digital gift card to a friend for her birthday, and her friends contribute to the gift by sending her money via P2P service in the wallet. At home, she receives notifications with updates about new collections, latest fashion events and style advice gathered for her from social media.



06 Takeaways to make a choice

Considering the uncertainty retailers face when it comes to mobile proximity payment, we have developed a list of considerations as a support to deciding between the various technologies and solutions available.

01

Mobile proximity payment is an intricate and growing market

MPP is a complex phenomenon that is growing worldwide. NFC is the predominant technology: it was chosen by many players, and the underlying infrastructure is developing. Customers are willing to embrace it as long as their customer journey is enriched. There are opportunities for all players, but at the moment it's unclear how to seize them.

02

Technology and ecosystem configuration define the offer

A critical first step to understand MPP implications is to consider both technology and ecosystem. Based on the technological framework - mainly depending on the location of payment credentials - and the value chain, multiple business models are possible from a service provider perspective: Telco-Centric, Telco-Bank collaborative, Bank-Centric and Collaborative-Independent-Provider. These configurations define the features of MPP services.

03

European offer is going through change and is waiting for tech giants to shake competition

The European market is still fragmented. On the NFC side, Telco-Bank collaborations are leaving room to Bank-Centric and Telco-Centric solutions, along with a number of P2B and QR offers. 2015 also saw the internationalisation of some services. Further uncertainty comes from the effects that the entry of tech giants will have on the European MPP market, likely to be a pull for adoption, which may lead to either consolidation or further fragmentation.

04

Retailers need to consider their and customers' perspective in order to make a choice

A systematic approach to evaluation is then required to compare all available offers. To this aim, we have developed an evaluation framework - the MPSA Matrix - based on both customer and retailers perspectives, which allows to map the offer. In some markets/contexts, a white label solution may also be advantageous, as it could provide a direct communication channel and ownership of consumer data.

05

Customer experience and added value to consumers are key for success

Retailers need to keep in mind that payment is only one moment of a much bigger picture: the customer journey. Therefore, MPP analysis needs to be put into context and integrated into a customer journey mapping that considers customers throughout all phases, from discovering a product all the way to the engagement, and on again. Mobile wallets are expected to play a big part in the future as they bring together value-adding services that take the customer experience to the next level.



digital.pwc.com

Contacts:

Massimo Pellegrino

Partner | Digital Strategy

Tel: +39 345 2448062

massimo.pellegrino@it.pwc.com

Lino Zompetti

Manager | Digital Strategy

Tel: +39 340 0974764

lino.zompetti@it.pwc.com

Contributors:

L. Barbero, P. Caprara, M. Infantino, S. Mancini

© 2016 PwC. All rights reserved. "PricewaterhouseCoopers" and "PwC" refer to the network of member firms of PricewaterhouseCoopers International Limited (PwCIL). Each member firm is a separate legal entity and does not act as agent of PwCIL or any other member firm. PwCIL does not provide any services to clients.

PwCIL is not responsible or liable for the acts or omissions of any of its member firms nor can it control the exercise of their professional judgment or bind them in any way. No member firm is responsible or liable for the acts or omissions of any other member firm nor can it control the exercise of another member firm's professional judgment or bind another member firm or PwCIL in any way.