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WHITE PAPER

MOBILE PAYMENT AT THE POINT OF SALES

Will Apple, Google, Paypal, Square & Co jeopardize NFC take-off ?

July 2012

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Introduction

EMERGING TRENDS

Mobile Payment has been under the spotlights for quite some time now, and a lot of new solutions and new entrants have been recently heavily publicized. It seems that those solutions can now be massively adopted, due to several trends:

- The massive adoption of connected devices, namely smartphones, and the quick uptake of tablets. Usages evolve quickly; being connected 'always and everywhere' is today a reality. The multiplication of screens, from TVs to computers and laptops, tablets to smartphones, allows for a transmedia experience for contents but also for services.
- Social networks extend to mobiles; SOLOMO - social, local, mobile - is the direction new mobile services are evolving to. The daily experience becomes more and more a hybrid between the virtual and real world, especially for young people.
- NFC seems to be ready for take-off: contactless POS readers are deployed by Visa and Mastercard, NFC starts to be embedded in phones, banks and operators progress on their business models - for ages -.

We however expect a strong acceleration this year, as players from the internet field enter the game, and will probably change the rules. On another hand, banks and operators have pushed their offers on the market, without proposing a clear value proposition for merchants and customers, who now have the chance to use mobile devices to rethink entirely the customer experience.

We believe that the success of mobile payment solutions is intimately correlated to the shift from the bank / operator couple to the merchant / customer duet.

M-PAYMENT?

If we define mobile payment as a payment transaction performed using a mobile phone, we can think of different use cases:

- Purchase of logos and ringtones, since the early 2000ies, typically paid by carrier billing[1]. Those have probably been replaced by 'in-app payments'[2], i.e. payment for virtual goods inside a smartphone application - and invoiced like an app. This method is most popular in - but not reduced to - gaming applications. Based on the freemium model, users can download the apps for free, but in order to profit from more features - like higher levels, new players, new forces or new cloths in games -, you have to pay for them small sums. Apple constrains its users to pay for apps and in-app applications via i-tunes. So did Google change its policy and now obliges developers to use 'Google Checkout', now merged with 'Google Wallet' for the payment of its Android applications and in-app services.
- M-Commerce[3] perceived as an extension of e-commerce: mobile web purchases using credit card, Paypal… credentials, to pay either for dematerialized products - transport tickets…- or physical goods
- Purchase of communication or SMS buckets via USSD
- Replacement of the credit card / wallet by the phone including an NFC payment system to pay at physical places.

Some figures give an insight to where the market is heading - French figures -

[1] With solutions like those proposed by Payvia

[2] According to IHS screen digest division, in-app purchases accounted for about 39 percent of app revenues in 2011 - $970 millions -, and it predicts that in 2012 that proportion has gone up to 49 percent. By 2015 it will account for 64 percent of all revenues.

[3] Forrester Research Online Retail Forecast, 2011 To 2016 'Mobile eCommerce revenues across Europe will rise from €1.7 billion in 2011 to €19.2 billion in 2017, reaching 6.8% of total web sales. Simple, easy to merchandise categories such as books, DVDs, music, and event ticketing, where mobile-specific features such as immediacy and location can be leveraged, will grow most rapidly. In this report we outline the growth projections for mobile commerce across key European markets, examine some of the drivers and inhibitors that will fuel this growth, and consider the state of mobile commerce in Europe by 2017'

- 1.8M contactless cards have been deployed a few months after the decision to launch them - 01/2012 -
- 10% of the electronic payment terminals are compatible with the NFC technology - 04/2012 -
- The NFC component on a mobile costs around the same as the wifi or Bluetooth component
- More than 500K NFC mobiles deployed mid 2012 - out of a total of 40 million worldwide in 2011, 100 million in 2012 -. 60+ NFC mobiles models will be available next year
- More than 500 apps on the Android Market are NFC compatible - 04/2012 -
- 16% of the French merchants have had at least one mobile transaction in 2011
- M-commerce represents 2% of voyages-sncf.com revenues, when Paypal revenues on mobile represented 4G$ in 2011
- Cash handling costs banks 2.6G€ per annum[4], small transactions - ~1€ - representing 20% of the cash transactions

The technologies enabling mobile payment are numerous - SMS, USSD, QRCode, internet, NSDT and NFC to name a few -. For years, the main drivers for these solutions, banks and operators, 'co-opeting' to enable the use of the mobile phone for payments at physical points of sales, have struggled over the business model. But since key players from internet start addressing a market preempted by operators and banks, the merchants now gain more power to pick up the solution which best suits their needs.

Scope of interest

As we believe customers and merchants, and not banks and operators, will determine the success or failures of mobile payment offers and technologies, we only consider in this white paper payments via mobile devices in physical stores.

We will consider the following elements:

- **Which key factors do explain the success of some of the current NFC or mobile payment initiatives?** With numerous cities mobilized, strong incentives from the government and a structuration of the eco-system between banks and operators, we examine whether finally all conditions for a take-off of NFC mobile payments are united
- **Do the new comers in the mobile payment arena take a radically different approach?** As the likes of Google, Paypal and Apple enter the market; they may provoke a veritable paradigm shift and are able to profoundly modify customer journeys. In the meantime, NFC payments struggle to take off because of the complexity of the relations between banks and operators
- Whilst changing profoundly the classical transaction model, those new comers may also put **the focus on the customer / merchant relationship**, instead of the bank / operator duopoly. Instead of the duopoly pushing a technology to the market, the customer / merchants may well shape the future of mobile payments by selecting and integrating the technologies that bring a real benefit to defined use cases.

[4] Rapport Pauget-Constant

What key success factors can be derived from full size deployments of payment systems?

A lot of solutions and commercial offers have been deployed all over the world, involving either the mobile as a way to make a payment or the NFC technology to perform a transaction, whether financial or not. Success and failures have most of the time been extensively described, facilitating the process of synthetizing key drivers.

However, no general rule can be derived from those experiences, and applying the same recipes in a different context does not necessarily lead to success[5]. The purpose of this chapter is only to sum up the drivers that appear most common in explaining the success of any given initiative.

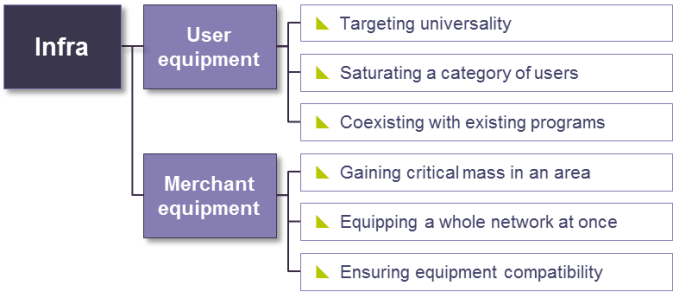
According to our research, the main drivers for adoption fall into 3 categories.

CATEGORY 1 - INFRASTRUCTURE

Metcalfe's law states that the value of a telecommunications network is proportional to the square of the number of connected users of the system. Whether the mathematical function can be discussed in regard to mobile payments, it is clear that the value of the network depends on its size. And the size of a network depends on the rapidity of propagation, in the case of NFC mobile payments, on the:

- NFC handset penetration
- Critical mass of the acceptance of NFC payments in the Points of Sales
- Consumer access to the payment solutions - credit cards, banks -

Therefore, the most important KSF as regards infrastructure can be summarized as follows:



On the user equipment side

Targeting universality. Be open to the whole population, independently of the bank or credit card they use.

The UK bank Barclays unveiled Pingit, an application with a very clear user benefit: enabling peer to peer payments or money transfers using a mobile phone. Although there are several such applications on the market, the reason why Pingit is the success story in the UK is its universality. It's open to all British citizens customers, not only Barclay bank customers, on any mobile network, on iPhone / Android devices, providing they are over 18.

This is of course especially important, as users do not have to ask whether the receiver is a Barclay Bank customer or not. With this choice, Barclay Bank applied Metcalfe's law, immediately increasing the value of the network to a maximum.

Saturating a category of users, build on learned behavior – and make it simpler.

When JR East Japan, a public transport company for the Greater Tokyo Area, issued their prepaid e-money card allowing 19 million travelers to just tap their contactless cards to the ticket gate and automatically deduce the fare, it encountered a huge success with 200 million transactions per month - also including mobile payments for shopping, especially at the stations -.

The extension to mobile was logical, allowing commuters to download train tickets and recharge their prepaid account over the air to their phones.

[5] As an example, French customers have legal right to open a free bank account with the attached payment means, thus reducing the need for the prepaid cards popular in the USA.

Co-existing with existing programs and technologies

Another successful mobile payment application comes from Starbucks: downloadable on iPhones / Android phones, it is basically the mobile variant of its successful loyalty card. A new version of the app is being rolled-out in July 2012[6].

Instead of using NFC, which would grant simpler usage but still has very low penetration, Starbucks uses QR code technology, which can be used on any smartphone. The Starbucks application allows the customer to pay for his purchases using a prepaid account - in 2011, 110.5M$ have been uploaded to the prepaid app, for 26 million transactions -. The mobile payment application is seen as an extension and a facilitator of the card program.

A comparable application, developed by the French startup Skimm! aims at creating a pure software solution to handle all transaction types - on line, at the PoS, money transfers[7]. -

On the merchant equipment side

Getting critical mass quickly in a defined geographical area

This strategy can be illustrated by the Suica card[8]. Basically a contactless transportation card, the e-money-functionality was extended to shops and vending machines inside the stations. Consumers quickly learned that they can buy newspapers, confectionary items etc. at shops where the Suica logo is displayed.

As merchants began to come on board, it became easier to bring others on board: DoCoMo found that its growth curve steepened with each major retailer that it added[9].

This strategy is also implemented in France, where NFC deployment is in defined 'contactless cities', typically medium-sized cities in which critical mass can be reached more quickly than for example in the Paris region by equipping both the customers and the merchants.

Deployment of 'Cityzi' in the center of Nice.

Equipping a whole network at once

Carrefour launched its contactless privative card with Paypass Mastercard at all its outlets in France. 2,5 million cards are now NFC compatible, as well as 25.000 cash registers in the 4,000 French shops, allowing NFC payments for amounts less than 20€. 25% of the Carrefour Pass card holders have used the NFC functionality…

Ensuring compatibility between contactless cards / mobiles and PoS equipments

The mobile extension of the Mobile Suica card only worked because the acceptance infrastructure was compatible with both contactless cards and mobile NFC payments.

[6] Upgrades to the app include the ability for Android users in the U.S. and Canada to reload their accounts using PayPal, a new dashboard feature to track Starbucks Rewards and an Android widget that lets users access balance, rewards and payment functions more easily.

http://www.mobilepaymentstoday.com/article/197199/Starbucks-upgrades-Android-payment-app, 11/07/2012

[7] https://www.skimm.fr/about.php

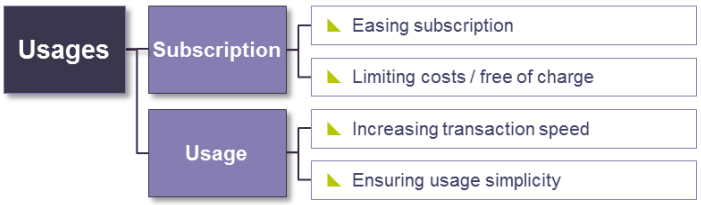
[8] JR East, NTT DoCoMo and Sony offered a new service combining DoCoMo's i-mode® FeliCa® smart-card handset and Suica, JR East's IC card train ticket, from January 2006. The Mobile Suica® service will enable i-mode FeliCa handsets to be used as Suica cards, http://www.nttdocomo.com/pr/2005/000642.html

[9] Beth Jenkins, Developing Mobile Money Ecosystems, Harvard Kennedy School of Government, p. 13f, 2008

In France, the interoperability at the hardware level has been achieved and should be obtained at the software level by the end of 2013.

CATEGORY 2 - USAGE

But more is needed than infrastructure. It is evident that a new service cannot develop itself if it makes an existing simple operation more complex and/or more expensive. Today, outside the mobile payment ecosystem, consumers and merchants are generally satisfied with the way they pay. Current mobile wallets demand efforts to merchants - deployment of readers, integration with current information systems - and from consumers - subscription, ease-of-use limited because of security concerns -. The demanded efforts are for the instant unmatched with a clearly defined benefit neither for merchants nor for users, especially if additional transaction fees are added on top of the fees associated with the credit card attached to the wallet.



Subscription

Making registration easy

When Mobile Suica was launched, the target of 1 million users for its mobile extension seemed reasonable. 13 months after launch, only 350,000 users had signed up.

According to Akio Shiibashi, director of the Suica Systems Department at JR East, this slow take-off was due to the complexity of the registration process. It has been simplified so that users can simply register directly via their smartphone or computer on the Internet[10], without any further action like calling their mobile operator, changing their credit card contract, waiting for the contract to be sent by physical mail, then signing and sending the contract back, etc. – for a payment service that is already provided by easier means.

Use of the service

Increasing transaction speed

In London, a congestion charge scheme was introduced in February 2003. Car drivers living outside London are charged should they want to drive within the city center. Transport for London wanted to offer drivers and delivery firms a choice of payment methods allowing those driving regularly in the congestion zone to pay the charges easily and with minimal paperwork.

A mobile option then complements online and at retail outlets payments. To use it, drivers pre-register their details online or by telephone, giving personal and credit card details so they do not have to enter the same information each time they wish to pay. Payment is done by sending an SMS message containing the last four digits of their credit card number to the London congestion charging short code. No need to open a mobile website and entering the whole credit card credentials. The short code can be simply saved in the phone's address book; the last 4 digits of the credit card might be saved on an SMS.

Nearly 20% of the 150,000 people driving into central London each day now pay by SMS.

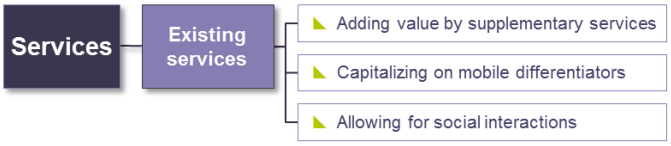
Ensuring the ease of use

The ease of use of the Pingit application provided by Barclays differentiates it from the competition. To transfer money using the app, the user has to choose the receiver of the payment in his address book or key in his number, select how much he wants to send and confirm the payment. Barclays will then send a text message telling the recipient how to access his money: if the recipient is not registered, he is granted a 24-hour delay to register.

[10] Dan Balaban: 'Japan's Mobile Wallets Fail to Inspire – Yet', in: American Banker, April 2, 2007

CATEGORY 3 - SERVICES

On the services side, the sole technology is not sufficient, but the fulfillment of actual needs has to be granted.



Adding value by adding additional / complementary services

The wallet 'Osaifu-Ketai', launched in 2004 by NTT DoCoMO, has been adopted by the other mobile phone operators, making it the de facto standard mobile payment system in Japan.

Osaifu-Keitai services include electronic money, identity card, loyalty card, public transport fare collection - including railways, buses and airplanes -, or credit card.

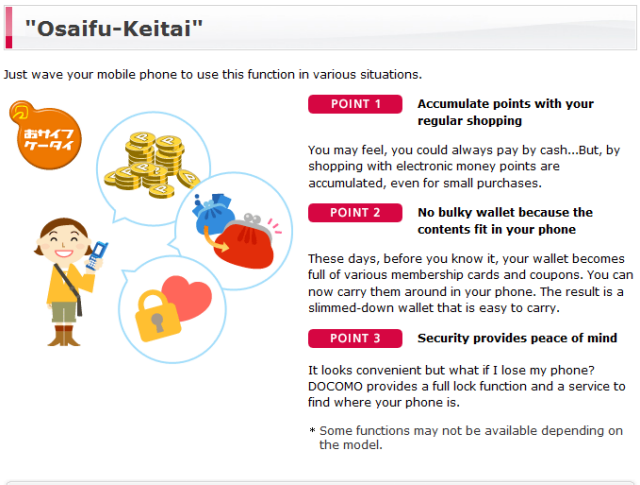
The service features DoCoMo's own payment scheme, iD, as well as a number of third party payment services, transit ticketing, loyalty programs, airline check-in and others. Banks or the financial industry are not included in the eco-system.

The Japanese example is often cited as a huge success for NFC. It is actually impressing when only the offer side is regarded: 8 years after the launch, about 90% of the points of sales accept contactless payments, and an estimate of 60% of the mobile phones in use have payment capacity.

But on the demand side, the perspective is quite different: out of the 117 million contactless card accounts, only 28 million accounts are registered for mobile payments, and 20 million are actually active users. According to Comscore, less than 10% of Japanese mobile subscribers used their mobile wallet during the month of December 2010: This is not yet the cashless society many observers prophesized.

But consumers do love loyalty point programs and coupons. Merchants also value, above the benefits of mobile payments, the transaction speed, the cash handling cost reduction and are overwhelmingly responsive to the benefits of the incentive-type information that 'wraps' the financial transaction, such as coupons, discounts and loyalty points.

DoCoMo has realized this and positions its wallet as a way to collect loyalty points and a convenient way to dematerialize loyalty cards - avoiding bulky wallets -. Security issues are also addressed, as illustrated by the example below.



Source: NTT DoCoMo website

It seems that consumers see mobile payment as a commodity, not as an additional value in itself. The big lesson from Japan is that the payment aspect of mobile payments is ironically irrelevant. Value has to be added to include additional benefits: consolidation of loyalty cards, collection of loyalty points, couponing, information on products and their availability, geolocalization, personalized relationship etc.

Capitalizing on the differentiators offered by the mobile device to make it the preferred channel

Another key element from the London's congestion charge SMS payment is that it fulfills a contextual need. Mobile payment allows paying whenever the driver finds himself in the 'congestion zone' without having this to plan beforehand or to search for a 'payment automat'.

Enriching the social experience

Like the Japanese experience, the true value of the Starbucks application is not in payment. It's either in the possibility to collect loyalty points via mobile phone,

or to check his status on the reward program. Another popular feature is the sending of gift coupons - between 5 USD and 100 USD - to an e-mail or facebook account directly from the mobile app. This corresponds to the success criteria of P2P payments, as defined earlier.

New comers, new models?

THE BATTLE ON THE SECURE ELEMENT

Basically, the recent moves around mobile payment show different types of actors taking positions, trying to capitalize on their strengths to impose a new model. One of the most important questions everyone tries to answer regards the position of the 'secure element', the control of which is key in the ecosystem: the one controlling the secure element is in a position to demand a share of payment transaction fees from banks and credit card issuers.

Traditionally, the operators - imposing their views on banks -, would prefer the security aspects, notably the authentication, of the transaction to be embedded and supported by a security chip in their SIM card[11], which they fully control, and can be deactivated easily in the event of loss or theft of the mobile. In this case, the business model is quite favorable to operators, as they can rent space on the SIM cards to whatever service providers. For the service providers on the other hand, there is no clear visibility on the long term evolution of the service price.

The secure element could also be integrated in the mobile phone itself. In this scenario, preferred by Google, Apple and the likes, the mobile operator has no control and the handset manufacturer can discuss directly with banks, issuers and merchants. Operators still keep some bargaining power, as they still subsidize handsets on various markets around the world. In this case, the business model is more attractive for the service providers, as they are not so highly depending on the mobile operator, but the uncertainty remains on the processes for distributing the applications to the end users and supporting them.

SIM manufacturers also propose to embed not only the secure element, but also the NFC chip directly in the SIM card. This would allow to deploy NFC-enabled SIM cards in every mobile phone. No need to wait for NFC phones anymore. This solution though reduces the NFC

[11] In fact, to be placed on the UICC, the circuit card which supports the SIM application.

capabilities to mobile payment[12] but doesn't allow for other NFC applications as tag reading. Until now, this solution hasn't been implemented.

DIFFERENT TYPES OF PLAYERS

We identified several types of players trying to gain some power in the value chain.

Worldwide players: Google, Microsoft, Apple

Google, the pioneer?

Google experienced with the launch of 'Google Wallet' the same problem as mobile operators face in the traditional eco-system. 'Google Wallet' is an application pre-installed on Google Nexus phones, downloadable on others, which is either linked with a Barclay/Mastercard for Citibank clients or can be uploaded as a prepaid wallet. To use the NFC-based wallet, users simply have to tap their phones to a mobile-enabled Mastercard PayPass Terminal. But for Google, the move in the payment arena also includes a move in the provision of services, such as coupons, loyalty programs and daily deals.

The operators reacted almost immediately to the launch. The second largest operator, Verizon refused the Google Wallet application on its network out of 'security concerns'. Google had to de-activate the application.

This resulted in bad press and plaints of 'anti-competitive behavior' against the operators at the FCC - Federal Communications Commission by consumer advocacy organizations.

According to blogs 'Google Wallet' seems now to be available at AT&T and T-Mobile networks on the 'Google Play', ex-Android market store. It can be downloaded for Nexus Phones, with the secure element in the phone[13]. Anyway, the operators do nothing to promote 'Google Wallet' or facilitate its download.

In Europe, Google - as well as PayPal - is currently lobbying the European Commission to block Vodafone, o2, T-Mobile and Orange forming a joint venture in the UK - code-named 'Oscar' - in their progress to create an operator digital wallet.

If the European Commission qualifies the operator's initiative as 'anti-competitive', operators will probably not be able to block Google Wallet as Verizon did and will have to integrate non-operator wallets.

Google Wallet had to face key show stoppers:

- **Low handset penetration**: The market share of the Nexus S 4G and Galaxy Nexus are close to zero.
- **Few financial partners**: Consumers want to be able to use their existing credit or debit card and not have to sign up for a new one. Currently only Citigroup/MasterCard customers can update to Google Wallet.
- **Only 1% Point of Sales**: According to Google, 150,000 point of sales are under contract, representing 1% of all PoS in the US. Consumers don't want to look for an acceptance mark. The payment method has to become ubiquitous in order to change consumers' behavior.
- **Lack of perceived benefit**: Customers are used to pay by cards. Issuers are launching NFC enabled cards and it's not clear that pulling out your phone opening an app, typing in a PIN code is more convenient than swiping a credit card or exchanging cash.
- **Strong opposition from the mobile operators**: 3 out of 4 US mobile operators, with together a 74% market share, pursue their own wallet initiative ISIS - see later -.
- **A suspicious finance industry**: the finance industry is also reluctant and this despite an advantageous business model for them: being aware of the bank's complaints about low margins in the payment industry, Google doesn't charge any fees. It is free indeed. But beside the culture clash between the traditional banking industry and the Silicon Valley company, banks worry on whether Google Wallet is far too inward-looking with its own brand, enabling Google to own the customer experience and letting the banks merely providing the rails.

[12] Enables the phone to act as a credit card emulator

[13] Financial Times, April 13th, 2012

But even though the European Commission compels operators not to block the inclusion of Google Wallet in the Google phones, they won't make things easy for Google. As Ali Salci, head of mobile financial services for Turkey's No.1 operator Turkcell brings it to the point: 'Google's business model is not structured for mobile operators to benefit'.

Google may thus be forced to modify Google Wallet so as to work with a SIM-based secure element, and the operators might be compelled to give access to the secure elements to competitors like Google - especially in relation with loyalty and couponing, which is in Google's main interest -.

Since a few months, with the departure of Google Wallet key personnel, Google seems to have been rethinking its strategy and following a more operator-friendly course proposing them to share advertising revenues. Google has basically the choice to cooperate with the operators or to follow a cloud-based strategy.

In the last few months, Google has been pushing Google Wallet as the default online payment method on its Google Play Store. Content downloaded on 300 million Android smartphones and tablets have thus to be paid via Google Wallet.

This step is very likely the first step in a move towards 'cloud-based payments', meaning that the 'secure element' is neither on the mobile phone nor on the SIM card, but in the 'cloud', hence on Google's server.

Contrary to the mobile operator's business models - based on a sharing of the commission revenues, or more precisely in 'renting parts of the SIM card' -, Google's business model is based on targeted advertising – AdWords -. According to Forrester Research, the market for payment context, at the corner of online and offline, is the most lucrative advertising market to emerge.

For Google, its mobile wallet should allow to link consumer interests in the virtual world with actual payment - and shopping - behavior in the physical world. Matching of both Internet - and mobile - search behavior with geographical and actual payment behavior would significantly increase the value of each user profile. Eventually, questions will arise on the protection of personal data, as they are strongly protected by local laws.

Furthermore, it would allow Google to address physical merchants to offer targeted couponing.

Google Wallet is associated with 'Google Offers' - a competitor of Groupon - and Google hopes to link the consumer behavior in the virtual world with behavior in the physical world.

What about apple?

Apple announced Passbook on the June 2012 Developer Conference in San Francisco. Passbook appears to be a mobile wallet, allowing to replace a physical wallet with a mobile counterpart.

Passbook was pitched by Apple executives as a user-friendly holder for fidelity cards, vouchers and also electronic cinema tickets, boarding passes.

The application is integrated in the iOS 6 operating system, hence immediately integrated in iPhone's and IPad's from September on. The deep integration allows for great usability. It does not rely NFC technology but on QR codes which are already widely accessible.

Consumers are merely not so much interested in payments, as in collecting loyalty points, loyalty cards and vouchers. Ticketing is already an increasingly popular activity on smartphones. As always, Apple surveys what works, and tries to improve it in terms of ergonomics whilst providing an end to end service for the mass market, thus reinforcing the customer stickiness to the brand.

Thanks to the geofencing technology, the loyalty card, ticket etc. of the appropriate merchant or company will

automatically pop up on the IPhone's screen, even when locked, at the merchant's place, thus suppressing the pain for the customer to retrieve his ticket. Additional services can also be provided by real-time integration: with his boarding pass on an IPhone, the users can automatically be informed of any boarding gate change, or get notifications on the expiry dates of their coupon, the location of their concert seats, their balance on the coffee bar card…

Apple's solution seems to comply with almost all the above-mentioned success factors, focusing both on customer and merchants benefits - 'all your stuff on Passbook' -. The fact that the merchant's loyalty card and vouchers automatically pop up on the iPhone's screen when inside the store or location can then also be used to create special offers and to trigger an interaction with the customer.

Apple already has the details of more than 400 million credit cards, collected via iTunes accounts. Although for the moment not including payment, Passbook can be considered as preparing the users for this kind of functionality. By first acting as an all-in-one application for electronic tickets, vouchers and loyalty cards, Passbook could later make an ideal home for iPhone owners' electronic money.

Microsoft, the challenger?

Microsoft's wallet seems like a fusion of Google Wallet and Apple's Passbook.

Like Apple's new Passbook app, the wallet aims to replace its physical counterpart by acting as a central hub where users can store all of their debit, credit and membership cards and coupons.

As with Google Wallet, and Apple's Passbook, the Microsoft wallet is integrated in the mobile OS, and will be released with Microsoft Windows Phone 8.

In contrast to Google, Microsoft has opted for a secure NFC SIM-based system avoiding thus the confrontation with the operators. Microsoft clearly cooperates with the operators.

Orange, which is the launch partner for the Wallet, has praised the SIM move, with a company speaker enjoying that Microsoft comply with the recommendations of the telco trade body, the GSMA.

Microsoft CVP Belfiore also revealed that Microsoft has been working with Isis, the US telco consortium that is building its own wallet, and expects to have its system on Isis at some point next year.

Traditional players: ISIS, Oscar, Cityzi…

ISIS, a joint venture with three of the four US mobile operators, represents 76% of the US market[14].

ISIS is close to European operator-led initiatives as 'Cityzi' in France or 'Oscar' in the UK.

As in Europe, the mobile operators in the US initially aimed at bypassing the financial industry, but now have reshaped their strategy and cooperate with banks and credit card issuers: Visa, MasterCard, American Express and Discover Financial Services joined the initiative.

Together with these partners from the financial industry, giving access to about 50 percent of all consumers in the US, a large scale trial will be conducted in summer 2012 in Salt Lake City and Austin. The nation-wide commercial launch should follow one year later.

Contrary to Google, the ISIS operators have no problems with sourcing NFC handsets that support their applications. ISIS says to launch with Samsung, LG, HTC, RIM, Motorola and Sony Ericsson from scratch.

Such an initiative has however been abandoned in the Netherlands, the JV formed in late 2010 by 6 partners for NFC mobile payment being dissolved because it takes too long and it is too complex to bring their solution to the market.

[14] Verizon, T-Mobile and AT&T. The 3rd largest operator Sprint is not part of the joint venture but partners with Google

mCommerce giants: PayPal

PayPal, the leader in Internet payment with 106 million customers worldwide, has seen its transaction originated from a mobile phone rise from $750 million to $4 billion in 2011.

Paypal basically allows consumers to link the information of their credit/debit card with a PayPal login in order to facilitate payments on the Internet as well as on the mobile Internet.

The user can type in the e-mail address or mobile phone number and a password instead of typing in credit card number, expiration date and security number. Paying via PayPal is considered more secure than typing in one's credit card credentials at a merchant's website, because of the 2-step process. Furthermore, and this is the basis of its success, PayPal allows for peer-to-peer payments.

As Google, PayPal intends to build the bridge between the online world and the physical world, but contrary to mobile operators and Google, considers itself as NFC-agnostic. Scott Thompson, the PayPal chairman: 'The fact is you've got to have more than just a shiny new technology to really change the way people shop and pay. We all know that shopping is fun, but paying is not…'

On the other hand, NFC is POS-centric. According to the CEO of e-bay, PayPal's mother company, the interest of merchants towards NFC was only lukewarm. NFC stands for 'Not for Commerce", he said jokingly.

PayPal claims wanting to get rid of the point of sales altogether and imagines a new shopping process with nobody standing in line to pay at the checkout or restaurant patrons having to wait for a waiter. In the future the very idea of a payment terminal may be obsolete. 'By the time NFC catches up, we'll be in a world that will move away from the point-of-sales terminal'.

PayPal sees the future in a dematerialized wallet, with which consumers can buy on the Internet, on mobile, and at physical stores. No credit card, no chip in a mobile phone, only one log-in, on Internet, on mobile and in physical stores, via the mobile phone or a point of sales terminal. This would mean that the secure element is based in the cloud.

While a card or an NFC mobile phone do present both identity and payment credentials, the cloud-based wallet stores the payment credentials and leaves the identity proofing to other approaches. The cloud-based wallet could be a path around mobile operators and their hold over NFC's card emulation mode.

With a payment system entirely situated in the cloud all sorts of devices connected to the Internet could become a payment device. PayPal is currently working with Samsung on Connected TV in order to enlarge online payment to web connected TV screens and their remote control, but game consoles could also be considered.

But instead of their claim to want to get rid of the point of sales, PayPal currently tests on a large scale with US-chain 'Home Depot' an application which would allow consumers to pay for their purchases at the cash register via a PayPal log-in. A mobile number and a PIN code are required.

For this, PayPal concluded a contract with Ingenico, the French payment terminal manufacturer in order to upgrade payment terminals without extra costs for the merchants, as only a software upgrade is needed.

Buyster, in France, follows the same principle. Buyster is a company created by Orange, SFR, Bouygues Telecom and Atos, launched in mid-2011. To conclude a transaction, a Buyster user will need to respond to the

SMS he receives with his personal pin code. Buyster gets directly into competition with PayPal in winning online merchants to accept this solution.

Startups: square, iZettle

Square, a start-up company founded by Twitter inventor Jack Dorsey, started with a simple idea: enabling iPhones to act as a credit card reader. Other companies, such as mPowa, rely on the same principle.

A small dongle was created which could be simply put into the iPhone's audio jack. This dongle immediately allows accepting all major credit cards with an enrolment on the Square website.

This solution was especially appealing for small businesses, including taxicabs, food trucks, coffee shops and even lawyers and accountants. Square is currently processing over $6 billion in payments on an annualized basis as of mid-2012.

The sign-up is easy; all major credit cards can be accepted. The card reader is mailed for free to any person having signed up. The commission with currently 2.75% and no minimum fee is attractive for small payments. Funds from all Square transactions are deposited directly to the merchant's linked bank account.

The card reader is available for iPhones, and new Android phones. It is however targeted to non EMV environments, as only the magnetic stripe of the card is read.

Square also launched an iPad app, 'Square Register', which turns the iPad into an actual cash register. Square Register also enables the merchant to collect statistics. The application is also designed for cash payments.

PayPal reacted to Square by launching an almost identical product: 'PayPal Here', having seduced 200,000 US merchants in the first month of existence in April 2012.

Square, challenged to keep their first mover advantage, launched another application, breaking into the consumer market, by adding value to merchants: 'Pay with Square', an application for iPhone and Android, allowing paying for products at merchant stores without needing to take the credit card - or mobile phone - out, nor to type in a PIN code. The consumer selects the - geo-localised - merchant, 'checks in', which brings the customer profile on the merchant's Square application, typically on an iPad.

The consumer has simply to tell his name to the person at the PoS, who then performs the transaction.

This disruptive offer allows for payments without a credit card, without cash and even without having to type in a PIN code.

The application is linked with a social media platform; the user can recognize which friends are in which stores around him - for example coffeeshops - and invite them. The application maps all the 'Square' enabled stores nearby, encouraging consumers to discover those stores. Square founder Jack Dorsey said 'the aim is to humanize merchant-customer relationship'.

70,000 out of the 1 million Square merchants have accepted this payment method.

Game changers: Gopago

'Consumers don't have really a mobile payment problem', says Jack Stephenson, director of mobile, e-

commerce and payments at JP Morgan chase. '95 percent of the time, paying with cash and credits cards actually works pretty well. Consumers have a mobile shopping problem. There's a difference', he said in an interview with Wired.

The true value for Leo Rocco, CEO of start-up Gopago, recently partly acquired by JP Morgan Chase, is in enabling shoppers to skip the line. Gopago is a mobile payment company whose primary focus is to make shopping easier by moving both orders and payments from the line to the smartphone — any smartphone.

Users may pre-select shops - like restaurants, coffee shops, hair salons etc. - in which they can command and pay in advance via their mobile app.

The payment is secured by typing in the credit card credentials once into the application. The service is thus cloud-based.

Customers collect loyalty points and reductions granted by the shops.

The service which previously had a small pilot in Mountain View, California - near San Francisco - was then launched in San Francisco and Las Vegas. The rollout will spread out to Dallas, Chicago and New York City later this year.

But similar to Square, GoPago addresses their offer also to merchants, - typically small businesses -, allowing them to build a mobile storefront from which customers can command and pay for the articles, accept orders, establish customer profiles and even a community, and get into direct contact with them via messaging.

Furthermore, the mobile storefront keeps track of sales - even individualized per customer -, inventory and customer activity. The application, typically for iPad, allows the merchants to customize the reports and print them. GoPago thus similarly addresses to final customers and merchants.

This sort of service is currently being tested by McDonald's in France, with the 'GoMcDo' app for online ordering and payment[15] - using a standard credit card or Paypal -, before the order is collected at a dedicated desk.

WHAT BENEFITS FOR THE CUSTOMER?

The key points of each solution

Should we summarize the customer journeys offered by the different solutions, we might distinguish between the two most critical processes: subscription and purchase.

[15] The payment gateway being provided by Point Group.

On the subscription side - mobile equipment

	Application download	Identification configuration	Payment means configuration	Information research	Settings configuration
Square / Pay with Square	1 Possible reception of a download link during a transaction via the « Square Card Reader »	2 Upload of an identity photo	3 Upload of credit card details PIN code mandatory for high amounts	4 Search of brands accepting Square, recording of the details of stores that present an interest	5 Configuration of the automatic selection of payment mode for some stores
Google / Google wallet	1 Pre-loading of the application, natively present in the Samsung Nexus phones	2 Key in of a PIN code necessary to activate the secure element (SE)	3 Upload of credit card details (Citi) ***OR*** Recharge of the Google prepaid card via credit card (Citi/other)		4 Configuration of the default credit card Configuration of the time out before a new input of the PIN code is necessary
GOPAGO	1 Application download	2 Capture of the name, surname & phone number PIN code selection	3 Upload of credit card details	4 Search of stores accepting Gopago	
PayPal « ***PayPal*** at the register »		1 Web configuration by activating the « In-Store check out » option PIN code selection	2 Selection of the payment mean on the web		
PayPal	1 Upgrade of the Paypal mobile application (« local » function added)	2 Upload of an ID photo		3 Search of stores accepting « Paypal Here »	4 Configuration of the automatic selection of payment mode for some stores

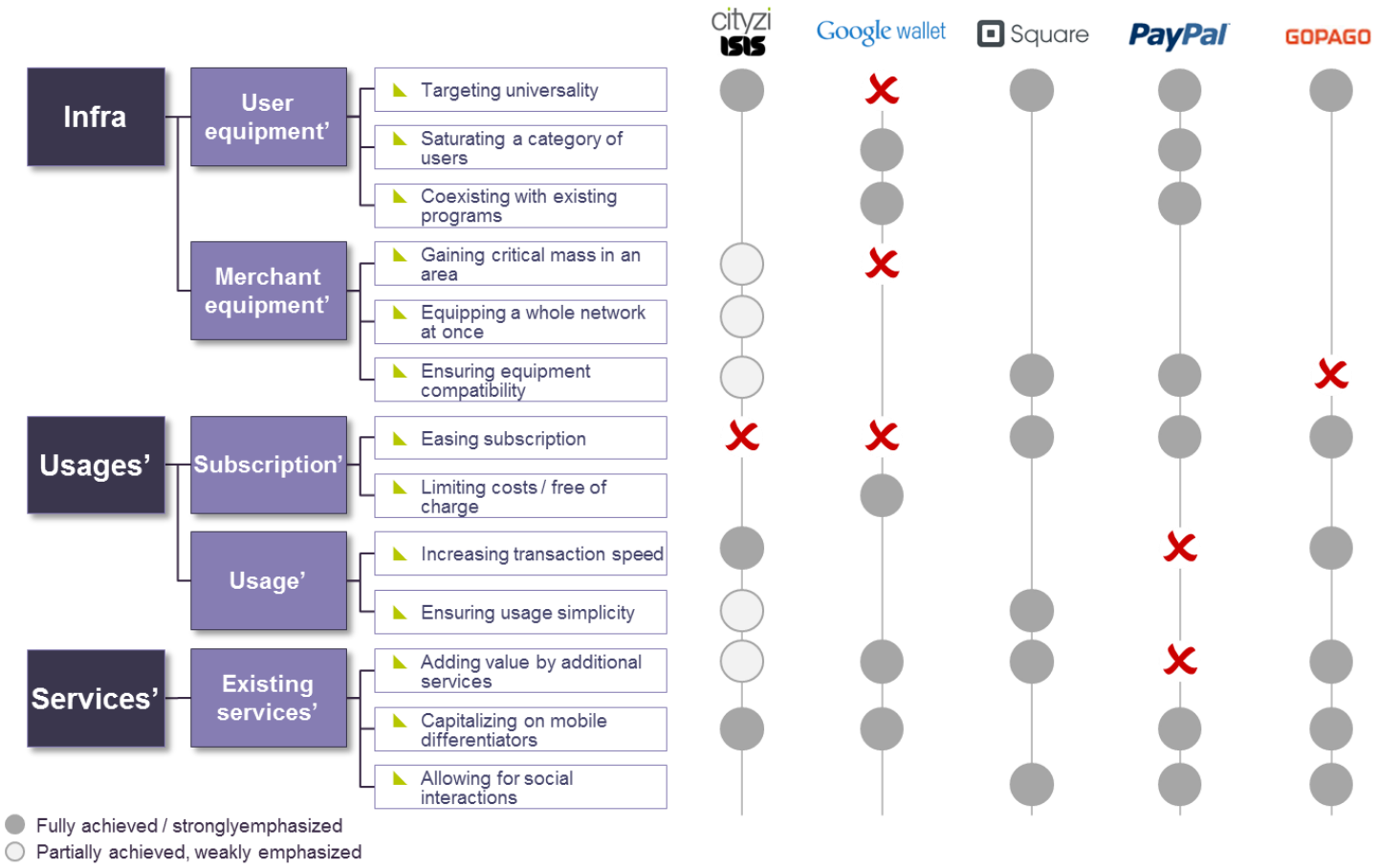
On the purchase side

	Activation	Choice of product / service	Identification	Validation	Goods pick-up
Square / Pay with Square	1 Automatic / Manual activation of the means of payment Notification of the customer check-in / push of the Customer account on the « Square Register » terminal	2 In-store product / service selection Choice input on the « Square Register » merchant terminal	3 Customer identification by his name Selection of the appropriate account number, check of the associated ID picture	4 Transaction validation on the merchant « Square Register » terminal Reception of an SMS on the smartphone	5 Picking up goods or services
Google / Google wallet		1 Preduct / service selection in store Choice input on the standard electronic payment terminal	2 Terminal activation ofterminal (activates the NFC antenna) PIN code identification on the smartphone (which activates the Secure Element)	3 Presentation of the smartphone close to the validation terminal Payment receipt issue	4 Pick up of the good / service
GOPAGO	1 Application launch then search of Point of Sale	2 Selection of the goods on the application		3 Purchase validation on the application, then receipt of a confirmation (after preparation delay on the merchant's side)	4 Identification of the customer showing his receipt on his mobile
PayPal « ***PayPal*** at the register »		1 In-store product selection	2 Keyboarding of the mobile number on the merchant's terminal	3 PIN code input on the merchant's termianl	4 Pick up of the good / service
PayPal	*PayPal has a second option (« PayPal Here ») which allows different customer journeys (including those proposed by Square)*				

Do they comply with the key success factors? ...

The graph below represents a very partial and biased opinion, as it has been constructed using only the strengths promoted by the providers of the solutions we considered. Moreover, this view does not take into account the economic aspects - transaction fees -, the technical aspects - EMV, PCI-DSS, cryptography, data protection…-, nor the legal aspects - SEPA compliance, European Directives…-.

Its very intention is only to demonstrate the sheer variety of approaches to fulfill a handful of very similar use cases.



From a logic of technology push to a logic of service pull: enabling merchants to change the Shopping experience

ARE THE NEW MODELS ADDING VALUE?

This great number of services marketed by players outside the traditional eco-system does add value: the services allow for new shopping experiences, enable new customer-merchant relationship and even a new human relationship between businesses and customers, with a focus on loyalty derived not only from couponing and rewards programs, but from customer intimacy and closer relationships.

But as we can see, the ecosystem is highly fragmented and it is very unlikely a merchant should adopt all payment means whilst a customer enrolls with more than a few payment systems.

However, it appears that most of those services do offer an answer to a specific need - P2P payment for example -, or add an extra value - e.g. Google's algorithm allowing merchants to propose targeted offers to their customers -. For instance, the customer promises each solution tries to fulfill comes along with a set of challenges to be overcome, that we can synthetize as follows:

No standard, no unique solution can emerge without bringing answers to the following questions:

- Repartition of the value between the ecosystem shareholders
  - Transactions revenue sharing between banks, operators, and others…
  - Creation of new pricing schemes / transaction fees on the banks side to take into account the reduction of their costs linked to cash management
  - Pricing schemes integrating the cost of new services - secure element -

Cityzi, ISIS… *« Traditional players »*	**Collecting different contactless services from various partners under the same umbrella brand**	◣ Structuration of the ecosystem between banks & mobile operators, both parties having to agree on the revenue sharing mechanisms ◣ Challenge: Encouraging first use
Google Wallet *« Fast mover »*	**Offering a mobile NFC wallet**	◣ Strong opposition from the operators and security problems as main obstacles ◣ SIM desintermediation, free transaction ◣ Confidence in the handling of key personal data
Square, iZettle *« Startup »*	**Converting an iPhone into a payment terminal | using the customer mobile to recognize him as he check in the store**	◣ Solution portfolio (Pay with Square, Register, Loyalty) ◣ European transposition (EMV…) ◣ Niche solution for a sort of merchants
Paypal *« Internet giant »*	**Transposing an online experience in a real world solution, without using the NFC technology**	◣ Service ergonomy ◣ All customer targets addressed
Gopago, Aislebuyer *« Game changer »*	**Pre-ordering, pre-paying goods and service from a mobile, to avoid queuing**	◣ Competition with lots of different solutions allowing to gain time (NFC tags wall, pre-order…) ◣ Impact / opportunity for the merchant, obliged to create a mobile site

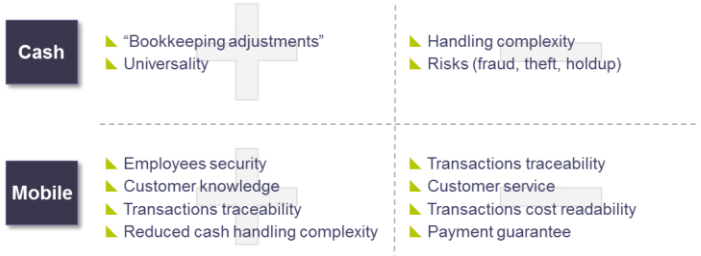
- Diversity of use cases and variety of operational constraints
  - Number of payment means available on the mobile which could possibly be used in Points of Sales
  - Ease of use, robustness of the subscription process and of the service use
  - Customer care availability and functioning for both the customer and the merchant
- Incentive for the customer and for the merchant to change their habits for something else
  - Where is the usage value of a new payment means?
  - How is the service enriched / improved by new technologic options?
  - How will confidence influence the choice between technological / usage options?

What is likely to occur is a consolidation of the market, either by fusions[16] or by addition of new features in the future release of the applications provided by the biggest and strongest actors. The response to a real need, and not the technology, will cause the mass adoption.

What role will have the merchants in this evolving market?

Of course, it is arguable that the future of commerce is omni-channel, and that the traditional, the web and mobile channels must be considered altogether in a unified approach. However, the advocates of the NFC sometimes tend to forget that the technology, even the smartest one, must fulfill a real user need to be widely adopted. Payment can be handled by a lot of means, and NFC payments are just one of the services that would be helpful to merchants and customers. It is now up to the merchants to pick up and integrate those possibilities to enrich the customer experience and reinforce the customer relationship.

For instance, mobile payments - or electronic payments in general - compete with cash payments as regards some criteria:



The merchant then must be well aware of the risks and opportunities each of his technological choices represent. But because of the threats they face from the other channels, they also probably have to seize the opportunities offered by the mobile technology not only to focus on the direct relationships with the customers, but go along this path, transform the layout of their shops and rethink about operational performance.

Disruption in the traditional customer / merchant relation very clearly occurs at various points within the store, and at various points in the shopping behavior starting before the customer enters the shop and ending after the transaction.

The online merchants often know more about their customers than their 'brick and mortar' counterparts as they can collect lots of information about them - cookies, profiles… - and can propose on the fly customized deals, when the traditional retailer often recognizes a frequent customer after he has swept his credit card to pay his purchases.

Traditional retail shops are also used as showrooms to see and touch products that will be bought later on online.

[16] To name only one, PayPal announced in July 2012 it has acquired card.io, the startup with the technology that lets users enter their credit card data by scanning it with a smartphone camera

Consumers use their smartphones to compare in-store prices, or to get user ratings and commentaries on products. Information is gathered not only at home, before the purchase, but directly in store. Additional information may be attached directly to the product package, with QR codes allowing to access more exhaustive information.

For instance, Amazon uses its barcode scanning tool on its mobile application to encourage users to scan item barcodes of at physical stores and then compare the prices. The objective is to transfer traffic from physical stores to their online shop. On the other hand, in France, Leclerc launched a big advertising campaign promoting its mobile price comparison application so as to convince customers visiting their supermarkets they cannot find better bargains elsewhere.

A lot of information has already been collected on the usage of mobile phones within a shop, and the studies[17] all agree that those behaviors are growing fast.

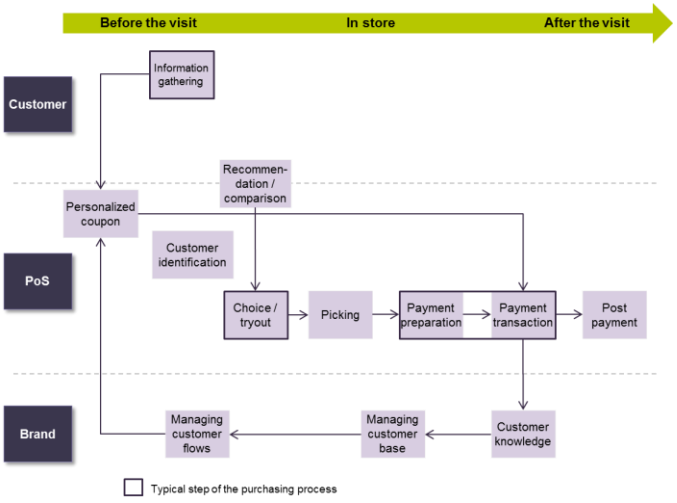
The retailer must then answer two questions:

- Which of those new mobile technologies, and to which extent, will they affect customer behaviors?
- How will the retailer be able to gain advantage of those new possibilities?

At this point, we think that the mobile technologies do offer a lot of opportunities to rethink the customer relationship:

- The changes in the customer behaviour favour the multiplication of contact and dialogue occasions with the customer that must be taken into consideration
  - 3 different spaces are restructuring: stores, homes, mobility & outdoor. The customer journey becomes more important than the contact occasion
  - Development of a 'ubiquitous business', adding value with innovative services, accessible everywhere, anytime, on the most appropriate channel
- Payment is only one aspect of the customer experience
  - The payment transaction must be painless for the customer, and be seamlessly integrated in the purchasing process
  - Before a global actor offers a killer application, multiple solutions will coexist, each answering a specific use case, and will not be merged immediately
- Taking 'time' into account will profoundly modify the commercial relationship
  - Time is an important factor for both customer and merchant: a seamless process gives a good feeling to the customer and improves the operational performance on the merchant side
  - The mobile allows to decouple several steps of the customer journey - interactions with the product, the vendor, and checkout -, thus helping to manage differently customer / vendor time
- Several obstacles must be overcome on the merchant / customer sides
  - If there are numerous solutions, the merchant will only select those that will ease his life or represent a benefit, and will not try to be exhaustive
  - The perception of risk and security are keys, during the transaction and as regards personal data protection
  - Solutions that improve the customer experience, with a similar - perceived - security level, will come out on top
  - The following graph illustrates how the mobile technologies may add benefits in different aspects of the customer relation during the purchase process:

[17] See for instance Comscore, Pew Internet & American Life Project…



All the steps of the above journey may be improved by the use of mobile technologies:

- **Shop visit preparation**: shops geolocalization, view maps of shopping malls, view stores layouts and customer guide to product locations down to a particular section of an aisle, collection of personalized coupons…
- **In-shop product information**: Self-service / assisted service using tablets - access to the catalogue, diagnosis tool to ease choice, personalized recommendation based on purchase history, view of customer account, view of product availability of goods that cannot be exposed in the store…-, use of one's smartphone to flash QR codes, get social networks recommendations, compare prices…
- **Customer assistance**: recognition of frequent / high value customers as soon as they interact with goods or information, allowing for personalized greeting and care, dynamic queues management
- **Checkout**: payment transaction completed without the need to go to a central cash register, allowing to think of new processes to pick up goods and hand them over to the customer…

Toward a transformation of retail?

The wide availability of enabling technologies will probably not be sufficient to boost mobile payments in shops. The integration of a significant range of services is key, but the most important driver will be the integration by the retailers of a combination of mobile technologies serving a better customer experience.

The key challenges to be solved by the retailers do affect four main areas.

- **Shop assistants**: Towards an increased customer interaction
  - Shift of the sales persons role, from demonstrator to advisor - analysis and use of a deeper customer knowledge granted by an immediate access to the store CRM -
  - Development of a more intimate customer relationship, because of new interactions allowed by the mobile equipment - screen sharing… -
- **Customer**: Improved segmentation and needs detection
  - Information research combining preliminary preparation and on the go interactions, in/out shop experience, interaction with vendors / social networks…
  - Real time access to enriched information, mixing physical presence and online channels
- **Checkout**: Redesigning for a better operational performance
  - Payment transaction does not need to interact with a central cash register. The time and place of the order validation, the goods preparation and the goods pickup can be done can be decoupled, with new processes to be implemented to handle security - removal of antitheft devices, handover of the payment slip… -
  - Physical reorganization of the shop layout, should the cash register and the associated queue disappear

- **Product**: Staging allowing an improved customer journey in shop
  - Goods selection can be done outside the display, using QR codes or NFC tags, with access to enriched information
  - Possibility to allow for a wider selection of goods than exposed in the store, with online stock availability check

NFC will take-off only if it serves an enriched customer experience.

Understanding that geographical specificities need to be taken into account is key, as much as it essential to understand that no foreign success can be reproduced and transposed directly in a different local context.

Services need to be adapted to the country: in France for instance, where everyone has a right to open a bank account and where merchants can obtain easily an electronic payment terminal, the need for prepaid wallets is less mandatory that in the USA.

There is no unique combination for success. But without merchants investigating innovative ways to interact with their customers, improve both the customer journey and their operational performance, mobile payments will remain technology-driven, remain highly fragmented between lots of solutions, and will remain a niche even though there is a huge potential they quickly go mainstream.

About the authors

cepheid consulting, a strategy, marketing and management consulting firm, assists its clients in anticipating and taking into account all breakthroughs driven by the use of new technologies.

We work along with our clients from all activity sectors, notably in telecommunications, as much on their business projects and the marketing of their offers as on the levers improving their operational performance and their profitability.

- Strategy: opportunity scoping, business model, business plan, launch of new activities, regulatory studies…
- Marketing: positioning studies, marketing mix definition, launch of new offers, multichannel strategy, innovation…
- Organization: process optimization, performance improvement, organization change, outsourcing of activities, project management…

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