



INNOVALUE

THE NEW WORLD OF RETAIL

New Challenges and Opportunities for the retail industry in the digital era



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1 - EXECUTIVE SUMMARY

The retail industry is changing the developments in Information Technology and Communication (ITC) technology. Consumers' increased adoption of mobiles, the convergence of retailing channels and the emergence of new payment solutions demand a constant reevaluation of existing and required technologies. While initiatives, like the development of Apple Pay, the roll-out of NFC enabled Android OS operated and Microsoft operated phones¹, are important to drive an acceleration of solutions like NFC – there is so much more going on underneath the surface with new solutions, like the acquisition of LoopPay by Samsung, being taken to market and consumer's changing payment preferences at checkout.

Comfort, safety and convenience rank high on consumers criteria for preferring a specific payment product such that its availability influences the probability of completion of the check-out process. Consequently these key factors do not only influence payment decisions, but also consumers' shopping preferences and the success of a checkout process. Moreover, consumers are asking for innovative payment acceptance solutions, as well as seamless shopping experiences that cross channels and touch-points. With the proliferation of mobile wallet solutions, increased adoption of NFC, the emergence of new methods of capturing transactions, offering value added services and their related methods of storing payment and consumers' credentials, retailers are faced by not only increased complexity of payment options at checkout but also by an increased risk to their customers, and so, ultimately to their businesses.

Fraud is still a relevant threat to retailers, not just for the short term losses it can cause, but also as a long term potential threat to a retailing brand's value and to consumers' trust. Research has outlined how the consumers' choice of retailer, channel and payment type is influenced by a negative experience of a fraud incident regardless of the actual responsibility of the retailer in whose brick-and-mortar or virtual shop fraud has taken place. With the increased number of new payment methods there comes an emergence of new payment technologies but not all of them offer the same benefits to consumers and merchants and provide the ability to address the risks connected to merchants storing consumers' payment credentials².

Host Card Emulation and, in particular Tokenisation, offer retailers the solution needed to address consumers' concerns regarding security risks related to new devices and technologies while meeting consumers' evolving payment preferences at checkout.

MasterCard, with its -brand agnostic- MasterPass wallet, its Tokenisation standards and its payment expertise, offers retailers the ideal solution to address these new challenges and to remain focused on the purchase journey and optimal consumer³ experience to enable a seamless checkout for the digital consumer within a multi-channel retail environment.

Ultimately the payment is only the final step to a purchase customer journey that should be an enabler and not a barrier to the completion of a purchase. Both consumers and retailers demand simplicity, seamlessness, and safety but it is up to the payment industry to provide such features and to the retailer to ensure that the simpler, seamless and safer option is made available to consumers both online and off-line.

1) E.g. Android OS operated Sony's Xperia Z2 and Z3 series, Samsung's Galaxy 5 and Microsoft OS operated Nokia's Lumia

2) Please refer to Chapter 10 for risk related details

3) Digital Consumers are consumers who interact and collaborate through web enabled devices and do not just purchase or are "sold to" through traditional marketing efforts. Don Tapscott's video: "The Digital Consumer and the Rise of a New Paradigm for Marketing" - <http://blogs.sap.com/innovation/sales-marketing/video-digital-consumer-rise-new-paradigm-marketing-0758591>

2 - INTRODUCTION

The retail industry is undergoing significant changes similar to retail banking, payments and all other industries that are impacted by the developments in Information Technology, Communication Services and Hardware. These convergence trends have been ongoing for the last ten to fifteen years. The pace of change is accelerating in all industries due to business potential, changes in consumer behavior and consumer expectations triggered by smartphones, tablets and cloud computing, as such, the newest technical standard is constantly changing and blurring the line between the e-commerce and the physical retail environments.

Within this context, consumers are changing the way they shop and, therefore, retailers must provide the ability to accept a payment in an environment that provides the consumer with an easy experience, secure and convenient payments at a physical or virtual checkout.

3 - OMNI-CHANNEL RETAILING AND INDUSTRY CONVERGENCE

Today online and in-shop buying experiences are converging as a consequence of consumer adoption of new devices and increased availability of real time connectivity.

E-commerce and the nascent m-commerce are growing at a fast pace, offering retailers opportunities that were not available up to a few years ago. Nevertheless, the establishment of new channels and new devices does not only imply that there are new ways to reach consumers, but also that the customer journey is mixing channels on a single purchase. Consumers can review a good online, and purchase it offline later (behavior otherwise known as “ROPO”-effect⁴), or they can window-shop in a brick-and-mortar store and then complete the purchase online (known as the showrooming-effect).

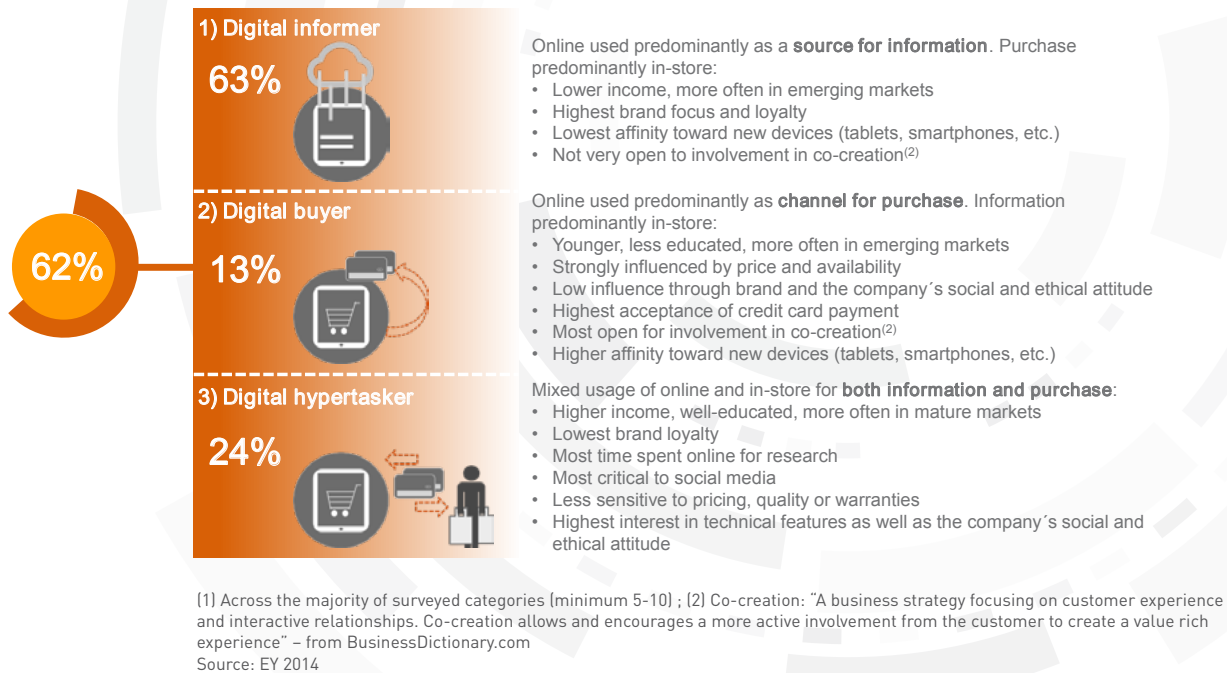
By focusing on one channel only or by not integrating channels at all, retailers are at risk of disconnecting with their customers and losing revenue in an environment where a competing retailer is just a click away.

In today's world retailers are not only challenged by the need to be able to operate through multiple channels but also by the need to seamlessly integrate all their channels so as to offer a consistent and smooth customer experience. This seamless or rather coherent integration is sometimes called “channel convergence” or “omnichannel retailing” and practically consists of the customers' ability to shop anywhere, anytime and anyhow.

These trends are accelerating as the adoption of digital channels has become even more pervasive within the daily life of consumers. Omnichannel retail is a long-term trend that requires today's retailers to react and adapt to the dramatic changes in consumer behavior.

4) ROPO (or ROBO) – Research On-line, Purchase (Buy) Off-line

Fig 1 – The digital consumer type



Payment is the point of ultimate value exchange between the buyer and seller and it is a key feature of any customer journey. Often can be a barrier to the completion of checkout. The retail channel is no longer limited to managing the channels and the logistics of goods but is faced with a growing complexity of payment interfaces, instruments, increased security risks and changing consumer payments behavior.

"BY FOCUSING ON ONE CHANNEL ONLY OR BY NOT INTEGRATING CHANNELS AT ALL, RETAILERS ARE AT RISK OF DISCONNECTING WITH THEIR CUSTOMERS AND LOSING REVENUE IN AN ENVIRONMENT WHERE A COMPETING RETAILER IS JUST A CLICK AWAY."

4 - PAYMENTS AND CHANGING CONSUMER BEHAVIOR

Payments are not only a core step in the purchasing process but also a good indicator that reflects the changes that are taking place in the retailing industry.

Payments at retail point of sale, online and mobile are fundamentally different in regards to payment methods in use, volumes, and growth rates. Very generally, in the overall retail industry:

- The traditional “brick and mortar” shop is still the most relevant channel with the highest volumes but characterised by relatively small growth rates. In this channel, electronic payments are gaining relevance but the share of cash payments is still significantly high;
- Online / e-commerce payments experience are similar in terms of volumes and growth rates but it is worth noting that, compared to the physical channels, online payments are more fragmented and varied;
- Mobile payments and payments via new converging devices based on mobile interfaces and infrastructures that share content across multiple devices represent a small-sized channel but with high growth rates and show early signs of heading to an even higher degree of fragmentation than e-commerce and online retail channels in regards to payment options.

Payments at a retail point of sale⁵

Although the online market is still growing strongly, the brick-and-mortar channel is still, by far, the most important channel for the retail industry in terms of sales value.

In Europe (EU26), in 2013, retail shops had an approximate market value of transactions of € 5,452.4bn⁶, of which 42.4% (€ 2,311bn) of sales were completed through a card payment and 57.6% (€3,141.4bn) were settled by cash.

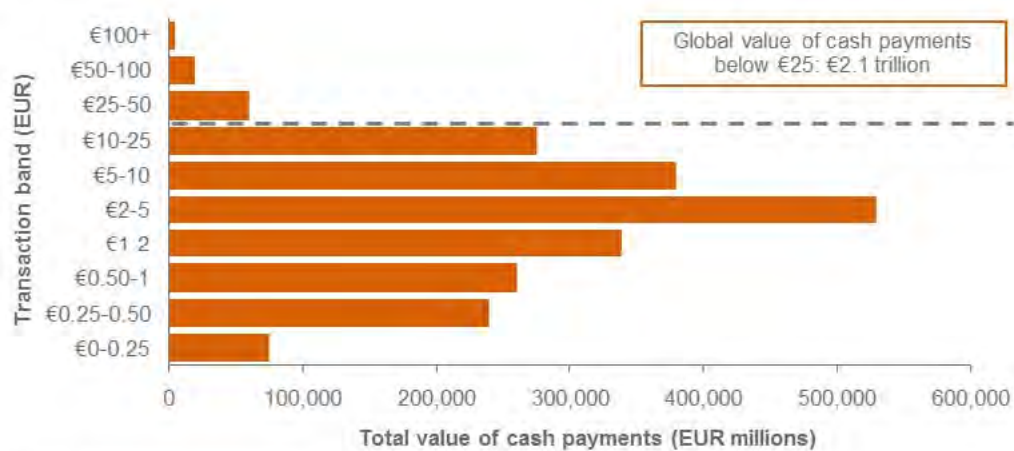
These numbers are an evidence of the fact that, while cash is still dominant, it is losing ground overall due to the increase of electronic payments although this varies by transaction type and value. Generally, the smaller the transaction value is, the higher the possibility / probability is that it will be settled by cash. The shift away from cash to electronic payments will likely accelerate as the European Union Commission⁷ has rationalized the cost of electronic payments to a degree that arguably these are lower than cash handling to retailers, hence eliminating a perceived cost barrier to card payments acceptance for small retailers.

5) By „retail point of sale” it is meant a physical shop.

6) Sources: EPC 2013-2014, European Country Rankings_C&MI_FINAL_0914.

7) EUR Lex, Regulation of The European Parliament and of The Council on interchange fees for card-based payment transactions, “COM/2013/0550 final - 2013/0265 (COD)”, 2015

Fig. 2 – Cash payments by value of transaction



Source: Datamonitor's Contactless Payments Opportunity Model (2014), Innovaue analysis

As it is going to be touched upon again in the following chapters, the following lists the types of transactions that will likely benefit from the functionality of contactless or NFC initiated payments, potentially through a mobile phone.

E-commerce:

The retail channel “e-commerce” has been growing by a double-digit percentage rate, which is the key to the growth of all retail sectors. This strong growth is still ongoing: Europe’s total e-commerce market in 2013 was € 518bn⁸, and it is expected to grow to € 826bn by 2018. This equates to an average growth rate of 11.4% p. a. The UK is today’s e-commerce market leader with a value of € 128.9bn of online purchases and is expected to keep its position until 2018 with an estimated transaction value of €175.3bn. eMarketer estimated business-to-consumer (B2C) ecommerce worldwide sales at \$1.471 trillion in 2014⁹, increasing nearly 20% over 2013 with sales expected to reach \$2.356 trillion in 2018¹⁰.

While the value of e-commerce is growing rapidly, it still represents only a small percentage of the total value of retailers’ transactions. Overall, the weighted market share of e-commerce in Europe was less than 10%¹¹ of the total retail revenues in 2013.

E-commerce is very fragmented in terms of payment methods used by consumers compared to retail POS where cash and cards dominate. Within the online context, card payments lead the market with a share of 51% followed by PayPal with a share of 19%, bank transfer with 9%, and cash at delivery that holds a 8% share.

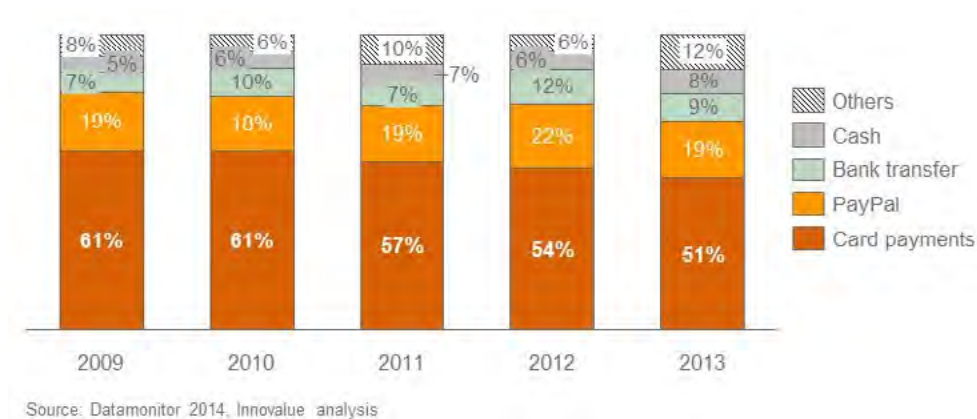
8) Source: EU26, European Country Rankings_C&MI_FINAL_0914

9) Source: <http://www.emarketer.com/Article/Worldwide-Ecommerce-Sales-Increase-Nearly-20-2014/1011039#sthash.G2YLwgB5.dpuf>

10) eMarketer estimates forecast a 2014-18 growth rate of 14% CAGR for North America, 11% CAGR in Latin America, 24% CAGR in Asia Pacific, 13% CAGR Western Europe, 9% CAGR in Central and Eastern Europe, 20% CAGR in Middle East and Africa respectively. Source: eMarketer

11) Source: EU26, European Country Rankings_C&MI_FINAL_0914

Fig. 3 – Online payments by payment type (% split based on transaction volume)



Mobile Payments:

With the forceful break-through of smartphones, their increasing capabilities and accessible content due to bandwidth growth, mobile devices are increasingly used for the purchase of goods and services. In particular, mobile devices are still used predominantly to buy virtual goods on websites, e.g. music, e-books etc. and these types of transactions are often referred to as remote payments. It is worth noting that through mobile wallets and mobile account interface applications, mobile phones are now starting to be used as instruments to pay in shops through a POS terminal. This type of payment is commonly referred to as a proximity payment.

Fig. 4 – Global share of mobile payments by type



Source: Javelin Strategy & Research, In-store mobile payments 2013-2018 forecast, Innovalue analysis

Mobile online retail payments still dominate the use of mobile phones for payment purposes, but mobile proximity payments are expected to grow at an increased rate via the leverage of payment applications such as Google Wallet, Apple Pay and mobile network operator's wallets.

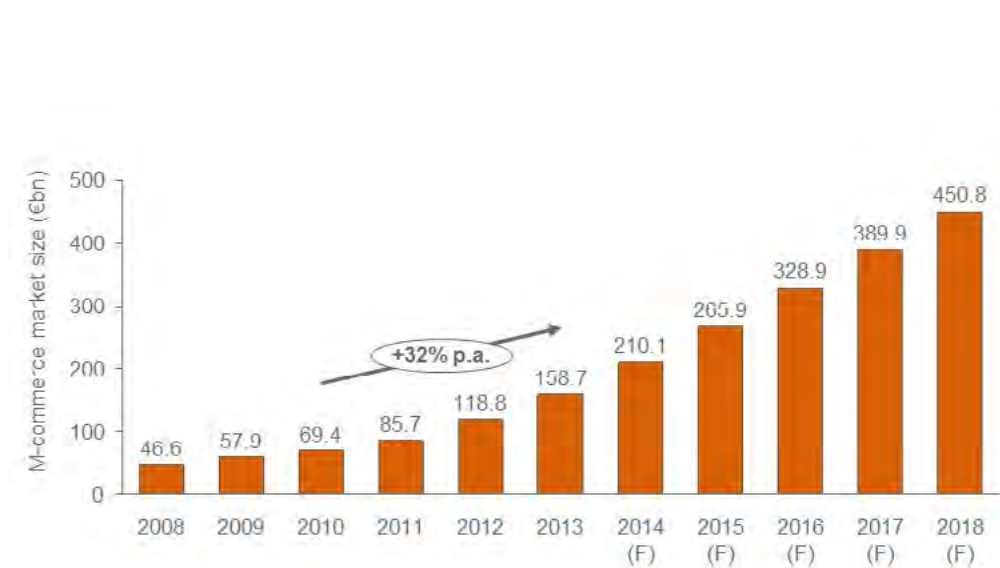
This is expected to grow further as Square has allegedly been working on an Android tablet of its own that would replace the iPad-powered Square Registers typically by small businesses¹² while, in response to Apple Pay, Google has been working on a new mobile payments system, called "Plaso" (pronounced "play-so"). Plaso is currently being tested at Papa Jones and Panera Bread, that would let people pay at check-out by just confirming their name or initials to the cashier.

Samsung Electronics America Inc. purchased in 2015 LoopPay driven by its vision to be "at the forefront of contactless payments to create a platform that brings together issuers, merchants and consumers that facilitate a seamless and rewarding digital wallet experience"¹³

These initiatives will ultimately bring more mobile-initiated payments into brick and mortar commerce.

The market size of mobile commerce is still low compared to in-store and online purchases. The mobile commerce market accounts for a value of € 158.7bn¹⁴ in 2013 but is growing at a higher rate (31.8% compound annual growth rate between 2010-2013; 23.2% CAGR forecasted for the period 2013 - 2018) than the estimated growth of 11.4 for e-commerce until 2018.

Fig. 5 – European m-commerce value



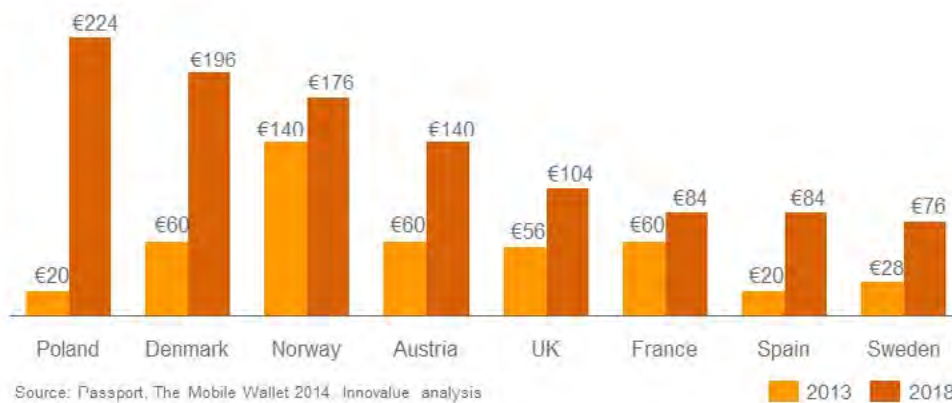
12) <http://www.theverge.com/2015/2/11/8019413/square-apple-ipad-mobile-payments-terminal-android-report>

13) <http://www.looppay.com/announcement>

14) "Source: EU29, Euromonitor 2013".

Mobile Commerce per capita:

Fig. 6 – m-commerce per capita in selected countries (2013-2018 forecast)



Overall, there is a general trend of increased adoption and growth of mobile commerce. To make sense of and maximize this opportunity, retailers have to be able to understand consumer preferences and behaviours as well as to understand the development of the payment technologies that are underlying a transaction, and the coherent relative implications

"MOBILE ONLINE RETAIL PAYMENTS STILL DOMINATE THE USE OF MOBILE PHONES FOR PAYMENT PURPOSES, BUT MOBILE PROXIMITY PAYMENTS ARE EXPECTED TO GROW AT AN INCREASED RATE VIA THE LEVERAGE OF PAYMENT APPLICATIONS SUCH AS GOOGLE WALLET, APPLE PAY AND MOBILE NETWORK OPERATOR'S WALLETS"

5 - DRIVERS OF CHANGE TO THE RETAIL BUSINESSES

The payment market is currently experiencing highly dynamic changes that lead to, and –at the same time– are consequences of, new emerging technologies in the market. The integration of payment card functionality into mobile phones enabling handsets to be used as a payment instrument is indicative of the establishment of new possible business models like the implementation of NFC transactions or the possibility to pay for goods via scanning a QR-code that has been printed into a catalogue.

All of these changes imply a cost to upgrade the infrastructure and an increase of risk from the retailer's perspective. So, the question arises, why we are experiencing such a wave of innovation?

The answer lies in a combination of market drivers of which the main ones are:

- 1. Rise of smartphones:** Since 2007, with the launch of the first iPhone and of Android based devices, the mobile phone has been transformed into an ever-connected portable pocket-sized computer. Together with the increase in data connectivity by transaction standards like UMTS, LTE and 4G, smartphones have enabled an ever present e-commerce-like opportunity on a small screen device.
- 2. Rise of millennials:** Millennials or Digital Natives born in 1980 or later grew up with connectivity, mobile interfaces and digital technology as part of their life. Digital technology seems to be omnipresent in the life of Millennials to the point that smartphones are often quoted as the channel of choice for any type of service including shopping and payments.
- 3. Emerging new business models and industry convergence:** Start-ups, incumbent layers from the financial services industry and technology providers have been monitoring technology innovations to develop new services as well as to evolve existing services. Payment, data and user interfaces have converged into a multitude of value propositions but ultimately the size and the brand value of companies such as MasterCard, Apple and Google are not only influencing and shaping consumer preferences but reshaping the retail environment through the development of new payment solutions as well as evolving their established products.

These drivers of change are highly interconnected. Moreover, they do not only influence the way consumers expect or are looking to complete a transaction, but also affect all other parts of today's life. From a retailer's perspective, the changes go well beyond payments, and one typical example is the retail channel convergence. Consumers require and expect sales and access to information to be integrated into a seamless and consistent user experience. Their expectations about payment availability and performance are only one of the many aspects of channel convergence, but it is a crucial part of the user experience as well as an influencing factor for the completion of a sales journey.

Fig. 7 - Smartphone adoption Europe (m)

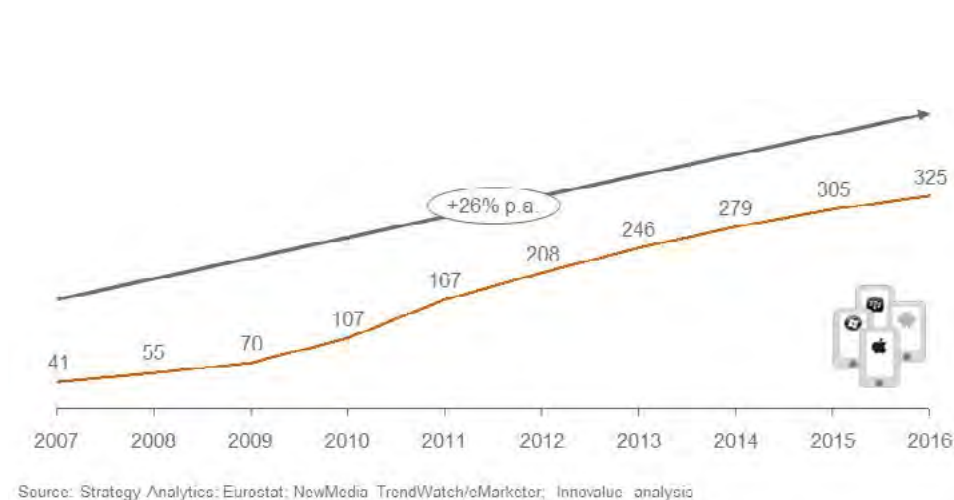
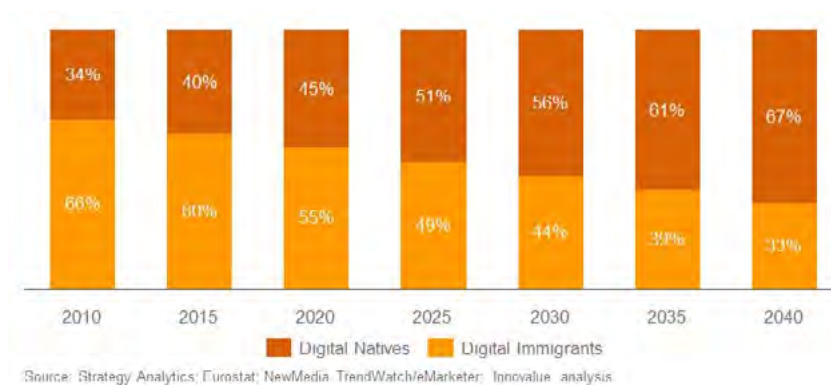


Fig. 8 – Demographic share of Digital Natives vs. Digital Immigrants



“CONSUMERS REQUIRE AND EXPECT SALES AND ACCESS TO INFORMATION TO BE INTEGRATED INTO A SEAMLESS AND CONSISTENT USER EXPERIENCE.”

6 - NEW CHANNELS, CONSUMER PERCEPTION, ATTITUDES AND PREFERENCES

Understanding consumer preferences and the ability to leverage the right triggers for the desired consumer behaviour are key factors for retailers to be successful in growing the rate of check-out completion. Consumer behaviour can vary significantly in regards to its payment preferences. Often the availability of a specific payment method can be a deciding factor for the consumer to complete his or her purchase.

Across all retail channels, shops, e-commerce and mobile commerce, consumers are growing more demanding and their needs and wants are increasingly more varied than ever before. On the one hand, customers have “classical” needs, such as the payment step of the transaction to be convenient, secure and at no cost to them. On the other hand, consumers are showing a new set of requirements: seamless and consistent experiences regardless of sales channels, value added services such as loyalty programs and in the perfect solution all of these services are connected to the consumer’s mobile phone for his or her convenience.

Consumer payment preferences at a retail point of sale

Nowadays, in-store retailers have to deal with a wide spectrum of consumers: those who prefer to pay in traditional ways such as cash, those who prefer payment cards – debit, credit and prepaid – and the younger technologically savvy “Generation Z”¹⁵, who may want to use their smartphone for everything.

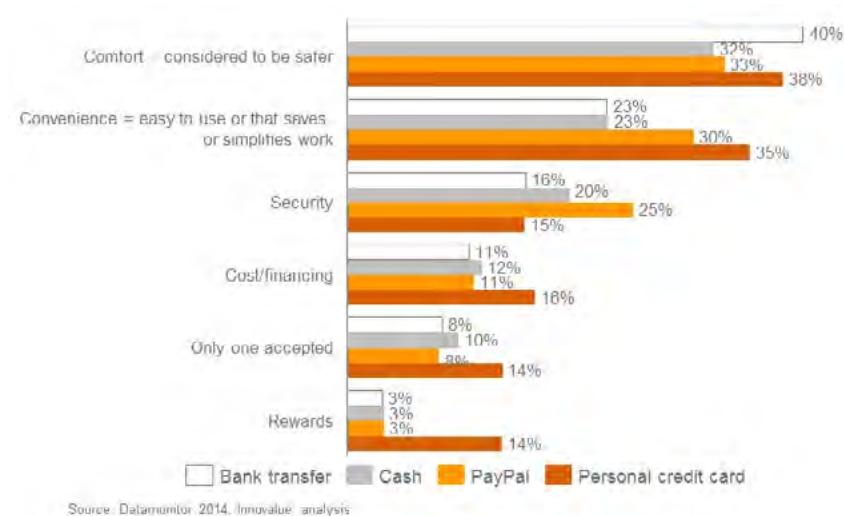
15) Born between 1995-2012, coming of age between 2013-2020. Source: www.socialmarketing.org

Most consumers prefer to pay with a card or cash at the retail POS with cash payments being most prevalent for low value transactions, typically for purchases between € 0,01 and € 25,00. This type of payment behaviour is now changing rapidly as contactless payments through cards or mobiles are offering a convenient method to eliminate cash in low value payments. Nearly half of all consumers globally have or want to use contactless cards¹⁶. Overall, consumers continuously show a growing preference towards electronic payments and small value transactions are no-exception. NFC transaction market is forecasted to experience staggering grow in the next 8 years, according to recent research from ReportsnReports.com, growing at an estimated CAGR of 8.83 percent from 2014 to 2022, reaching a total global contactless transaction value of \$16.25 Billion by 2022.

Drivers for consumer e-commerce payments behavior

As already mentioned in the previous chapter, payments are more fragmented for e-commerce channels. Not so different from the typical findings for the in-shop payment preferences, there are some key factors influencing consumers' choices in terms of payments. Datamonitor's research on online consumer preferences in 2014 in a sample of European countries shows that the main reason to choose a specific payment method is comfort (25% - 40%), followed by convenience and security. Rewards do not appear to be a relevant driver for consumer behaviour with the exception of payment cards.

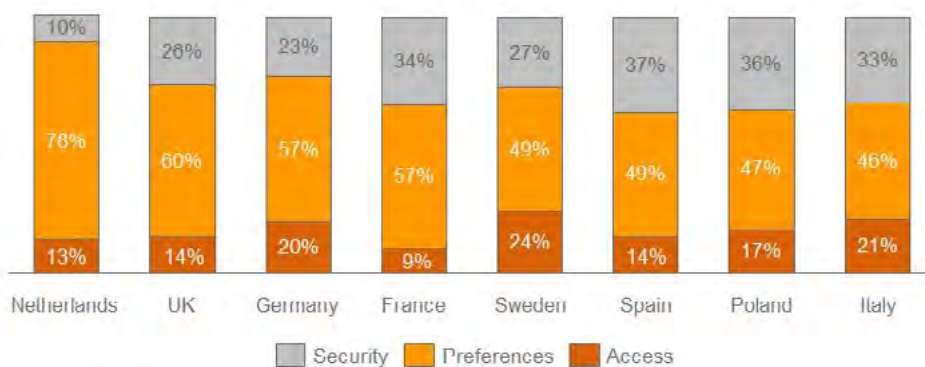
Fig. 9 – Factors driving online consumers' payment preference



Within this context it is also worth mentioning that there are still significant barriers to e-commerce adoption as more than 50% of European consumers in Datamonitor's research still do not trust online payments, and, as such, they avoid them. Reasons range from lack of access to security issues as well as general preferences – factors that appear to limit the consumer attitude towards e-commerce in a similar manner across most of the largest European markets.

16) DataMonitor 2010 and 2014

Fig. 10 – Consumers’ reasons not to shop online in selected European countries



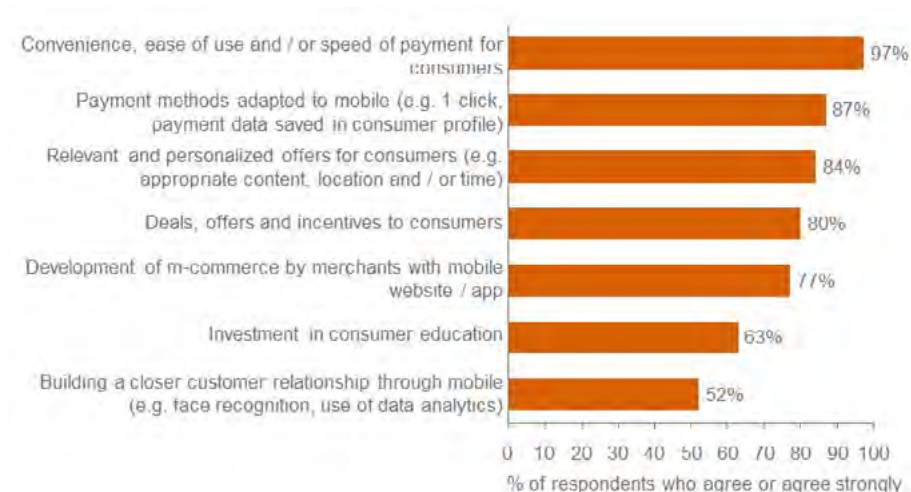
Source: Datamonitor Financial Services Consumer Insight Survey 2012 ,Innovalue analysis

Online retailers may have to consider such factors if they were to reduce the share of online non-buyers or to reduce the probability of consumers abandoning their trolleys without completing their purchases. For example this could be reached through leveraging consumer preferences for payments with a higher (perceived) security standard.

Consumer mobile payment preferences

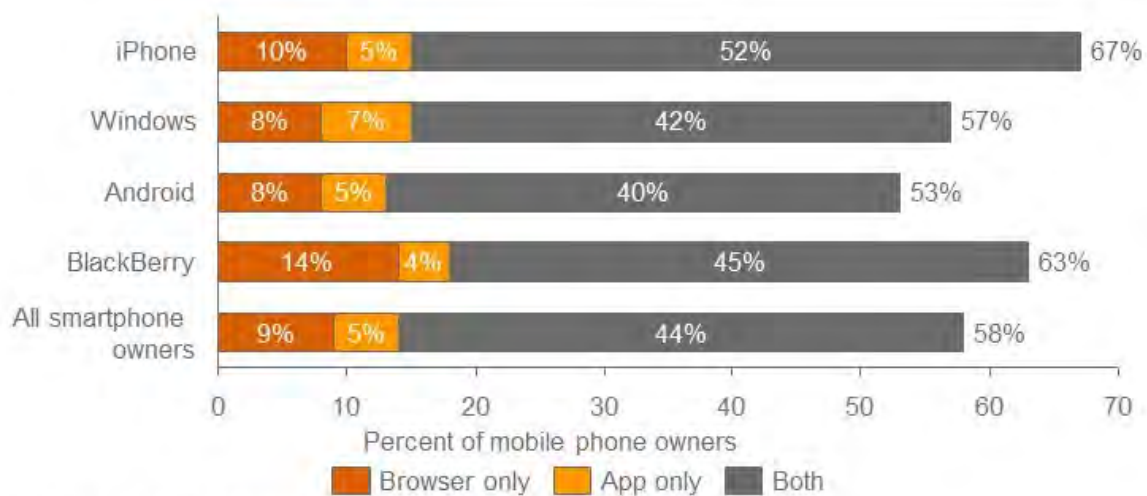
Consumer mobile payment preferences appear to be driven by a more complex number of factors, e.g. the growing number of smartphones, improved mobile data connectivity and overall social changes. Analysing these drivers for consumer adoption of m-payments, one of the key factors is once again “convenience”. But it is worth noting that “speed of payments” (including a quick purchase in store as well as 1-click-ordering via mobile apps) and value added services like incentives and personalized offers, also score highly within the context of the research. These new factors appear to be highly relevant in the context of mobile commerce and provide a valuable indicator to retailers searching to maximize sales through the mobile channel.

Fig. 11 – Key drivers for consumer adoption of m-commerce/ m-payments



Source: Edgar, Dunn & Company - Advanced Payments Report 2014

Fig. 12 – Penetration of m-commerce by type of handset operating system in use



Source: Javelin Strategy & Research 2014, InnovaValue analysis

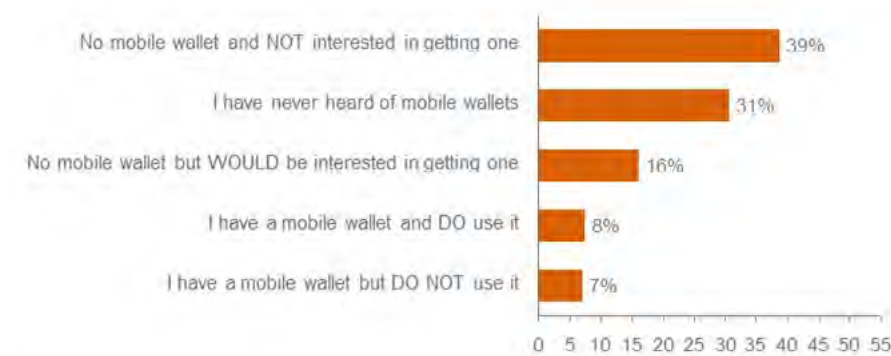
While the majority of consumers quote security as a key requirement, they tend to trust and seek ease of use and convenience from a secure payment service provider, a financial services website or a dedicated secure application (e.g. a wallet with trusted password management functionality). These solutions are, in most cases, sufficiently secure, but often require new infrastructure or can prove challenging to roll out. NFC technology, for example, is versatile and a secure transaction capture interface. It offers significant opportunities, especially in low value payments and the convenient interface can also be used for non-payment transactions like loyalty. Nevertheless, it took NFC a long time to achieve market recognition and an early critical mass. Despite having been a convenient payment technology available to players for over fifteen years, it is gaining traction only lately after having reached a broad support by the ecosystem. This system does not only include payment providers, banks, mobile network operators and retailers but also telecommunication, internet and mobile manufacturing companies such as Apple, Google and Samsung. The latter made consumers aware of NFC on their devices whereby they facilitated an acceleration in adoption and usage.

Within the context of mobile payments the prevailing product and trend is mobile wallets. Mobile wallets are applications that can store a multitude of cards and account details from different issuers and banks. Although consumer adoption is not yet very high, it is expected to grow rapidly based on the number of consumers that are manifesting interest to adopt such a product. 16% of European consumers are interested in getting a mobile wallet in the short term and 22% of European consumers see the benefits in the use of a mobile wallet based on Datamonitor's research¹⁷.

European early adopters of mobile wallets claim an overall positive user experience, 71% of respondents. Those who use mobile wallets regularly, appear to find them "very helpful" for payments purposes; 8% of respondents "feel safe" by paying remotely via the wallet. Furthermore, 22% of wallet owners think that wallets do "simplify their shopping experiences".

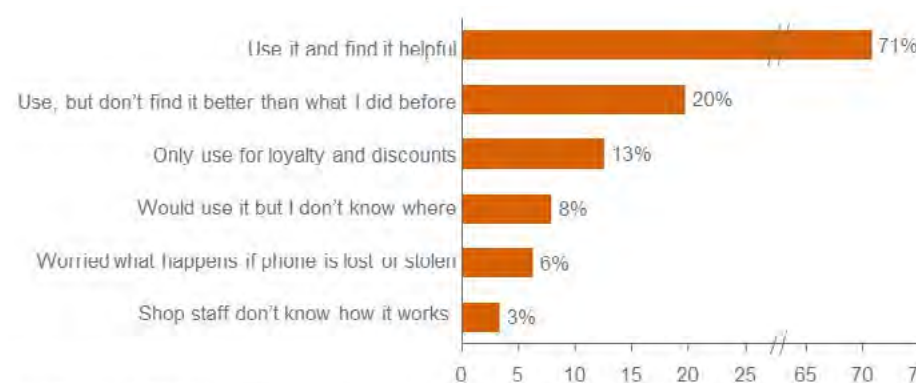
Therefore, on the basis of these factors, consumer preferences appear to be supportive of increased mobile wallets adoption and of their increased role in shopping check-outs in the future. As mobile wallets gain traction, these are factors that retailers will have to consider in developing their payment acceptance strategies to maximize sales throughout all channels.

Fig 13 – Mobile wallets penetration



Source: Datamonitor 2014, Innovaue analysis

Fig 14 – Consumer attitudes towards mobile wallets



Source: Datamonitor 2014, Innovaue analysis

“WHILE THE MAJORITY OF CONSUMERS QUOTE SECURITY AS A KEY REQUIREMENT, THEY TEND TO TRUST AND SEEK EASE OF USE AND CONVENIENCE FROM A SECURE PAYMENT SERVICE PROVIDER.”

As mentioned, consumer preferences at checkout are very important for retailers as these are not only influencing consumers' willingness to shop but they also have an impact on trolley abandonment rates. Ultimately consumer preferences, together with the leveraging of mobile devices for payment purposes are leading to a change in the way transactions are initiated and settled at checkout.

7 - NEW WAYS TO PAY AT CHECKOUT

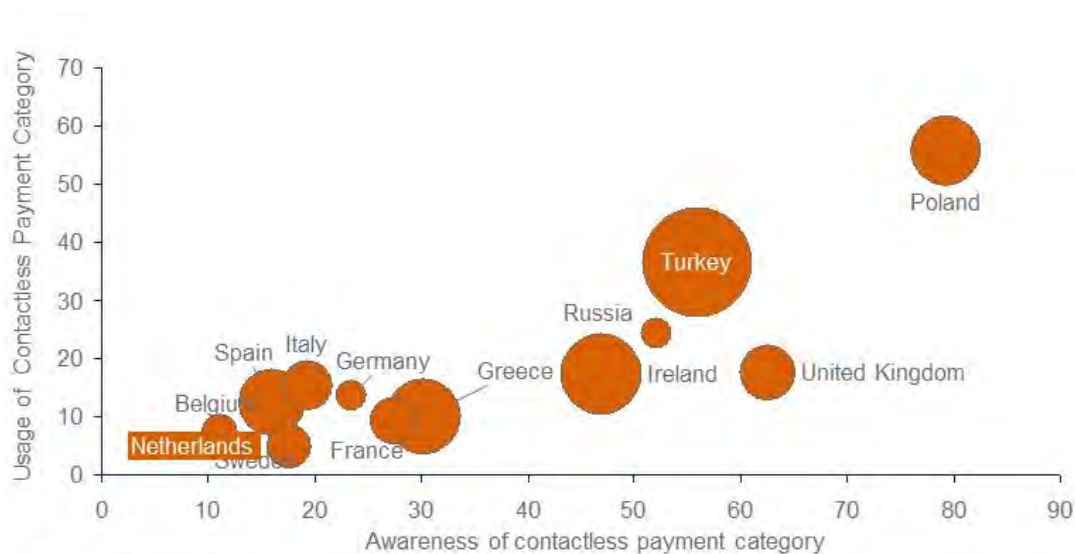
One of the most common instruments to initiate an electronic transaction is the use of a plastic card with a magnetic stripe and/or a chip with a POS terminal. With the increased adoption of smartphones, there are a number of initiatives emerging: NFC (Near Field Communication), Bar-/QR-code, Bluetooth Low Energy (BLE), alpha-numeric codes and/ or geolocation.

NFC is the most known of these emerging technologies because it is often installed on payment cards and not only used by smartphones. NFC is a short-range wireless communication technology that enables data transfer between two devices without requiring physical contact between them. A connection is automatically established in less than one second and therefore the system enables very fast and convenient checkouts. NFC is expected to be the fastest growing of the existing new technologies thanks to the Apple's release of iPhone 6 and iPhone 6 Plus and the adoption of other handset manufacturers such as Google, and Samsung. As a transaction capture interface NFC is going to be part of mobile wallets.

It is to be said that NFC isn't only an ideal payment initiation interface for a handset device, but it is also the best suitable technology and user experience to be leveraged for cash substitution, in particular in small value transactions.

Therefore, NFC is increasing in Europe. The total number of contactless cards within the EU29 was 129.6m in 2013 with 555.6m transactions to a value of € 5.2bn. UK and Poland are the two countries leading this growth. In 2013 the UK market had 36.5 million contactless cards, up from 20m in 2012, to a purchase volume of € 770m. On its side, Poland had 20m cards in 2013 and has become the leading NFC market in Europe in which contactless enabled 19.3% of card transactions to a purchase volume of € 1.5bn. Amongst the new payment types, contactless is the interface that has gained the most consumer awareness and recognition.

Fig. 15 – NFC consumer awareness, usage and interest in Europe



Source: Global Consumer Tracker (GCT) – 2013 (Online survey of banked respondents aged between 18 – 65 years),
Innovalue analysis

A QR-code in general is a comparatively simpler technology that can be used for online as well as in-store payments. Generally, the QR-code is displayed at a payment terminal or on a web page. The payer initiates the payment by having the code read by his or her mobile phone and then by authorizing the transaction by a PIN number input on the same mobile terminal. The advantage of QR-codes is their relatively easy implementation as most screen terminals are able to show them. A product and its QR-code can be displayed in a poster or in a catalogue which offers potential customers to complete an order instantly at any time and to have it delivered at a registered address. These latter types of transactions have been subject to a number of attention grabbing trials over the last few years positioning QR-codes as perfect solutions for location-specific, self-serviced, remote sales.

There are a few other technologies at various stages of testing and roll out – such as Bluetooth Low Energy (BLE), Geolocation, alpha-numeric codes and sound authentication. Amongst these, BLE is the most important from a retailer perspective as it is experiencing growing popularity and it is currently supported by an increasingly large number of start-ups as well as by established companies such as Apple through its iBeacon technology. Retailers would need to install small devices called “beacons” to be positioned in store to capture transactions as well as to provide location-based services such as coupons. It has to be noted that a common misunderstanding about BLE is that although it can be used as a payment initiation method, it is a better complement to NFC by enabling location based services. In addition to the possible payment-use, BLE can also be used for information transfer. Consumers are able to pull information and merchants can push information through the device to support a consumer journey, promote goods or provide incentives and discounts.

Summing up, amongst all of the emerging technologies, retailers expect that NFC will be one of the most important transaction technologies for their businesses, based on the PCM Research in 2013.

Fig. 16 – Type of solutions and technology that merchants deemed to be best for their businesses



Source: PCM Research 2013, Innovalue analysis

Within this context, mobile wallets are the typical payment products through which NFC is going to be leveraged. Most known examples of mobile wallets are Apple Pay, Google Wallet and wallets from mobile network operators.

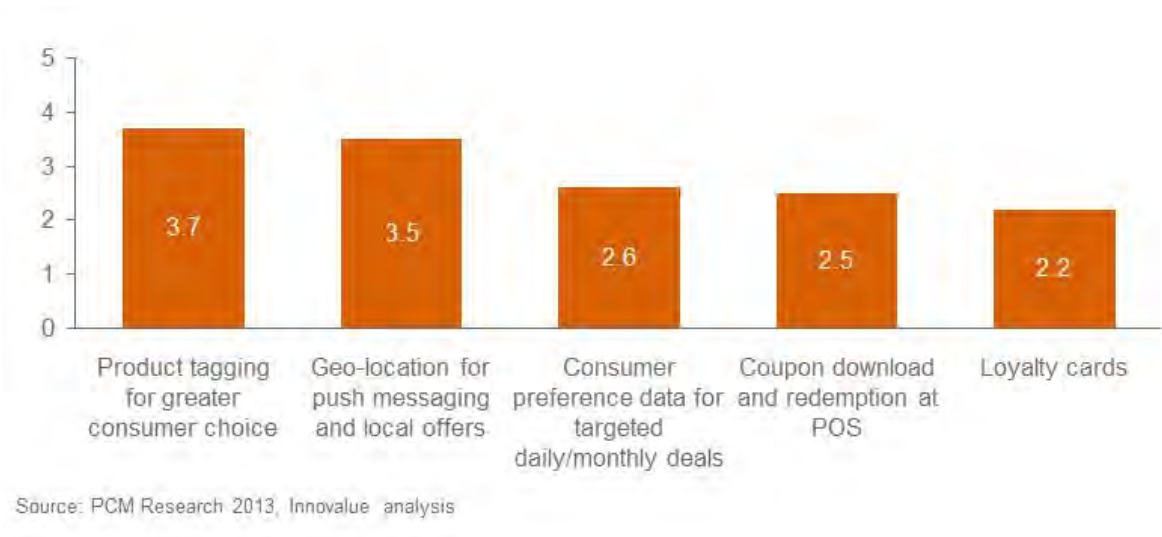
The additional relevant functionality from a retailing perspective is the option for users to store and control their online shopping information, like shipping address and payment card details, in one central place. It provides a technologically convenient method for consumers to access an easy consumer experience and buy services online through seamless transactions.

All of these new ways to pay will change not only the way consumers shop but also potentially the way retailers interact with consumers and the amount and type of information that they can access to enrich the customer experience.

8 - THE ADDED BENEFIT OF VALUE ADDED SERVICES

The concept of value added services (VAS) is quite old but not old-fashioned. VAS are still part of the current consumer buying experience at a high rate and, through new devices like smartphones, they will evolve both in terms of reach and scope. Retailers have clear expectations on what type of VAS they would seek to leverage from cards and online payments as highlighted by a PCM Research in May 2013. Product tagging and geo-location services appear to be most popular amongst all possible VAS-options.

Fig. 17 – Value added services sought by retailers from mobile devices



VAS are changing with the rising break-through of smartphones as these offer an ideal platform to develop and deliver VAS applications. Smartphones enable location-based services and they are able to provide access to dynamic services whereas a retailer can

Fig. 18 – Value added services most likely to be used by consumers



Currently there is a very crowded/ competitive space with a number of start-ups, as well as MNOs, in addition to incumbent retailers trying to play a role in the field of VAS-programs. Ultimately this will result into an increased set of choices for retailers in terms of availability of these programs.

While there is a lot of value that retailers can derive and add to consumers through the new payment methods and through value added services there are threats that will need to be addressed.

9 - FRAUD AS A LONG TERM CHALLENGE TO THE FUTURE RETAILING BUSINESS

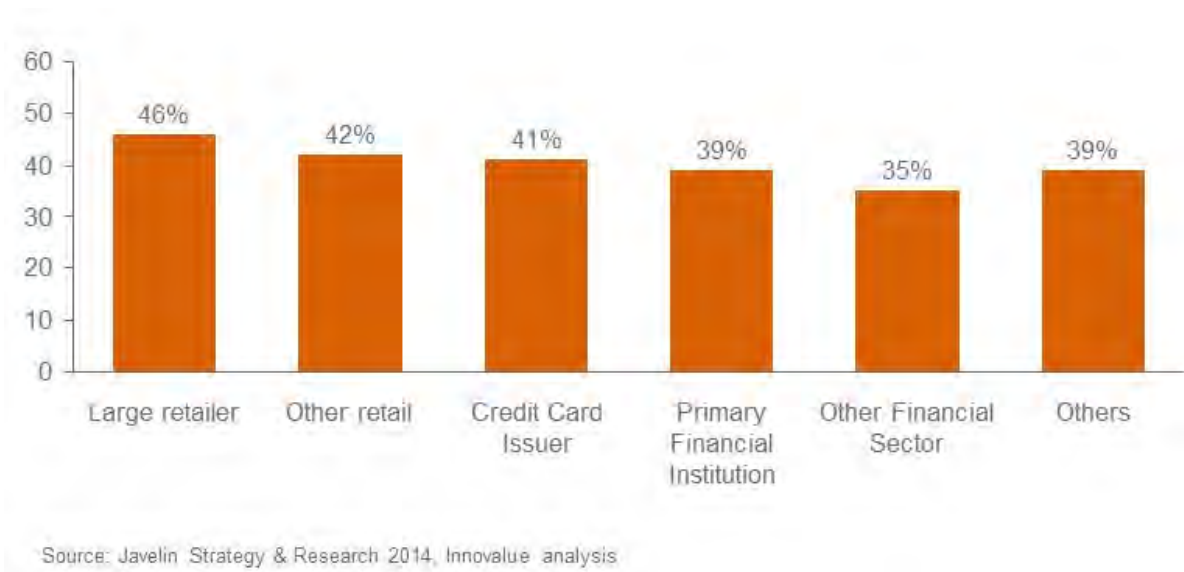
“Payment fraud” is a term that refers to a payment that takes place through a payment instrument that has been compromised and that has not been initiated by its rightful owner. This may happen through all retail channels, when goods are paid for in a shop at a POS terminal as well as online or through a mobile commerce interface. Payment fraud may occur as a result of an account take-over as well as by the use of a counterfeit or stolen and compromised card. The affected parties are not only consumers and the financial institution whose product has been compromised – the consequences extend also to the retailers. The direct effects include stolen consumer money, losses that are typically covered by the financial institution, and the violation of personal data. Indirect effects are potential damage to the reputation of most of the involved parties and the damaged consumer trust that may lead to the change of purchasing patterns.

Even though all of the players involved in the payment value chain invest significantly to prevent, contain and reduce fraud, it is still a relevant issue affecting consumers.

14.2% of all European consumers¹⁸ and 17.5% of consumers globally experienced at least one fraud incident during 2013. Even though the number of affected consumers appears to be significant, the total fraud losses show that fraud only accounts for 0.04%¹⁹ of all transaction values in the case of payment cards.

Analyzing former fraud incidence rates, one can see that fraud affecting the retailer infrastructure represents the greatest risk for the affected consumers. These fraud incident types include card details stolen and PIN compromised in a physical environment, or stolen credit card credentials from online payment gateways.

Fig. 19 – Frequency of fraud incidence by type of organisation/ location type



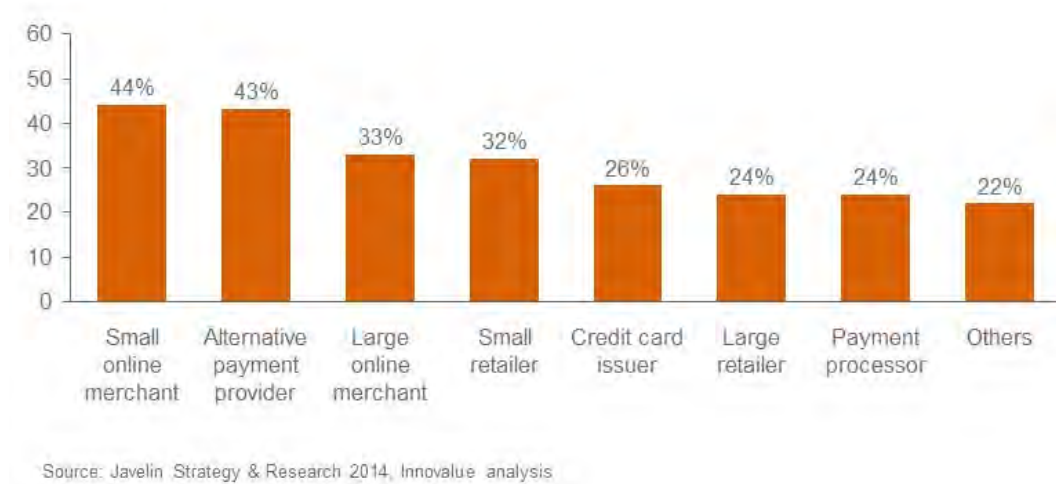
But what are the consequences of payment fraud to retailers? Assuming that a retailer has satisfied all requirements and that the infrastructure has not been breached: none. However, while at least there is no direct financial impact, the consequences from a consumer perspective are relevant, even if not often appreciated in their magnitude and gravity.

One severe consequence is the consumers' reaction to the fraud. As the following graphic shows, 44% of victims avoid online retailers where fraud incidents have taken place, hence damaging future sales and potentially affecting brand and reputation through negative word-of-mouth. Therefore, from a retailer's perspective, preventing and avoiding fraud means securing revenues and preserving brand value.

18) Source: Datamonitor 2014, regarding EU10

19) Source: ECB – Third report on card fraud (Feb. 2014); Using cards issued within SEPA 8 all reporting schemes

Fig. 20 – Proportion of data breach victims that avoid the organization where the breach occurred



It is important to mention, that even if the fraud accident is not a retailer's fault, consumer perception is likely to be misled and the fraud accident is likely to be associated to the retailer itself²⁰. This risk is in line with the post-payment-fraud behaviour of consumers as 67.2% of consumers/ victims globally were more cautious in making payments and completing sales²¹.

Consequently, retailers have developed fraud prevention strategies of their own. Often these are generally adapted from the financial services industry as compliance to payment acceptance requirements. This is a reductive approach as retailers potentially need to make a bigger contribution in this context, in particular in regards to channels in which the offering of payment technologies and consumer preferences are more fragmented. The preference to more secure online payment methods (e.g. wallets such as MasterPass) or the support of tokenisation, which can be used online as well as in mobile payment applications, do not only protect the retailer but also the consumer and it prevents unnecessary risks. Overall, fraud is as bad for the payments industry in general as it is for retailers and customers. Adopting a reductive approach to tackle the issue is not the most advisable course of action.

The challenge is such that regulators are taking steps to, in their view and approach; address fraud by mandating "strong customer authentication" in a range of payment scenarios²². Ultimately the EU's Payment Services directive 2 (PSD2) will impact payments providers as well as the methods of payments available at brick-and-mortar and online checkouts.

Within this context it is important that the retail industry understands, and address, all the possible points of compromise throughout the payment lifecycle beyond the transaction capture and authorization steps.

20) Source: Javelin Strategy & Research, 2014 Data breach fraud impact report

21) Source: Datamonitor 2014

22) <http://www.out-law.com/en/articles/2014/september/psd2-eu-ministers-move-to-tighten-payment-authorisation-requirements-for-mobile-app-payments/>

“44% OF VICTIMS AVOID ONLINE RETAILERS WHERE FRAUD INCIDENTS HAVE TAKEN PLACE, HENCE DAMAGING FUTURE SALES AND POTENTIALLY AFFECTING BRAND AND REPUTATION THROUGH NEGATIVE WORD-OF-MOUTH.”

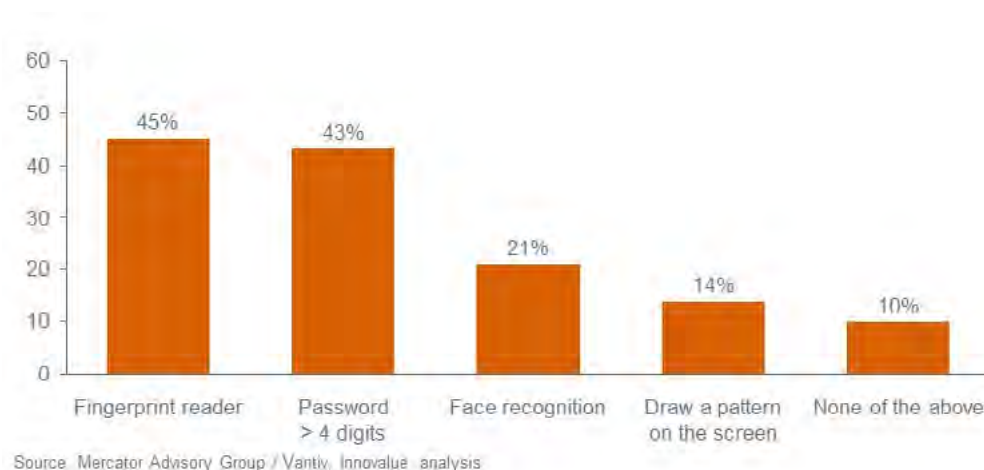
10 - The implications of payment credential storage for retailers

While the method of initiating a transaction is relevant to the retailers as they would have to ensure that their checkouts are able to accept those payments, the storage of the sensitive payment credentials is even more important as it constitutes the weaker link of a payment device and it is one of the likely targets of fraudsters. The data breach compromising over 40 million debit and credit cards in December 2013 at Target Corporation²³ is only one of the high profile cases that hit the news recently.

As e-commerce payment types keep growing in numbers and types and as mobile commerce grows with similar implications, the vulnerabilities of devices will create risks for all parties involved including retailers, in addition to banks and payment organisations.

In August 2014, almost eight months after the data breach at Target Corporation was first revealed, the estimated cost its shareholders was value to \$148 million²⁴. While the cost of damages and fines is quantifiable there is an even higher brand damage cost that is rarely quantified. Consumers rely on a feeling of security when deciding whether or not to shop at certain online stores. While “actual security” is practically factual and can be measured in numbers like the percentage of compromise cases, fraud figures, etc., “perceived security” is a relative factor and is it based on the feelings that are based on past experiences, expectations and word-of-mouth as well as the influencers’ views about the likely “actual security” of using a certain payment method or entering a certain store. As the graph below illustrates, consumers have their own perceptions of security of authentication methods.

Fig. 21 – Consumers’ preferred security authentication methods for mobile devices



23) “Target security breach affects up to 40M cards”. Associated Press via Milwaukee Journal Sentinel. 19 December 2013

24) “Target Shares Tumble as Retailers Reveals Cost Of Data Breach”, Forbes, 5 August 2014

“Perceived security” is a huge factor in the success of online retail stores – especially for those who fall into the small to medium category. It’s crucial to employ the right security measures, and, in order to guarantee that a business is actually secure, retailers need to start with backends like Firewalls and web application protection. Additionally, retailers need to take a further step and actively scan for threats and/ or vulnerabilities within their websites.

Sensitive payment data is typically stored on a chip or magnetic strip of a plastic card; it can be equally stored on a mobile phone or on any other electronic device like a watch, an entry pass or in items of wearable technologies. On smartphones, the payment credentials are generally either stored on the device itself, as a “secure element” or they are accessed from the cloud and downloaded as required (as in the case of Host Card Emulation otherwise referred as HCE). A hardware-based secure element (SE) is a tamper-resistant container – e.g. the EMV chip – capable of securely hosting payment credentials and sensitive applications or data. The payment credentials can be held in three ways:

1. **As a SIM-based secure element** (integration of payment functionality into the telecom SIM);
2. **As an embedded SE** (through the integration of an additional, secure chip into a mobile phone circuitry);
3. **As other small devices**, for example a microSD card.

All of the three ways have advantages and disadvantages and they are preferred by different players. Mobile network operators typically opt for SIM-based secure elements; handset manufacturers like Apple and Samsung typically prefer embedded secure elements on smartphones while microSD cards have been used by banks.

The choice regarding the most suitable payment solution does not challenge banks, but retailers are also responsible for the acceptance and endorsement of the safest payment methods as well as for the encouragement of consumers towards the safest payment methods.

“CONSUMERS RELY ON A FEELING OF SECURITY WHEN DECIDING WHETHER OR NOT TO SHOP AT CERTAIN ONLINE STORES.”

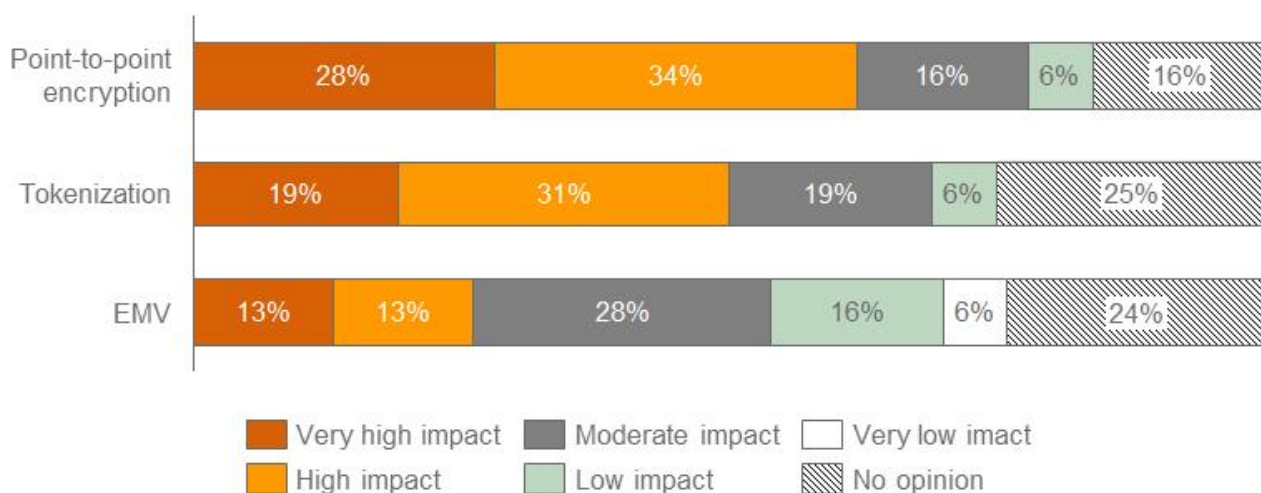
11 - THE SOLUTION TO THE SECURITY CHALLENGE: HOST CARD EMULATION AND TOKENISATION

Host Card Emulation (HCE) and Cloud Storage enable mobile phones to perform transactions while the payment credentials are stored somewhere other than the handset itself. Whenever required, the payment credentials are downloaded from the cloud to a trusted execution environment on the mobile device, or in a virtual, software-based infrastructure on the mobile device and then deleted once the transaction has been completed. HCE is often used by financial services organisations as a way to offer services when they lack access to a secure element and it is a security option open to all payment providers.

The disadvantage of HCE is in fact the lack of a hardware-based secure element. However, this can easily be addressed by pairing HCE with the generation of one-time card numbers, otherwise called Tokens (in a process called “tokenisation”). Tokenisation is a well-established technology that has been available and in use with nice environments for a long time only that, nowadays with growth of e- and m-commerce, it is gaining more public visibility.

A recent Aite Group survey published in May 2014 on the effectiveness of security technologies highlighted that the optimal security solution is not only provided by the anti-fraud systems provided by the payment provider side but also by comprehensive approaches including EMV cards, point-to-point encryption and tokenisation.

Fig. 22 – Effectiveness of security technologies



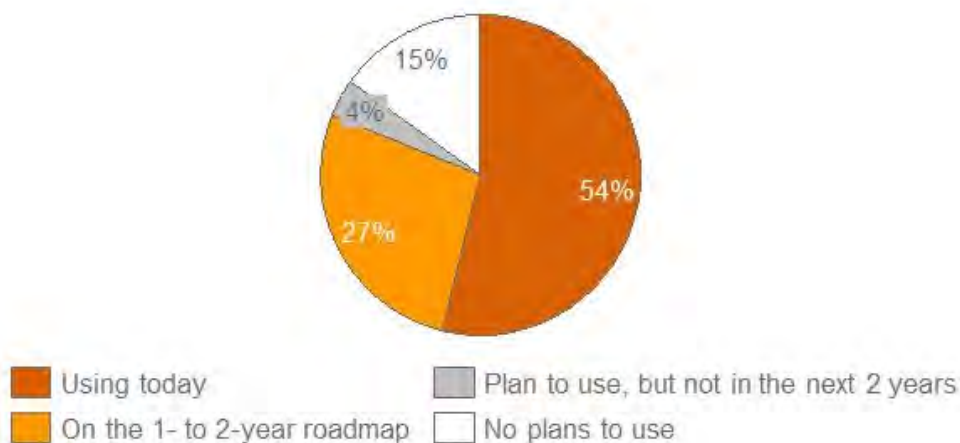
Source: Aite Group survey of 36 U.S. merchants, March to May 2014, Innovalue analysis

Tokenisation is a relatively new concept that is gaining acceptance amongst the retailer community on the basis of its advantages and of its level of security. It completely removes credit card data from retailer's internal payment processing and routing systems and replaces it with a unique, one-off generated placeholder, or "token". Retailers need only the token to authorize a transaction and they don't require the actual card data from the consumer. The token is then matched with the customer's card credentials that are stored at a highly secure, offsite location with the financial institution.

Because of the ability of removing sensitive customer credit card data from the critical steps of a checkout, Tokens are gaining popularity as a preferred option within the wider industry. Apple and Google are already relying on this secure technology to enable payments on their devices. In the future, tokens will be used not only for online payments, but also at the point of sale via payments initiated by mobiles, for example by Apple Pay, Google HCE, etc..

Retailers are no exception to this and tokenisation is gaining attraction as a preferred solution to enable a transaction.

Fig. 23 – Tokenisation deployment by merchants



Source: Aite Group survey of 36 U.S. merchants, March to May 2014, Innovalue analysis

(n=26)

Overall tokenisation offers retailers the opportunity to enable payments that are perceived as secure and that are offering a high degree of actual security to their consumers.

Tokenisation has evolved from concealing the credentials by producing a token to a significant driver to an improvement of the user experience by enabling security on a very simple user interface, not affecting the consumers, similar to a one-click experience.

Tokenisation solutions such as MasterCard's Digital Enablement Service (MDES) token platform for mobile payments, is an example of how the leading market companies are shaping the market through intelligent integration of token solution with applications. MDES supports contactless payments and Digital Secure Remote Payments (DSRP). The latter is a transaction method where a consumer is able to make in-app purchases using a token. While contactless payments leverage NFC technology for point-of-sale (POS) transactions, DSRP delivers EMV-like transactions for in-app payments.

Within this context, retailers should leverage the expertise and experience of payment companies who possess a wealth of experience that is leveraged from organisations whose focus is to enable and secure the transactions underlying our economies. Ultimately it is not a matter of competing or duplicating but to join forces in shaping the direction of digital convergence in the retailing industry in a direction that benefits consumers and retailers alike.

"TOKENS ARE GAINING POPULARITY AS A PREFERRED OPTION WITHIN THE WIDER INDUSTRY. APPLE AND GOOGLE ARE ALREADY RELYING ON THIS SECURE TECHNOLOGY TO ENABLE PAYMENTS ON THEIR DEVICES. IN THE FUTURE, TOKENS WILL BE USED NOT ONLY FOR ONLINE PAYMENTS, BUT ALSO AT THE POINT OF SALE VIA PAYMENTS INITIATED BY MOBILES."

12 - CONCLUSION

Overall physical-digital convergence is transforming the retail experience. Although the traditional store format is not changing significantly, the consumer is: the pervasive innovations have changed their shopping habits and needs. The question is "what does convergence mean for retailers" and, within this context, "why is it important to understand the new payment types?" From the consumer perspective, technology is largely irrelevant, but in the end, it is technology that provides the best balance between the user experience and security that is necessary to facilitate consumers completing a sale through a secure checkout.

Within the increase of channels and payment methods, retailers are also facing risks and threats. Not taking action means potentially losing customers and revenues as the new payment types are increasing the potential points of weakness for fraud. This does not only cause short term financial losses but it also affects the retailer's whole business relationship with the customer-basis. Consequently it is important for retailers to understand the new payment methods: on the one hand, to avoid direct fraud losses and potential brand damage and on the other hand, to protect their valuable customers by

pushing them, through preferential acceptance, to opt for the safer payment technology and, where possible, avoid vulnerabilities.

NFC and mobile wallets have the potential to provide new business opportunities as a payment instrument as well as an enabler of value added services. Within this context Host Card Emulation and Tokenisation offer the ideal combination of technologies to enable a secure multichannel environment for retailers with a browser as well as a mobile interface in online as well as offline environments.

Anticipating consumers' purchasing behaviour, understanding the new payment types and selecting which technology is not only more suitable to a seamless but also a safer checkout will help retailers maximise sales in the short term as well as to safe-guard their relationship with their customers in the long term.

MasterCard has launched products like MasterPass and MasterCard Digital Enablement Services (MDES), enabling in-store and online transactions through NFC, QR-codes, tags, HCE and tokens. This is a typical example of services and solutions designed for a secure and simple customer experience with the ability of providing also VAS, including account balances, real-time alerts, loyalty programs, and MasterCard special offers and experiences that maximize the benefits to retailers and the value to consumers alike.

Ultimately the payment is only the final step to a purchase customer journey that should be an enabler and not a barrier to the completion of a purchase. Both consumers and retailers demand simplicity, seamlessness, and safety but it is up to the payment industry to provide such features and to the retailer to ensure that the simpler, seamless and safer option is made available to consumers both online and off-line.