VeriFone
THE WAY TO PAY™

WHITE PAPER

A Cashless Future on the Horizon

Contactless solutions are transforming payment. Speed, expediency and increased operational efficiency have put contactless on the counter in convenience, quick service and ticketing environments.

Executive Summary

The European payments landscape is changing. Between 2000 and 2008, the number of retail cashless payments grew by over 160%, to 87 billion transactions. Retailers and financial institutions are fuelling the shift from cash to cards, as they seek to reduce the cost of managing, handling, processing and accepting cash payments. According to 2010 figures by Retail Banking Research, 'cash' costs the industry around €84 billion each year - equivalent to 0.6% of Europe's total GDP or €130 per person.

Numerous factors will drive cash substitution including the Payment Services Directive, the Single Euro Payments Area (SEPA), payment card interchange fees and Merchant Service Charges. VeriFone believes that retailers' acceptance and promotion of new POS technologies such as contactless will play a crucial part in this transformation.

Many experts concur that contactless payments for small purchases has the potential to drive debit card usage even higher and expect to see a significant increase in the use of contactless cards in countries such as France and the UK from 2010 onwards.

Undoubtedly, momentum behind contactless is growing. Major card issuers are moving from trial to roll-out; the business case for merchants is becoming increasingly powerful; and consumer benefits more visible. VeriFone aims to help the industry move to the next stage by offering a range of compliant, secure and easy to integrate POS infrastructure capable of meeting their needs today and well into the future.

VeriFone believes that by using new contactless payments platforms, retailers can benefit from greater speed, convenience, revenue and loyalty while reducing consumer reliance on cash and the operational burden that it brings.

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Overview

Recent innovations at the point of sale, such as chip and PIN and the adoption of wireless technologies, have brought about significant changes to the way consumers pay. As we shift from cash to e-payments, contactless is the latest technological revolution to transform the customer experience at the point of sale (POS).

Contactless payments are simply payment transactions that require no physical contact between the consumer payment device and the physical point-of-sale (POS) terminal. The consumer holds the contactless card or device in close proximity (less than 2-4 inches) to the merchant POS terminal and the payment account information is communicated, wirelessly, (via radio frequency (RF)).

In the US, contactless cards are non-EMV and work like magnetic stripe cards – typically PayPass Magstripe and VISA MSD. The cards do not control amount remaining and all payment passes without a PIN; and usually in off-line mode. The security level is no greater than with classical magnetic stripe card transaction. In Europe, the focus is on EMV cards which have two interfaces: a contact one, which works as a normal EMV card; and contactless which provides optional PIN authorisation where additional security is required.

Contactless payment has progressed reasonably quickly since the emergence of the first products in the USA in 2004. Datamonitor estimated 80 million contactless devices globally at the end of 2008. Today, it values the global contactless market at potential value of $963 billion a year. In the US the potential is enormous, with low value cash transactions of $297 billion per year. The UK is also a major market with 18 billion sub £15 cash transactions each year.

Card issuers and banks have been the first to champion contactless. EurActiv reports that Visa Europe is spending around €10 million helping retailers to adopt the new technology with the vast majority of contactless devices distributed across the UK. Italy and Turkey are the other two front-runners, while pilot projects are in progress in France, Germany, Poland, Spain and Switzerland.

Outside retail, a major area of potential growth is urban transport. Major trials of open loop ticketing and payment systems are already being trialed in US, Asia and Europe. Examples of widely used contactless smart cards are Hong Kong's Octopus card, South Korea's T-money (bus, subway, taxi), London's Oyster card, and Japan Rail's Suica Card, which predate the ISO/IEC 14443 standard.

Examining the Gains

Retailers and consumers have traditionally resisted using payment cards for low value transactions. Consumers think cards are slower than cash and do not associate them with buying routine day-to-day items. Retailers see the cost of processing a traditional card transaction, often needing online authorisation by the card issuer, as unattractive and too costly for low value payments.

At the same time, everyone recognises that cash does present its own problems. As well as being inherently insecure, it is expensive to handle, and errors are commonplace.

There is, therefore, a real and sizeable market for a true cash replacement product that is faster, more convenient and more secure than notes and coins Contactless, which combines EMV standards with wireless technology, offers just such a solution.

For issuers and service providers alike, the contactless payment interface stimulates additional card-based transactions. The Smart Card Alliance's investigation of contactless payments in the US confirmed that not only is this technology significantly faster than contact chip and PIN transactions, but also reported:

- increased cardholder transaction volumes
- increased average transaction size
- increased transaction speeds

The two primary benefits of contactless payment for both consumers and retailers are speed and convenience. Market research firm Tower Group estimates that contactless payment can reduce individual transaction times by 10 to 15 seconds and, in busy retail environments, this speed of service is attractive. For this reason, contactless payment transactions below a certain threshold can be made without requiring cardholder authentication.

In the USA contactless can be used for transactions between $5-50. In the eurozone, contactless cards can be used for total purchases of up to 25 euros. In the UK the upper threshold has been raised from £10 to £15 to bring them closer in line with European limits.

CONTACTLESS PAYMENT BENEFITS

Card Associations and issuers:
- increased card transaction volumes and revenue
- penetrate cash transaction markets
- minimal change to infrastructure

Merchants:
- reduced transaction times
- reduced cash handling and operating costs
- improved reliability
- ease of introduction to existing payment infrastructure

Consumers:
- improved transaction speed and convenience
- trouble-free – no need to carry cash

Faster transactions equate to faster service and shorter queues, and contribute to lower levels of customer drop-out. For retailers, increased throughput translates to increased revenue — particularly in convenience and quick service settings. In effect, contactless payment gives retailers the ability to better serve a higher percentage of customers entering their premises, thereby generating increased revenue opportunities and enhanced customer loyalty through improved customer service.

Contactless capabilities at the POS means retailers also benefit from lower costs through reduced cash handling and improved operational efficiencies. This makes contactless payment a viable economic proposition, even for small retailers previously unable to justify the acceptance of card payment for low-value transactions.

Tap-and-go payment not only transforms the interaction between cardholder and retailer at the POS but also opens the way to new customer relationship management (CRM) initiatives. In the future, contactless and near field communications (NFC) interfaces will enable payment systems to play a key role in recognising and serving customers in retail environments — cardholders will tap or wave a contactless card on entering the store — or over specific items — to explore personalised special offers.

In terms of deployment, a key advantage of implementing contactless solutions is that the technology can be readily adapted to current payment systems. Existing POS devices can be easily modified with an interface to a contactless reader, giving retailers a 'future proofed' solution to support full-scale contactless rollouts.

Millions of consumers are already familiar with contactless payment technologies through electronic 'wave and go' toll collection systems such as EZPass and FasTraK, and 'tap and go' travel on transit systems such as Transport for London's Oyster card. Now, an increasing number of consumers worldwide are using contactless payment devices — such as cards and key fobs — to speed through payment transactions at gas stations, convenience stores and quick service restaurants (QSRs).

With ever more sophisticated consumers demanding speed and simplicity when paying for goods and services, contactless payment solutions offer the ideal route to genuinely improve the customer experience while simultaneously generating wider business rewards.

Momentum is Gaining

Globally 16 million PayPass cards have been issued for use at more than 56,000 merchants in 19 countries. PayPass alone is now used in 13 countries: Australia, Canada, Japan, Lebanon, Malaysia, Philippines, South Africa, South Korea, Taiwan, Thailand, Turkey and the USA. According to Frost and Sullivan, the global contactless payment card marketplace has grown to almost 1% of all card-accepting merchants, and roughly 3.5% of all general purpose payment cards.

In many cases, the consumer incubator for contactless card usage has been transit. Here, the introduction of bankcard network-branded transport cards has been the 'mode du jour'.

Warsaw City cards in Poland, for example, have proved that contactless technology is highly effective for fare collection in mass transit environments. In addition to speeding the flow of travellers in bus and train stations, this form of automatic fare collection has the added benefit of eradicating cash and fraud issues for transit agencies.

In New York, MasterCard, CitiBank, the Metropolitan Transit Authority (MTA) and VeriFone created a platform that allowed those with MasterCard PayPass cards to gain access to 30 city-based subway stations. VeriFone's PCI certified Secura 720 unattended payment devices and contactless interface, bills the journey direct to their MasterCard. With a transaction time of under 0.3 seconds to read, verify, accept or reject the card and open the turnstile gate, this system allows the subway, which handles 8 million passengers a day, to keep running at peak efficiency even during rush hour.

In some cities, transit agencies and card associations are now using open loop ticketing and payment systems; working together to extend the use of contactless payment solutions. Oyster and Visa operate a co-branded multi-application card for transit and retail payment. Under this arrangement, users benefit from Oyster and Visa's 'wave and pay' function on a single card to quickly and securely pay for low cost items while travelling around London. Similarly, in Hong Kong, over 11 million Octopus cardholders are now able to pay for groceries as well as transport and parking using a single contactless card.

Contactless payment is also proving ideal for unattended turnstile applications, removing the cost of staffing a reception or box office. The technology can be used to identify season ticket holders at cinemas and sports grounds, paid members or session users at fitness centres, or to control access to buildings or events such as exhibitions.

While there is no shortage of transit and ticketing trials, roll-outs and success, there is a consensus that critical mass is needed for contactless to take off, particularly within the mainstream retail environment. Historically, there have simply not been enough cards, in the right places to find readers. Issuers of cards aren't interested in putting cards out unless there are terminals.

However, things are now changing – and fast. In 2010 alone, there have been hundreds of new implementations. Contactless EMV programs are now running successfully in Europe, Turkey, Taiwan, Malaysia, Mexico, Lebanon, Korea and South Africa.

For example, fuel giant Orlen Germany will deploy cashless payment terminals across its entire 511 service station network by the end of 2010 and has already introduced the technology in 120 locations. Furthermore, French company Carrefour will also implement a similar project at its 210 hypermarkets and 1,200 service stations in France. Within forecourts, contactless reduces customer waiting times and increases site efficiency; reducing the time a vehicle spends at the station, so more cars can be served.

By the start of 2010, Visa payWave was live in retail environments in Switzerland, Turkey and the UK, with pilot programmes and implementation plans well underway in most other European countries.

In the UK, many of the first London-based contactless pilots have now gone national: with coffee shops and fast food outlets such as Café Nero, EAT, Krispy Kreme, Prèt a Manger and Yo Sushi leading the way. Here, Barclaycard, in association with Barclays, has now issued over six million contactless cards which can be used in over 20,000 retail outlets across the UK.

Thanks to the foresight of card issuers and acquirers, some of Europe's largest retail brands have now committed to contactless payments as part of their future growth strategies.

Future Growth

According to a study by IMS Research, the number of locations that accept contactless payments is set to increase by over 12.5 million by the end of 2013. IMS also forecasts that the number of contactless-enabled points of sale in existence will grow more than six times faster than the overall EFTPoS market.

A major pioneer of contactless, VISA predicts it will have more than 12 million contactless cards in Europe by the end of 2010. The London-based Olympics in 2012 will provide a unique platform for contactless and is already being billed as the first 'cashless' Olympics. With much media hype and card based investment surrounding the Games, contactless in the UK is set to escalate. It is estimated that one in seven UK residents will have a contactless card by the end of the year.

How Contactless Works

Contactless payment transactions require no physical contact between the consumer payment device and the POS device. In a contactless payment transaction, the consumer holds the contactless card or device in close proximity to the merchant POS solution — there is no need to accurately orient the card or device — and the payment account information is communicated wirelessly (via radio frequency). If multiple contactless devices are held within proximity of a reader, anti-collision will prevent multiple devices from being read. To ensure a deliberate card read, a single contactless device must be placed within range of the reader.

Contactless technology is ideal for speeding up small-value payment transactions where cash is the predominant form of payment. Rather than inserting a payment card into an PIN entry device, or swiping it through a magnetic stripe reader, a cardholder can use contactless to pay for goods by simply waving a card within 2-4cm of the contactless reader.

With no PIN or signature requirement, contactless payment is easy to operate. As a result of the flexibility of form factor permitted by the interface, small contactless key fobs are emerging as a practical and easy access alternative to cards.

The contactless interface can also be used with chip-based cards or in magnetic stripe card environments. In Chip and PIN scenarios, PIN entry can be used to verify contactless transactions. In a non-Chip and PIN transaction, data derived from magnetic stripe-related information and secret data is transmitted by the contactless chip in response to a signal from an Electronic Funds Transfer Point of Sale device. In some instances, this data undergoes authorisation in a manner similar to a magnetic stripe transaction.

The Contactless Transaction

There are two primary components of a contactless system:

- **Contactless reader**: A mechanism which emits electromagnetic waves and is able to communicate with a contactless card appearing in its range. The high frequency radio waves emitted are used to both provide power to the contactless card and to communicate information between the card and the reader.

- **Contactless card or device**: The antenna on the contactless card absorbs the electromagnetic waves emitted from the contactless reader in order to power the transponder. The transponder is a chip connected to the antenna which is able to communicate with the reader. Transponders can be read-only, read-write memory or processor devices, and can be embedded in a card, paper label, key fob, mobile phone and so on.

The process underpinning a contactless transaction is:

- The cardholder waves a contactless card within a few inches of the contactless reader. Once a transponder appears within the range of the device's contactless card reader, the characteristics of the reader's electromagnetic field are changed and the contactless smart chip is powered "on".

- Once the chip is powered on, a wireless communication protocol (system agreement on low level communication parameters) is established between the contactless reader and the card, and the data transmission begins.

- Mutual authentication is performed and secured channel (encryption) is established, if applicable.

Security Features

EMV compliant contactless cards are underpinned by the same advanced technology that secures chip and PIN transactions. Although the use of a contactless interface does not routinely require the consumer to enter a PIN, the card's chip tracks activity — and after a number of consecutive transactions may prompt the user to enter a PIN. This security feature is designed to re-affirm card possession and deter any potential fraudulent use, should the card be lost or stolen.

Additional security measures can also include a unique built-in 128-bit encrypted key on every contactless card, generating a Dynamic Card Verification Value. At a system level, payment networks also have the ability to automatically detect and reject any attempt to use the same transaction information more than once.

Standards

Contactless payments use the international standard ISO/IEC14443 for contactless reader-card communications, and leverage the existing payments infrastructure which has supported payment cards for more than 40 years.

American Express, Discover Network, MasterCard and Visa have all agreed to use a common mark to communicate the acceptance of contactless payments based on the ISO/IEC 1443 standard. The symbol enables consumers and merchant staff to understand how and where to present contactless cards and other devices, so they interact correctly.

Fast Track Contactless with VeriFone

VeriFone is the industry leader in bringing contactless payment solutions to the market, in both integrated and peripheral formats. In February 2007, ABI Research provided independent confirmation of VeriFone's technology and thought leadership in contactless payment, naming VeriFone as one of the top two providers of contactless readers. ABI Research's evaluation criteria included product innovation and feature set, industry leadership and knowledge transfer, global capacity, as well as vertical market focus and product adoption.

VeriFone's leadership position was established a decade ago, when it provided integrated contactless readers to support the first Mobil SpeedPass deployments. In 2004 VeriFone undertook the world's first national rollout of a contactless payment programme in conjunction with MasterCard, installing 70,000 Omni 70000MPDs at McDonald's restaurants in the US.

Since then, it has participated in many worldwide implementations – bringing contactless to everything from banks in Hong Kong and transport systems in Turkey to retail merchants in Canada, fast food in the UK and taxis in New York.

Implementation of any contactless scheme requires consideration regarding compliance and certification with individual payment association specifications. VeriFone POS solutions can be enabled to accept the contactless payment features as currently defined by the following:

Card Issuer	Format
MasterCard/ Maestro	*PayPass:* MasterCard International's contactless payments programme • *PayPass* MagStripe—designed for authorisation networks that support magnetic-stripe credit or debit applications • *PayPass* M/Chip—designed for networks that support EMV Chip data
Visa	Visa Contactless: Visa's contactless payment programme which includes both magnetic-stripe and EMV applications.
American Express	ExpressPay: American Express' contactless payments programme, and contains differentiated specifications for EMV and non-EMV transactions.
Discover Card	Zip: magnetic stripe contactless scheme.

As standards for contactless payment continue to evolve and change, VeriFone's contactless POS technology is designed to be updated as easily as other POS devices - quickly and simply.

VeriFone's Contactless Solutions
VeriFone's modular approach to enabling customer-facing systems with integrated contactless readers gives retailers a 'future proofed' solution that enables the easy upgrade of existing POS equipment to support full-scale contactless payments.

VeriFone's unique side-by-side application architecture saves on costly re-certifications by allowing applications to be installed and run independently. Whether it's a new application or update to an existing application, it can be created and installed individually without affecting existing application certifications.

VeriFone's contactless hardware solutions for contactless include:

- **VX Evolution**
  Representing the next generation of VeriFone's popular VX payment solutions, VX Evolution portfolio includes integrated contactless and VeriShield Protect end-to-end encryption. The portfolio utilises VeriFone's acclaimed Verix platform and comprises four new systems designed to PCI PED 2.0 specifications, all featuring industry-leading performance with ARM11 advanced processors and large standard memory configurations. All optionally include integrated contactless for acceptance of contactless cards, fobs and mobile-phone initiated payments

  VX 520: The countertop workhorse, featuring standard 160MB memory for unprecedented performance and security as well as multiple communications options, including dial, Ethernet, and GPRS quad-band, as well as battery capability for mobile use

  VX 680: A leap forward in mobile payment featuring more memory, more power, and large color display touch screen and full range of communications options for WiFi, GPRS, CDMA and Bluetooth connectivity

  VX 820: A fully-loaded programmable PIN pad featuring a 3.5" color display and touch screen, with a back-lit keypad that is easier to use and builds upon user-based design for easier interaction and data entry. Connectivity is simplified with a single-port link to USB, Ethernet or serial communications.

  VX 820 DUET: A stylish, hand-over payment device with integrated PIN pad functionality that consolidates the functions of a modern countertop device and a separate PIN pad into one, easy-to-handle device for both consumer and merchant use.

Other VeriFone contactless options include:

- **QX120 and QX1000**
  These standalone contactless readers can be easily connected to almost any payment device or POS system for easy upgrading to provide contactless functionality. These stylish and robust devices can be freestanding on the countertop or mounted for maximum customer convenience.

- **MX 800 Series**
  VeriFone's MX 870, MX 880 and other MX Series devices are customer-facing and offer optional contactless modules, that can be fitted as and when a retailer needs. These solutions can be integrated directly with electronic cash registers and existing POS systems.

- **V^x 810 and V^x 810 DUET**
  VeriFone's V^x 810 PIN pad and V^x 810 DUET dual-user countertop solution both offer an optional contactless module that will accept multiple contactless payment forms, from key fobs to cards to NFC-enabled mobile phones.

- **Unattended**
  VeriFone has several unattended multi-media solutions that are perfect for kiosk and pay-at-pump applications. Retailers such as supermarkets, petroleum stations, and convenience stores find its ATM-style key pad, hybrid card reader, and optional contactless reader easy to use. Plus, its large color display allows retailers to stream advertising messages to customers.

Conclusion

The introduction of EMV chip technology across Europe brings added security to traditional card transactions and is enabling the payments industry to introduce new, faster and more convenient ways to pay.

Adding contactless payment to the POS offers significant advantages to retailers where speed and convenience are crucial to maintaining customer loyalty and maximising revenue during peak hours. It also helps convert a high proportion of low-value cash sales to card, thereby reducing operational costs.

Processing payments securely and cost-effectively in seconds, contactless is an ideal payment method in situations where merchants need to process a large number of low value transactions, such as in fast food restaurants, convenience stores and transport terminals. They are also ideal for remote or unattended payment situations, such as vending machines, road tolls or parking meters

As consumer acceptance and demand for contactless payment grows, VeriFone is leading the way by supporting contactless payment at the POS. VeriFone's consumer-facing contactless readers can be easily integrated into any POS architecture as modular add-ons for existing EFTPoS devices, to provide a future proofed solution that supports full-scale contactless implementations.

From banks to retailers, card issuers and technology vendors, the industry is gradually uniting behind contactless. The future success of contactless now depends on broader awareness and a more visible value proposition for the consumer.

With card issuers ramping up consumer campaigns and high profile applications such as the Olympics 2012 on the horizon, it won't be long before everyone begins to buy in to a 'cashless' future.

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