

# The Future of Payments

How payments in the UK will  
evolve in the coming years –  
a view from Consult Hyperion

Commissioned by Payments UK

Authored by Consult Hyperion



03 Executive Summary - Maurice Cleaves, Chief Executive, Payments UK

A View from Consult Hyperion

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04 Introduction & Background

04 Pace of Change in the UK Payments Market

06 Drivers of Change

06 Technology Drivers

08 Digital Currencies

08 Business & Consumer Drivers

10 Regulatory Drivers

12 Financial Inclusion

12 Key Drivers Summary

14 How the UK compares with the rest of the world

15 Comparison with UK

17 Likely Developments

## Executive Summary

Are you reading this on a screen? In 2015, the odds are high that the answer is 'yes'. With PCs, tablets, smartphones and wearables becoming increasingly ubiquitous, technology is touching every area of our lives. Naturally the advent of this digital age has also revolutionised the way we pay and the way we manage our finances. Yet, amazingly you don't need to look too far back to a time when there were no debit cards or cash machines let alone internet shopping or banking, and the only way of paying a regular bill would have been manually with a cheque or cash.

In the past decade the UK banking industry has invested heavily to make sure its customers and businesses benefit from technology advances. Consequently we've seen a steady stream of change - with the introduction of chip and PIN which has made card use safer and more widely available, contactless technology on cards which has made it faster than ever to pay by plastic, Faster Payments which allows internet and phone payments to be made at the touch of a button at any time of day or night and the introduction of Paym which has enabled customers to make secure payments via their mobile using only the mobile number of the person you want to pay.

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**Given the pace of change - and customers' increasing appetite for increased speed and convenience the big question is what on earth is coming next?**

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Payments UK asked this question of Consult Hyperion - who as key technology providers in the retail payments sector are well placed to have a view. This short report gives their opinion of where the world is going.

I think the range of innovation outlined in their report underlines the vibrancy of payments in the UK. There are more than 1,500 payment service providers already in this country and a growing fintech sector; future changes such as the Payment Services Directive 2 could see the number of providers grow further and the range of services available to customers further explode.

Payments UK is set to play a key role in working collaboratively across the industry to ensure all of that potential is harnessed in a way that ensures all of us have access to the safe, reliable yet highly innovative world class payment systems we all need.

**Maurice Cleaves**

Chief Executive, Payments UK

# A View from Consult Hyperion

## Introduction & Background

In the UK, we are in the early days of another period of significant change in how we pay. The UK's financial technology (fintech) sector is leading the world in innovation, and this is being backed up by pressure from the regulators to increase competition and to ensure that access to the country's payments infrastructure is made available on equal terms for everyone, whilst at the same time improving the service to consumers. And the established banks and payments companies are not standing still; there has been significant innovation in recent years, through the launch of Faster Payments to speed up internet and phone transfers, plastic cards being upgraded with contactless technology, and services such as Barclays' Pingit and the cross-industry Paym and Zapp, which enable customers to make use of their mobiles for making payments.

The consumer's adoption of new technologies, in particular the smartphone, is behind much of the change in payments and banking. Smartphones have become ubiquitous, certainly amongst the under-45 age groups, and their owners increasingly expect to be able to use them for almost everything, including payments. The payments industry has responded, and we are seeing for the first time that the aspiration of mobile payments is being matched by the reality of convergence of consumer desire, technology readiness and the development of appropriate business models. This time it's real.

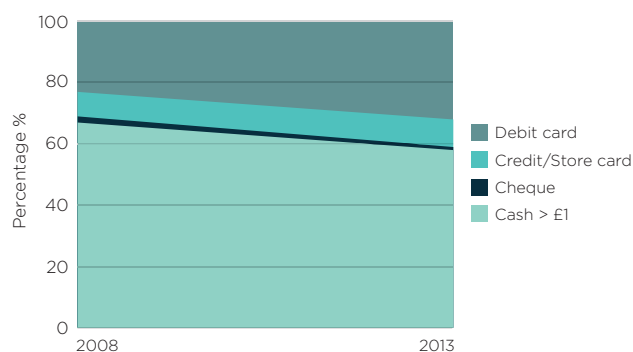
So this paper considers these various pressures and technological developments in some detail, and sets out how we, Consult Hyperion, envisage the UK payments industry developing over the next few years from the perspective of the consumer.

## Pace of Change in the UK Payments Market

It can seem that the pace of change in the payments industry is at times rather slow. So a historical perspective is helpful in illustrating that this is not the case – and that in fact the UK payments market is vibrant and innovative, although the adoption of innovations by the consumer is understandably more restrained. After all, we're all conservative when our own money is involved.

Consider the following diagram, which illustrates how the usage of different ways of paying by British consumers<sup>1</sup> has changed over the five year period 2008 – 2013<sup>2</sup>.

Figure 1: Consumer use of debit cards, credit/store cards, cheque and cash by frequency of use

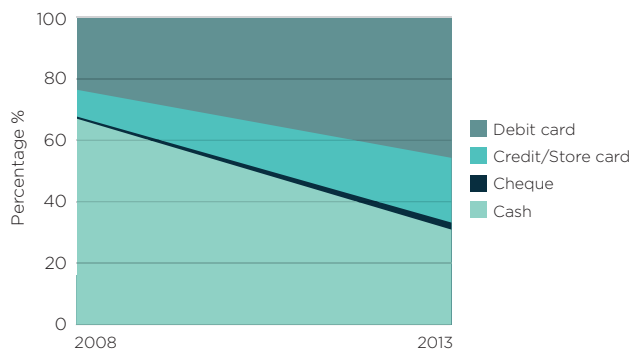


Over the past five years the debit card has consolidated its position as the nation's preferred way of paying for things, with use of both cash and cheques continuing to decline. These effects are only emphasised further by the next diagram, which breaks the same figures down by value, rather than frequency of use.

<sup>1</sup> Strictly speaking, these are what are known as 'spontaneous payments'.

<sup>2</sup> Source: Payments UK, Consumer Payments report. The figures shown exclude payments of regular bills, such as credit card statements and similar.

Figure 2: Consumer use of debit cards, credit/store cards, cheque and cash by value



The debit card is set to become the dominant way of paying for things – it already has, in terms of total amount spent, and is eating into the dominance of cash in terms of frequency of use. Overall, credit and debit cards dominate the world of high street and retail payments. By comparing the two diagrams above and on the previous page we can see that, even though cash is still widely used, its principal use is for low value transactions. In a recent report from Payments UK<sup>3</sup>:

*“Figures published today (21 May) show that the total number of cash payments made by consumers, businesses and financial organisations in the UK fell to 48% last year (from 52% in 2013).”*

*“This is the first time that ‘non-cash’ payments have exceeded those made with cash, reflecting the steady trend to use automated payment methods and debit cards rather than pay by notes and coins. However, cash remains the most popular payment method by volume, followed by the debit card, which accounted for 24% of all payments last year.”*

*“Despite the shift, cash remains the most popular way to pay among consumers, who used it for more than half (52%) of all their transactions in 2014. The current forecast is that this figure will drop below 50% next year (2016), but there is no prediction for cash to disappear.”*

One unexpected feature is that although the frequency of cheque use has continued to decline since its peak back in 1990, the total value of cheques has actually increased recently – the average value of cheque payments tends to be considerably higher than for other types of transaction – the average personal cheque value is now £242.

What’s missing from these figures – missing because they only launched recently – is the rise of mobile payment options that are processed via the UK’s Faster Payments infrastructure. These include Barclays’ Pingit and the cross-industry Paym and Zapp, all of which provide an alternative to using cash, cards and cheques. Customers’ growing preference towards electronic payments was highlighted recently by Halifax<sup>4</sup>, who stated that nearly 85% of its customers’ current account transactions are now electronic, and cash withdrawals now make up just 16.6% of customers’ spending.

So it is clear that significant changes are happening in the UK payments world. We need to consider what is driving those changes.

Cheques are an interesting example of a technology that persists, despite apparent obsolescence. They fit into a particular niche, and customers and organisations that occupy that niche are keen to retain them. There is work underway by the banking industry to extend their life through introducing faster cheque clearing and cheque imaging (allowing customers to take a photo of a cheque and send it to their bank in order to pay it into their account).

But Consult Hyperion believes that, despite the banking industry’s investment in cheque technology, the demographics of who is using cheques means their future looks far from certain. Few people under the age of 50 would be sad to see them go, and the only time that most under-25s see a cheque is when they receive one from a grandparent.

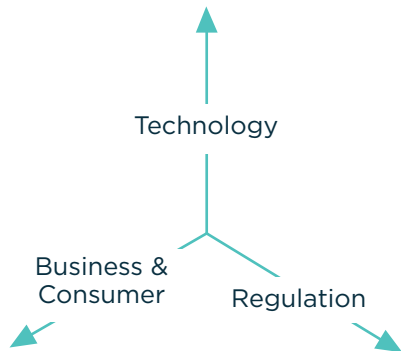
<sup>3</sup> Cash overtaken by ‘non-cash’ payments in 2014, Payments UK, 21 May 2015

<sup>4</sup> “Card is king as cash usage continues to fall – Halifax”, Finextra, 13 April 2015

## Drivers of Change

We at Consult Hyperion believe there are three principal groups of drivers of change in consumer payments; advances in technology; the imperative for businesses to respond to the needs of their customers (and the consequent emergence of new business models); and regulatory pressures.

Figure 3: Drivers of Change Groupings

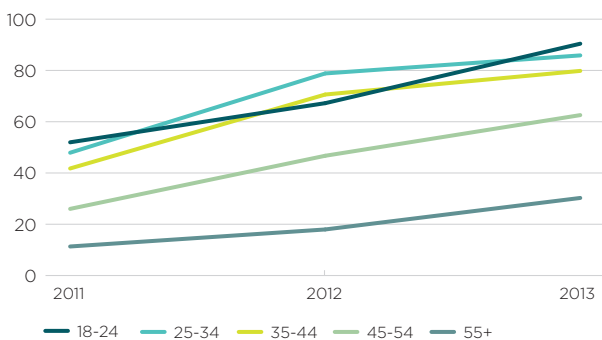


## Technology Drivers

The mobile phone has a very significant role to play in the delivery of services to consumers. In many global markets smartphone penetration is already well above 50% with the majority of those smartphone owners using mobile internet and mobile apps on a daily basis<sup>5</sup>. The UK is no exception, with penetration and mobile app usage both in excess of 60% and growing. However, it has taken time to reach this point. Smartphones have been available for some time, yet it has taken several years for their capabilities to reach the point where widespread use is the norm.

When we consider the usage of smartphones broken down by age group, the long-term influence of this effect becomes most clearly apparent:

Figure 4: UK Smartphone Penetration, by Age



(source: Google)

The under 45s are very enthusiastic adopters of mobile technology (and the under 55s are not far behind), and increasingly smartphone users expect to be able to do EVERYTHING through their mobile phone (“there’s an app for that”). This has clear implications for payments, as suggested in a recent report:

*“Growth continues in the e- and m-payments markets, along with convergence between the two modes, as some e-payments transactions migrate towards m-payments due to increased use of tablets and smartphones. M-payments are expected to grow annually by 60.8% through 2015 while e-payments growth will decelerate to an annual growth of 15.9%<sup>6</sup>.”*

Today’s smartphone is an extremely sophisticated device. Since the arrival of the iPhone and Android smartphones in the late 2000s, the smartphone has gained many features that are extremely useful for payments innovation; for example, a consumer transaction can be geo-logged (fixing the payment to a place), and tying it to that consumer and device. The latest smartphones support Near Field Communication (NFC<sup>7</sup>) for payments – Apple have launched the Apple Pay service in the United Kingdom (which relies on existing card payment infrastructure, together with newer developments such as NFC and tokenisation, of which more below), and Samsung are to launch Samsung Pay for their Android devices some time later in 2015<sup>8</sup>. Smartphones have also gained a biometric capability, with both Samsung Galaxy and Apple iPhone devices incorporating fingerprint readers.

Lloyds Bank have recently been investigating the use of the smartphone, its NFC interface and the contactless cards issued to their customers in an innovative way; the bank-issued card is used to validate that the smartphone (and Lloyds’ banking app) is being used to access Lloyds’ services by the legitimate cardholder<sup>9</sup>. When the customer downloads the app, on first use the customer will be required to tap their debit card to the phone’s NFC interface to identify themselves.

At the moment, smartphones are being widely used for some basic financial transactions, such as balance checking, online bill payments and other general banking functions. We expect the mobile phone to take an increasingly leading role in the payments space over the next five years.

<sup>5</sup> <http://think.withgoogle.com/mobileplanet/en/>

<sup>6</sup> Cap Gemini, World Payments Report 2014

<sup>7</sup> NFC is a technology that allows a mobile phone to interact with a retailer payment terminal, or a contactless payment card; so it can allow the phone to emulate a payment card, or to accept payments from a card.

<sup>8</sup> [www.finextra.com/news/fullstory.aspx?newsitemid=27662](http://www.finextra.com/news/fullstory.aspx?newsitemid=27662)

<sup>9</sup> <http://www.telegraph.co.uk/finance/newsbysector/epic/lloyds/11716844/Lloyds-Bank-moves-closer-to-abolishing-pass-words.html>

At the heart of this trend are two key concepts, which build on the NFC capabilities increasingly available on smartphones:

- Safe storage of payment details in a smartphone, allowing a customer to carry their payment details around in their phone and leave their wallet at home, through the use of a range of technologies known variously as Secure Element (SE), SIM SE, or Host Card Emulation (HCE).
- The removal of the need for passing card or account details to a retailer when shopping, so that a customer need never worry about their account details being misused by a retailer.

This is achieved through a process called tokenisation, in which the card details are replaced with a token derived from the card details. When payment is made, this token is passed to the retailer by the mobile phone. The retailer's device then passes the token on to the bank for verification – the bank is able to verify the token, and authorise payment, and the retailer never has to see the customer's card details.

Tokenisation is not only useful for payments on the high street. It also has the potential to make internet shopping through your mobile phone as secure as chip & PIN.

A supporting trend is the growing use of biometrics<sup>10</sup>. We are already seeing customers using their fingerprint to authenticate transactions (e.g. Apple Pay, Samsung Finger Scanner), but the customer experience so far has suggested that there is room for improvement. For example, fingerprints may always remain substantially the same (as CSI and other TV programmes would attest), but these are not what the technology in mobile phones use – instead they use a simpler derivative of the fingerprint, known as a profile. And it would appear that, for at least some people, the process of generating these profiles is vulnerable to small changes in the fingerprint, so that a profile generated may not be usable (say) a year later, and the customer is required to re-register.

The Halifax has been experimenting with another biometric, which uses the unique rhythm of a customer's pulse as a password<sup>11</sup>. Whether or not this is launched as part of their service remains to be seen.

Consult Hyperion expects to see more sophisticated use of biometrics emerging over the coming years, specifically in the use of multiple biometrics. This might involve a fingerprint being used to access the device, supplemented by another biometric to authorise a financial transaction – perhaps voice recognition (though this might be difficult in a noisy environment such as a shopping mall), or iris checking (via the camera on the device).

Other interesting developments in the world of biometrics include:

- Daon's face recognition and authentication software;
- Finger vein technologies, as currently being piloted by Barclays;
- On-card fingerprint authentication, developed by Zwipe and currently backed by MasterCard.

The natural evolution of both biometrics and mobile payments is in the sphere of wearables. Passive wearables, such as wristbands that can be used for contactless payments, have been around for some time (an example is Barclays' bPay), but we're now seeing the emergence of active wearables, such as smartwatches – which are essentially smartphones without the phone. Examples are the Samsung Gear range and the Apple Watch. With regard to using active wearables for payments, the Apple Watch is leading the way, and demonstrates some innovative thinking around customer authentication.

As is well documented, the Apple Watch can detect your heartbeat. The natural corollary of this is that the watch knows when it's on your wrist, and when it's taken off. To exploit this for payments, the Apple Watch will ask the customer to authenticate yourself (via the customer's iPhone) when it's placed on your wrist, and assume that that authentication holds good until it's removed from your wrist. So paying with the Apple Watch will require no further authentication once you put it on in the morning, provided you don't take it off.

At the moment, initial authentication is made via fingerprint, which, as we've already explained, currently has shortcomings. But there's no reason why in the future it couldn't be supplemented with other biometrics including those that would be difficult to use at the till in a shopping mall – such as iris-scanning, or voice recognition. This then introduces the concept of sustained biometric authentication; perform strong authentication once (to check that the right person is using the wearable, then – provided bio-monitoring indicates that the wearable hasn't been taken off – no further biometric authentication is necessary, though separate authorisation for a payment may still be required.

In the future, Consult Hyperion expects to see reducing reliance on the companion mobile phone, so that all customer authentication is done directly via the watch itself – with a continued emphasis on sustained authentication.

<sup>10</sup> "Biometrics" refers to a set of technologies that rely on measurable characteristics of the human body, such as fingerprints, eye retinas and irises, voice patterns, facial patterns and hand measurements, for authentication purposes.

<sup>11</sup> <http://www.telegraph.co.uk/finance/personalfinance/bank-accounts/11469107/Forget-your-bank-PIN-Halifax-trials-technology-where-customers-are-recognised-by-their-heartbeat.html>

## Digital currencies

Of course, no discussion about future trends in payments would be complete without a mention of Bitcoin. There's no doubt that Bitcoin is an interesting technology, with many financial technologists and commentators enthusing about it. However, the fact is that no matter how good a payments technology is, unless it's relevant to consumers' everyday lives, it has at best a limited future. So what is the benefit to the average British consumer? According to Bitcoin<sup>12</sup> themselves:

- **Payment freedom** - it is possible to send and receive any amount of money instantly anywhere in the world at any time.
- **Very low fees** - Bitcoin payments are currently processed with either no fees or extremely small fees.
- **Security and control** - Bitcoin users are in full control of their transactions; it is impossible for retailers to force unwanted or unnoticed charges as can happen with other payment methods.
- **Transparent and neutral** - all information concerning a Bitcoin transaction is readily available on the blockchain<sup>13</sup> for anybody to verify and use in real-time.

But how much of this matters to a British consumer? International transactions remain comparatively rare, and few people pay transaction fees for domestic transactions. With regards to security, most people think that it's the banks' problem, not theirs; and the idea of transparent transactions is likely to alarm most people, rather than reassure.

Further, most people are, quite reasonably, conservative with regard to their money, and so it would be very difficult to move UK consumers away from bank accounts, payment cards and Pounds Sterling. For all these reasons Consult Hyperion doesn't think Bitcoin will have a significant role to play in the future of payments in the UK.

Interestingly the technology underlying Bitcoin - the blockchain - could have widespread use, as it provides a means of creating a decentralised and irrevocable record of transactions. So it certainly has potential applications for contracts, or passports, or other distributed/offline applications where legal enforcement of contracts is important, but speed of transaction isn't. For now, the potential applications and impacts of blockchain and digital currencies in the payment space remain to be seen.

<sup>12</sup> <https://bitcoin.org/en/faq>

<sup>13</sup> A blockchain is a public ledger of all transactions that have ever been executed against it. It is constantly growing as 'completed' blocks are added to it with a new set of recordings. The blocks are added to the blockchain in a linear, chronological order.

## Business & Consumer Drivers

The strongest driver for development in the retail payment sector amongst the business community is competition, principally aimed at customer acquisition and retention. This has only increased in recent years with the emergence of new payments companies, such as PayPal, and more recently Apple Pay and Samsung Pay. These have increased the pressure on the traditional payments organisations - principally the banks and international card schemes - and has encouraged them to innovate in order to compete, for example through the Faster Payments infrastructural development, and individual services such as Pingit, Paym and Zapp (see below).

Another strong business driver in the retail sector is always cost, and pressure in this area increased on 10th March 2015, when the European Parliament voted to cap interchange fees on credit and debit cards, a move the European Commission said 'could lead to a reduction of about €6 billion annually in hidden fees for consumer cards', but which will also naturally reduce the income of the affected payments companies. Consult Hyperion expects that this decision will remove the business case for many credit card benefits, such as cashback, which have driven customer take-up and use of new services.

**Paym** is the first service with the potential to link up every current account in the country with a mobile number. Friends, family and small businesses can register to receive payments which are made seamlessly from within participating banks' and building societies' existing mobile apps. Launched in April 2014, the service is already available to more than 90% of UK current accounts.

**Pingit** is a forerunner of Paym introduced by Barclays in 2012 that introduced a new and persuasive idea: the ability to pay friends and businesses using just a phone number. The standalone app is open to non-existing Barclays customers and has evolved to integrate with Paym and enable payments to businesses and charities, including using alternatives to a mobile number, such as a QR code.

**Zapp**, scheduled to launch later this year, is a new way for customers to make PIN protected real-time payments to businesses using their existing bank or building society smartphone app. Zapp is working to partner with banks and building societies and retailers and acquirers - 35 major retailers plan to offer the service as well as five banks.



The underlying business needs of retailers themselves have also been strong drivers of payments developments in recent years. Traditionally, small and medium-sized retailers have relied upon a simple payment terminal, whose only functionality is taking payments. But this is only a small part of what many retailers need; many want inventory management (so they know what they have in stock, and how much they have sold) and transaction reporting for the purposes of accounting and stock control.

For these retailers, the principal innovation in recent times has been the development of the mPOS – a point-of-sale device which uses a mobile phone or tablet, with a card reader attached in some way. This market has developed in two distinct directions:

- Small card reader attachments, with an associated app running on a smartphone (two examples are iZettle and PayPal). These are aimed squarely at the small retailer or sole trader who previously wouldn't have found it easy to get the facility to accept card payments. The associated smartphone applications typically offer simple inventory management and transaction reporting.
- Tablet-based solutions, such as Square. These solutions are aimed at slightly larger retailers who need a full point-of-sale service; often the tablet is presented as a touch screen till, with a card reader wirelessly attached. It offers additional support capabilities or the ability to interface to the retailer's existing inventory management system.

In each of the above cases, the retailer will typically pay around 2.5% transaction fees to the service provider. This might seem expensive, but these services give small retailers access to additional capabilities and information services that conventional card companies don't offer, such as transaction reporting and analysis (so the retailer knows what's selling well, and how much he's sold), and some level of inventory management (so, simplistically, he knows how much he's got left).

In addition to these specific drivers, there are more general concerns about new Payment Service Providers operating using innovative business models or technologies, and their ability to support the more complex transactions, such as returns and disputes. The conventional card payment schemes have built up a great deal of expertise in these areas over the course of decades of operations, and it is not uncommon for a startup to fail to realise how complex these are, and consequently to fail to adequately budget for them in their business model.

Many of these business drivers reflect the need to attract customers, by addressing their aspirations or concerns. So for example a lot of the move towards Apple Pay has been driven by the perception that a certain sector of customers want to use Apple Pay, and banks will lose customers if they don't support it<sup>14</sup>.

But for every customer that is keen to adopt the latest device or service, there is a customer who is rather more cautious. In general, it is probably true to say that most customers do not feel there is a hole in their lives that only a new way of paying for things can fill. They typically have concerns around:

- **Privacy:** maybe they don't want their bank (or anyone else) to know what they bought that day.
- **Security:** they want to be confident that they won't become a victim of fraud – or if they are, it will be sorted out quickly and efficiently. In particular, they want to be confident that their bank is "handling all of that sort of thing" on their behalf. It's not reasonable to expect customers to be au fait with IT security countermeasures.
- **Ubiquity:** they want to be able to pay for their goods anywhere, not just a select group of shops.
- **Understanding:** Some customers need more time to become familiar with and have confidence in a new way of paying for things. So banks need to give them time, and answer their questions as honestly and openly as possible.
- **Ease of authentication:** People are used to using PINs, and weaknesses in some forms of authentication such as biometrics that can require multiple attempts before authentication succeeds can put people off. This may increasingly become an issue with the drive towards multiple factor authentication.

A failure to reflect on these customer drivers can severely impact on the potential success of an innovation in the retail payments sector, and developers would be well advised to consider them carefully.

<sup>14</sup> [http://www.uswitch.com/mobiles/news/2015/07/apple\\_pay\\_hsbc\\_and\\_first\\_direct\\_now\\_on\\_board/](http://www.uswitch.com/mobiles/news/2015/07/apple_pay_hsbc_and_first_direct_now_on_board/)

## Regulatory Drivers

Regulation is playing a crucial and powerful role in determining the future evolution and development of payments, with a potential for revolutionary change over the next few years.

In the international arena, the most significant recent influence has been increasing concern amongst governments and financial regulators around money laundering and terrorist financing. This has given rise to the international Financial Action Task Force (FATF) Recommendations; essentially a set of guidelines for financial regulators and institutions on good practice in Anti-Money Laundering (AML), Countering the Funding of Terrorism (CFT), Customer Due Diligence (CDD) – also known as Know Your Customer (KYC) – and Partner Due Diligence (PDD). High profile prosecutions by the US Treasury and others have ensured heightened emphasis by financial institutions and other Payment Service Providers on: establishing customer identity; ensuring a continuing relationship with the customer so that the initial identity verification holds good; monitoring transactions; and the diligent enforcement of transaction limits.

The net result of this international activity has been an increasing interest amongst Financial Service Providers (FSPs) in technologies that can authenticate customers after an account has been opened; that is, to tie them back to the original registration. Interest has increased in technologies such as biometrics and various PIN alternatives (though the PIN remains surprisingly effective for most customers).

The European regulatory initiative of interest in payments is around plans to revise the existing Payments Services Directive (PSD). In mid-2013, the European Commission outlined proposals for what is commonly referred to as PSD2. Their current objective is to finalise PSD2 by mid-2015, for enactment in national legislation by 2017.

PSD2 is seeking to address the emergence in recent years of the Payment Initiation Service Providers (PISP), an intermediary who establishes trust and assurance of payment between that payer and the payee, so that transactions can go ahead as quickly as possible.

The other principal elements of PSD2 are expected to be:

- Third party access to payment account information; any bank or FSP that holds a customer's payment account will be required to provide access to that account to a third party licensed service provider, with the customer's explicit consent. This is aimed at improving the information available to customers about their complete financial affairs, a service increasingly offered by account aggregators (also known as account information services, provided by Account Information Service Providers, or AISPs), who enable customers to access all of their various online bank accounts, credit card accounts, savings etc. using a single online portal.

An important consequence of this aspect of PSD2 is of interest to Payment Service Providers (or Account Information Service Providers) with an eye to innovation in payments and customer service; since it requires unimpeded access to a customer's account held at a Payment Service Provider, it implies that an Application Programming Interface (API)<sup>15</sup> should be made available, thus enabling the development of innovative new integrated payments services – of which more later.

- Transaction charges should be transparent; both the payer and the payee must receive information about any charges to be applied by their Payment Service Providers before a payment is processed.
- The rules around customer authentication are significantly strengthened, with the aim of ensuring that Payment Service Providers can be confident that customers are who they say they are. Payment Service Providers will be required to use strong customer authentication – two (or more) factors. In this context, a factor refers to something that asserts that a customer is the legitimate user of the service. (So one factor might be a PIN, another might be a fingerprint. So two-factor authentication might imply that both a PIN and a fingerprint are required to prove a customer is who they say they are.) At least one of these factors must link the transaction to a specific amount and a specific payee, which implies that (for example) a fingerprint must be presented at the time of the transaction, since only then is the amount of the transaction known.

<sup>15</sup> An API, or "Application Programming Interface", is a term commonly used to describe a mechanism which allows an outside organisation (such as a PSP) to develop an app that talks directly to (for example) a bank's systems. It might do this to gather data about a customer's accounts, or to initiate a payment.

The changes regarding Account Information Service Providers and transaction charges should have the consequence of increasing competition in the payments space. This might be considered to place PSD2 at odds with another recent development; as has already been noted, the European Parliament has recently voted to cap interchange fees on card transactions, a move that it was claimed would, amongst other benefits, 'pave the way for innovative payment technologies to be rolled out'. Whether or not this is the case remains to be seen – certainly some innovative ideas that we at Consult Hyperion have encountered have had their business case pulled from under them by this development (since someone somewhere always has to pay for innovation). However, it might also be said that innovative ideas that simply extend or build on old infrastructure do not represent true innovation, and this development, in concert with PSD2, might influence innovation in that regard.

The UK regulatory regime is naturally strongly influenced by both international initiatives and European regulation. Domestically, a new regulator has recently been established – the Payment Systems Regulator (PSR) – who took over the task of regulating payments systems in the UK on 1 April 2015. An early act of the PSR was to publish a Policy Statement, entitled "A new regulatory framework for payment systems in the UK".

The key themes of the PSR's Policy Statement are:

- Competition, which is to be enhanced through the transparent publication of information about access for financial providers to the national payments rails (Bacs, Cheque & Credit Clearing Company, CHAPS, Faster Payments and LINK); so access requirements will be objective, open, risk-based and publicly disclosed. In this way, Payment Service Providers and others will be able to compare offerings in a meaningful manner, and competition between the primary providers will be enhanced.
- Innovation is to be facilitated by increased visibility of access to the national payments rails and the complementary increased competition, so that a barrier to entry for new payments service offerings and new Payment Service Providers is removed. An important element of this is an emphasis on Technical Access Solutions, which is taken to be a reference to APIs, a cornerstone of many innovation initiatives. The PSR's enthusiasm for innovation and encouragement for dialogue is also important in this regard – what the PSR calls a "no surprises" culture.
- Customer Services is an important element of the PSR's policy, and an increased focus on customer services can only lower the perceived risk for customers when they encounter an innovative new payments service, thus encouraging its take-up. Innovation in customer services is an area with particular potential, for both retailers and end-customers.

There is an opportunity for innovators to develop new services by utilising transaction data and combining it with shopping basket information and other sources of data.

Taken as a whole, Consult Hyperion believes that this international, European and UK regulatory environment will influence payments services in the following directions:

- An increasing emphasis on customer identification and authentication, particularly multi-factor authentication (a generalisation of two-factor authentication, described earlier). So customers will increasingly authenticate themselves to their phone and their active wearable at the start of the day, perhaps using a biometric, and then provide supplementary authentication (perhaps as simple as the PIN) at the time of actually making a purchase;
- Facilitation of innovation; including approaches such as the incorporation of payments into customers' apps on their smartphones, by making APIs available. So we will see the end of the search for one's debit card when using a new app, and instead a reliance on credentials established using the enhanced customer identification and authentication services;
- Significant developments in customer-facing information services, so that a customer (or more likely his/her app) has access to all transaction data across all banks/financial service providers – so a customer knows precisely what he bought, when and where, no matter what payment service he used.

Similarly for retailers, automated integration across Payment Service Providers of all transaction data, linked to inventory management tools, will mean that his till can do so much more than take payments; it becomes a comprehensive stock/inventory management tool, which tracks sales and is capable of integrating with complex retail back office systems.

This is one of those areas where Consult Hyperion anticipate that there will be significant levels of innovation, resulting in new services that no-one can currently envisage – but which, like the smartphone itself, we will all quickly come to wonder how we ever managed without, and retailers will welcome the new sales and inventory management functions which will help them run their businesses more efficiently and profitably.

- A demand for stronger competition, through transparent information services detailing charges and other aspects of a service.

## Financial Inclusion

One aspect missing from all of these regulatory initiatives is an explicit mention of financial inclusion. In the UK, surveys suggest that as many as 700,000 households – and up to 1.9 million individual adults – do not have access to a bank account<sup>16</sup>. It is worth acknowledging that these statistics may be overstated, since there is evidence that some people (in particular the under 25s) are using alternatives to conventional bank accounts, such as the prepaid cards offered by Payment Service Providers, in order to hold their money and access basic payments services.

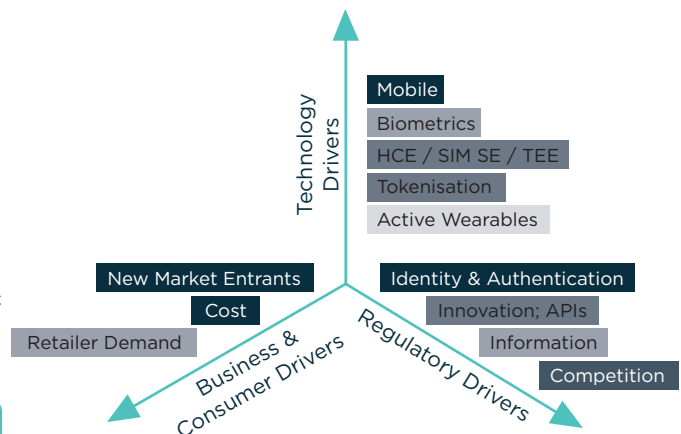
Financial inclusion is one area that has the potential to benefit from the innovation enabled by the emerging regulatory environment. For example, arguably one reason for the rise of the payday lender in the UK is the development of zero hours contracts and their incompatibility with the conventional bank account/direct debit bill payment. So it makes sense for me to take out a £100 loan that costs £15 for a week, if that means there's enough in my bank account when a Direct Debit for my home energy use comes in – the alternative being that I incur a £30 bank charge when the Direct Debit is declined.

Innovation would help here, if the energy supplier could connect to such customers using their own app. So when I'm about to get a bill, I get a message saying it's due, and giving me the opportunity to either pay now, or defer for a week – at no (or minimal) charge – and then initiate the payment myself (via a so-called 'in-app payment') when I have the money available, using Faster Payments.

## Drivers Summary

The factors that Consult Hyperion have identified as driving change in the payments industry are summarised in Figure 5. The degree of shading varies depending on the degree to which each factor has so far been realised or payment products or services are currently available.

Figure 5: Identified Drivers of Change



### Key:



As the above figure illustrates, we have seen significant developments in terms of both the business and technology drivers which accord with regulatory pressures; so we're seeing significant levels of innovation and competition. Also customer authentication is advancing (though a great deal of work is still required). A significant number of new market entrants and an emphasis on the cost of payments further demonstrate this. Underlying all these developments is an increasing emphasis on the mobile phone as the preferred customer device (developments in tokenisation and the use of HCE/SIM SE/TEE are further evidence of this).

However, there are areas that are currently underdeveloped, and it is in these that Consult Hyperion sees significant potential for innovation and development. The most significant of these is in the area of information, both for customers and for retailers.

For retailers, the emergence of the mPOS, in all of its various forms, has been a significant step forward, but this is the only positive step. For customers, detailed information about their financial activity is either unavailable or requires significant effort to bring into one place. This is particularly the case for financial activity that took place more than a few years ago, or which involves closed accounts, or relates to wider financial services such as insurance or loans.

<sup>16</sup> "Financial Inclusion Annual Monitoring Report 2014", Centre on Household Assets and Savings Management, University of Birmingham



An 18 year old student wants to book her coach ticket home for the weekend, but when she comes to pay she finds the price has gone up as the weekend approaches and she can no longer afford it. So she Whatsapps her mother, who is out shopping and away from her laptop. Her mother uses her smartphone and her mobile banking app to Paym some money directly into her daughter's bank account, and the student buys the ticket. So she can make it home for the weekend after all.

## How the UK compares with the rest of the world

### Innovation and technological development/payment systems elsewhere in the world

There has been innovation around the world in non-cash payments, resulting in substantial levels of takeup which continues to accelerate. Indeed, the greatest growth in non-cash payments has been in the emerging markets of Asia and Africa, where technological developments such as mobile money – the prime example being M-PESA in Kenya – have encouraged a move towards non-cash payments along paths that were never envisaged in Europe and North America. But it should be remembered that these countries are starting from a very low base of non-cash payments, since their economies have long been dominated by cash, so that comparisons with the UK are not meaningful. Consequently we believe that the UK's key comparators are Europe and North America.

Looking at the United States first: the US is very different from the UK – obviously it is much bigger, with a population almost five times as large. But in terms of the payments industry its size can sometimes act against innovation. The net result is that this huge country has a multitude of small banks and other small financial service providers, all competing against each other and struggling to achieve scale, and this only serves to hold back the delivery of innovative services. So there has been no investment in common infrastructure like the UK's Faster Payments service, the rollout of Chip & PIN is only now starting<sup>17</sup> (and is limited to debit cards), and in lieu of central systems such as the UK's Faster Payments Service there is a heavy dependence on cheques for paying bills etc.

Although there are many differences, the US has its equivalent of the European Parliament's move on interchange fees on card transactions. The Durbin Amendment limits fees charged to retailers for debit card processing. The – possibly unintended – consequence is that the profitability of the banks issuing and acquiring card transactions has been dented. Taken with the intensely competitive market conditions, the net result has been a significant reduction in the funds available for innovation.

On the retailer side, there is activity in the mPOS sector, though Square is (in Consult Hyperion's view) the only operator in the SME sector with any significant traction. Of interest, though, is CardFlight, which provides similar mPOS capabilities, but is aimed at the large retailer sector, and so supports deep integration with such a retailer's complex back office systems.

The US was the market where Apple Pay was first available, with other countries following on behind. Viewed from an independent perspective, it's a marvel of marketing; Apple branding is everywhere, retailers choosing to accept Apple Pay are required to upgrade their POS terminals, and there is a market perception that Apple are somehow leading in payments. And yet they aren't; it's purely a front end for conventional card payments, in a private payments world that is endorsed by the card schemes. And in fact Apple Pay could be said to be moving against the regulatory flows described earlier:

- It's a private payments world, controlled by Apple.
- It requires Apple Pay-specific changes to existing infrastructure.
- It moves against the flow towards opening up information about financial transactions, certainly to third party apps.

It is not inconceivable that these issues may cause the financial regulator to demand changes at some time over the next few years.

The emergence of Apple Pay – and the subsuming of bank brands beneath the Apple brand<sup>18</sup> – encapsulates the fears of banks when they review developments in the payments sector, as customer pressure means that they must embrace Apple Pay, but without brand presence. It provides an insight into how the world may develop; it is possible to conceive of a future in which banks are left simply holding customers' accounts, and with no direct involvement in payments, and no involvement in the more profitable elements of their customers' financial lives.

The EU market is much more difficult to summarise largely because, despite the EU's efforts, the financial services industry in each country has unique characteristics which do not appear to be converging. For example, German consumers generally use credit cards significantly less than other Europeans, and also like to pay in cash; internet purchases are usually paid for through invoicing, with funds being transferred from a bank account. In the Netherlands a lot of people pay online with iDEAL, an online payment method that allows customers to order online using direct transfers from their bank account. Belgian customers primarily use cards and online bank payment to pay online, while in Luxembourg customers use credit cards. In Poland mBank supports mobile payments direct from bank accounts, and Finland has by far the highest proportion of non-cash payments in the world (448 transactions per inhabitant during 2012, with recorded growth of 10.6% during 2012<sup>19</sup>) for both online and face to face purchases.

<sup>17</sup> An interesting aspect of the US market's difficulty with chip & PIN is that of PIN management, which is carried out using ATMs in the UK. But there is no unified ATM network in the US equivalent to LINK in the UK, so that this option isn't available. For a number of US card issuers, this is a real issue, since their customers won't be able to change their PINs or unlock PIN blocked cards.

<sup>18</sup> This equally applies to other tech brands, such as Google, Samsung and Amazon, who are replacing the banks as trusted brands in the minds of many customers.

<sup>19</sup> Cap Gemini World Payments Report 2014

## Comparison with UK

It is very difficult to make direct comparisons between the payments industries in different countries. All payments services ultimately rely on national infrastructure, which obviously differs substantially between countries, resulting in a different environment for development. However, we can make some general distinctions.

The biggest fundamental differences between the US and UK markets are a consequence of scale, as described earlier. This results in significantly fewer players in the market, since there is no potential for a multitude of players if there aren't enough customers to go around (a successful service needs to achieve scale, which generally means it needs a minimum of 500,000 to 1 million customers, depending on the proposition) and the geography generally means that everyone is competing for the same customers.

This should mean that there is limited scope for innovation in the UK market – but that is not the case. Instead, innovation has often been achieved through cross-industry collaboration. Good examples include: the development of the Faster Payments service, which makes it possible to transfer money from one account to another or pay bills almost immediately by internet or phone, twenty four hours a day, seven days a week; the upgrading of UK cards to contactless technology; and last year's launch of Paym, which enables customers to make secure transfers via their mobile phone.

In addition to these collaborative industry innovations, the UK is an established centre of excellence for fintechs. According to the UK Government:

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*“The UK and Ireland is now the fastest-growing region for fintech investment (Accenture). Deal volumes here have been growing at 74% a year since 2008, compared with 27% globally and 13% in Silicon Valley. During the same period, the value of fintech investment increased nearly eightfold, to US\$265 million in 2013 – a rate of 51% a year, nearly twice the global average (26%), and more than twice that of Silicon Valley (23%)<sup>20</sup>.”*

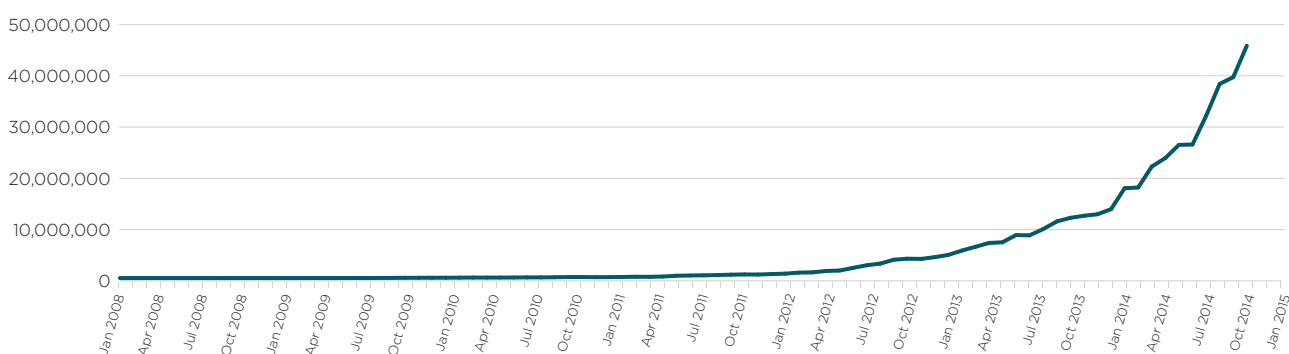
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And it is these factors that set the UK apart: we have a modern, responsive payments infrastructure, with a vibrant fintech community, and a regulator seeking to push the sector towards further innovation, competition and enhanced services to consumers.

But these positive developments should be viewed in the light of the natural conservatism of people, particularly when it concerns their personal finances. As much as payments innovators would like to believe otherwise, new technologies take a long time to achieve momentum, particularly in the payments space.

As an example, consider contactless payments in the UK. The move to contactless payments began in 2007, when five banks in the UK began issuing the cards in and around London. However, the technology (which technologists already regarded as old hat) then languished, as the financial community failed to ‘sell’ the service to card-accepting businesses or customers. But eventually as more retail brands signed up, and thanks to marketing from at least one big bank in the summer of 2014 – more than six years after launch – contactless card usage took off<sup>21</sup>, as can be seen in this graph<sup>22</sup>:

Figure 6: The Rise of Contactless: Contactless payment usage increases rapidly from early 2014



(Source: UK Cards Association)

<sup>20</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/341306/fintech\\_-\\_The\\_UK\\_s\\_unique\\_environment\\_for\\_growth.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341306/fintech_-_The_UK_s_unique_environment_for_growth.pdf)

<sup>21</sup> Though it must be acknowledged that usage is still low, particularly when compared against conventional payment card usage of in excess of 900 million transactions a month (source: UK Cards Association).

<sup>22</sup> UK Cards Association

This is backed up by anecdotal evidence; some retailers have reported that customers are increasingly asking to 'go contactless', and a retailer who is not able to offer contactless is at risk of being seen to be backwards or old-fashioned – a significant risk to business if the retailer's key customer base is the under-30s. Conversely, there is also some (limited) evidence of pushback from retailers. Some report that the payment is so fast they don't get a chance to talk to their customers any more, and an opportunity to build a relationship has gone.

In addition to consumer conservatism, there are concerns around access for new financial providers to the underlying payments infrastructure. With connectivity to Faster Payments and other services a key enabler for many innovative services, access is a particular concern for fintechs, who need unobstructed, fast, competitive access to the nation's payment rails. It is to be hoped that the new UK regulatory regime will ease these concerns.

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## Likely Developments

### The Next Five Years

Considering the direction that the new PSR has indicated (including pressure for competition, enhanced information services and greater innovation, including an API framework), combined with an industry focus on the integration, for example, of payments into customers' apps on their smartphones and other devices, Consult Hyperion conclude that there will be significant growth in non-cash payments, that payments will become faster and cheaper, and that there will be greater transparency for customers around the detail of their transactions – such as information about any charges. These developments will be underpinned by:

- Significant improvements in customer identification, in particular through the use of multiple biometrics (using a combination of biometrics such as iris scanning, fingerprinting or voice recognition).
- Substantial developments in the information available to customers, and further improvements for retailers. So, for customers, we would expect this to include:

*Access to detailed basket information; so when I buy something in a store, I expect to have the details of precisely what I bought, how much it cost etc. available in my payment app.*

*Access to all of my financial accounts in a single aggregated app, if I so choose; and value-added functionality in that app to allow me to get a clear picture of my financial position, for example.*

Both of these would be dependent on the financial service providers making APIs available, which requires significant development efforts on their part, not least to ensure security.

- Increasing use of apps with integrated payment capabilities. In general, people prefer dedicated apps on their smartphones; for example, for mobile banking, they use them in preference to conventional internet banking (which is perfectly possible from a modern smartphone) as the apps improve the experience for the customer. This trend can only grow in momentum. But again, this requires that financial service providers make APIs available.

Consult Hyperion expects much of the development over the next five years to come from two main sectors: the traditional payments organisations, such as banks, who will innovate to protect their market position and to better serve their customers; and from fintechs, seeking to become or support new market entrants, with what they hope will be services that are more attractive to customers through greater use of innovation.

But what does this really mean for consumers? We see an increasing emphasis on the mobile phone, so that – for those consumers who want it – the phone becomes the primary means of paying for things and managing their various accounts:

- Bills (that aren't already paid using Direct Debit) will be paid using an app – which might come from your bank, but is likely to be a single, aggregated (and specialised) app from a new organisation.
- Cheque imaging – some banks already enable customers to scan in their paper cheque using their mobile as an alternative to paying in a cheque in a branch, but this option will be much more widely available when the technology is rolled out across the industry. A project is currently underway to achieve this.
- High street and internet transactions will be made using your mobile phone (rather than handing over a physical card), with your card details embedded in it – though there is a good chance that payment might be made directly from your bank account, through services such as Zapp or an enhanced Paym.
- Payments to friends and family will increasingly be from your bank account, either directly (using your mobile banking app and Faster Payments) or, for convenience, through Paym.

Despite these changes we're not expecting anything that will completely replace what we have now – so we are not predicting the 'death of cash' any time soon. Consequently we expect to see a continuing presence on the high street of ATMs. But we do anticipate improved integration between the mobile phone and the ATM, so that you can request cash from your mobile banking app, which will connect to the ATM wirelessly for the delivery of cash.

The role of ATMs in financial inclusion will also ensure their longevity; people with cards and limited budgets will continue to find cash useful in budgeting, an oft-overlooked function of notes and coins.

### The Next Ten Years

During the 5 – 10 year timescale, we expect further refinement in the development gains already made, and greater degrees of innovation coming from fintechs and their associated PSPs.

Further, we anticipate increasing reliance on biometrics, but that their use will be more sophisticated and less intrusive. So the use of biometrics at the time of a payment will be replaced by sustained biometrics, allowing a set of biometric checks to be made (for example) once per day, and the resulting degree of authentication sustained and usable by apps throughout that day, without further checking. This step is dependent on the widespread adoption of active wearables (such as Samsung Gear, Google Glass and the Apple Watch), those wearables becoming more affordable for general adoption, and their sophistication in their use of biometrics undergoing significant advances.

### The Next Fifteen Years

Of course, looking beyond ten years is very difficult – in any technology-driven sector, fifteen years is an almost infinite time in the future. To put this in perspective, the first iPhone was launched only eight years ago in 2007, and now for many people it's almost impossible to remember what life was like in the time before smartphones.

So to make firm predictions about developments in fifteen years' time is folly. But will there be payment technologies and services we haven't even imagined yet? Almost certainly!

In contrast, will we have seen the 'death of cash' by 2030? Probably not. Although it might be regarded as an old technology, cash has a degree of utility that many consumers find extremely useful.

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the fact that the *Journal of Applied Behavior Analysis* is the most widely read journal in the field of behavior analysis.

It is my hope that this book will be useful to you in your current or future work. I would like to thank the following individuals for their assistance in the preparation of this book:

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