payments strategy forum

Horizon Scanning Working Group

The Horizon for Payments

Draft for discussion 07/04/2016
Version 1.0

Detailed Report from the Horizon Scanning Working Group

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2 THE PAYMENTS HORIZON AND A NEW VISION FOR UK PAYMENTS – EXECUTIVE SUMMARY

The Horizon Scanning Working Group has considered the impact of initiatives taking place internationally, regulatory developments and technology themes on the payments markets in the UK with a view to making proposals to the Payments Strategy Forum for further consideration.

The UK payments industry is at an exciting point in its history, forming just one part of a bigger story of global digitalisation. The UK payments industry, while idiosyncratic, is generally a leader in payments innovation and there are limits to what it can learn from its overseas competitors. However, initiatives like the New Payments Platform in Australia are migrating towards a single 'push' scheme and should be kept under observation as the UK may usefully learn something for its own strategy.

By and large most regulatory intervention stems from Europe. The digital agenda and move to e-invoicing set the stage for innovation. The Bank of England's review of its RTGS system considers how technological advances (like Distributed Ledger Technology) could help it meet the needs of the next generation. PSD2 and the associated work by HM Treasury on Open Banking direct the industry to opening up access to the system using APIs. Security and privacy remain key concerns with these continuing to be the greatest risks affecting consumers, alongside concerns over the potential detrimental impact of digital exclusion.

Developments in technology may mean that many detriments identified by the Payments Community could be addressed. Potentially, use of APIs, distributed ledger technology, richer data and identity management could bring benefits to users and PSPs. Some technologies are already being introduced on a competitive basis by card schemes – enabling users such as merchants to avoid onerous regulation by deploying technical solutions like tokenisation.

The current payments systems, while offering many benefits, are not versatile and struggle to respond to user needs. There are barriers to making greater innovations necessary to meet rising customer expectations and access to payments systems. Simplifying and redesigning the core payments systems over time, using layered architecture and APIs would naturally open payments systems to greater participation, foster innovation, improve competition and create greater resilience, ensuring payments mechanisms are fit for the next generation.

2.1 SUMMARY OF CONCLUSIONS FOR THE USER NEEDS WORKING GROUP

User Needs detriments identified by the Payments Community may be somewhat improved by regulatory interventions, which largely stem from Europe. However, the advent of the Payment Services Directive II (PSD2) is likely to have the greatest impact, in opening up access to account data to third parties and hopefully spawning a range of new services to meet customer needs. Means to improving security however could increase unwanted friction in payment services.

Internationally the User Needs Working Group may be interested in BankServ in South Africa which addresses problems related to misdirected payment (UN 12,13 and 14) a. It operates an online Account Verification Service. A Request to Pay, which addresses user needs for control in payments, is being worked on in the US. Services like Transferwise largely by-pass the traditional schemes and make remittances significantly cheaper.

Technology offers the greatest opportunity to meet user needs, although security and privacy continue to be over-riding concerns. The development of new technologies like big data analytics, artificial intelligence and improvements in decision making sciences leave consumers vulnerable to new potential detriments. Conversely, APIs, distributed ledgers and layering could ameliorate several detriments related to the key issues of control, transparency, reduction of errors and instant access to information. The way in which those detriments could most likely be resolved would be through a redesign of the core payments schemes based on this technology.

2.2 SUMMARY OF CONCLUSIONS FOR THE SIMPLIFYING ACCESS WORKING GROUP

There are currently a number of regulatory initiatives looking at issues related to access to payment markets in the UK, and directly relevant to the PSF's Simplifying Access Working Group proposals. These include the PSR reviews into the supply of indirect access to markets, and on the ownership and competitiveness of infrastructure provision; PSD2's new requirements obliging payment account providers to open access to third parties and the Bank of England's strategic review of its real-time gross settlement (RTGS) infrastructure. The PSR review of the infrastructure provisional findings includes the view that competition for, and within, the provision of infrastructure is not sufficiently competitive. The proposed remedies include competitive procurement, divestment of PSP shareholdings in VocaLink to remove the vertical ownership that may impede competition and innovation and to ensure interoperability through common payment messaging standards. Technological solutions may help.

Access to payment systems appears easier in some other international payment ecosystems. However, there is a lesser degree of sophistication of some of the payments systems which inherently means simpler access. Developments in Australia (NNP), America (TCH) and Singapore (G3) should be kept under observation. A conclusion of the international scan is that very few countries demonstrated a greater degree of access than the UK or conversely dealt with the fundamental problems associated with the UK system.

Layer modelling and APIs are two specific technologic principles which could significantly achieve a simplification and actual opening up of access to payments schemes to PSPs, along with a move to a single 'push' scheme.

2.3 SUMMARY OF CONCLUSIONS FOR THE FINANCIAL CRIME WORKING GROUP

The Working Group should consider the following regulations in more depth: The 4th Money Laundering Directive which may make it more difficult for high-risk customers and Politically Exposed Person (PEPs) to gain access to financial services; HMT Proposals on digital currencies which may increase the legitimacy around their use; and PSD2's new IT security requirements and work to reduce fraud on direct debits.

The Financial Crime Working Group may usefully learn from international examples which focus on identity and authentication. Initiatives include identity proxies, alternative sign-in methods, national initiatives for identity verification and digital signatures and beneficiary verification (which may help to address misdirected payments).

From a technological point of view many of the detriments identified for the Financial Crime Working Group relate to identity of counterparties and KYC. These issues derive from the often poor quality or simply the lack of sufficient data in the payment instructions that would allow PSPs

to perform adequate checks. Improving the amount and quality of data would be a necessary step to solving these issues. Using technologic principles like layering and APIs along with richer data and big data could help prevent and fight financial crime. Should Distributed Ledger Technology be developed, smart contracts may provide for a simpler KYC landscape.

2.4 PROPOSALS FOR FURTHER CONSIDERATION BY THE PAYMENTS STRATEGY FORUM

Bringing together the Horizon Scanning Working Group's overall intelligence gathering and analysis there are a number of key themes emerging. Digitalisation is taking place around the world at a fast pace. Developments in technology could answer many of the detriments outlined by the Payments Community and create solutions which meet the PSF's objectives that payments systems be secure and resilient, versatile, responsive and efficient. Key themes we believe will resonate with the Forum include: the move to real time, the use of richer data, improved messaging standards, the use of new, well governed APIs, a layered payments architecture and the potential of Distributed Ledger Technology.

The Group has considered what will appear on the horizon in the short (1-3 year term) and the longer term (3+ years). In particular, it has been concerned with developing an outline of what the future *could* look like for payments. In the short-term the PSF should discuss the following proposals for admission in the strategy:

Short-term proposals:

- Support the work of the Open Banking Working Group; and ensure the necessary leadership and support for Open APIs is in place to enable guidance facilitating compatibility as the schemes and the underlying platforms evolve in the medium to long term
- Implement Richer Data through the inclusion of a reference in the payment message and required APIs
- Implement the 'Request to Pay' APIs and 'Confirmation of Payee' APIs independently of existing schemes to demonstrating an 'Overlay API'
- Support the Bank of England RTGS infrastructure review
- Support the general move to ISO messaging and particularly the move globally to a single, instant 'push' messaging.

Longer-term proposal:

- Simplify the UK payments scheme platforms by following a layered approach to payment systems implementation together with a migration approach using APIs to minimise disruption.

The development of such a simplified scheme platform would allow the flexibility of distributed federated and/or centralised distribution of the technology platform underlying the schemes, allowing for future localised technological evolutions, simpler access and on-boarding and faster innovations without impacting the entire delivery chain. This proposal is described in the solution concept assessments annexed to this document.

- Monitor and co-ordinate efforts to develop Distributed Ledger Technology (DLT) to ensure that correct used cases are followed and the systemic impact is understood.

If it is to be taken forward, developing DLT as an interoperable 'open standard' will still allow for competition in its implementation.

These proposals, taken together, could allow for significant improvement of the UK's payments systems and offer the opportunity to provide a simplified platform enabling many identified detriments to be resolved.

3 INTRODUCTION

The Payments Strategy Forum was established in summer 2015 by the Payment Systems Regulator. Its goal is to identify, prioritise and help to deliver initiatives where it is necessary for the payments industry to work together to promote collaborative innovation. The aim is to make payment systems work better for those that use them. It is tasked with developing a strategy by summer 2016. Three objectives underpin its work: payments should be secure and resilient; versatile and responsive to user needs, and efficient (Payment Systems Regulator, 2016).

The Horizon Scanning Working Group was established to assist the Forum. Its role is to provide intelligence on relevant UK and international initiatives, regulatory and technological developments; assessing these against the detriments identified by the Payments Community; and to make short and long term recommendations to the Forum.

The following document outlines how the group went about its work, summarises its findings and explains the recommendations above it has made to the PSF. Annexed to this document are the Solution Concept Assessments which provide detail on next steps along with a discrete report on Account Number Portability.

The PSF is requested to review this document and to provide its considered views to the Group on necessary amendments.

4 WHAT WAS THE WORKING GROUP SET UP TO DO?

4.1 OBJECTIVES

As noted in the introduction the Working Group was set up to provide intelligence on the 'horizon'. It should:

1. Explain the political and regulatory context within which payments is operating and developing
2. Summarise international developments and learnings for the UK
3. Consider technological developments and how these can be applied within payments
4. Make proposals for the long term UK Payments Strategy.

The intelligence gathering exercise undertaken by the Working Group is based on the expertise of its membership and their own research and analysis. No specific research project was established.

Objectives 1 and 2 provide immediate material for the other working groups ('User Needs', 'Access' and 'Financial Crime') which together with objective 3, offer material for the 5-10 year time horizon, for which the Working Group makes specific proposals.

Separately, the Working Group was also tasked more specifically by the Forum to consider Account Number Portability. The Group has not at this stage assessed benefits or otherwise of ANP but has put forward a potential solutions on how ANP could be achieved within the current UK payments systems. The Grouphas submitted a paper on ANP to the forum as a separate report.

4.2 METHODOLOGY

Members for the Horizon Scanning Working Group were invited from the Payments Forum and Payments Community. In total 34 members self-selected to join group, including representatives from individual firms, trade associations, consultancies and user groups. Observers attended from the Financial Conduct Authority and the Payment Systems Regulator.

Together the membership applied weights to the various detriments provided by the Payments Community, since it was recognised that not all detriments were of equal importance. The concept of importance of a detriment was acknowledged to be hard to define. 'Importance' was mainly measured relative to how many (or what proportion of) service-users (at their level in the payments value chain map) would benefit from the resolution of the detriment. No specific data was used to score this measure, and thus scoring was based on the experience of the members of the group, where individual scores were agreed by majority. Scores were set on a scale of 1-4 with 4 being the most important. Initiatives across the geographic, regulatory and technological horizons were scoped. Initiatives were tallied without weighting. The importance score of the detriment was multiplied by the tallied number of initiatives corresponding to the detriment to create an overall score. These scores populate the graphs which illustrate this document. A paper outlining this process was presented to the PSF. Given the limitations in methodology, the scores should be taken as 'indicators' rather than as a robust measure. In a further iteration of this report, scores could be amended to automatically update the findings, should this be required.

The group organised itself into three sub-groups to consider the regulatory horizon, the geographic and commercial horizon, and the technological horizon. Each group noted relevant initiatives, considered their relevance and mapped them to the payments value chain and to the detriments provided by the Payments Community. The Payments Community identified 94 detriments which were grouped into 21 categories by the PSF. The work of the sub-groups is illustrated in both the graphs, which show the types of initiatives that are most likely to solve detriments; and in the tables which highlight those detriments for which little existing initiatives are designed to address. In some cases, the detriment may be solved by individual firms working competitively. In other cases, it highlights the need for concerted action to address the problem.

Separately a report was written to consider the potential merits of Account Number Portability for discussion by the PSF.

The Horizon Scanning Working Group convened to discuss a consolidated picture of the horizon. Proposals were formed based on this work before being subject to scrutiny by the whole Horizon Scanning Working Group.

5 POLITICAL AND REGULATORY LANDSCAPE

In the past decade, the payments industry has seen significant changes in the payment systems and types of products used by service users. The industry has witnessed the successful launch of the Faster Payments Scheme in 2008, the Current Account Switch Service (CASS) in 2013, PayM in 2014. There may also be new services launched in the future, such as Zapp. These changes have been driven by a combination of regulatory and commercial incentives. The 2007 Payment Services Directive opened up the payment service industry to other players outside the traditional banking world, and in the UK the Payment Services Regulator was established in April 2015. In 2014, the Chancellor of the Exchequer George Osborne announced his vision for the UK "to lead the world in developing Fintech" (Bank of England, 2016). The announcement heralded the development of a regulatory regime designed to enable the unlocking of disruptive innovations and to foster new competition in the interest of service users. Examples include the Financial Conduct Authority's initiative Project Innovate, which will launch a 'Regulatory Sandbox' in spring 2016, and the active encouraging of regulatory technology, or "Regtech". There have also been successful commercial innovations, albeit still at an embryonic phase, like the Currency Cloud and Transferwise.

The Payments Systems Regulator's role is to promote competition and innovation in payments systems, and to ensure they work in the interests of the organisation and those customers who use it. In this context, the Horizon Scanning Working Group has identified several key EU directives and UK regulations that could affect these goals:

- the Payment Services Directive II (PSD2),
- the Payment Accounts Directive (PAD),
- the Interchange Fee Regulation (IRF),
- the Fourth Money Laundering Directive (4 MLD),
- the Competition and Market Authority (CMA) investigation,
- the Bank of England's review of RTGS,
- several initiatives by the European Retail Payments Board,
- the regulation of digital currency,
- the move to digitalisation, and
- the General Data Protection Regulation (GDPR).

5.1 A SUMMARY OF THE REGULATORY HORIZON FOR THE WORKING GROUPS

5.1.1 The regulatory horizon for the 'user needs working group'

The User Needs Working Group may wish to consider the following regulations which are likely to have some impact on the way consumers interact with services:

- Payment Services Directive 2 (section 5.2.1 to 5.2.1.4) opens up access to the payment market to non-traditional players and most importantly allows them access to customer account data (with the customer's permission) which could see the development of services which help people to manage their money better or switch more easily. PSD2 should also increase security of online payments.

- The Payments Account Directive (section 5.2.2) improves access to basic bank accounts, enhances transparency and comparability, and facilitates switching. However, its impact is

likely to be limited as previous reforms already in place in the UK, such as CASS and the Basic Bank Account Agreement, effectively forerun the Directive in the UK.

- The aim of the Interchange Fee Regulations is to reduce the cost of card payments to users, and to increase merchant control (although in reality some in the industry believe it may change very little from the perspective of merchants or the existing card schemes).
- The Competition and Markets Authority market investigation seeks to improve access to, and switching options for, current accounts for both consumers and businesses. It has also made recommendations on overdrafts
- Although business rather than consumer focused, the various European-level initiatives around e-invoicing have so far had little success in fostering a harmonised market enabling more growth, although the ERPB is currently working towards possible solutions. There is potential for a standardised e-invoice regime being also a new request to pay payment system for B2B payments – but only if industry/government really pushed it.

Overall these initiatives could improve trust and confidence in the market, if implemented in a balanced and considered way, and if firms innovate in ways that are customer centric, transparent, fair and avoid conflicts of interest. The increased security created by PSD2 may increase friction in payments which some end-users may find frustrating.

Whilst work on 4 MLD should lead to reduced opportunities for criminals to launder money through the UK, exclusion from financial services for certain categories of customer is likely to continue to be a detriment and may require a collaborative approach by the industry to address.

None of these regulatory initiatives deals with the inflexibility of individual payment mechanisms (like DD), control issues like Request to Pay or the problems identified with Continuous Payment Authorities. Nor do they deal with misdirected payments or the desire for more data or payment tracking (except perhaps the e-invoicing initiatives have potential to assist in some of these areas but that potential seems allusive at present). Unavailability off free to use ATMs in more rural locations – linked to lack of availability of branches – continues to be a problem.

5.1.2 The regulatory horizon for the 'simplifying access working group'

There are currently a number of regulatory initiatives looking at issues related to access to payment markets in the UK, and directly relevant to the PSF's Simplifying Access Working Group proposals. These initiatives include:

- Two market reviews being conducted by the PSR into the supply of indirect access to markets, and on the ownership and competitiveness of infrastructure provision. The PSR has already adopted a "Sponsor Bank Information Direction", and pushed for an industry code for sponsor banks in order to increase transparency for firms wishing to gain indirect access to payment systems. The infrastructure review proposed remedies include competitive procurement, divestment of PSP shareholdings in VocaLink to remove the vertical ownership that may impede competition and innovation and to ensure interoperability through common payment messaging standards.
- PSD2 will introduce new requirements obliging payment account providers to open access to third parties. It also introduces new obligations on designated payment systems and indirect access providers not to discriminate when passing payment instructions through the system. Regarding access by non-bank PSPs to accounts maintained with a credit

institution, PSD2 requires that Member States ensure access on an objective, non-discriminatory and proportionate basis and any rejection must have a disclosed "motivated reason".

- The Bank of England is conducting a strategic review of its real-time gross settlement (RTGS) infrastructure in response to changes in payments arising from 'technological innovations' and 'a more dynamic focus on competition and innovation driven by the PSR' which will consider technology like Distributed Ledger Technology (DLT)

Despite these developments, there is still scope for industry to collaborate to improve the experience of PSPs who have to deal with: the diversity of schemes, the complexity of the scheme landscape and associated standards, rules and messaging; as well as switching, choice of PSPs and lack of competition. There may also be merit in considering how technology could improve these areas.

5.1.3 The regulatory horizon for the 'financial crime working group'

The Working Group should consider the following regulations in more depth:

- The 4th Money Laundering Directive (section 5.2.4) which may make it more difficult for high-risk customers and Politically Exposed Person (PEPs) to gain access to financial services, although this depends on how it is implemented
- HMT Proposals on digital currencies (section 5.2.7) which may increase the legitimacy around their use
- Payment Systems Directive 2: New IT Security (section 5.2.1.2) which could inadvertently restrict firms' ability to respond to cyber threats
- PSD2 (section 5.2.1) which could deal with the issue of fraud on direct debits

There continues to be tension between direct and indirect participants and responsibility for AML which is not covered by current regulatory initiatives.

With regard to Financial Crime Working Group solutions, we would recommend in particular a legal review of each solution to consider the data protection implications in addition to a review of existing regulatory requirements.

With regard to setting standards for addressing identity and authentication, it is suggested that consideration be given to using the revision of JMLSG guidance as 4 MLD is implemented.

With regard to the opportunity for the payments industry to exploit a UK digital identity approach for the benefit of payment services and end users it is suggested that consideration be given to exploit /utilise a broader UK digital identity approach, including government initiatives in this space.

5.2 KEY REGULATORY INITIATIVES IDENTIFIED ON THE HORIZON

The Horizon Scanning Working Group identified several regulatory or related initiatives across both the European and UK horizon, different aspects of which are represented below in the Graph. They show how key aspects of PSD2 (access to the payment system, third party access to payment accounts and new IT security and the 4th Money Laundering Directive would appear to contain either: (i) existing imposed regulatory requirements for individual PSP implementation; or (ii) potential for UK Payments Industry collaboration on implementation of imposed requirements,

which could impact the most in terms of helping to solve the detriments identified by the Payments Community. While PAD (consumer right to a payments account) has some potential to address certain detriments, voluntary initiatives concerning key aspects of the Directive are already in place in the UK, so its impact is likely to be limited.

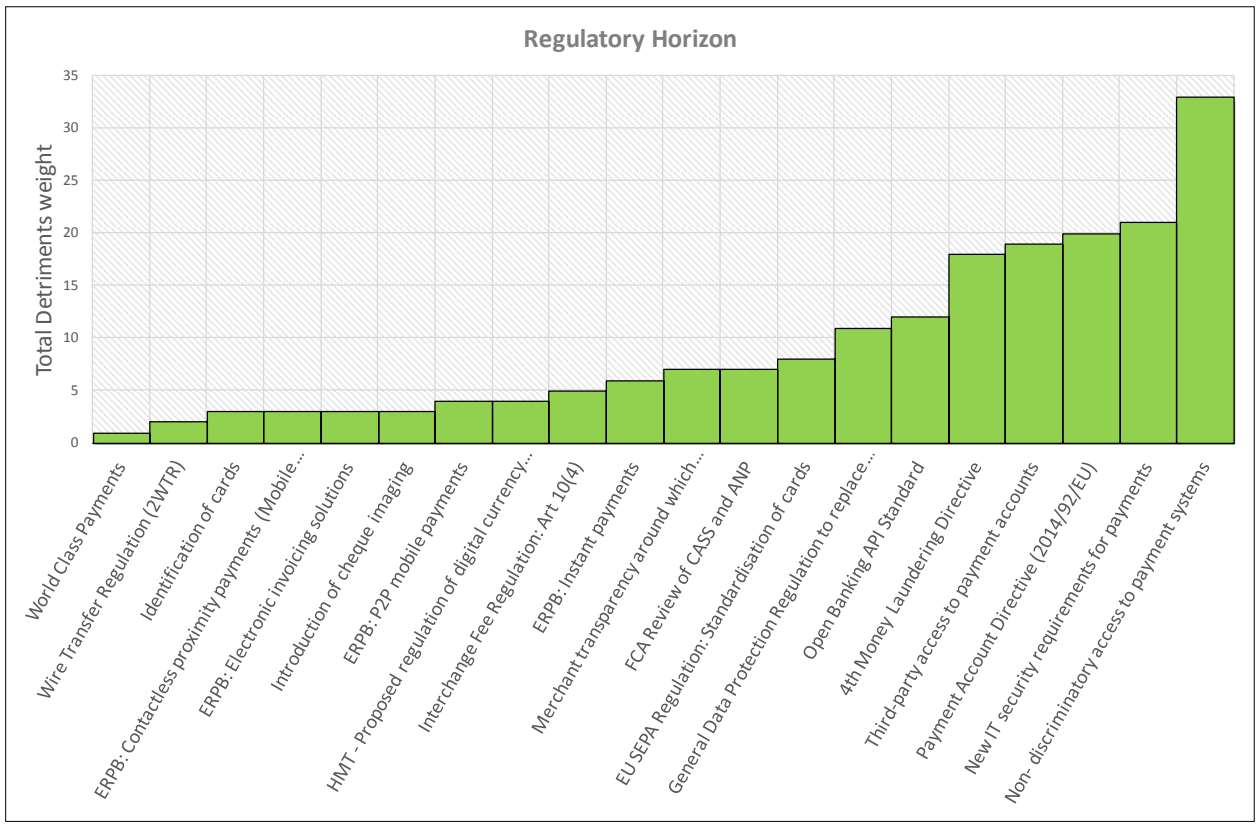

Figure 1: Regulatory initiatives by the detriments they solve

5.2.1 Second Payment Services Directive (PSD2):

The PSD2 was adopted in December 2015, and will come into force across the EU in January 2018. It introduces a number of significant changes to payments regulation across the EU, and will shape the payments competitive landscape in the years to come. If implemented well, it could address a number of detriments identified by the PSR Forum. The PSD2's key objective is to increase competition in the payment space and open the market for TPPs and new services covering payment initiation and account information services. Therefore, the opportunity for new business models, services and underlying technologies is going to increase and reflect in the market through the arrival of more new entrants that can play in this space.

It will also require considerable industry collaboration in a number of areas, for instance in the development of standards for sharing data. The PSF should consider how its strategy could ensure implementation by coordinating the required "considerable industry collaboration".

5.2.1.1 PSD2: Third-party access to payment accounts and payment account information

These provisions require payment account providers (ASPSP) to permit third party services providers (AIS and PIS) to - with the consent of the customer - access their account information such as balance and recent transactions, and/or initiate payments directly from the account. This new element of regulation is one of the most significant changes introduced by PSD2, and will require industry collaboration to ensure that the availability of funds can be communicated in real time, particularly given the number of different potential business models that may want to take advantage of these changes, and the fact that the ASPSP is not required to have a contractual agreement with the AIS or PIS.

The UK's approach to managing this challenge could be partially addressed through the Open Banking Standard, a government-driven initiative to create a standardised API that permits any third party complying with the standard to be able to access account information on behalf of their customer. The aim is to encourage the development of new and innovative services that can make use of the information held in bank accounts for the benefit of their customers, and it will require significant industry collaboration to implement. For instance, new services may emerge which allow consumers to provide multiple account data to a third party service which can then offer analytics on transactions (similar to MoneyDashboard) as well as highlight and enable switching to new products which better serve the customer. Additional control may improve take-up of electronic payments among the marginally banked.

The Open Banking standard is however intended to be a voluntary standard for industry participants, so will not be able to replace the regulatory implementation of PSD2, although it could help address a number of the complexities involved in resolving liability disputes or ensuring customer consent between parties that have no contractual relationship. Its scope is also much wider than the payments industry, so it is not designed solely with PSD2 compliance in mind. In fact, some of the potential uses of this standard API will be rendered more difficult by PSD2, such as the requirement to complete strong customer authentication in order to access any level of account information. See the section specific to Open Banking Standard below which highlights a potential PSF strategy of pushing the Open Banking Standard which appears to have somewhat stagnated in progress now the government has left it to industry to follow through.

User need detriments that may be partially addressed as this element of PSD2 is implemented include UN 20, as it may improve consumer confidence to use online payment services, UN1 and UN2 regarding customers' lack of control over payments, through their access to third parties that might be able to offer such a service.

In helping third parties to initiate payments and access bank account information real-time, PSD2 will serve to address access-related detriments (SA 24, SA25 and HS10). It will also provide ample opportunities for banks to innovate (dealing with a lack of innovation, detriment SA26).

5.2.1.2 PSD2: New IT Security requirements

The PSD2 requires effective management of operational and security risks, and introduces detailed requirements around the authentication of customers and the authorisation of payments. This is intended to enhance the level of consumer protection and thereby strengthen customers' trust in online payment services (detriment UN8), and their ability to make use of new technology solutions. However, the provisions set out a very inflexible regulatory framework for the security of online payments, and this may restrict firms' ability to react to cyber security threats which could undermine consumer confidence. It is also likely to lead to higher levels of customer friction (see

detriments FC 13 - 16), which can in fact reduce online security (e.g. through frequent 'forgotten password' requests, using the same password for several accounts etc.) rather than increase it.

PSD2 will have an impact on identity management. The Horizon Scanning Working Group supports the introduction of SecurePay approach based on multi-factor authentication (MFA) to authenticate the user and control access. MFA typically needs at least two of the following categories: knowledge (something they know); possession (something they have), and inherence (something they are.

The European Banking Authority has been tasked with developing the detailed requirements in this area. There may be an opportunity for industry collaboration to ensure that any requirements are compatible with UK initiatives, such as the Open Banking Standard.

There is a need for industry alignment in relation to the application of provisions related to incident reporting and advocacy to ensure that there are no overlaps/duplication with the Network and Information Security Directive, an EU Directive which, amongst other things, requires companies in critical sectors – such as energy, transport, banking and health – as well as key Internet services to adopt risk management practices and report major incidents to the national authorities.

5.2.1.3 PSD2: Access to payment systems

An important provision in PSD2 requires non-discriminatory access to payment systems. This provision is not new, but the wording has been strengthened in relation to 'designated' payment systems/schemes, (which in the UK includes Bacs, CHAPS, Faster Payments, LINK, Cheque & Credit, Northern Ireland Clearing, Visa and MasterCard). Whilst the schemes themselves remain exempt from any legislative requirement to open up access to the system, scheme members who provide indirect access to other PSPs will not be permitted to discriminate against other authorised PSPs wishing to gain access, and where they refuse access to the payment system, they must provide the applicant PSP with "full reasons for any rejection". It is unlikely to lead to significant changes in improving access to payment systems or schemes in the UK, choice, or competition (as highlighted by detriments UN29, SA1-7, Sa25 and HS9), but may increase indirect access to SEPA for UK firms wishing to operate cross-border.

The PSR is however conducting a review of the UK's current landscape around access to payment systems, and the Bank of England's review - covered below in section 5.2.11 - considers whether or not the RTGS should be opened up to non-bank PSPs. These initiatives may lead to greater domestic access to payment systems than PSD2.

Similarly, the PSF's own work on Simplifying Access may solve these detriments more successfully.

5.2.1.4 PSD2: Direct debit guarantee

The UK Direct Debit Guarantee currently offers a never-ending guarantee which some believe makes it difficult for service providers to manage for risk in the provision of goods and services and also may act as a potential barrier to non-banks offering the service (detailed as UN6 and FC17). Additionally, this guarantee has meant that direct debits are potentially open to fraud. The PSD does not mandate a life-long direct debit guarantee, but provides a 13 month window of refund right for users in case of unauthorised transactions. If the UK implements PSD2, avoiding the use of a national derogation in this space, these issues might be solved with an associated reduction in fraud.

5.2.1.5 Open Banking Standard

In the Autumn Statement 2014, the UK government announced its intention for the UK to be the global centre for financial technology and to lead the world in open source data in banking. One of the measures to support this goal would be the development of an open standard for application programming interfaces (APIs) in UK banking. This was outlined in a report on Data Sharing and Open Data for Banks written by the Open Data Institute and consultancy firm Fingleton Associates. Following the results of a government Call for Evidence in early 2015, an industry steering group was set up in September 2015 and given the task of drafting a report setting out the framework for such an API standard. Following wide collaboration within the payments and wider industry, the Open Banking Standard report was published in February 2016, and recommended the setting up of a governance framework and implementation plan for the standard. The proposal for the standard has been well received in other jurisdictions.

The standard could provide the basis for innovative solutions to several customer detriments identified by the PSF, such as UN1 and UN2 on the lack of customer control over payments, and HS9 regarding the lack of alternative rails for business users. It could also address detriments raised by the payment service community such as HS7 about allowing the external market the freedom to innovate, HS10 about third party providers being unable to initiate payments or access account data, and UN15 on the limited opportunities for third party reporting.

However the government has stopped short of providing explicit support for the standard, so progress on the standard has slowed. Questions remain over leadership to drive the development of the standard, as well as funding. We propose that there is a role the PSR can play in driving the project forward so that sufficient progress can be made over the coming months and years. If not there is a risk that individual players - who are obliged to implement PSD2 - will take individual approaches, resulting in market fragmentation and further complexity for smaller players.

5.2.2 Payment Accounts Directive 2014/92/EU (PAD)

The Payment Accounts Directive was adopted by the European Parliament and the Council of the European Union in July 2014. It aims to:

- improve transparency and comparability of fee information on payment accounts through provisions on the disclosure of fees and charges, some standardised terminology, and rules on packaged accounts
- facilitate switching of payment accounts within a Member State
- ensure every EU resident has access to a payment account with basic features

The Directive has some potential to address certain detriments, but voluntary initiatives concerning key aspects of the Directive are already in place in the UK so its impact is likely to be limited.

Firms are obliged to apply the provisions on packaged accounts, switching and payment accounts with basic features by 18 September 2016. Requirements related to increased transparency and comparability of fees will fall into place once further details have been agreed by regulators.

Prior to this Directive the UK's retail banking industry had agreed voluntary arrangements to enable two out of the three key changes introduced by PAD: (a) account switching (i.e. CASS launched in September 2013 which has 40 bank participants) and (b) 'basic bank accounts' (agreement made by 9 banks December 2014 to offer basic bank accounts).

On transparency and comparability, the UK has already introduced annual statements and common terminology for borrowing services. As such, much of the substance of the Directive has already been achieved in the UK. For example, certain detriments around "financial capability" identified by the Forum (including UN5 relating to charges for bounced direct debits) are addressed by the basic bank account agreement.

Beyond existing activity, the Directive:

- will ensure that people who are unbanked are assured of their right to open a basic bank account. This is important in opening up access and making electronic payments available to people currently excluded from the market.
- may lead to a greater number of banks (and non-banks who offer payment accounts) offering a switching service and offering basic bank accounts

While there is limited scope for industry collaboration specifically on PAD, in order for PAD to be effective it may be helpful for the industry to undertake an awareness raising campaign to highlight consumers' right to an account and their ubiquitous availability. This could also help to counter previous problems relating to lack of awareness of basic payments accounts and the mis-selling of current and packaged accounts. Likewise, activity around the Directive may go some way towards raising public awareness and consumer confidence in the switching service, which could lead to a reduction in the incidence of detriments related to difficulty in switching (AP2, AP3 and AP4).

However, on its own, the Directive will not provide the control that the unbanked or marginally banked require and so there may be limited up-take of electronic payment services among those who may stand to gain most from using them. This points to the need for industry to address issues of customer control and 'request to pay'.

There is also scope for the industry to consider how it can work together to solve detriment UN27 and UN28, relating to the inconsistent application of JMLSG guidance on acceptable identification and verification documents for account opening, which is currently often a barrier for vulnerable or non-standard customers. PAD still allow for banks to refuse a customer to open a bank account if they think it would infringe money laundering regulations. The Directive has very strict criteria for refusing to open an account and banks should not be able to hide behind AML as a reason for refusing an account. Even so, if the Directive is poorly implemented, there is potentially a risk that identity requirements could limit the usefulness of PAD in increasing inclusion.

5.2.3 PSR Interim report – Market review into the supply of indirect access to payment systems (MR15/1.2.)

The PSR has recently published two interim reports on the current set up of the payments infrastructure supply chain. They have been issued for comment from all levels of the payments ecosystem including PSPs, Operators and Central Infrastructure providers as well as relevant trade associations. Each has relevance for the aims and objectives of the Payments Strategy Forum and there is an overlap around potential solutions, or 'remedies'.

In its review of the supply of indirect access to payment systems (MR15/1.2) (Regulator, 2016), the PSR noted that competition in the supply of indirect access is producing some good outcomes for indirect payment service providers. It also noted high overall satisfaction with the quality of service and higher levels of recent investment and innovation in the market. However, it also raised some concerns around choice, and the ability of indirect payment service providers to switch providers.

In particular, the PSR found that financial crime regulation is limiting the provision of indirect access for some indirect payments systems providers, and market conditions are less favourable for non-agency and smaller indirect payment service providers.

The PSR considers that the ongoing development of new entry by indirect access providers, new forms of access arrangement, and its current and anticipated regulatory work on access should improve choice, quality and price for service users. Its interim conclusion therefore is to monitor those developments, and take further action if its concerns are not sufficiently addressed over the next 12 months.

The interim report on infrastructure provision reflects the PSR's same core objectives around competition and innovation to enable the best end user service, focusing on the interbank payment systems provided through Bacs, Faster Payments and LINK. As such the review centres on VocaLink as the current Central Infrastructure provider in the UK's supply chain for these services. The provisional findings include the view that competition for, and within, the provision of infrastructure is not sufficiently competitive.

The proposed remedies include competitive procurement, divestment of PSP shareholdings in VocaLink to remove the vertical ownership that may impede competition and innovation and to ensure interoperability through common payment messaging standards.

New technology may help here. For instance, detriments associated with access to payment systems and innovation could also be partly addressed by standardising the payment layers, making it easier to make discrete changes at pace. Another example would relate to the proposed remedy on interoperability. Interoperability may be enabled through technical solutions around Richer Data which can build upon the benefits of improved payment messaging standards. For the end user such solutions could underpin new end user payment options such as Request to Pay or e-invoicing, giving customers more control of their transactions (thus addressing other User Needs detriments). It will be important to align timings of the relevant work underway via the Payments Strategy Forum and the final outputs and directions from this separate, but related, Market Review.

5.2.4 Fourth Money Laundering Directive and new Wire Transfer Regulation

An important area of concern for law enforcement is financial crime and terrorist financing of various forms. Legislation has been in place for many years to help to prevent and track these activities. European legislation is based on core recommendations made by the Financial Action Task Force ("FATF"), a collaborative global body.

Two key elements of the European legislation have recently been updated. These are:

- The Fourth Money Laundering Directive (Directive (EU) 2015/849) of 20 May 2015, to be implemented by member states by 26 June 2017; and
- The Wire Transfer Regulation (Regulation (EU) 2015/847) of 20 May 2015, which will apply (with direct effect without needing to be implemented by member states) from 26 June 2017.

To further combat terrorist financing and also prompted by the terrorist attacks in Paris late last year, the European Commission is developing proposals to amend 4MLD to tighten up rules related to customer diligence requirements for prepaid cards, and to bring digital currencies within the scope of 4MLD.

In the UK, Guidance developed by the Joint Money Laundering Steering Group ("JMLSG") is approved by HM Treasury and followed by the Financial Services Industry to comply with the UK Money Laundering Regulations 2007 ("MLRs"). As 4MLD (like 3MLD) is a minimum harmonisation Directive, the UK can choose to apply higher standards than set by the Directive. The JMLSG Guidance will need to be updated and this is a potential area for collaboration within the industry and with users. In comparison with 3MLD, 4MLD provides an enhanced framework for a risk-based approach to prevention of money laundering. In developing guidance to support the development of new risk-based approaches to prevent money laundering, industry participants and users could co-operate in identifying areas of concern and approaches to reduce the risk of money laundering, while still enabling access for vulnerable or non-standard customers (detriment UN27 and UN28) as noted above. 4MLD should also assist in combatting fraud and enhancing confidence in payment systems which could help overall engagement in online services (detriment UN20).

5.2.5 European electronic ID initiative (e-Idas Regulation No. 910/2014)

Regulation (EU) N°910/2014 on electronic identification and trust services for electronic transactions in the internal market was adopted on 23 July 2014, and will apply from 1 July 2016. Its aim is to enable secure and interoperable entity identification & authentication between businesses, citizens and public authorities. Some practical online use cases would include as submitting tax declarations, enrolling in a foreign university, remotely opening a bank account, setting up a business in another Member State, authenticating internet payments, submitting a bid for an online call for tender, etc. The Regulation seeks to do this by:

- ensuring that people and businesses can use their own national electronic identification schemes (eIDs) to access public services in other EU countries where eIDs are available.
- creating a European internal market for eTS - namely electronic signatures, electronic seals, time stamp, electronic delivery service and website authentication - by ensuring that they will work across borders and have the same legal status as traditional paper based processes. Only by providing certainty on the legal validity of all these services, businesses and citizens will use the digital interactions as their natural way of interaction.

This regulation has the potential to help address detriments UN8 and FC14 about security measures being so complex that customers attempt to circumvent them in the interests of convenience. It could also help address UN20 regarding consumers' lack of confidence in the shift to online services as it limits the use of e-IDAS credentials to the legitimate user. The EBA's Discussion Paper on Strong Customer Authentication and intra-PSP Communication proposed that e-IDAS could be a useful framework for the payments industry and the implementation of PSD2. However the scope and timeline of adoption of e-IDAS by the private sector (and even by government entities in different EEA countries) is unclear, and no country outside the EEA has indicated they will be adopting e-IDAS identification services; this limits the appeal of this framework for PSPs with a global presence. In addition, the UK does not yet have an electronic identification scheme (unless Gov.uk Verify qualifies), so it may have limited benefit in the UK.

If the framework were to be extended to use by the private sector, it might also be able to address detriment FC5 ad FC15 on the difficulties making international (and some national) payments due to the challenge of assuring identity. It also might help address detriment FC2, FC3 and FC4 on the complexity and cost of online verification of identity.

5.2.6 UK electronic ID initiative (Gov.uk Verify)

GOV.UK Verify is a government initiative to allow individuals to complete verification of their identity online with a certified service provider, giving them access to government services securely and privately. GOV.UK Verify is being built by Government Digital Service (GDS). It is currently voluntary, and being tested with various government departments, such as DWP, HMRC, DVLA, BIS and Defra. It aims to go live in April 2016 (at least according to minutes of January meeting of GDS Privacy and Consumer Advisory Group).

This initiative might help address UN20 regarding consumers' lack of confidence in the shift to online services, as it might increase trust amongst consumers in the use of online services if the government is leading the way. As with e-IDAS, if the initiative were to be extended to use by the private sector, it might also be able to help address detriment FC5 ad FC15 on the difficulties making international (and some national) payments due to the challenge of assuring identity. It also might help address detriments FC2, FC3 and FC4 on the complexity and cost of online verification of identity.

5.2.7 HMT proposals to apply anti-money laundering controls to Virtual/Digital Currency Exchanges ("DCXs")

Virtual/digital currencies operate outside the regulated field and outside government-controlled monetary frameworks. As such, they allow payments to take place in an uncontrolled environment. This contributes to their allure but can facilitate criminal activity, on the basis of anonymous (or at least pseudonymous) transactions.

Whilst the UK Government is keen to support the development of FinTech and related activities, it has decided that some control is needed. It is therefore putting in place requirements for DCXs to carry out customer due diligence ("CDD") so that at the touch points with the "real" financial world, where virtual/digital currency is exchanged for fiat currency, or vice versa, users of virtual/digital currencies are identified and their identity verified. The Government views this as a proportionate approach to regulation in this area, which will support the growth of confidence in virtual/digital currencies as legitimate forms of currency for payment. There might be scope for collaboration in developing the risk-based CDD needed for DCXs, however this could be limited as there could be quite standardised approaches.

5.2.8 Interchange Fee Regulation

On 29 April 2015 the European Parliament and the Council of the European Union adopted the Interchange Fee Regulation (IFR). Interchange is collectively agreed inter-bank fees usually between the acquirer and the issuer belonging to a certain card scheme.

The IFR's aim is to create a properly functioning Internal market in the area of card-based payments and internet and mobile payments based on cards, by setting fees for the use of payment card schemes at economically efficient levels, whilst contributing to fair competition, innovation and market entry of new operators. The IFR imposes requirements directly on card schemes, issuers, acquirers and merchants. The PSR is the main competent authority for monitoring compliance with and enforcing the IFR in the UK, although the FCA and Trading Standards Authorities will have some responsibilities in this respect also.

On 9 December 2015, the IFR introduced interchange fee caps on consumer debit and credit card transactions where both the issuer and acquirer are located in the EEA. This regulation aims to

reduce costs for merchants and thus make these transactions more affordable, potentially passing further benefit to consumers. Commercial card transactions are exempt from the caps.

From 9 June 2016 business rule requirements will come into force. The business rule requirements, amongst other things, are aimed at ensuring consumers and merchants have accurate information on fees paid in relation to payment transactions and to stop merchants being prevented from choosing a cheaper card or from steering consumers towards the use of such cheaper cards.

To enable this, the IFR requirements mean that "payees and payers should have the means to identify the different categories of cards. Therefore the various brands and categories should be identifiable electronically and for newly issued card-based payment instruments, visibly on the device. In addition, the payer should be informed about the acceptance of the payer's payment instrument(s) at a given point of sale. It is necessary that any limitation on the use of a given brand be announced by the payee to the payer at the same time and under the same conditions as the information that a given brand is accepted." Articles 10(4) and (5) are introduced for these purposes.

These are areas identified for potential UK industry collaboration so that the requirements are implemented in the same way by the industry. This could help tackle detriment UN18, which states that there is a lack of transparency/clear information on types of payments (and products) for consumers to be able to select the best choice with confidence. However, it highlights the increasingly complex landscape of payment schemes for consumers who are unrealistically expected to make sense of the options.

This regulatory (and possibly industry collaboration) initiative goes some way to alleviate detriment HS11 that a lack of user say in changes mandated from card scheme level means merchants bear costs with no representation at governance level and that they are in a must-take position irrespective of costs.

The main detriments where there is currently no regulatory initiative which may assist and where there may be scope for UK industry initiative instead is HS12 and 13 – around the potential issue raised by the Forum's detriment list that card scheme governance does not adequately represent merchants and can be inflexible when translating USA-based rules into rules for EU firms.

However as weighted by the HSWG, there are other areas thought to be of higher priority for the Forum. But this may connect to the initiatives of the ERPB around EU standardisation of card payments, which is set out below.

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Though not fully supported by the HSWG and as weighted by the Sub Group, there are other areas thought to be of higher priority for the Forum. But this may connect to the initiatives of the ERPB around EU standardisation of card payments, which is set out below.

Though directionally the IRF requirements have been generally well received, they have been inconsistently communicated and implemented to key stakeholders, specifically merchants . To deliver the transparency and choice options, they do require significant effort by most stakeholders,

including merchants that request the changes, to ensure implementation. There is a concern of "be careful of what you ask for". Significant implementation considerations are imposed to deliver the required convenience, choice, transparency and cost savings.

5.2.9 Article 7 – Scheme/Processing Separation

Equally from 9th June 2016, Article 7 of the above European regulation comes into force. Article 7, otherwise known as "Separation of payment card scheme and processing entities", addresses regulatory concerns that international card schemes, such as Visa and MasterCard, have commercial and operational advantages versus processor-only organisations, when offering transaction-processing services in Europe.

Article 7 requires, Payment card schemes and processing entities to

- be independent in terms of accounting, organisation and decision-making processes
- not present prices for payment card scheme and processing activities in a bundled manner
- not cross-subsidise such processing activities
- allow for the possibility that authorisation and clearing messages of single card-based payment transactions be separated and processed by different processing entities
- not discriminate in any way between their subsidiaries/shareholders on the one hand and users of the payment card schemes and other contractual partners on the other hand
- not make the provision of any service they offer conditional in any way on the acceptance by their contractual partner of any other service they offer.

The forced and very visible separation of payment scheme and processing, is intended to introduce greater competition between the likes of Visa and MasterCard and with other existing payment processing providers. It is likely that all processing entities will be eager to pursue all processing opportunities that maximise their processing capacities, and not be restricted to card transaction processing only.

Source: REGULATION (EU) 2015/751 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2015

5.2.10 Introduction of cheque imaging in the UK

The Small Business, Enterprise and Employment Act 2015 (PART 1 Access to Finance - Section 13 and associated Secondary legislation) introduces changes to the Bills of Exchange Act 1882 to enable cheques to be presented as images between consenting banks in place of the existing physical exchange of paper. It also repeals the changes introduced by the Deregulation (Bills of Exchange) Order 1996 which enabled data only exchange with recourse to paper. Changes enable the introduction of cheque imaging thereby improving the customer offering by speeding up cheque processing, reducing costs, and enabling new products to be developed by banks and third party suppliers.

The changes are currently being enabled by the development of an Image Clearing System (ICS) by Cheque and Credit Clearing Company Ltd and the Belfast Bankers Clearing Company Ltd within the UK.

This initiative continues the existing multi operator model (which was considered a detriment – SA22 - by the Payments Community) by the introduction of an electronic cheque processing scheme, but this is mitigated by the reduction in the overall number of schemes due to the closure of the two existing sterling paper schemes. Eventually it will result in an electronic payment scheme speeding up cheque payments as well as enabling sort codes to be transferred between banks. This will address a long standing complaint relating to the ability of small banks to move between sponsoring banks and granting greater access of small banks to the payments market. Like other electronic payment schemes it will have the ability to reroute payments under the Current Account Switch Service to the new bank whilst maintain the same payment times. As it is an electronic payment scheme it will be able to better accommodate account number portability (ANP) if this is developed.

The move to cheque imaging enables customers to benefit from the same timescales even when the drawer has changed bank since issuing the cheque. These changes should further enable niche players in the payment market to innovate in customer arena. It could enable the introduction of other collaborative payment/image related services over the secure network. The build of the infrastructure was competitively tendered resulting in a new supplier of payment infrastructure to the UK. Whilst the initiative was initiated by HMT (due to a perceived lack of innovation from banks (detriment HS7)) it will result in the collaborative development of a flexible system. Initially this will be a pay in one day and receive the next working day, but has the functionality to move to same day or hybrid model for processing, although this would require significant further investment by institutions that participate. CMA Retail Banking Market Investigation

On 6 November 2014, following the conduct of market studies, building on work done previously by the Office of Fair Trading, the Competition and Markets Authority (CMA) decided to make an ordinary market investigation reference, under section 131 of the Enterprise Act 2002, in relation to the supply of retail banking services to personal current account (PCA) customers and to small and medium-sized enterprises (SMEs) (Authority, 2014).

It has provisionally found that there are a combination of features of the markets for PCAs, business current accounts (BCAs) and SME lending (in each of Great Britain and Northern Ireland) that give rise to adverse effects on competition. These features relate to low levels of customer engagement, barriers to accessing and assessing information, barriers to switching and incumbency advantages, and multiple account holdings with the same banks (for instance, current account, business account and an SME lending product) (Office, n.d.).

The remedies it proposed in its notice involve measures to promote engagement and prompt searching and switching behaviour, as well as measures to make it easier for SMEs to shop around between lenders. In particular, the CMA is proposing measures to facilitate comparisons between providers, make it easier to open Business Current Accounts and to improve the switching process (Office, Cabinet Office, n.d.).

The implementation of the Open Banking API should allow new services to develop, including those that could help customers switch to products better suited to their needs, with less consumer effort required. Thus use of algorithms could improve consumers' ability to 'assess' the market. (However it will rely on more post-sale product information to be made available to effect the most meaningful change in the market).

5.2.11 Bank of England – Real Time Gross Settlement (RTGS) Review

Following an outage of its RTGS system on 20 October 2014, the Bank of England launched an independent review of the causes of the disruption. Following the publication of the review's results (conducted by Deloitte)[1],the Bank has recently announced that it has completed, or agreed steps that will complete, all the actions in response to the Deloitte report (Government, n.d.)

Furthermore, the Bank announced an overall review of the RTGS system in order to address the challenges of today's payment market and also to meet and shape payments trends in the coming decades.

In structuring the blueprint for the RTGS review, the Bank will seek to answer the following points:

- The mission of the Bank, that is the maintenance of the UK monetary and financial stability;
- The desired level of functionality;
- The access to the RTGS and the challenges it raises; and
- The role of the Bank in delivering payments and settlement services, looking closely at how the UK compares to elsewhere around the world and the international guidance on risk standards set out in the Principles for Financial Market Infrastructure. In light of the emerging results of the blueprint, the Bank's supervisory function will review whether any changes are necessary to the supervisory model for the high value sterling payments system.

The Bank's aim is to have agreed on a blueprint for high-value sterling settlement by the end of 2016, with technological development of that blueprint beginning in 2017. To do so, the Bank is consulting with a wide range of stakeholders, both in the industry and outside and it considering whether Distributed Ledger Technology could help. The outcome of the Bank's work could help address detriment SA27 regarding difficulties obtaining a Bank of England settlement account in order to become a direct participant of certain designated payment schemes.

5.2.12 European Retail Payments Board initiatives

The European Retail Payments Board (ERPB) was set up by the European Central Bank in 2013, as the successor to the SEPA Council which had governed the Single European Payments Area (SEPA) since 2010. The ERPB's aim is to foster the development of an integrated, innovative and competitive market for retail payments in euro in the EU.

The ERPB has initiated a number of new projects, which are listed below. Whilst most are limited to the Euro system, they are likely to have an impact on UK PSPs and the UK Payment Services landscape.

5.2.12.1 ERPB: Instant Payments

In November 2015 the ERPB endorsed a scheme proposal for instant credit transfer, known as SEPA Credit Transfer, or SCTinst. It will be developed by November 2016, and implemented by November 2017. The European Payments Council (EPC) has been tasked with creating an SCTinst rulebook to underpin the operation of this scheme, and the intention is to extend the scheme to SEPA Direct Debit (SDD) and card payments.

[1] by the then Office of Fair Trading (OFT) and HM Treasury through the Payment Systems Task Force.

The UK payments industry will have to collaborate to ensure interoperability with the EU system in order to facilitate cross-border payments. It will also need to collaborate in order to extend its domestic instant payment system to Customer to Business (C to B) and to cards and direct debit.

This scheme may help address detriment UN3 (lack of real-time pull functionality), and UN11 (lack of real-time balances leading to financial detriment caused by overspending and returned payment fees). However, as it is limited to the SEPA area, it may have limited impact on UK consumers. It may also reduce detriment H9, on lack of access for business users to online credit transfer payments.

5.2.12.2 ERPB: Person-to-person (P2P) mobile payments

In June 2015, the ERPB agreed on recommendations to set up a mobile Person-To-Person payment network across the EU. This aims to allow payments to be made between customers across the EU using a phone number as a proxy instead of an IBAN number, similar to the UK PayM initiative. The potential proxy could extend to other identification information that the payee is prepared to share, such as an email address. The project aims to set up a standardised proxy lookup (SPL) service, using existing EU and national infrastructures, such as SEPA payments and IBAN. Whilst the plan is currently focused on P2P payments, it may be extended to Person to Merchant/Retailer (P2M) in future, as this holds a stronger business case.

As with SCTinst, the UK payments industry will need to collaborate in order to ensure interoperability with the EU system. Currently the main opportunities for the UK payments industry lie in contributing towards the ongoing work of the steering committee to set up a mobile P2P forum. The first meeting was held inMarch 2016 and next scheduled for April 2016. A number of UK based entities are represented for example Electronic Money Association, PayM and Payfriendz.

This project may assist in reducing detriment HS8 regarding the lack of interoperability between mobile payment solutions, although the structure of the proposed solution is rather restrictive, and is not focused on mobile phone payments, but rather the use of a mobile phone number as a proxy for an IBAN or other account type of number. Industry and UK/EU collaboration may also help address the lack of options for new technologies and/or market entrants who may not wish to use the traditional 4-party system (detriment HS3). However, as the proposed solution aims to use existing infrastructures as much as possible, the extent to which this project is likely to solve detriment HS3 is limited.

5.2.12.3 ERPB: Contactless proximity payments (mobile and card-based)

In November 2015, the ERPB published a statement agreeing to develop, over time, a secure, convenient, consistent, efficient and trusted payment experience for customers (consumers and merchants) for all retail transactions at the point of interaction (POI), based on commonly accepted and standardised contactless and other proximity payment technologies.

A working group has published a report setting out a number of recommendations for the take-up of mobile and card-based contactless proximity payments in the EU, many of which are already under development. These include further standardisation across industry, coordinated communication promoting the take-up of contactless, and the addressing of certain technical and regulatory issues.

As with the mobile P2P project, the UK will need to collaborate with the EPC and the ERPB and provide input to any relevant consultation processes. This project could potentially assist in reducing detriment HS8 regarding the lack of interoperability between mobile payment solutions.

5.2.12.4 ERPB: Electronic invoicing solutions

In June 2015, the ERPB began to look at the potential benefits of a harmonised SEPA-area electronic invoice/bill presentment and payment (EIPP/EBPP) service, and proposed the setting up of a working group to analyse existing EIPP/EBPP solutions in the EU. The working group will report back in November 2016, analysing the reasons why previous attempts have failed and the barriers to the take-up and integration of such solutions in Europe. On this basis, the ERPB will then review the need for further work in this field.

The UK payments industry should monitor these developments with a view to using the same or similar standards in the UK to ensure interoperability. The development of such solutions could also represent an opportunity for third party firms gaining access to banking data via the Open Banking Standard. This could lead towards a solution for detriment HS1, where the distance between the physical and financial supply chain affects e-invoicing and reduce the costs associated with account reconciliation (UN31).

5.2.12.5 ERPB: SEPA standardization of cards

The ERPB's Card Stakeholder Group maintains the SEPA Cards Standardization volumes, with the next one (Volume 7.05) due to be completed by 31 October 2016. The Volume defines standard requirements to enable an interoperable card and terminal infrastructure across SEPA, based on open international card standards. It only applies to Euro payments, and whilst IBAN and BIC can be used for inter-PSP transactions, PSPs may not require customers to provide more than simply the IBAN when initiating euro transactions (SCT and SDD). It may impact on the UK payments market where customers should be informed that they don't need to provide more than their IBAN. If ANP is eventually adopted, customers may be able to use only one IBAN for each account they hold throughout their lifetime.

5.2.12.6 Other European initiatives around e-invoicing

E-invoicing is the electronic transfer of billing and payment information between business partners.

The ERPB's current initiative on electronic invoicing (e-invoicing) is highlighted above where it is noted that the ERPB is looking into why previous attempts to foster a harmonised e-invoicing regime across Europe has failed.

The problem that exists with the European e-invoicing market today is market fragmentation in technologies, diversity of data and usage requirements and different approaches to their implementation. Because no existing e-Invoicing format has achieved dominance, market players need to support multiple formats which requires substantial mapping and conversion exercises. According to the European Commission the key challenge is to define a single and clear semantic data model because a common data model will facilitate semantic interoperability and ensure technology neutrality.

It may be useful for the PSF to note some of the other e-invoicing initiatives and to consider whether the PSF should adopt a strategy for the UK payments industry which incorporates pushing for either industry collaboration (which so far seems to have been lacking in noticeable achievement in this area) or regulatory requirements around e-invoicing. There may be potential

significant benefits in the PSF fostering a widespread use of harmonised and interoperable e-invoicing across the UK's private and public sector, allowing for quicker retrieval of money from customers and quicker and cheaper processing as invoice information can be fed directly into a company's payment system. These company payment systems obviously rely on the services offered by the UK's Payments Industry and there is potential for a standardised e-invoice regime therefore being a new request to pay payment system for B2B payments.

Potentially the following detriments identified by the PSF could be ameliorated to some extent by such a new system:

- UN1 regarding poor flexibility or ease of use to control push or pull payments;
- UN10 regarding corporate service users wanting to know where payments are at all times in case its non-real time;
- UN14 regarding missing reference data causing misdirected payments/expensive in management of exceptions;
- UN22 Transparency of users for services in the corporate space
- UN31 reconciliation costs and treasury management for business; also government reporting costs;
- And of course the particular detriment highlighted in relation to e-invoicing - HS1 – that a lack of communication and engagement between financial and non-financial firms makes e-invoicing less effective.

The relevant e-invoicing initiatives the PSF would have to consider further in relation to a decision to incorporate an e-invoicing initiative in its payments strategy are as follows:-

- The European Committee for Standardization (CEN), which is funded by the Commission and runs a number of activities on e-invoicing implementation issues
- A series of informal meetings with representatives of standards organisation produced the report, 'e-Invoicing Standardisation Overview, issues and conclusions for future actions', September 2012
- Following the adoption of Directive 2014/55/EU on e-invoicing in public procurement and in accordance with the provisions of Article 3 within, the Commission issued a standardisation request to the European standardisation organisations in December 2014. The work is being carried out by the CEN Project Committee on Electronic Invoicing (CEN/PC 434).
- European Multi-Stakeholder Forum on Electronic Invoicing brings together delegates from national e-invoicing forums and stakeholders from the user side of the market. Its objective is to help pave the way for a broad-scale adoption of e-invoicing at national and EU-level. The Forum is chaired by the Commission and meetings are held twice a year. As part of its mandate, the Forum will support the implementation of Directive 2014/55/EU on e-invoicing in public procurement.

As mentioned under the ERPB initiative, any such UK-centric initiative would need to collaborate with or closely follow the European-level initiatives so that a variation in national rules governing the validity of e-invoices in legal, financial and administrative terms would not make their cross-border use difficult.

5.2.12.7 EU Digital Single Market

The Digital Single Market is a European Commission initiative trying to bringing down barriers to unlock online opportunities within the EU.[2] The Digital Single Market strategy is built on three policy areas or 'pillars'[3,4]:

1. **Better access for consumers and businesses to online goods and services across Europe** – this requires the rapid removal of key differences between the online and offline worlds to break down barriers to cross-border online activity.
2. **Creating the right conditions for digital networks and services to flourish** – this requires high-speed, secure and trustworthy infrastructures and content services, supported by the right regulatory conditions for innovation, investment, fair competition and a level playing field. .
3. **Maximising the growth potential of our European Digital Economy** – this requires investment in ICT infrastructures and technologies such as Cloud computing and Big Data, and research and innovation to boost industrial competiveness as well as better public services, inclusiveness and skills.

In the context of the Strategy, key regulatory objectives that the Commission has identified include:

- Rapidly concluding negotiations on common EU data protection rules.
- Giving more ambition to the ongoing reform of telecoms rules.
- Modifying copyright rules to reflect new technologies, and to make them simpler and clearer.
- Simplifying consumer rules for online purchases.
- Making it easier for innovators to start their own company.
- Boosting digital skills and learning.
- Enjoying the same online content and services regardless of the EU country we are in.

We expect that the payments industry would be substantially affected by the EU data protection reform that has been put forward by the Commission in 2012.[5] The Reform consists of two instruments:

- The **General Data Protection Regulation** which the Commission hopes to enable people to better control their personal data and businesses to make the most of the opportunities of the Digital Single Market by cutting red tape and benefiting from reinforced consumer trust.
- The **Data Protection Directive** for the police and criminal justice sector which intends to ensure that the data of victims, witnesses, and suspects of crimes, are duly protected in the context of a criminal investigation or a law enforcement action.

[2] http://ec.europa.eu/priorities/digital-single-market_en.
[3] https://ec.europa.eu/digital-single-market/en/news/digital-single-market-strategy-europe-com2015-192-final.
[4] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1447773803386&uri=CELEX%3A52015DC0192.
[5] http://europa.eu/rapid/press-release_IP-15-6321_en.htm.

5.2.10.7. The General Data Protection Regulation

The current EU data protection regime is based on the Data Protection Directive (95/46/EC)[6] that was introduced in 1995. Since then, there have been significant advances in information technology, and fundamental changes to the ways in which individuals and organisations communicate and share information. In addition, the various EU member states have taken divergent approaches to implementing the Data Protection Directive, creating compliance difficulties for many businesses.

For this reason the EU's legislative bodies are preparing an updated and more harmonised data protection law, the draft General Data Protection Regulation (GDPR). On 15th December 2015, the European Parliament and the Council of the European Union reached an informal agreement on the GDPR. [7] The GDPR will introduce a number of new concepts and approaches**,** the most significant of which are outlined below. The GDPR main ambition is to be more future-proof and forward-looking than the Data Protection Directive, and as technology-agnostic as possible.

Key concepts and changes are:

- **Greater harmonisation:** The GDPR introduces a single legal framework that applies across all EU member states. This means that businesses will face a more consistent set of data protection compliance obligations from one EU member state to the next.
- **Expanded territorial scope:** Non-EU businesses will be subject to the GDPR if they: (i) offer goods or services to EU data subjects; or (ii) monitor EU data subjects' behaviour. Many non-EU businesses that were not required to comply with the Data Protection Directive will be required to comply with the GDPR.
- **Clear and affirmative consent:** Unlike the Data Protection Directive, the GDPR does not distinguish between ordinary and explicit consent. It instead adopts a uniform approach and proposes that consent must be freely given, specific, informed and explicit, and demonstrated either by a statement or a clear affirmative action.
- **Increased enforcement powers:** Currently, fines under national law vary and are comparatively low (for example, the UK maximum fine is £500,000). The GDPR will significantly increase the maximum fine.
- **The "one-stop shop".** Currently, each DPA may exercise authority over businesses operating on its territory. Under the GDPR, a business will be able to deal with a single DPA as its **"**lead authority**"** across the EU. Cooperation among the DPAs will also be significantly strengthened to ensure consistency and oversight.
- **Privacy by design and by default:** Businesses will be required to implement data protection by design (for example, when creating new products, services or other data processing activities) and by default (for example, data minimisation). They will also be required to perform data protection impact assessments to identify privacy risks in new products.
- **Firms will have to appoint data protection officer** if they are handling significant amounts of sensitive data or monitoring the behaviour of many consumers. Firms whose core business activity is not data processing will be exempt from this obligation so as to avoid red tape.

[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31995L0046:en:HTML.
[7] http://www.europarl.europa.eu/news/en/news-room/20151217IPR08112/New-EU-rules-on-data-protection-put-the-citizen-back-in-the-driving-seat.

- **Pseudonymisation**: The European Parliament Text introduces a concept of "pseudonymised data" (that is, key-coded or enhanced data). Pseudonymous data will still be treated as personal data, but possibly subject to fewer restrictions on processing, if the risk of harm is low.
- **The right to be forgotten:** Consumers will thus have the "right to be forgotten" or erased from the databases of companies holding their personal data, provided there are no legitimate grounds for retaining it.
- **The right to know when your data has been hacked:** companies and organisations will be required to notify the national supervisory authority of serious data breaches as soon as possible so that users can take appropriate measures.
- **The right to data portability:** Article 18 of the Commission Text proposes that data subjects would have a new right to obtain a copy of their personal data from the data controller in a commonly used format.

[Please note: No reference has been made with regard to banking structural reform-ring fencing, BRRD and TARGET2 etc.

5.3 REGULATORY INITIATIVES MAPPED TO THE DETRIMENTS

Mapping regulatory initiatives to the detriment categories shows that action is being taken to improve access to the payments system. Some of the regulatory issues may improve transparency and access for vulnerable consumers too.

Detriment Category	Initatives Mapped
ACCESS	20
BACK END COMPETITION	3
CHOICE / COMPETITION	7
COMMON STANDARDS AND RULES	0
COSTS / COMPLEXITY	7
CUSTOMER ASSURANCE	2
DIGITAL CURRENCIES	1
E-INVOICING	1
FINANCIAL CAPABILITY	13
FRAUD / KYC / SMALL PSPs	4
GENERAL KYC / FRAUD / AML	0
GOVERNANCE	7
GREATER CONTROL	7
INTERNATIONAL	1
OTHER	1
RETAIL	6
RISK OF CHANGE	1
SCHEME GOVERNANCE	1
SYSTEM VULNERABILITY	2
THIRD PARTIES	3
USER NEEDS	0
Total	**87**

Table 1: Number of regulatory initiatives which answer detriments identified by the Payments Community. One initiative may help to solve multiple categories of detriments

5.4 BRIEF CONCLUSIONS FOR UK PAYMENTS STRATEGY

Overall the sub-group finds that while there is significant regulatory activity, the initiatives do not successfully deal with all of the detriments outlined by the Payments Community. There is little to support customer assurance although some initiatives could improve transparency. There is limited support for e-invoicing which could hinder improved payment services for SMEs and corporates (and the associated benefits of liquidity and growth).

Furthermore, and as acknowledged by the CMA in its retail banking market investigation, regulatory complexity constitutes one of the main barriers to entry in the financial services market. Apart from the large number of requirements that market participants have to comply with, each regulator is also often responsible for similar or overlapping parts of the market. As the market is currently operating during a time where a number of significant and critical regulatory measures with long term effects are expected to be implemented by different regulators (i.e. PSD2, banking recovery and resolution, ring fencing, payment accounts framework, access obligations for payment systems, data protection regulation), it will be important that the regulators involved ensure that their collaboration is indicative of close cooperation and communicated clearly to the market and that they do not underestimate the potential economic impacts or legal uncertainties that can arise from an uncoordinated approach.

6 THE INTERNATIONAL HORIZON

Analysis of payments across the international horizon confirms that global digitalisation is changing the face of payments. Banks are no longer the sole custodians of the financial products and services which were once their preserve. Digital platforms are now widely available for moving money, borrowing/lending or even funding a business venture; all of which are requiring banks to develop digital strategies that can compete to retain their existing customer base.

An international comparison shows that the UK payments market is world leading in many ways despite its idiosyncratic nature and design. Many innovations found in other countries are simply catching up with the UK and in this respect do not therefore meet the needs identified by the Payments Community in the detriments list. Others are focussed on the move to digitalisation and the promotion of e-commerce.

The analysis of the geographic horizon was representative rather than exhaustive and covered 35 identified initiatives. In scanning payments innovation around the world, consideration was given to the purpose of innovations as well as the functionality and technology because these are often shaped by the environment (i.e. the PEST factors). Specific initiatives often appear under a number of themes.

6.1 A SUMMARY OF THE FINDINGS FOR WORKING GROUPS

6.1.1 The international landscape for the 'user needs working group'

Overall, international initiatives offer a limited contribution to the user detriments outlined, especially around issues of greater control, customer assurance and financial capability (detriments UN3, UN5, UN6, UN7, UN10, UN15 to UN27). This is because in certain instances, some of the UK's own payments related services are already considered as world class, such as the Faster Payments Service. However, initiatives like Australia's New Payments Platform do allow for the development of overlay services which may address more user needs detriments. It is therefore suggested that the NPP initiative should be kept under review.

There are other initiatives the Working Group should consider. For instance, alternative sign-in methods like Apple ID improve the user experience so that security does not become an obstacle (UN8). Problems related to misdirected payment (UN 12,13 and 14) are addressed by BankServ in South Africa which operates an online Account Verification Service. A Request For Payment service, which addresses user needs for control in payments is being worked on in the US. Services like Transferwise make remittances significantly cheaper. We therefore draw the attention of the User Needs Working Group to sections 6.2.1 below on Identity and authentication and 6.2.8 on new and evolving payment instruments.

With reference to corporates and SMEs we found that there are a wide variety of services in development across the world that aim to insulate the customer from the complexities of the underlying payment systems by giving them a simple 'one click' buying experience. Services like Klarna and Alipay generally achieve this by acting as an intermediary between customer and supplier by providing an assurance to the buyer that their goods will be as advertised and will be delivered and providing an assurance to the supplier that they will receive payment. Many of these services accept a number of different payment types, with most using the international credit and

debit card networks to fulfil the actual payments. So for the customer they only need to register one preferred payment mechanism (generally a credit card but could be a bank transfer mechanism), once this has been done, subsequent purchases are 'one click' and do not require re-entering of security information for each transaction. For the supplier they can receive payment for their goods from the service and the underlying payment mechanism used by the customer is irrelevant to them.

6.1.2 The international landscape for the simplifying access working group

Access to payment systems appears easier in some other international payment ecosystems. However, there is a lesser degree of sophistication of some of the payments systems which inherently means simpler access. A conclusion of the international scan is that very few countries demonstrated a greater degree of access than the UK. Where access is complex in European systems it attracts more onerous regulation (see section 6.2.9 on structural and governance developments below describing mandated open access).

In considering the longer term payments strategy, the group may wish to take note of scheme by-passing in section 6.2.5 which was a noticeable trend in analysis (based on distributed ledger technology) as well as the development of intermediary services in section 6.2.3 which highlights that the underlying differences between payment mechanisms are increasingly of less interest to consumers.

6.1.3 The international landscape for the financial crime working group

Identity and authentication are areas of focus in multiple international payment ecosystems, responding to the opportunities and challenge of digitisation. We draw the attention of the Financial Crime Working Group to section 6.2.1 on identity and authentication below which summarises international initiatives in identity proxies, alternative sign-in methods, national initiatives for identity verification and digital signatures and beneficiary verification (which helps to address misdirected payments).

6.2 THEMES IDENTIFIED ON THE INTERNATIONAL HORIZON

35 initiatives were mapped across the payments value chain and a number of themes emerged.

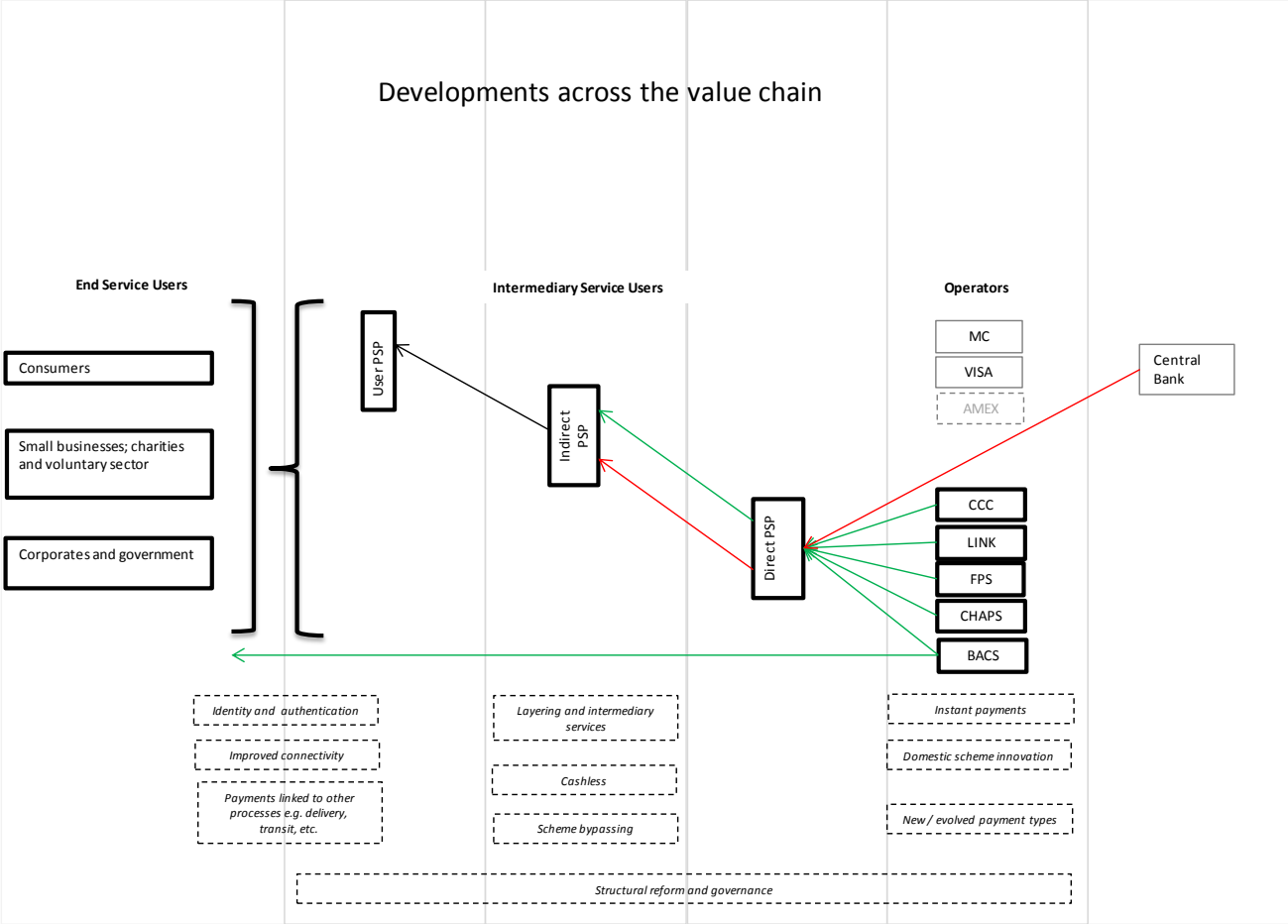

Figure 2: International payments mapped to the Payments Value Chain

Of these themes there was an over-arching 'super theme' that became apparent: digitalisation. The following table maps the initiatives to the themes identified:

Initiative themes	Number of initiatives
Identity and authentication	6
Layering and intermediary services	6
Cashless society	0
Scheme bypassing	3
Instant payments	7
Domestic schemes	8
New / evolved payment types	9
Structural and governance changes	4
Improved connectivity	0
Payments linked to other processes e.g. to delivery, to transit, etc.	5
*** SUPER THEME "digitalisation" ***	17

Table 2: International initiatives by identified theme

17 of the 35 developments considered are in some way linked to the digitisation of society and commerce with a number of governments having a clear ambition to move towards an e-economy,

e.g. overlaying services onto mobile services, delivering government services digitally, a deeper integration of payments into the value chain, and moves to a cashless society, etc.

Once these initiatives are mapped to the detriments identified by the Payments Community, it shows that the PSF may usefully observe the developments of The Clearing House and New Payments Platform which are developing faster payments services based on ISO20022 with value add overlays and information messages and the delivery of government services digitally through initiatives like Singpass, RealMe and E-Estonia.

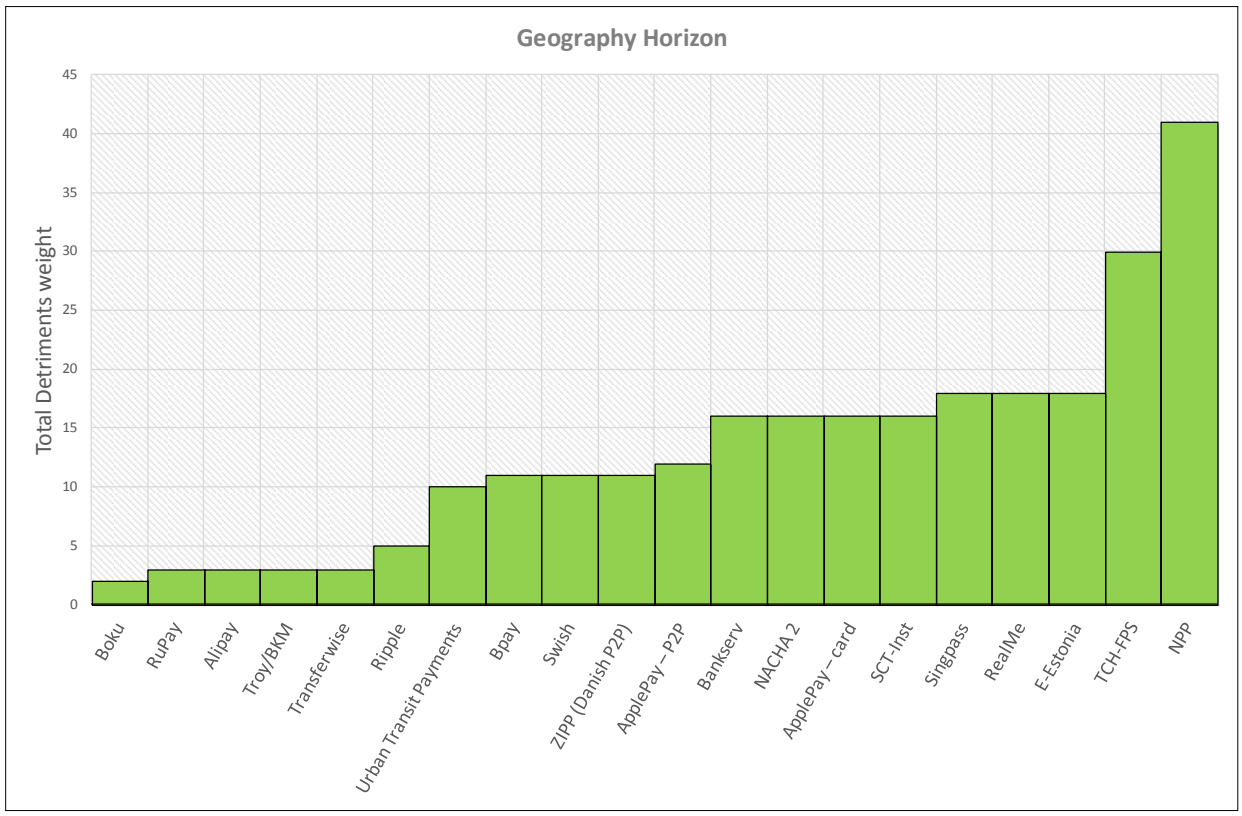

Figure 3: International initiatives weighted by the detriments they solve

Each of the international initiatives has different degrees of success and consumer/end-user adoption. Of the 10 highest scoring initiatives, 8 are nation-wide. Further investigation may need to be undertaken to determine the key success factors for any of the initiatives that are of interest to the UK's payments community.

6.2.1 Increased connectivity

The pretext of any digital banking revolution relies on the underlying connectivity and IT infrastructure needed to make all of this possible.

The practical effects of a broader digital transformative piece transform the lives of how people live, learn and work disrupting established practices in a variety industry sectors. An anticipated trend is one of convergence between the information technology, finance and media industries. This is likely to require closer regulatory alignment between interrelated and corresponding financial and telecoms regulators.

Singapore offers a neat example of the role its government is playing in investing towards this needed infrastructure, topping the Ookla chart as the nation with the highest download speeds, as well as articulating its Smart Nation vision defined as being 'a nation where people live meaningful and fulfilled lives, enabled through seamless technology, offering exciting opportunities for all.' Singapore also has a real time payments initiative underway called G3 which is moving to a single 'push' scheme.

6.2.2 Identity and authentication

The developments in this area are very much about supporting digitisation in a number of areas:

- *Identity proxies* - Traditionally payments products are accessed using either a card PAN or a bank account identifier (sort code and account number in the UK). Tracking the broader technical trend towards multiple personal identifiers, there are a number of initiatives that allow payments to bank accounts to be made on the basis of proxies. SWISH (Sweden), PAYM and the Danish instant payment systems all support mobile phone numbers. But other proxies are planned e.g. email address, national identity (Thailand) and commercial IDs such as Facebook ID. So far, this data is only being used to make person-to-person (P2P) instant payments and is not being used in other contexts to verify customer ID or to increase security by "hiding" bank account identifiers.
- *Alternative sign in methods* – as well as other methods of identifying customer accounts there has been significant development of alternative sign in methods aimed at making the on line experience simpler for consumers. These methods help to deal with the detriments identified around overly complicated security measures which put off consumers (detriments FC4 and FC14). PayPal, Google, Apple ID and Alipay in China are all examples of alternative sign ins. Paylib is another example that has been developed by French banks. With a Paylib account, users are able to pay on the web using a simple login and password instead of having to enter all their credit card information. The user experience is similar to paying with your PayPal account. In addition, there are a number of biometric authentication methods such as Apple's TouchID which link in these alternative sign-in methods and make the user experience more convenience and secure.
- *National initiatives for identity verification and digital signatures* –There are a number of government initiatives to make online access to government services simpler and more secure. For example Singapore launched SingPass in July 2015 to allow citizens access to over 200 e-services. This is similar to the New Zealand government's RealMe initiative launched in 2013 aimed at facilitating on line access to government and non-government services. So far the usage of RealMe for non-government services has been limited. It is notable that these initiatives have both taken place in small economies.
- *Beneficiary verification*: services to verify the identity of the beneficiary have been developed by Bankserv in South Africa. They operate batch and an online Account Verification Services (AVS). These allow the payer to verify before a payment has been made that the intended beneficiary is being paid, thus avoiding misdirected payments (detriments UN12, UN13 and UN14) and the need to recall funds post payment.

6.2.3 Layered and intermediary services

Service layering is the area that has seen the most innovation and which is becoming increasingly complex. Sometimes the layers are bank provided and sometimes not. An example of complex non-bank layering is PayPal. For example a customer may use the Amazon 1-Click ordering which may rely on PayPal as the payment method which in turn relies on a debit card to fund the PayPal account. Applepay, Venmo and Googlepay similarly build a proposition on underlying payment mechanisms. Klarna, which provides a similar service with additional options (e.g. pay after delivery) is also a type of intermediary service and relies on existing payment mechanisms. There are also bank provided layers, particularly in real time. In Sweden the underlying instant payments service is BIR, while P2P payments are made via SWISH. The same model applies in the UK and Denmark.

This overall trend to layering, particularly in the mobile space, makes the underlying differences between payment mechanisms (e.g. cards versus payments) increasingly immaterial to the consumer. In many parts of the world it is much easier for a business to join or access card systems and accept card payments than to access the interbank systems and accept direct payments from customers into their bank accounts. A customer's transactions on a card account may accumulate over a period (normally monthly) and then that card account is (normally) settled from their bank account.

6.2.4 Cashless

In Sweden, the government has had a clear policy of creating a cashless society for many years. Already, cash represents only 3 percent of Sweden's economy, compared to an average of 9 percent in the eurozone and 7 percent in the U.S., according to the Bank for International Settlements. There are cashless bank branches, fewer ATMs, and virtually any commercial transaction can take place using electronic payments. Even Stockholm's sellers of Sweden's answer to the Big Issue, were equipped with portable card readers to accept virtual payments two years ago. Recent news, however, suggests that the country is still in transition, as the Swedish Central bank has called for more access to cash, especially in remote/poorer areas.

Should the UK government consider a move to a cashless society, Sweden may prove a useful example to understand the particular challenges and transition states.

6.2.5 Scheme bypassing

There are a number of examples of where payments systems have been developed that bypass the traditional payment and card schemes. There are three key ways to by-pass the conventional SWIFT scheme by making payments: card to card; using a service like Transfer-wise which uses local automated clearing houses (ACH); or by way of Distributed Ledger Technology (DLT) which is already being used as the basis by the cross border payments provider Ripple as well providing the basis for Bitcoin. Both Ripple and Transferwise aim to provide lower cost and faster cross border payments. Carrier billing services – allowing payment for something with an extra charge on a mobile phone bill - are not new.

BOKU is an example of a carrier billing service. Customers can chose to pay using their mobile phone number and the payment is debited to their mobile phone account. This can be quite useful for the unbanked since they may make payments without having a bank account (or a credit card). In a way this mechanism works in a similar manner to using a credit card (which must be settled each month as well). If the mobile phone account is a 'Pay Monthly, and linked to a bank account

then it may well be settled by a direct debit each month. Since the mobile account does need to be funded to cover calls as well as purchases, this can by cash for pre-pay or 'Pay As You Go' mobile accounts.

Many central banks are investigating Distributed Ledger Technology like that used by Ripple as they review their own payment systems. However, Ripple has yet to be used for inter-bank transfers, primarily because it is new and there is uncertainty about risk.

6.2.6 The move to real time

The move to instant payments to support online and mobile is well known and is happening all around the world, with services under development in the Far East, Europe and the Americas. Typically, the first use cases are consumer based. The development of real time services in countries like Australia (New Payments Platform - NPP), Singapore (G3) and the US (The Clearing House -TCH) is also in some cases underpinned by a move to what is effectively a core 'push scheme' built on ISO20022 messaging standards. Some countries (including the Netherlands in Europe) envisage the migration to the new scheme for many if not most business payments that are currently processed through the current bulk batch payment system. As well as being a way to offer enhanced services directly to bank customers, these real-time services are also being layered up and used by third parties to create new services.

One example of this type of layering is Paym, the UK mobile phone payment service. This allows customers to make a payment to another person provided both of them are register (via their PSP) for the service. The underlying payment systems are either Faster Payment or Link (PSPs choice as to which to use).

Another example is the New Payments Platform, currently under development in Australia. All payments via this new system will be cleared and settled in real time providing certainty to both payer and payee. Though the system is not live yet, there are plans for a number of 'overlay services' that will sit above the system (and these might be developed collaboratively or competitively). The overlay services are likely to be services that carry more data than today (that is of value to the parties to each transaction) without having to be embed that data into the transaction itself.

A further example is in Saudi Arabia when the main inter-bank system is being updated to include additional services for customers including the possibility of withdrawing from ATMs without a card, obtaining prepaid cards loaded with amounts as per clients' request, facilitating electronic payments for purchasing tickets, and cash-back options from tellers and shops to reduce pressure on ATMs.

6.2.7 Domestic schemes development

Although centralised models featuring a single clearing operation are common, infrastructure provision is not seen as a 'natural monopoly'. A number of infrastructure providers compete and operate across borders and therefore there is a variety of operating models internationally. In some cases, such as the UK, there may be a single Central Infrastructure such as VocaLink supporting several core bank to bank services such as near real time and bulk electronic payments.

However, just as VocaLink competes and supplies its services abroad, a range of other suppliers have emerged in the multi-provider model that supports SEPA. The introduction of SEPA was intended to be managed and implemented by cross party agreement within the payments industry,

but needed a regulatory mandate for formal and ubiquitous adoption. While the intention was to provide a number of schemes that would allow common payment processing, the schemes were intentionally designed to allow competition at the operator level.

Allowing for competition has led to some incompatibilities between operators requiring banks that wish to use multiple operators to implement different business rules and formats of messages (variations on the ISO20022 messages). In addition, local country rules make cross border processing difficult, for example, local tax rules in Spain, centralised mandates in Belgium. While the intended goal was to allow for multiple operators of the scheme that could interact with each other to provide access to all potential parties, this has not yet been achieved in practice and may be unlikely to be achieved without direct governance.

A number of countries are in process of developing domestic card schemes or promoting their own domestic card schemes as alternatives to the international schemes such as Visa and MasterCard - examples include TROY in Turkey and schemes in Switzerland and Poland.

6.2.8 New and evolving payment instruments

A number of countries (e.g. USA) are investigating or developing Request To Pay services. Unlike a direct debit that relies on the debtor pre-authorising payments, RTP services require the debtor to authorise each payment with their bank before it is paid within a defined time window. Once the customer has authorised the payment, a credit transfer follows. There appear to be a number of drivers for this kind of mechanism – for example online payments in the Far East and cheque replacement linked to payables reconciliation in the US.

There have been a number of initiatives around bill paying e.g. BPAY in Australia. Although bank-enabled billing solutions have been around for over 10 years, the advent of mobile devices has stimulated renewed interest in convenient bill paying.

Some innovation relates to the substitution of one payment mechanism for another. There appear to be a number of drivers e.g. cost differentials, desire to innovate, and local conditions e.g. low penetration of credit cards. IDEAL and ZAPP are based on using payments to provide payment services that compete with cards. On the other hand, the Sri Lankan CEFTS service uses the cards /ATM infrastructure to allow customers to make inward and outward fund transfers at a nominal fee in real time, 24x7.

6.2.9 Structural and governance developments

Although card payments have been governed by international schemes, payments have evolved as national services managed and operated by the local banks. There are developments, particularly in Europe, where the historic model continues to evolve i.e.

- *Scheme rules that are agnostic about clearing and settlement layer:* SEPA is built on the basis of a set of scheme rules developed by the European Payments Council (EPC) that do not specify how clearing and settlement is to be performed. The National Automated Clearinghouse Association (NACHA) in the US is a similar model where it has long operated as a rule setting body without any operational responsibility. FedACH and The Clearing House (TCH) provide the ACH services according to the NACHA rules in the US.
- *Competing central infrastructures*: SEPA has enabled multiple clearing and settlement mechanisms to exist and co-operate. Although many countries have continued to operate a national clearing house, SEPA has allowed some processors to be pan SEPA e.g. Equens

and European Banking Authority. The lack of proscriptive operational rules has however led to a certain amount of service variants across Europe.

- *Mandated open access:* many national payment systems continue to operate on a tiered access model i.e. direct and indirect participant. In some cases, a tiered model has led to smaller banks (indirect participants) being unable to offer equivalent payment services as compared to the direct participants, mainly for reasons of cost. This is not the same in the card schemes who have always operated a single layer participation model. Increasingly authorities are seeking to increase regulation and make payments services easier to access e.g. by mandating more open access to bank accounts under upcoming European directive PSD2.

Another emerging area of change is in settlement services. All payment systems ultimately rely on central bank RTGS services to settle funds between institutions. Traditionally settlement is undertaken on a batch basis during working hours only. The Australian central bank will be providing line by line settlement 24x7 to support the new instant payments system being developed. Both the European Central Bank and the Bank of England have announced a review of their real time services (including a review of Distributed Ledger Technology), which may facilitate other payment innovations.

6.2.10 Payments linked to other processes

There are a number of developments that relate to integrating the payments process within another part of the value chain. Klarna and AliPay are examples of services that link the payment to the delivery of the goods. The use of contactless transport cards (e.g. Hong Kong Transport authority) for non-travel related purchases is an example of linking the payment to transport services. Again the theme is using underlying payment rails to support overlay services.

6.3 INTERNATIONAL INITIATIVES MAPPING TO THE DETRIMENT CATEGORIES

The mapping exercise showed significantly, and possibly not surprisingly, the list of international initiatives and the list of grouped detriments show low levels of overlap as summarised in the following table.

Detriment Category	Initatives Mapped
ACCESS	2
BACK END COMPETITION	2
CHOICE / COMPETITION	0
COMMON STANDARDS AND RULES	20
COSTS / COMPLEXITY	0
CUSTOMER ASSURANCE	15
DIGITAL CURRENCIES	1
E-INVOICING	0
FINANCIAL CAPABILITY	0
FRAUD / KYC / SMALL PSPs	0
GENERAL KYC / FRAUD / AML	0
GOVERNANCE	2
GREATER CONTROL	6
INTERNATIONAL	6
OTHER	0
RETAIL	5
RISK OF CHANGE	0
SCHEME GOVERNANCE	6
SYSTEM VULNERABILITY	0
THIRD PARTIES	0
USER NEEDS	0
Grand Total	**65**

Table 3: Number of international initiatives which answer detriments identified by the Payments Community. One initiative may help to solve multiple categories of detriments

Account Number Portability (ANP) was an initiative that a geographic scan covered and no live examples were identified on an international basis. However, Sweden does have in operation arrangements which approximate account number portability using a separate number from their bank account number (called a bankgiro number), which can be issued to customers to set up the equivalent of direct debits and credits.

The Reserve Bank of India did look into ANP in 2013/2014 and concluded that portability is not immediately feasible, although recent comments have been made by Reserve Bank of India deputy governor indicate it may resurface on the political agenda (recent news reports, Feb 2016). In the Netherlands account portability was in place for several years (1980s), however more recently the scheme was abandoned because it was considered to be disproportionally expensive when compared to the end-user benefits. It was replaced by a switching service similar to the service we now have with CASS in the UK. Other markets have also looked at this concept but did not pursue it (including Australia, 2011).

6.4 CONCLUDING REMARKS AND RECOMMENDATIONS

Greater features and functionality in the payments infrastructure (vs. the UK) exist in a number of countries but they typically address niche payment domains, whether it is B2C or B2B or P2P.

What has evolved in the last decade is that across the globe consumer expectations have increased, enabled by emergent technology, which is challenging payments providers and systems to respond. Retailers, such as Amazon, and other non-high-street bank financial service providers, such as PayPal and Klarna, are demonstrating innovation and the effective application of technology, and pervasive consumer connectivity via the smartphone to meet or exceed consumer expectations.

The underlying payments infrastructure upon which all these new layered services are being offered has evolved at a slower pace, however it is noteworthy that newer providers such as Apple have chosen to build their services on top of the existing infrastructure rather than creating new infrastructure. The reason for this is that consumers and businesses rely on the resilience and security of the existing payments infrastructure every day and therefore change needs to be planned, considered and measured. There is heavy investment in the current UK infrastructure by PSPs and their customers (i.e. consumers, merchants and suppliers). From our scan we know other countries are grappling with the same issues as the UK, and a few have proposed a renewal of their payment systems (Canada for example).

The geographic subgroup looked to ascertain whether any of the international initiatives could resolve the UK's detriments and found that there were very few examples that resolved the fundamental challenges. In examples that came close, such as Australia's NPP (New Payments Platform) and TCH (The Clearing House) which offer real-time payments, they have yet to be proven models for the future and still may be said to have some flaws around their settlement models given that they are only addressing part of the complete payment ecosystem.

It may be possible to conclude that there may be benefits to considering a managed renewal of the UK payments system to deal with the underlying issues and creating a system that allows greater

flexibility to deal with detriments while still providing for the respected resilience and security of the current system.

7 TECHNOLOGY HORIZON

Payments and the banking industry in general are undergoing a major transformation. Technology is playing a very important part in this process. The arrival of smart phones has helped to accelerate changes in customer behaviour and expectations. Customers expect services in real-time and from anywhere from any provider. What has already been possible in other industries is failing to be also possible in banking and payments, which has brought the need for new payments systems into the spotlight. Suddenly, even schemes such as Faster Payments in the UK, which provide near real-time payment services, may start to feel insufficient.

Customers are also demanding other features such as acknowledgement of delivery, payee confirmation, rich data attached to the payment. Customers' expectations are driven from their experience in other sectors, such as the logistics sector's 'track and trace' service.. The existing platforms within the banks and central infrastructure are, in cases, decades old. It is recognised that the age of banking infrastructure is a key source of systematic risk. It also hinders innovation and competition and thus consideration should be given to new technological approaches to underpin UK payments systems.

The working group has analysed which technologies, technological concepts and design choices are available, or emerging, that could mitigate the detriments identified by the Payments Community. Our analysis shows that technology has significant potential to address the concerns identified by the User Needs Group, the Simplifying Access Group and the Financial Crime Group and these are highlighted below, along with a more detailed explanation of key technologies that may help to solve detriments, including APIs, layering, Distributed Ledger Technology and more consistent messaging standards. We also highlight a number of technological developments available to improve retailers' business propositions and the end-user experience.

However, the technology available also provides us with the opportunity to consider how it could help to change payment systems over the longer term so that they promote competition, speedy innovation and efficiency while meeting a wider range of customer needs. To this end, learning from the telecoms industry we have submitted to the forum two solution proposals which follow our recommendations about how technology should be used to significantly simplify UK payment schemes so that they may benefit future generations of service users.

7.1 A SUMMARY OF FINDINGS FOR THE WORKING GROUPS

7.1.1 The technology landscape for the 'user needs working group'

During the analysis of the detriments related to User Needs, we found that various technologies, namely, APIs, distributed ledgers and layering could ameliorate those detriments related to the key issues of control, transparency, reduction of errors and instant access to information. The way in which those detriments could most likely be resolved would be through a managed redesign of the core payments schemes.

A collaborative approach to using these technologies in the core payments infrastructure would then allow PSPs to compete to use those features to provide what users need and demand. We therefore recommend to the User Needs workgroup that they consider the use of technology, rather than new regulation to solve those detriments.

We consider other detriments such as the fines imposed on merchants by schemes or the never ending liability on the PSP created by direct debit could also be resolved by the creation of a new scheme platform as suggested by our long term proposals. The proposals allow for new types of payment services with diverse operating rules. Such new services would appear as a result of competition and would carry rules of operations more adapted to the market needs.

Security and privacy continue to be over-riding concerns for users. The development of new technologies like big data analytics, artificial intelligence and improvements in decision making sciences (section7.2.8) leave consumers vulnerable to new known and unknown detriments.

7.1.2 The technology horizon for the 'simplifying access working group'

The analysis of the detriments allocated to the simplification of access working group show that the technologies cited above in 7.1.1, specifically layer modelling and APIs would be crucial to the simplification of access. We refer the simplifying access working group to section 7.2.4. Those technologies may constitute the foundation to simplify today's variety of access technologies, messaging standards and connectivity to the various schemes.

We propose a further investigation of the t use of layer modelling and APIs which may help to achieve a simplification and opening up of access to payments schemes to PSPs.

7.1.3 The technology horizon for the 'financial crime working group'

Among the detriments assigned to the Financial Crime Working Group those related to identity of counterparties and KYC are the most important issues. The current variety of payment messaging and in some cases lack of payee and/or payer data in the payment message contributes to make difficult the fight against certain types of fraud. What the detriments also describe is the need for specific types of financial crime prevention mechanisms.

These issues derive from the often poor quality or simply the lack of sufficient data in the payment instructions that would allow PSPs to perform adequate checks. Improving the amount and quality of data would be a necessary step to solving these issues, since it would allow the development of services on top of the payment systems to help with KYC, ID verification and identity assurance.

Layering and APIs along with richer data and big data can help and actually be part of the solutions to diminish and better prevent and fight financial crime.

There are however certain detriments which mirror those encountered in the User Needs Working Group, that cannot be solved with technology, such as the limitless liability derived from direct debit, which could be used to commit fraud or the penalties applied to merchants. Those are examples of detriments that require regulation or different scheme rules to be resolved.

7.2 KEY TECHNOLOGIES IDENTIFIED BY THE TECHNOLOGY HORIZON SCAN

A number of technologies were identified by the Horizon Scanning Working Group. Technological developments could help improve almost every aspect of the payments value chain. However, some technology has the potential to reshape the entire payments value chain.

When initiatives are weighed in terms of their contribution towards solving certain detriments, key technologies score highly. These include Distributed Ledger Technology, APIs, X as a Service, layer modelling, big data, richer data and identity management. These initiatives are described in more detail below. It is worthwhile noting that DLT, APIs, X as a Service and Layer modelling are all

interconnected. While it is possible to implement APIs without DLT, is unlikely that DLT could be usefully implemented without APIs or some form of layer modelling. Indeed, the usefulness of all the technology on the horizon highlighted relies to a degree on APIs.

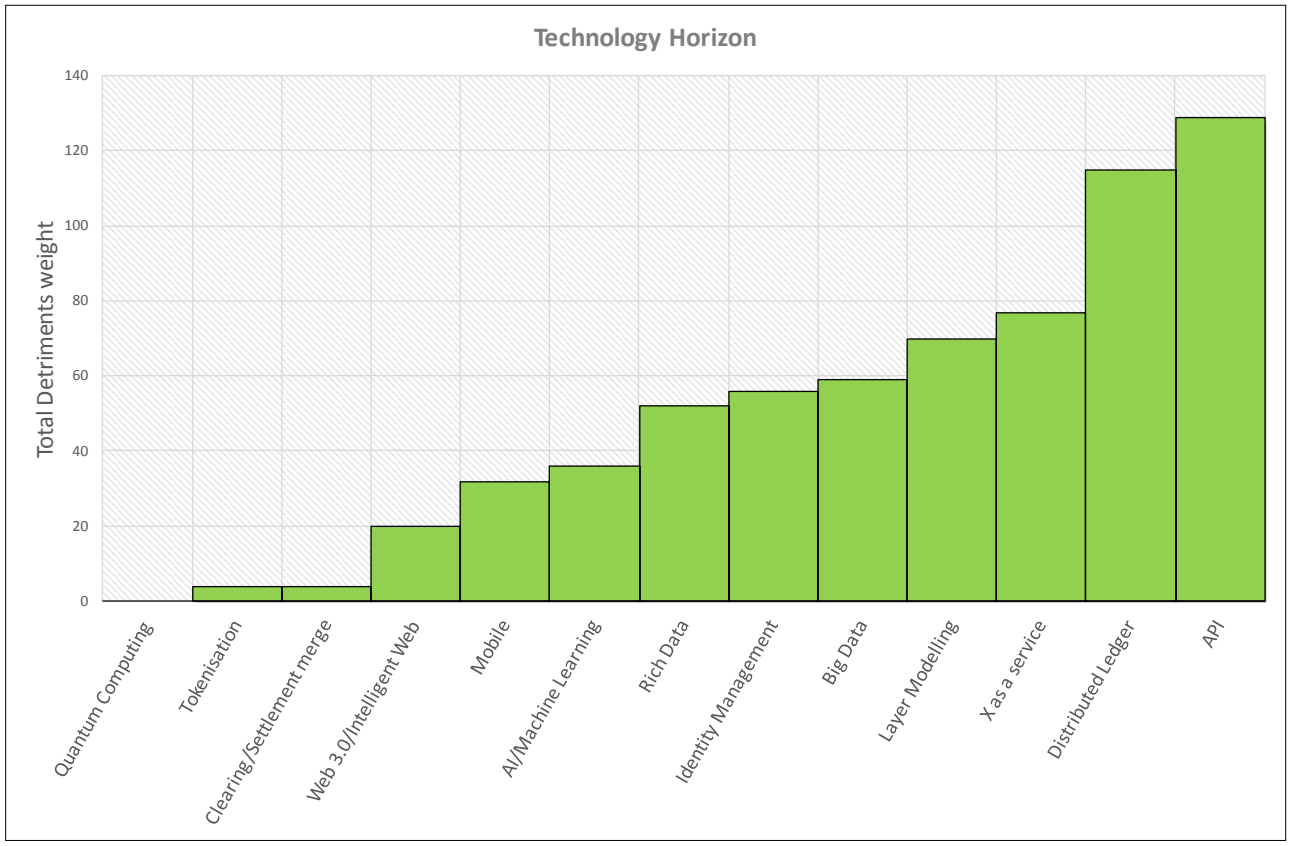

Figure 4: Technology initiatives weighted to the detriments they solve

Further initiatives were identified on the technology horizon which change or improve the retail sector and end-user experience.

7.2.1 Identity Management

Proving your identity and having authority to make a payment is one of the biggest causes of friction in financial services. For Payment Service Providers, properly identifying the customer to the institution and the institution to the customer are critical aspects in providing financial services to customers. PSPs are looking to enable seamless and robust identity recognition across all channels to ensure the customer omni-channel vision works for all yet meets regulatory requirements.

The use of biometrics is a key area of innovation. In the UK, Barclays and HSBC have already deployed voice biometrics in their contact centres. Whereas, Atom bank, a UK challenger will allow mobile log on with facial recognition and voice biometrics when they launch. Apple's Touch ID uses fingerprint scanning. Globally, USAA allows customers to choose from a range of biometrics to log into their app, such as face, touch and voice.

Using biometrics significantly improves the authentication process for users as they are no longer required to remember passwords or PINs but simply need to present themselves. There remain

security concerns about different approaches to identification and authentication, the most significant risk to users being the theft and possible replication of their biometric data, of which there are not multiple versions which can be given out like PINs and passwords.

Identity Management is central to payments both for identifying the originator and beneficiary of the payment instruction, but also for the correct routing to the instruction, and handling misdirected payments.

Misdirected payments and the issues that result from them are of concern to the Payments Community (detriments UN12-15). An API based customer authentication solution could address the problem by linking the name to the sort code and account number. This could be implemented in a similar way as that achieved by the PayM database for mobile payments, where banks provide a customer authentication to account ownership. Data protection issues would be dealt with through a general permission that forms part of the condition of service.

The alternative to using an API-based customer authentication approach would be to amend scheme messaging to incorporate the name of the account holder alongside the account number and sort code. Use of an API-based customer authentication solution could be a cheaper and more elegant approach than incorporating such additional data into the payments messages.

Distributed Ledger Technology could provide for a simpler KYC landscape in the form of a smart contract. A smart contract would allow for customer information to be held securely; access could be controlled; and there would be a clear audit of change. For example, the data on a company and its directors would be held within the contract with a clear auditable trail.

7.2.2 Richer Data

The concept of "Richer Data" responds to the need to send information alongside payments to and from an individual or organisation. In the past a payment was a physical transfer of value in exchange for the equivalent value of physical good or service. Now the value (money) is electronic, the services can be electronic too or goods provided remotely. Previously the exchange had an immediate context given the physical proximity of the parties, today this is increasingly not the case. However, payments continue to need a 'context', hence the need to attach data to the transfer of value (payment).

Beyond the basic data requirement imposed by anti-financial crime regulations, the need to provide context to a payment translates into the need to associate the payment to other data, which is relevant to the parties involved in the underlying business transaction. In the payments world the 'critical data' is the payment itself along with the minimum data required to comply with AML regulations. The 'payload' is any data any user would like to link to the payment.

In current UK domestic payments schemes, payments carry a 'reference field' of limited size. It is now more commonly accepted that more data should be able to be associated with the payment – conceivably any data, of any size and format. However, the attachment of significant data volumes (a video for instance) would potentially result in too large a file (or 'payload') for payment network or schemes to deal with, especially given the fact that thousands if not millions of other payments may require processing at the same time; and time is a critical aspect of payments that is not easily compromised.

The working group analysed techniques for managing richer data. The international standard CCITT N7 used in mobile telephony was taken as a helpful standard. We concluded there are principles that could allow our payment systems to achieve a level of data enrichment without compromising the functionality and performance of the payment system. These principles are:

- Critical data must be protected in its transmission.
- Associated payload must be transferred separately not competing with critical data for bandwidth. This typically translates into using a different network altogether.
- The critical data should include a defined number of data types and some fields to enable a link between the payment and an out-of-band transmission of the payload. The actual application of the principle could result in the attachment of a link, in the form of an URL or other to the payment so that it can be linked to the Richer Data.

The use of Richer Data in this way could help address identified detriments such as the current lack of control and difficulty in reconciling costs (UN 9, 15 and 31 and 32). Richer data would allow for delivery confirmation, the actual detail of the content of the transaction as well as easier reconciliation of payments and accounts.

Richer Data could have big implications for both consumers and businesses. For instance, a utility provider could transfer the entire itemized invoice along with the payment request enabling the consumer to view their bill through a URL before making bill payment a 'one click' exercise.

Designed in the right way Richer Data could also enable consumers or firms to part-pay invoices to which they agree to be charged. Discrepancies over invoices can increase payment time considerably. Allowing payers to pay for those parts of the invoice they agree would improve firm cashflow, while the unpaid parts of the invoice are negotiated. In effect, Richer Data could support a 'Request to Pay' or 'e-Invoicing' interaction, which empowers customers to control the timing and amount of their payment while making reconciliation for the payee easier.

Richer Data could also reduce fraud by ensuring fraud such as those that divert payments away from the intended beneficiary are identified before the payment is made. For instance, in house sales some scams intercept conveyancers' emails and request payments of house deposits to be made into a fraudster's account and the customer loses their deposit. Richer Data would provide an additional obstacle for scammers to get round and help to provide re-assurance when people transfer such large value payments. In a similar way real time Richer Data could provide better communication between the user of the funds and the grantor of such funds, limiting use of funds to a particular purpose provided for in the data by the grantor (for instance in house buying, this would limit the use of funds for anything other than the purchase of the house for which it was intended).

7.2.3 Blockchain: Distributed Ledger Technology (DLT)

Bitcoin has been heralded as a major technology innovation as digital currency, but its underpinning technology is of more interest. Commonly called the 'blockchain' or 'distributed ledger technology', there are two key technology types:

- Unpermissioned - an open decentralised ledger, which records the transfer of value, where each transaction is cryptographically chained to the previous transaction. The result is permanent, immutable and verifiable record of the truth, which cannot be edited.

- Permissioned - where a consensus of the truth is reached by computer algorithms. Instead of needing a paper copy, a "Smart Contract" is produced where all parties are in sync, together with the allowable rules of processing. Thus the "paper Single Ledger" where banks account for transactions could be replaced with a "Distributed Ledger Technology" (DLT). This would remove the cumbersome reconciliation process and settlement latency, where transaction information is recorded separately and errors are not identified and rectified until late in the post-trade process.

DLT is a key concept since it allows all participants, in this case PSPs, to have a copy of the transaction ledger and therefore the entire system is more resilient, less prone to attacks and each entry in the ledger is final since it has been accepted by any of the two methods explained above. Having a copy of the ledger is important as it removes the need for a central authority to authenticate, own and track transactions. This also implies that within the right regulatory framework, clearing is enough to complete a transaction and in real-time or near real-time so removing the costs associated today with the current system.

DLT is an area of technology attracting significant investment with many competing implementation teams focused on the technical challenges. It is worthy of further consideration by the PSF given the claims about its accessibility, resilience, security and ability to allow innovation – key attributes sought by the PSF in its strategy for payments.

7.2.4 APIs

The current payments systems communicate via a variety of message technologies, which comprise the communication network, generally private telephony lines to centralised infrastructures and scheme message formats and interactions, for example:

- SWIFT MT,
- BACS 18,
- ISO 8583, cards and Faster payments,
- ISO 20022

Web APIs are not new and nor are they singular in kind. An API is simply a set of protocols for building software and linking it to other software. However, APIs are important to payments because they offer a standard and discoverable solution for developers looking to integrate services or develop overlay services. Thus they allow for the easy build of new software and the development of service innovation.

Web APIs are frequently used to help join up services into a single package that works well for the consumer. These 'packages' allow new payment services to develop.

PSD2 has provided momentum for HM Treasury's work on Open APIs for banking. The Horizon Scanning Working Group supports the work of the Open Banking initiative. Indeed, it will help to address a number of detriments around third party access to data, improving security (which might possibly increase trust, even if it increases friction) and allows for the development of services which could give users more control over their spending and thus payments. We hope and expect the Open Banking initiative to continue with the necessary leadership so that there is effective governance and guidance for APIs as they develop.

We explain how APIs could be used with layer modelling in our solution proposal submitted to the PSF.

7.2.5 Layer modelling

The Layer Modelling approach is established best practice in the IT and telecoms industry where end-to-end systems are built in layer stacks. Each layer offers a standards-based service to the layer above.

The link between layers is clearly defined as service definition, which isolates the function of each layer. In this way it is possible to replace the components inside any layer, preserving the service characteristics without affecting the other layers. The most well-known layer stack is the OSI model for networks, which composed of 7 layers and is the foundation of the internet model.

The concept of Application Programming Interfaces (APIs) are widely used in all industries for internet based software-to-software communication without any user intervention. Correctly classified and regulated APIs can create logical separation layers in the payment flows between parties involved.

Standardising the payments layers and APIs would go a long way to significantly addressing the detriments associated with access to payment systems, choice, competition and governance. Because of the ability to isolate the individual stacks and replace their components, deploying a layered API approach also lends itself well to innovation. Unlike the current system which requires all parts of the system to adjust their processes when something changes, within a layered model, this is no longer necessary. Changes can be made efficiently without affecting other parts of the chain, providing a degree of insulation from change. This insulation from change allows for multiple service innovation opportunities, improved competition and choice for participants.

We explain how layer modelling might be implemented in the payments systems in our solution proposal submitted to the PSF.

7.2.6 X as a Service

As a result of a growth in APIs, X as a Service has been coined as a term. X as a Service, also known as Xaas, or 'Anything as a Service' is a collective term used to describe the way in which new services can be created by the bringing together of different parts of the system. 'Anything' could be information, infrastructure, software, communications, monitoring etc. And these can be developed to provide services which can be packaged up and sold to others.

Payments are an integral part of the marketplace and therefore there is scope to develop 'payments as a service', combining other services (e.g. data analytics, identity management, smart contracts etc) into new payment services.

The concept of X as a Service with regard to payments refers to the possibility of creating new types of payments that are offered to payment participants as a service that are easy to access and use. But it is also linked to the design concept of pushing 'intelligence' to the edge of a system rather than concentrating intelligence in the centre.

A good example of X as a Service comes from the telecom industry. Previously UK users were reliant on the centralised BT network for information or 'intelligence' about their phone and usage.

For instance, to discover the last caller, the user would be required to dial 1471. The intelligence was centralised within the network. However, following the development of the internet and mobile telephony, that 'intelligence' was decentralised and stored outside of the network on apps, like WhatsApp, Google hangouts etc.

In the same way, in the payments system the concept of distributed ledger points at the removal of the central authority.

Developing the concept of X as a Service further within payments would enable authorised PSPs accessing payments systems to develop payment types that would adapt and better service the needs of communities of services users in the business and commercial context. The deployment of such new services would be fast and would also allow for continuous upgrades and improvements. For instance, rather than having a single flavour of direct debit, with X as a Service there could be many versions, each adapted to the type of business in which the payment collection is inserted.

Using the X as a Service approach could be particularly helpful for allowing niche groups to receive services that meet their needs in a cost effective way (for instance, the unbanked wishing to make electronic payments). It may also allow for innovation to meet the needs of SMEs for whom there appears to be less innovation in the payments services (possibly because the potential return from changes that would help them are not worth the investment required to make changes within the current payments systems).

7.2.7 Developments in Commerce (Retailers / Merchants)

Payments are an integral but are a constituent part of a much more multi-faceted trend towards digitalisation of customer experiences in commerce. Customer interactions now span across physical, online, social and mobile channels. The marketplace for payments is changing rapidly as connectivity increases person-to-person, person-to-machine and machine-to-machine. An over-riding feature of the marketplace is for 'frictionless' payments, that is, making transactions smoother, easier and speedier to execute in as convenient a way as possible for the user.

Payments-related innovation has already taken priority for many of the larger multi-channel retailers based in the UK and outside the UK. There are good practices where further opportunities can be identified to generate additional sales, reduce costs and fraud, enhance profitability and improve the customer experience. Retailer innovation around payments has been significant – and includes developments in cooperation with card schemes to create retailer-branded payment mobile wallets and greater integration to loyalty, rewards and information services for consumers

7.2.8 Big data, data analytics and artificial intelligence

Big data are large data sets that can be analysed for unknown patterns, correlations, market trends, customer preferences and other business information (Rouse, 2016) using algorithms. Everything we do is increasingly leaving a digital trace – data -, which we, and others, can use and analyse: activity data (where you are, browsing history etc), conversation data (emails, social media and phone calls), photo and video data (including CCTV etc) and sensor data (via the Internet of Things and the devices we interact with).

Big data are important to payments systems because payments data will increasingly become a tradable commodity in their own right.

For consumers, PSD2 brings about the possibility of sharing bank account data – payments data - with third parties for the provision of new services. For instance, a service might provide a holistic view across multiple bank accounts allowing a customer to more accurately manage and reconcile their spending. The service could offer switching to more suitable products or make recommendations on savings strategies. For corporates and SMEs payments analysis could help predict sales or offer suggestions on buying strategies. For retailers, combining customers' personal data with other technology (like Bluetooth Low Energy) could enable them to provide bespoke, in-store sales advice to the customer.

The availability and access to transaction data held by payment service providers as well as the ability to manipulate data will widen the scope of payment and retail financial services offered to consumers and merchants. This could mean a shift in a user's main relationship away from the payment provider to an application that enables management of these services. In turn this could shift the user's relationship to the application developer.

Artificial intelligence adds another facet to service development and provision. Artificial Intelligence (AI) simulates human intelligence, including reasoning (problem solving), knowledge (representation and management), planning (set goals), learning (improved by experience), natural language processing (read and understand communications) and perception (input from sensors).

At the back end AI should improve customer security, remove many manual processes involved in payments operations and systems management and result in higher straight through processing rates and increased resilience. At the front end, it should bring about enhanced personalised and possibly, personable, automated services. For example, IBM has created an intelligent computer named "Watson" that is used to demonstrate how in the future AI may be able to help you manage your spending, deliver automated advice on your pension and set up the payments without the consumer doing anything apart from having a conversation with 'Watson'.

Big data analysis and AI presents risks as well as potential benefits to consumers. The super-enhanced ability to profile customers, especially when bearing in mind the increase of data available about them (biometric data, location data, social media, transactional data, product/service use data and other monitoring data) combined with advances in behavioural psychology, decision making sciences, neuro-marketing and artificial intelligence puts privacy at risk. It also exacerbates opportunities for exploitation, exclusion and scams within financial services. The increasing need for expert knowledge to manage these services also reduces the pool of professionals that can provide quality assurance on the algorithms and processes which underpin services, thus reducing the democratic governance of those services. Taken together these changes could create unforeseen detriments which could have an impact on payments.

7.2.9 Tokenisation

'Tokenisation…is the process of substituting a sensitive data element with a non-sensitive equivalent, referred to as a token, which has no extrinsic or exploitable meaning or value…' (Wikepedia, 2016). A particular advantage of tokenisation is that, assuming good practice is followed, tokens offer consumers greater security. Value-less encrypted, one-time-use only tokens replace the transfer of real personal information which reduces risk.

From a merchant perspective tokenisation is attractive. If the merchant is no longer exposed to sensitive user data, then there is no longer the requirement to adhere to regulations for the protection of such data. For instance, it negates the need for card scheme security compliance (PCI

DSS) and moves fraud risk to the regulated payment service provider. The increasing regulatory burden and financial crime risk on e-commerce providers may see them moving to more technical solutions like tokenisation which provide them with sufficient flexibility to implement the payment functionality without themselves having to become payment service providers.

7.2.10 Social messaging, conversational commerce and embedded payments

Social messaging and conversational commerce are predicted as key growth areas in 2016 (Messina, 2016). Conversational commerce includes use of voice biometrics for authentication as noted above, but extends further through messaging, text and voice commands to embed payments within more natural conversation. Uber's integration into Facebook Messenger is cited as a good example (Facebook, 2015), where tapping the address sent by a friend allows the option of ordering a taxi immediately. The user is no longer required to have an Uber account or to open an Uber app to order the taxi. Instead payment is made through Facebook (powered by the payments platform, Braintree).

Embedded payments allow users to bypass the usual login requirements for payment based on pre-registered account information. Amazon's 1-Click is an obvious example of this, where default settings are used, like the default payment card and delivery options, to enact a quick, effortless transaction.

7.2.11 Contactless and wearables (NFC, RFID and BLE)

From a user perspective contactless payments work in a similar way to embedded payments. Contactless also bypasses the need for PIN.

Near Field Communications (NFC) or Radio-Frequency Identification (RFID) are used to enable secure payments. A chip with antenna can be inserted into a mobile phone, card, key fob, wrist band or other wearable item (jewellery, coats etc) and enable payments. There are limits on contactless payments (£30 in the UK) and payments can be blocked if necessary. Data about payments can also be held separately on a linked app.

Paypal and Apple are investing in Bluetooth Low Energy (BLE) technology which allows users' mobile phones to automatically connect with retailers and make purchases without the need to queue or authenticate the payment. The advantages to BLE include its reduced power consumption and ability to connect without reception. Users can choose their level of 'hand-free' and opt to confirm payment verbally or complete a prompt. With BLE retailers are able to locate their customers within store, personally greet them or push marketing information. With previous transactional data to hand retailers can personalise the information they push.

7.2.12 Internet of things

The Internet of Things (IoT) is shorthand for the connecting of various machines and appliances over the internet. Their connectivity allows a continual stream of data to be harnessed about them. In turn that affords information about their state and their use which can be usefully and meaningfully communicated to retailers and users via the internet and apps. Additional services help people set rules to control the use of appliances.

7.2.13 Smart contracts

'Smart contracts are computer protocols that facilitate, verify, or enforce the negotiation of or performance of a contract, or that make a contractual clause unnecessary' (Wikipedia, 2016).

Smart Contracts effectively bring contracts to life and significantly reduce the effort for parties in a contract to enforce their rights.

An example of smart contract innovation is from a Hackathon in September 2012 where Team Issueth won a prize for a smart contract system that would provide instant compensation to customers affected by flight delays (Caffyn, 2015), thus connecting airline data, customer data and flight data to facilitate an automated payment, based on a contract overseen by a computer. In future, Smart Contracts could be used in a variety of ways to ensure that payments made by one party are used in a particular way or to halt services automatically when payments are not made. In most cases this should enhance the user experience. However, detriment could be caused where negotiations would be more appropriate than a strict enforcement of a contract. Rights to appeal and liability for redress will need to be taken into consideration.

Distributed ledger technology provides the technology for smart contracts. This technology is discussed in more detail in section 7.2.3.

7.2.14 Developments for SMEs

SMEs have seen some developments in the way they make payments:

One example is the introduction of mPOS (mobile point of sale) that allows small traders to take card payments using their mobile/tablet and a connected device. Examples in the UK include iZettle, WorldPay Zinc and BarclayCard anywhere. Some of these companies are now using these payment relationships to sell add-on services to customers, for example iZettle are providing cash advances to customers which are paid back by the card payments that the SME collects.

Other mPos companies such as 'square' (which doesn't yet take payments in the UK) provide additional services using software such as POS/inventory management for iPad that integrates with their card payment solution. Another example of technology bringing payments to small business is GoCardless. This technology allows small companies and sole traders to collect payments via direct debit from their customer's accounts, for example by window cleaners or dance instructors. Direct debit penetration in SMEs has been somewhat limited due to the infrastructure required to manage direct debits but the technology developed by GoCardless allows anyone to collect via direct debit.

7.3 TIME HORIZON

The technologies that are mentioned here may not yet be available or may require developing. For instance, APIs are freely available. However, APIs would yet need developing to solve some of the detriments identified. Below is a table which outlines the type of time horizon over which some of the key types of detriments may be solved.

Detriment	Code	Category	Short Term (<3 Years)	Long Term (<6 Years)
Poor flexibility or ease of use to control your push and pull payments	UN1	GREATER CONTROL		NEW SCHEME
Difficulty in handling exceptions and failures caused by inability of consumers to control payments	UN2	GREATER CONTROL		NEW SCHEME
Direct Debits are too rigid/lack transparency for customers with unpredictable incomes ; no control over exact dates or amounts; no part payments or flexibility causing exclusion from discounts and returned payment fees	UN7	GREATER CONTROL		NEW SCHEME
Lack of confirmation of receipt (FP)	UN9	CUSTOMER ASSURANCE		NEW SCHEME
Corporate service users would like to know where payments are at all times in case it is not real-time	UN10	FINANCIAL CAPABILITY	OPEN API	
No real-time balances causing financial detriment (overspending causing returned payments, fees)	UN11	CUSTOMER ASSURANCE	OPEN API	
Investigation to solve issues around misdirected payments too complex	UN12	CUSTOMER ASSURANCE	CUSTOM API	
Difficult to know who you are paying leads to misdirected payments and fraud	UN13	CUSTOMER ASSURANCE	OPEN API	
Lack of transparency/clear information on types of payments (and products) for consumer to be able to select best choice with confidence	UN18	FINANCIAL CAPABILITY		NEW SCHEME
Reconciliation costs and treasury management for businesses; also government reporting costs	UN31	OTHER	RICHER DATA	NEW SCHEME
Not enough direct PSPs	SA1	CHOICE / COMPETITION	ACCESS API	
Difficult for PSPs to switch bank provider	SA8	CHOICE / COMPETITION	ACCESS API	
Different in rules and standards within EU to the UK	SA12	COMMON STANDARDS AND RULES		NEW SCHEME
No real substitutability between payment systems in the event of system failure	SA15	COMMON STANDARDS AND RULES		NEW SCHEME

Table 4 A selection of detriments identified by the Payments Community and the time horizon over which technological initiatives may solve them

7.4 TECHNOLOGIES MAPPED TO THE DETRIMENTS

When the technologies are mapped to the detriment categories it shows that they can help across the full gamut of issues identified. 'Choice/competition', 'common standards and rules', 'customer assurance' and 'greater control' all resonate with the PSR's objective to make payment systems work better for those who use them and the desire for increased choice across the value chain, competition and innovation.

Detriment Category	Initatives Mapped
ACCESS	3
BACK END COMPETITION	2
CHOICE / COMPETITION	34
COMMON STANDARDS AND RULES	33
COSTS / COMPLEXITY	5
CUSTOMER ASSURANCE	35
DIGITAL CURRENCIES	2
E-INVOICING	4
FINANCIAL CAPABILITY	28
FRAUD / KYC / SMALL PSPs	7
GENERAL KYC / FRAUD / AML	10
GOVERNANCE	0
GREATER CONTROL	32
INTERNATIONAL	1
OTHER	13
RETAIL	17
RISK OF CHANGE	1
SCHEME GOVERNANCE	9
SYSTEM VULNERABILITY	1
THIRD PARTIES	4
USER NEEDS	3
Grand Total	**244**

Table 5: Number of technological initiatives which answer detriments identified by the Payments Community. One initiative may help to solve multiple categories of detriments

Those initiatives which relate to developing layered modelling, standard APIs (including those that allow for the access to customer data), distributed ledger technology should be undertaken collaboratively. However, those that relate to big data analytics and artificial intelligence appear for the time being to be best left to the competitive space. Collaborative effort will be needed to enable 'X as a Service'. However, the packaged services that spring from this enabling will be firmly in the competitive space.

7.5 CONCLUDING REMARKS AND RECOMMENDATIONS

Technological advancements available now and on the horizon are encouraging, especially considering their potential to deal with the issues identified by the Payments Community. Not all change could be implemented immediately however and would need to be phased in over time as technology develops or becomes available. An important step therefore would be to ensure that any short term developments do not stand in the way of or create obstacles to longer term solutions on the horizon.

8 CONCLUSION

Bringing together the Horizon Scanning Working Group's overall intelligence gathering and analysis there are a number of key themes emerging. Digitalisation is taking place around the world at a fast pace. Developments in technology could answer many of the detriments outlined by the Payments Community and create solutions which meet the PSF's objectives that payments be secure and resilient, versatile, responsive and efficient. Key themes we believe will resonate with the Forum include: the move to real time, the use of richer data, improved messaging standards, the use of new, well governed APIs, a layered payments architecture and the potential of Distributed Ledger Technology.

The Group has considered what will appear on the horizon in the short (1-3 year term) and the longer term (3+ years). In particular, it has been concerned with developing an outline of what the future *could* look like for payments. In the short-term the PSF should discuss the following proposals for admission in the strategy:

8.1.1 Short term proposals

Over the short-term the PSF strategy should:

- Support the work of the Open Banking Working Group; and ensure the necessary leadership and support for Open APIs is in place to enable guidance facilitating compatibility as the schemes and the underlying platforms evolve in the medium to long term
- Implement Richer Data through the inclusion of a reference in the payment message and required APIs
- Implement the 'Request to Pay' APIs and 'Confirmation of Payee' APIs independently of existing schemes to demonstrating an 'Overlay API'
- Support the Bank of England RTGS infrastructure review
- Support the general move to ISO messaging and particularly the move globally to a single, instant 'push' messaging.

8.1.2 Longer term proposal

Over the longer term the strategy should aim to:

- Simplify the UK payments scheme platforms by following a layered approach to payment systems implementation together with a migration approach using APIs to minimise disruption.

The development of such a simplified scheme platform would allow the flexibility of distributed federated and/or centralised distribution of the technology platform underlying the schemes, allowing for future localised technological evolutions, simpler access and on-boarding and faster innovations without impacting the entire delivery chain. This proposal is described in the solution concept assessments annexed to this document.

- Monitor and co-ordinate efforts to develop Distributed Ledger Technology (DLT) to ensure that correct used cases are followed and the systemic impact is understood.

If it is to be taken forward, developing DLT as an interoperable 'open standard' will still allow for competition in its implementation.

These proposals, taken together, could allow for significant improvement of the UK's payments systems and offer the opportunity to provide a simplified platform enabling many identified detriments to be resolved.