

CHANGING PAYMENT LANDSCAPE¹

József Czímer

This paper is intended to be different from others. I shall of course discuss almost all new achievements in the forefront of the payments industry – and there is a large number of them – but we shall see how very few systems in fact serve the vast numbers of different payment tools. Also, this article tries not to be too technical, because the authors believe that even bankers claiming to be payments specialist are unfamiliar with the entire value chain of the payment service industry. The aim of this paper is to show what the customer sees and what is behind this front and accordingly, to show the interaction between the various elements of the system.

JEL codes: G20, G21, G23

Keywords: payment services, bank card payments, mobile payments, payment infrastructure

Although the European Parliament adopted European Commission proposal to create safer and more innovative European payments in Brussels on 8 October 2015, known as **PSD2**, this paper will refer to the **PSD1** due to the fact that, firstly, the **PSD2** has not yet entered into force and, secondly, the **PSDs** this paper deals with have not been changed significantly.

When **PSD2** enters into force it will intend to amend and replace **PSD1** to

- reduce ambiguity;
- level the playing field for payments providers;
- increase consumer protection;
- stimulate innovation;
- increase competition; and
- enforce the implementation of new payments type.

The two major provisions and implications of **PSD2** will be the followings:

- it accepts the Third Party Payment (TPP) provision; and
- under the “Access to Accounts” (XS2A) rule it will force banks to provide customer account information to third parties via API, if the account holder agrees.

¹ This paper was made with the the aim of summerizing the observations of leading payment consulting companies mainly based in the City of London

Since there is no hard deadline for transposition and some of the provisions await development, there remain some uncertainties; however, it is certain that the **PSD2** will have a considerable role in payment services. An additional paper will have to deal with just the regulation and its implementation.

1. WHAT IS A PAYMENT TRANSACTION; WHAT IS THE TASK OF THE PAYMENT SERVICES INDUSTRY?

To effect a payments transaction is a very simple service that involves moving a certain amount of money from one “payment account” to another “payment account”²

- **A payment account** is an electronic entry incorporated into the general ledger system of a Payment Service provider, which can be the following institutions according TITLE I. Article 1. of the PSD defines as follows:
 - 1) This Directive lays down the rules in accordance with which Member States shall distinguish the following six categories of payment service provider:
 - credit institutions within the meaning of Article 4(1)(a) of Directive 2006/48/EC;
 - a) electronic money institutions within the meaning of Article 1(3)(a) of Directive 2000/46/EC;
 - b) post office giro institutions which are entitled under national law to provide payment services;
 - c) payment institutions within the meaning of this Directive;
 - d) the European Central Bank and national central banks when not acting in their capacity as monetary authority or other public authorities;
 - e) Member States or their regional or local authorities when not acting in their capacity as public authorities.
 - 2) This Directive also lays down rules concerning transparency of conditions and information requirements for payment services, and the respective rights and obligations of payment service users and payment service providers in relation to the provision of payment services as a regular occupation or business activity.

² 14. “payment account” is an account held in the name of one or more payment service users which is used for the execution of payment transactions – DIRECTIVE 2007/64/EC OF THE EUROPEAN PARLIAMENT AND OF THE THE COUNCIL of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (further PSD)

- **Account managementkeeping** is a system operated by a payment service provider and contains the customer accounts whether current account, credit account or any type of other accounts. Although some legal regulations provide for paper -based payment tools as well – mainly cheques – nowadays all payments are processed electronically.

2. INFLUENCE OF LEGISLATION ON THE PAYMENTS INDUSTRY

2.1. SEPA Legal and Regulatory Framework

In September 1999, the European Central Bank published in a press release, “Despite the introduction of the euro, however, there is still a clear gap between the service levels of domestic and cross-border retail payment systems [...]. Indeed, the single currency environment argues strongly in favour of a single payment area.” In November 2000, Commissioner *Frits Bolkestein*, then in charge of the Internal Market and Taxation, reiterated, “The [European] Commission’s political objective is exactly that: a modern Single Payment Area for the entire EU where there is no frontier effect for cross-border payments.”

To achieve this goal, the EU co-legislators, that is the European Parliament and the Council of the EU representing EU Member States’ governments, adopted several legislative acts designed to drive forward the integration of the euro payments market.

2.2. General European Frameworks

The European Commission has the right of initiative to propose laws for adoption by the EU co-legislators, that is the European Parliament and the Council of the EU representing EU Member States’ governments. The vast majority of European laws are adopted jointly by the European Parliament and the Council of the EU under the so-called ordinary legislative procedure. This legislative procedure gives the same weight to the European Parliament and the Council of the EU in a wide range of areas.

EU Directives lay down certain end results that must be achieved in every EU Member State. National authorities have to adapt their laws to meet these goals; that is, they have to implement EU Directives, but are free to decide how to do so. National implementation measures are texts officially adopted by the authorities in an EU Member State to incorporate the provisions of an EU Directive into national law.

EU Regulations are the most direct form of EU law. As soon as they are passed, they have binding legal force throughout every EU Member State, on a par with national laws. National governments do not have to take action themselves to implement EU Regulations.

2.3. Regulation (EU) No 260/2012 defines mandatory deadlines for migration to SEPA

In February 2012, the European co-legislators adopted Regulation (EU) No 260/2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No 924/2009 (the SEPA Regulation). Article 6 (1) and 6(2) of the SEPA Regulation provide that credit transfers and direct debits should be carried out in accordance with the relevant requirements set out in Article 5 of the Regulation and the Annex thereof, by 1 February 2014, subject to certain limited exemptions mentioned in the Regulation. In non-euro countries, the deadline will be 31 October 2016. Effectively, this means that as of these dates, existing national euro credit transfer and direct debit schemes will be replaced by SEPA Credit Transfer (SCT) and SEPA Direct Debit (SDD).

The European Commission introduced, on 9 January 2014, a proposal for a new EU Regulation amending the SEPA Regulation to “give an extra transition period of six months during which payments which differ from the SEPA format can still be accepted” in the euro area after 1 February 2014.

In February 2014, the European Parliament and the Council of the EU, respectively, adopted a new EU Regulation “amending Regulation (EU) No 260/2012 as regards the migration to Union-wide credit transfers and direct debits” which states, among other things, “In Article 16 of Regulation (EU) No 260/2012, paragraph 1 is replaced by the following: [...] By way of derogation from Article 6(1) and (2), PSPs [payment service providers] may continue, until 1 August 2014, to process payment transactions in euro in formats that are different from those required for credit transfers and direct debits pursuant to this Regulation. [EU] Member States shall apply the rules on the penalties applicable to infringements of Article 6 (1) and (2) (...) from 2 August 2014.” In the view of the European Commission, this procedure “does not change the formal deadline for migration of 1 February 2014.” Consequently, Article 6(1) and (2) of Regulation (EU) No 260/2012, which stipulates the 1 February 2014 compliance date, remains unchanged.

Regulation (EU) No 248/2014 of the European Parliament and of the Council of 26 February 2014 amending Regulation (EU) No 260/2012 as regards the migration to Union-wide credit transfers and direct debits' was published in the Official Journal of the *European Union (OJ)* on 20 March 2014. Article 2 of Regulation (EU) No 248/2014 states, "This Regulation shall enter into force on the day following that of its publication in the *OJ*. It shall apply, with retroactive effect, from 31 January 2014."

Different euro area countries decided on different timelines during which they made use of the option to continue processing non-SEPA formats, that is some countries did so during the full six months additional transition period agreed by the European Commission, the European Parliament and the Council of the EU while others settled for a shorter timeline

2.4. Payment services in the internal market (Payment Services Directive)

The Directive 2007/64/EC of the European Parliament and of the Council of the EU of 13 November 2007 on payment services in the internal market, generally referred to as the Payment Services Directive (PSD), was implemented by most EU Member States by 1 November 2009. The PSD aims at establishing a modern and comprehensive set of rules applicable to all electronic payment services – not just SEPA services – in the EU. The PSD is not a "SEPA Directive", but rather, the very broad and ambitious scope of the PSD makes it the most significant and comprehensive piece of EU financial services legislation in relation to the payments market ever seen. The PSD is of particular relevance with respect to the roll-out of SEPA Direct Debit services due to the fact that the PSD introduces common rules for the authorisation and the revocation of direct debits.

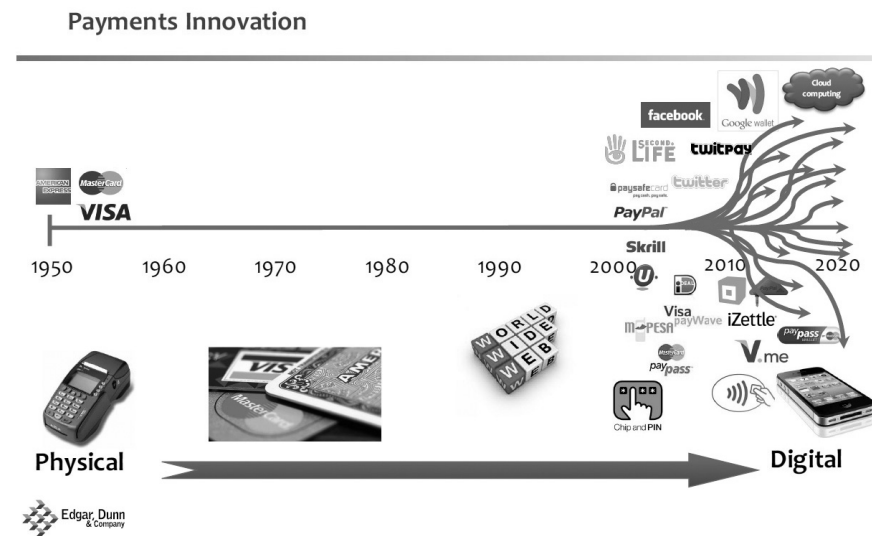
Article 87 of the PSD requires the European Commission to present a report on the implementation and impact of the Directive, together with proposals for its revision, in November 2012. On 24 July 2013 the European Commission published a "payments legislative package" which includes the European Commission proposal for a revised PSD (PSD2) (see the introductory part of this paper).³

³ <http://www.europeanpaymentscouncil.eu/index.cfm/about-sepa/sepa-legal-and-regulatory-framework>

3. THE IMPACT OF TECHNOLOGY ON PAYMENTS

3.1. Bank cards. From Diners Club to contactless

Figure 1



Source: Sidenius (2015)

Discussion of the history of over sixty years of bank cards should begin with a figure made by Edgar, Dunn and Company, which illustrates well the difference between the first fifty years and the past fifteen. This development was partly determined by the needs of payment services industry, and was precipitated by possibilities offered by the rapid development of technology. New developments take five to ten years before they enter the market. (Just an example: we used contactless technology at ski pistes as early as in the first half of the 1990s, but it took almost 15 years before it took on in bank card payments).

Below is a detailed overview of the evolution of the bank card industry:

- 1950: Four gentlemen at a dinner table founded Diners Club – the real diners' club;
- 1951: The first real credit card enters the market;
- 1958: Amex enters the market;
- 1958: BankAmericard, later Visa enters the market;
- 1965: Eurocard Brussels is launched;
- 1967: The first ATM is introduced by Barclays Bank;
- 1979: Mastercharge, later known as MasterCard is launched;
- 1988: The first nationwide PIN;
- 1992: Eurocheque and Eurocard form Europay;
- 2002: By acquiring Europay, MasterCard becomes MasterCard comes to be MasterCard Worldwide;
- 2005/6: Worldwide debit card expenditures exceed credit card spendings. This was an important step in that it transformed bank cards into a means of payment rather than a means of credit;
- 2007: Barclaycard introduces the first contactless card in the UK;
- 2010 – : Union Pay/China overtakes Visa as the world's largest bank card scheme;
- 2015: Transport for London introduces contactless payments on its whole system.

The following table sums up the summarizing data for the year of 2014:

	Billed transactions	Number of transactions	Cards in circulation
	billion USD	million transactions	million cards
Visa	3,4	30,0	90,3
MasterCard	2,3	25,0	41,0
China Union Pay	1,6	7,0	391,0
Total	7,3	62,0	522,3

Source: Lafferty Group Materials (2015)

A quick look at card operations reveals that one of the major directions of development was targeted at security. This author believes that the most crucial step in this respect was made by the adoption of the EMV standard (Eurocard/MasterCard/Visa) in 1992, which decreased the number of frauds in countries adopting the standard.

Technology experts have invented, and will go on inventing, different new tools like tokenisation, the use of biometric identification, etc.; however, this author believes that the chip&PIN system (see Europol situation report)⁴ has attained a sufficient security level in Europe (and will do in the United States next year). The application of all further solutions will depend on the cost/benefit ratio.

The other big step was the introduction of the contactless technology. In this respect the United Kingdom is in the forefront by introducing this in the London transport system. There are currently 74.5 million contactless cards in circulation in the UK according to the UK Cards Association, and some 60 per cent of Transport for London passengers use them on a daily basis (TfL statistics).

Due to the speed of payment, many experts believe contactless is the future. The practice of the TfL and other users shows that the system can handle large masses without making any kind of concessions to security.

⁴ Europol Public Version, Situation Report, Payment Card Fraud in the European Union

3.2. Mobile payments

The industry refers to Industry “uses the definition ”mobile payment” to define payments initiated by mobile phones. A mobile phone is a telephone that can make and receive calls over a radio-frequency carrier while the user is moving within the service area. This definition is from Wikipedia, but is true for any part of the economy, where mobile phones are used. In short: it is an IT device with capabilities that can be used for many operations, including, of course, payments.

Payment transactions were defined in Chapter 1. A mobile phone, as an IT device capable of making data transfers, can take part in this process without doubt, but like a bank card it is not in itself a means of payment, which money is.

There have been many projects seeking to set up mobile payment system. According to McKinsey, more some five hundred systems have been developed, but relatively few have been succesful. It should be stressed that those projects proved to be successfull that did not want to to solve the entire retail payment question, but rather, aimed at solving one part of it. (More about the Zapp system later).

The Berlin-based payment consultancy company Lipis & Lipis published a paper entitled “Mobile Payments Beyond the Hype” in which they grouped applications as follows:

Phone as card accepting device:

iZettle
Square
thumpzup
CardEaseMobile
EzoTap
ApplePay*

Phone as eCommerce device via ACH:

swish

Phone as P2P payment device:

M-Pesa
Pingit (Barclays Bank uses FPS)
PayM (the author’s addition, uses FPS)
swish
Bank of Ireland
PayPal (e-money system)

<i>Phone as authentication device:</i>	HSBC
<i>Phone as a payment token:</i>	StarbucksCard

Note: *The author's addition

The question remains: what is a payment transaction? According to the above definition, it involves transferring money from one account to another. In this system mobile phones can be very useful tools, but what is needed to effect the payment transaction is **infrastructure**.

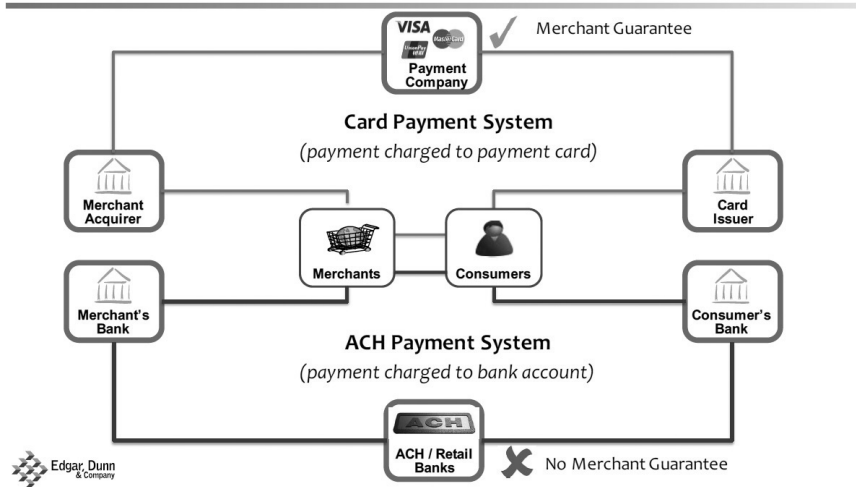
4. THE INFRASTRUCTURE OF THE PAYMENT INDUSTRY

It is a well-known fact that money has existed for a long time, with the possibility of changing different kinds of denominations from one to another. Transferring or “moving” money was a considerably easier process. With the first “bancos” and later banks (the Monte dei Paschi di Siena being the first one) came the need to move money between banks. Later central banks appeared, offering the possibility to also be a “giro” institution.

Technology offered more complex systems to the point that only specialised institutions could function as “giros” or “clearing houses”. Along with the development of the clearing houses came Diners Club and the other card schemes. Nowadays we have two types of infrastructure:

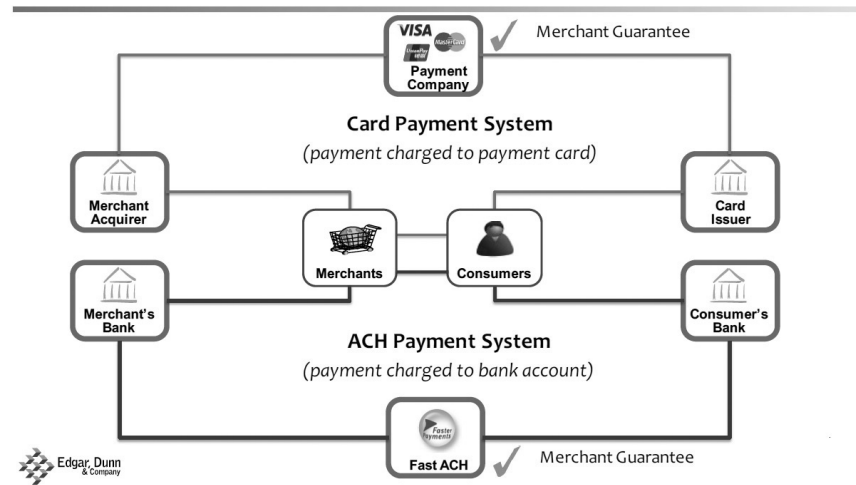
- 1) **Automated clearing houses**
- 2) **Payment Card Systems**

Figure 2
Bank Clearing versus Payment Card Systems



Source: Sidenius (2015)

Figure 3
Bank Clearing versus Payment Card Systems



Source: Sidenius (2015)

Fig. 2 and 3. show the system of the existing payment infrastructure. There is one small difference between them, one that is important and could lead to a new era in payments.

A box at the bottom of Figure 3 says “ACH/Retail Banks” with a cross next to it indicating that it does not guarantee of payment to the merchant, that is, the retailer can only be certain he has been paid when the amount arrives in his bank account.

Practically all except 19 ACHs in the world work according to this scheme.

The same box in Figure 3 reads “Fast ACH” which means that the ACH provides a system allowing to transfer money from one account to another practically instantly, in 15–20 seconds, offering at the same time the guarantee shown beside the box.

For an ACH to be considered an immediate payment service provider, it has to satisfy the following conditions:

- money transfer from payment account to payment account;
- the transfer must be irrevocable;
- 365/7/24 service availability;
- immediate execution (~ 15–20 sec);
- immediate confirmation;
- automated digital processing.

According to “World Payment Report 2015 – Capgemini/RBS” the following ACHs correspond to the above criteria, at least at the moment of writing this paper:

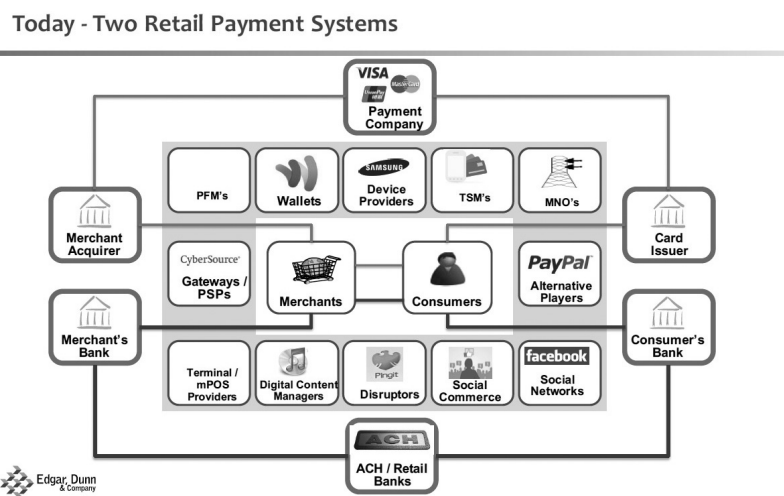
- Bankgirot – Sweden;
- Elixir – Poland;
- Fast and Secure Transfers (FAST) – Singapore;
- Faster Payments System (FPS) – United Kingdom;
- Internet Banking Payment System (IBPS) – China;
- Immediate Payment Service (IMPS) – India;
- Instant Payment System – Norway;
- NIBSS Instant Payment (NIP) System – Niger; and
- RealTime 24/7 – Denmark

According to the same report there are ten more clearing houses around the world that roughly conform to the above criteria.

The advantages of immediate payment systems will be discussed in the closing part, together with a summary of development possibilities of the payment markets.

In summary of the infrastructure, we borrow another figure by Edgar–Dunn. It clearly depicts the two parts of the payments infrastructure system. The top part, which shows the links mainly between card issuers and retailers, contains the different card schemes – Visa, MasterCard, China Union Pay, Amex, etc. – through which all card transactions are paid including payments which are initiated by mobile phones acting as card interfaces, such as ApplePay and others. The lower part, linking consumers’ banks to retailers’ banks, shows the Automated Clearing Houses, irrespective of whether they operate in a traditional RTGS (Real-Time Gross Settlement) or an immediate payment systems. On the whole, Figure 4 reveals how practically every payment, whatever system it is initiated in, will be processed through one of two systems.

Figure 4



Source: Sidenius (2015)

4.1. Electronic Money

The only additional payment systems not processed on card schemes and ACHs are the different types of e-money issued by e-money issuing institutions. In the EU, this activity on is governed by Directive 2009/110/EC of the European

Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC.

Para (8) of the Directive states, “The definition of electronic money should cover electronic money whether it is held on a payment device in the electronic money holder’s possession or stored remotely at a server and managed by the electronic money holder through a specific account for electronic money. That definition should be wide enough to avoid hampering technological innovation and to cover not only all the electronic money products available today in the market but also those products which could be developed in the future.”

According to EU legislation, Member States are required to transpose the Directive, but in short it means, that e-money is a monetary means stored on an electronic device. Originally, when e-money appeared in the 1990s (e.g. the Geldkarte in Germany or the Proton card in Belgium), the e-money was stored in the cards’ chips; nowadays, however, e-money, chips have been replaced by e-money stored on servers, such as PayPal, the largest of its kind globally, or the Hungarian Barion system.

When developing the Directive in 2008 and 2009, regulators forecasted that e-money would assume a considerably larger role. Expectations included the notion that telecom service providers would join the payment business by issuing e-money. Eventually, discounting Vodafone and its M-Pesa system, none of the large telecom companies ventured to set up a system that would had to have met stringent financial regulations.

5. SOME THOUGHTS ABOUT THE FUTURE OF THE PAYMENT SERVICES INDUSTRY

Considering the future of the payment industry, three areas can be distinguished:

- Automated Clearing Houses
- Services using ACHs
- Bank card payments

5.1. Automated Clearing Houses (ACHs)

As discussed earlier, there are currently two types of ACHs. Most of them are **traditional RTGS systems**. Their services are continually improved and they can offer more frequent cut-off times; however, the service remains the same: batch payments initiated by the participating payment service providers to be processed by the recipient banks.

Immediate payment systems offer a different type of service. In these systems payment is initiated by the customer of the bank directly and is made directly to the beneficiary's account. This type of money transfer offers many possibilities, and of course comes with many benefits for the stakeholders.

At macro level, the introduction of real-time payments offers tangible benefits to a national economy through increasing liquidity and efficiency of the payments system, which in turn will support GDP growth. These benefits will have a particularly positive impact on government – that is in the form of taxes – but will also have applicable benefits to central banks and other payment services industry stakeholders.

The most pronounced benefit to an economy is likely to be the impact of increasing the velocity of money and the fact that the National Bank possesses with an additional effective means to carry on monetary processes.

A real-time payments system offers more possibility to the Banks and other financial service institutions to introduce new, quicker payments services by making use of the technological benefits of smart phones (see later).

A real-time payments capability delivers benefits to corporations and government, as well as payers and receivers as well. It offers a better possibility for treasuries to manage liquidity more effectively by regulating the in- and outflow of payments more punctually. A number of significant benefits to corporations will be accomplished through the digital initiation of payments offered by Banks, using the increased possibilities of the payments system.

Independent of their level of wealth, consumers are keen to manage their payments better, that is to pay later and receive payments quicker. A real-time payments system offers them this possibility. Moreover, the immediacy of the solution fits perfectly into today's lifestyle, where “on demand” is critical.

In summary of the above, and looking to the future, we have to cite *Eddie Keal*, Banking & Financial Markets Leader of IBM Europe. At the Future Money 2014 conference in London, he predicted that in ten years' time real-time payments will become a standard imposed by regulators on the payments system.

5.2. Services using ACHs

The special features listed above offer possibilities for individual payment service providers to use the infrastructure provided by a faster payment system and offer unique services. These services can be initiated

- as a solution of one participating bank → Pingit by Barclays;
- as a solution of the services providers community → PayM of Payments UK; and
- as a solution of a specialized venture → Zapp owned by VocaLink.

5.3. Pingit

Barclays Pingit is a system for the mobile transfer of money in the United Kingdom. It was launched by Barclays in February 2012 and was initially only available for use by Barclays current account holders, who were over the age of 18, for the sending and receiving of payments. This was later extended to all UK current account holders and the age limit was dropped to 16. The application used for Pingit is currently available on iOS, Android, Blackberry OS, and Windows Phone.

The latest version of the app supports customers aged over 16 with a personal current banking account with any UK bank, and UK small businesses that bank with Barclays.

There is also an option to receive payments on the Barclays website, which is open to all app users and also to UK small businesses who bank elsewhere and Barclays corporate customers.

Money transfer is made to the account associated with the phone number rather than the app installed on that phone, meaning all phones rather than just smartphones with the app installed would be eligible to receive payments.

The Pingit service works on the Faster Payment Scheme, so payments are effectively instantaneous, even between Barclays and non Barclays customers, and they are free. Pingit is compatible with the Paym mobile payment system which works across other UK banks.

5.4. PayM

PayM is an industry-led collaboration initiated by the payments council (now Payments UK) that allows you to securely send and receive money straight to your current account using just a mobile number.

PayM means that there is no need to exchange sort codes or account numbers and anyone using PayM to send money is able to check the name of the recipient before confirming the payment – so they can be sure they are sending it to the right place.

Working with participating banks and building societies, PayM was launched in April 2014, and more than 40 million customers are now able to register – representing more than 90% of current accounts.

PayM is now run by an independent company made up of participating payment service providers that offer the PayM service directly to their customers and uses Faster Payments System Scheme.

5.5. Zapp – “Pay by Bank App”

Zapp is the UK’s leading mobile payment innovator. Zapp’s technology is backed by some of the biggest names in financial services and retail. Zapp is an independent company within the VocaLink group, but also uses the Faster Payments System Scheme.

Clicking the Pay by Bank app symbol online will automatically open a consumer’s bank app on their phone. Once securely logged in, they can quickly complete payments. Consumers will be able to see their account balances before they pay and choose different accounts to pay from, thereby staying more in control of their finances.

Pay by Bank app transactions are protected by a consumer’s existing bank app security and because the payments use secure digital tokens, customers don’t need to reveal any of their financial details to retailers when they are shopping.

To sum up the above three examples, Zapp and/or Zapp-type payment systems may have the greatest potential to become to be industry leaders. The fact that the consumer does not have to open any additional accounts and is able to manage his/her finances from one account, and the fact that the retailer receives his money instantly, is clear evidence for a winning position.

It is not so easy, however, to organize such a service system, because the operator has to contact directly or indirectly each of the participants, meaning that the system can be set up only with the cooperation of the partner retail banks.

The partner commercial banks have maintained a long-term relationship with card schemes, to which Zapp offers direct competition. This all means that, notwithstanding any other benefits, only a very organized and cautious approach can offer a success.

And an additional remark: because this system operates on national ACHs, additional future solutions are needed to make the system international – to which card users are very much accustomed.

5.6. Bank card payments

The author believes that because of its embeddedness, bank card payment will remain the leading form of retail payment in the world. The fact that Visa or MasterCard, or in many places both, are available at retailers means that network development is not a significant priority. Where the task does come up, the partner bank will do the job for them.

Most probably steps will be made to improve customer identification by using multiple biometrics, but the author believes it would be enough if the card issuer would issue a card at least with EMV chip (for use with the PIN&Chip verification system) which gives enough protection against fraud. Hungary in this respect is a good example, where fraud affects only 0.006 % of all payments.

The largest boom on the bank card market can be anticipated in the use of contactless cards. Developers will do everything to increase the even now very high level of such cards enabling their use for large-amount transactions as well. In most countries telecommunication is quick enough to process these payments, so it is thought that investments aimed at the card industry should go to finance the development of POS terminals capable accepting contactless cards as well.

We can also anticipate an improved integration of mobile phones with ATMs resulting in the possibility to obtain cash from ATMs by using mobiles integrating card data wirelessly.

As a final summary, it should be noted that cash will keep its role for a long time around the world. Some countries, notably Scandinavia and the UK, are proud to have achieved a level less than 50% of cash usage.

And one more thing: technological development in our era is so quick that no one can anticipate anything punctually, except of meteorologists. So keep your eyes open.

REFERENCES

- Capgemini – Royal Bank of Scotland (2015): World Payments Report 2015, London. <https://www.worldpaymentsreport.com/download>.
- Consult Hyperion (2015): The Future of Payments – How payments in the UK will evolve in the coming years. UK: Guildford. <http://www.paymentsuk.org.uk/sites/default/files/The%20Future%20of%20Payments%20Aug%2015.pdf>.
- McKinsey&Company (2015): The Fight for the Customer. McKinsey Global Banking Annual Review 2015. <http://www.mckinseypanorama.com/media/18162/The-fight-for-the-customer-McKinsey-Global-Banking-Annual-Review-2015.pdf>.
- SIDENIUS, PETER (2015): National payment strategies and innovation in the payment industry (presentation). 31st Regional Banking Conference, October 19, Budapest.
- Edgar, Dunn & Company (2015): Advanced Payments Reports. London. <http://edgardunn.com/law-firm-support/14-issues-and-opportunities/173-2015-advanced-payments-report>.
- Moorgate – OPUS – BNY Mellon (2015): Global Payments 2020: Transformation and Convergence. https://www.bnymellon.com/_global-assets/pdf/our-thinking/business-insights/global-payments-2020-transformation-and-convergence.pdf.
- Lafferty Group (2015): New Payments Landscape. Conference materials, October 8–9, London.
- Europol (2015): Payment Card Fraud in the European Union – Perspective of Law Enforcement Agencies. Situation Report, Public Version.
- Lipis & Lipis (2015): Mobile Payments Beyond the Hype. Berlin.
- Fed (2015): Consumers and Mobile Financial Services 2015, Washington: Federal Reserve Report, március. <http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201503.pdf>.