Historical Perspective of Innovation in Electronic Payment Instruments

By

Iulian Pogor

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Signature of Author: ____________________________

MIT Sloan School of Management
May 6, 2011

Certified By: ____________________________

Michael A. Cusumano
SMR Distinguished Professor of Management
Thesis Supervisor

Accepted By: ____________________________

Michael A. Cusumano
SMR Distinguished Professor of Management
Program Director, M.S. in Management Studies Program
MIT Sloan School of Management
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By

Iulian Pogor

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ABSTRACT

Electronic Payment Instruments have seen unprecedented innovation in the past XX-th century. Most of this innovation was made possible by advances in information and communication technology. Advances in ICT paired with financial innovation have brought to life the nowadays so common credit/debit cards, expeditious processing of electronic funds transfers, online and mobile payments.

Past innovation in electronic payment instruments built primarily on top of a pre-existent base. Also, it developed along the opportunities opened up by technological innovation. Revolutionary business models like Global Transaction Services would have been very difficult if not impossible to implement without the progress in IT, IT infrastructure and integration. In addition, future innovation will continue to be bounded by regulatory and legislative frameworks in the financial and banking industries. Evolutionary trends in innovation in electronic payment instruments can be affected also by any shifts in the monetary systems predominant at a certain point in time.

Future innovation trends will be shaped by the current advances in online and mobile electronic payment instruments in the United States and in other OECD countries. Large markets like China and India are important technological stakeholders as well, picking up and implementing quickly the new technology to address their development needs.

Thesis Supervisor: Michael A. Cusumano
Title: SMR Distinguished Professor of Management
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1. Introduction

The emergence of modern commerce and technological progress necessitates new means of payment that are more convenient, more expeditious, and more secure – qualities that are not effectively fulfilled by the traditional means of payment. Historically, under constant pressure from the evolving commercial models, payment systems emerged into highly sophisticated modern electronic payment instruments.

The rapid growth of digital commerce is setting new standards on specialized payments and is influencing the evolution of current electronic payment instruments, their importance in reducing transactional and financial risks becoming even more significant.

Undertaking a historical study and an industry analysis approach, I’m planning to examine the evolution of electronic payment instruments and identify specific drivers of innovation with the scope of determining current and future development trends. First, I’ll examine the current market situation of electronic payment instruments. Next, I’ll study the history of basic electronic payment instruments and how specific industry innovations influenced their evolution. Consecutively, based on past evolution and on current progress and research in the industry, I’ll try to determine future development trends of electronic payment instruments.

The thesis will discuss the evolution of payment instruments, which are methods of payment distinguished from financial instruments.
2. Definitions

Modern payment systems are indispensable to our lives as individuals and to the smooth functioning of the economy. They consist of a set of instruments, banking procedures, and, typically, interbank funds transfer clearing systems that ensure the circulation of money. Payment instruments, hereinafter referred to as “PIs”, are instruments/methods used in paying for goods and services, and/or for transfers of funds expressed in monetary units from one account to another, or from one entity (be it company or an individual) to another. The multitude of existing PIs consists of such payment instruments as cash, wire transfers, and credit card based payments, or any variation thereof. These should be distinguished from financial instruments (i.e. financial engineering products like SWAPs, repos and other derivatives) and from financing instruments (i.e. promissory notes, share certificates, bonds, guarantees or other instruments used to obtain financing for a business or company).

This paper will research the electronic PIs, hereinafter referred to as “EPIs”, their past and current evolution, and the existing drivers of innovation in EPIs. In their existing form, all EPIs are based on two core EPIs – electronic funds transfers, hereinafter referred to as EFTs and otherwise known as wire transfers, and electronic debit/credit cards. All other EPIs are based on either of these two or on a mixture of them. For instance, the well-known electronic online payment platform PayPal will use either the debit/credit card cover for a payment, or the bank account, withdrawing funds from the bank account through the same infrastructure used by EFTs. Notwithstanding, apart from the two core EPIs (i.e., EFTs and card processing), the paper will reflect on other proliferating EPIs such as online EPIs (e.g. PayPal), e-checks, and current
trends like mobile banking.

The most important to date of all EPIs are EFTs. Even the electronic debit/credit card payment processing is based in part on EFTs. Vendors get the funds for the merchandise sold as credits to their bank accounts. The credit entries in turn are posted to their accounts by their respective banking institutions, which in turn get the funds from the credit card company (e.g. American Express, MasterCard or Visa) which subtracts the amount from the credit card holder and from the banking institution issuing that particular card.

EFTs are essentially inter-bank (i.e., from one bank to another) transfers of digital money. Banks keep the funds of business entities and of individuals in the form of digital account entries. In simple terms, when one party makes a funds transfer to another party the banks intermediating the funds transfer subtract the amount of the transfer from the payer’s account and add it (i.e., assign it as a credit entry) to the payee’s account. The process of the wire transfer, depending on the particular condition, may be simple or sophisticated.

In the case when the payee’s account is with the same bank as the payer’s, the process is quite simple. The bank will subtract the funds from one account and will credit it to another account – all done internally. If however, the payee’s account is with a different bank, there may be a number of scenarios, each of varying sophistication. For instance, the payer’s bank might have correspondent relationship with the payee’s bank. A correspondent relationship means that one of the two banks has a correspondent account with another one (i.e. a bank’s account with another bank). Business entities have business accounts with their banks whereas banks have correspondent accounts with other banks or banking institutions. The two banks might have
mutual correspondent accounts, or the payer’s bank might have a correspondent account with the payee’s bank, or the payee’s bank might have a correspondent account with the payer’s bank. If there is an existing correspondent relationship between the two banks then the wire transfer process is not that complicated again. The payer’s bank will just credit the amount of the transfer to the payee bank’s correspondent account and the whole process will be done internally again. The bank will subtract the funds from the payer’s account and will add them to the payee bank’s correspondent account. If however, it is the payer’s bank that has a correspondent account with the payee’s bank, then the payer’s bank will subtract the funds from the payer’s account and will instruct its correspondent bank (i.e., the payee’s bank) to subtract that amount from its correspondent account with them and to credit that amount to the payee’s account with the payee’s bank. This scenario is not that complicated either. If the wire transfer goes out from an originating bank that does not have any relationship with the payee’s bank then the payment will go through a clearing house. Whatever the sophistication of the process is, banks on each end, and whatever bank in between might be intermediating the wire transfer, would charge service fees.

Today’s banking models have grown out of traditional branch/retail approaches used throughout the XX-th century. In the current world of technological innovation, of socially permeating globalization trends, ballooning multinational corporations, and ever growing cross border trade, banks have emerged with new operating models and platforms as well. Many of these new platforms are based on technological advances allowing real-time processing of transactions, be it online or in the local retail branch. As for the operating models, these have evolved together with more expanded customer needs.
As corporate customers grow international and expand into cross-industry conglomerates, so do their banking needs. Large, originally US-based only corporations have grown into full fledged transnational conglomerates. Domestic payments, check clearing, and overdraft lines are no longer the primary banking services that these new sophisticated bank clients require. Most of the corporate America has international interaction at varying degree. These days, at a certain point almost every company would require international wire payments handling, even if that company’s main business is domiciled locally. Some may even require integration of the bank’s payment systems with the customers’ accounts receivable and payable software, while others may need international Trade Finance assistance. Growing trends in international trade of goods and services dictate more professional foreign exchange services (which due to increased volatility more often than not require sophisticated financial engineering in hedging the risks).

On the other hand, banks have grown international as well. Many large US banks have branches and subsidiaries throughout the world and vice-versa, large foreign banks have a more amplified presence in the United States. Banks pursue cross-border expansion for a number of reasons. Mainly, it is for reaching untapped markets. However, banks do it for other important reasons too – reasons that derive from their strategic approaches to new business models. As discussed later herein this paper, Global Transaction Services concept as a business model require a holistic approach to serving customers’ needs. For instance, if one large corporate client sets up a new big subsidiary in Russia it might start banking there with a reputable European based bank which in turn might have a subsidiary in the United States. In this case, the US corporate client might decide to move some of its accounts to the US subsidiary of the European bank to achieve a better efficiency and straight through processing of payments between the headquarters and the Russian subsidiary. Corporate clients have preference for expeditious fee-
less intra-bank payments and that is why reason why they choose to bank with large banks that have a large network of branches. As Dangelmaier and Smart observe in their work “The Changing Landscape of International Payments”, “financial institutions have subsidiaries, branches and associated banks in multiple countries and move funds to the destination country via an intra-bank transaction” (51-59).

All of the above developments have triggered new strategic approaches to growth, business development and customer service in the banking industry. Initial attempts to package banking services for better targeting failed due to IT limitations. Current IT platforms however allow for more sophisticated and versatile core software products and modules. Banks are able to cross-sell services, better integrate and package them. At the same time, previously sophisticated bank products (i.e. letters of credit in trade finance) got automated and now allow for dedicated customer relationship officers to be more resourceful for their clientele.

Although the progress and innovation in IT in the financial industry in general and in the banking sector in particular is plausible, it is not the only factor that shapes the banks’ new business models. The implications brought upon the banking sector by the economic crisis are immense. Banks are reorienting their profit centres and are impacted tremendously by new risk-limiting regulation. In their account on the current state of the banking industry, Mackman and Sanders indicate that “banks face a number of obstacles in this new financial world, however, and their old business models and legacy systems cannot compete in the new world of transaction banking” (290-300).

Innovation in new business models is as important for banks as is the innovation in
individual bank products. Weichert provided an illustrative example when comparing the amount of operating revenues of credit card companies Visa and MasterCard, of technology companies like First Data, CheckFree, and TSYS, and of remittance companies MoneyGram and Western Union all totalling to just half the payment revenues of Bank of America (236-249). Also, in her work “Payments Innovation: A Comparison of Banks and Non-Banks and How They Can Learn From Each Other”, Weichert emphasizes correctly that “this value creation is rarely driven by technology, but rather comes from business model innovation” (236-249).

Consequently, the banking sector has evolved to adopt new more competitive business models. One of the common approaches adopted by the banking industry is the creation of Global Transaction Services (hereinafter referred to as GTS) units. As Lavayssière and Vergne reflect in their paper “Global Transaction Services and the Appeal for Banks in ‘Getting Back to Basics’”, GTS “is fast becoming the preferred model, as it allows banks to view and treat the needs of clients holistically with a set of synergistic products and services (e.g. cash management, trade finance and payments services)” (242-252). Although at first glance and in theory it might appear that GTS is an easy business model to adopt, in practice the challenges are significant and range from organization incompatibility to IT modules’ integration.

In a few words, GTS as a concept, business model and development strategy relates to packaging and cross-selling banking products and services to its customers. In certain ways, GTS is much similar to the concept of an “industry platform” (Cusumano 24). It provides banks with a platform to bundle complementary products/services across the entire spectre of products offered by a financial institution and beyond (i.e. Citibank offers investment services from its affiliate Smith Barney). The GTS concept will be described in more details in the follow on chapters
however, the one primary banking service that supports all of the inter-bank monetary flows is the electronic wire transfer. It evolved to be serviced by modern-day interbank communication platforms like S.W.I.F.T., discussed also in more details later in the follow on chapters, and intermediated by more advanced clearing systems. The essence of the clearing systems employed by every country in the world that has a monetary unit has not changed much since the beginning of the last century. Today’s applications however, make them much faster, real-time, automated, and almost error free, reducing the human factor to the minimum. Gone are the days when it took days for a payment to clear through the system to get from one account in one bank to another account in a different bank.

National clearing inter-bank systems, independent of the country to which they belong, process payments in domestic or national currencies. A country might have more than one clearing systems (i.e. Fedwire Funds Service, Clearing House Inter-bank Payment System (CHIPS), and ACH in the United States). A bank making a payment on behalf of its client or on own behalf in an inter-bank over the counter transaction with the beneficiary of the payment being in another bank in the same country will use that country’s inter-bank clearing system.

Nowadays, clearing systems and platforms evolved to handle inter-bank transfers in real time. Mostly, this evolution was originated by the intent to provide an expedited alternative to clearing paper checks. ACH in particular was thought to provide for a substitute to cheques (Jolly 175-181). Jolly elaborates that nowadays’ ACH “has evolved into an integrated electronic network for clearing and settlement that connects depository institutions in the US. The ACH is best used for sending and receiving low-value batch payments overnight, such as bill payments and direct deposits” (175-181).
Some bank transfers however do not require routing through clearing systems. For instance, intra-bank payments (within the branch network of a certain bank) do not require routing that payment through the clearing system and can be handled internally by the intra-bank processing module of the core software platform the bank is using. International wire transfers however, as mentioned earlier, are done through a system of correspondent banks and accounts and the footnote below Dangelmaier and Smart observe that the majority of cross-border payments are settled through intra-bank and inter-bank correspondent relationships.¹

As a case example, let’s take a German based bank that opens a US Dollar correspondent account with a US-based bank. The US bank will then become the German bank’s US correspondent bank. If a company or an individual who holds an account with the German bank decides to send out a US Dollar denominated wire transfer to someone in the US, their German bank will instruct their respective US correspondent bank to pay from their US Dollar correspondent account with them the wire transfer destined to the US domiciled beneficiary. Correspondent banks are usually large banks with large branch networks. In certain instances the US beneficiary of the US Dollar transfer might even have an account with one of the branches of the US correspondent in which case the wire transfer will not be routed through the clearing system but will be disbursed internally directly to the branch for further credit to the beneficiary’s account.

An important point to be made in the context of describing the routing of international

¹ "More than 80 per cent of today’s cross-border payments are conducted through intra-bank transactions or inter-bank relationships — nostro/vostro accounts, for example — between a correspondent bank and a respondent bank." (Dangelmaier and Smart 51-59)
payments through correspondent banks is that banks choose their foreign correspondent banks based on the scale of such correspondent banks and they do so exactly for same reasons why large corporate clients choose large banks with large branch networks – to achieve additional efficiency by an intra-bank straight through processing of payments. Large banks that achieve such scale (e.g. Bank of America, Citibank) act as processing centres and clearing houses.

In other instances, international wire transfers may employ processing through an external clearing system. In the case above with the German payment originator, the US beneficiary of the wire transfer may have the account with a US bank other than the originating bank’s US correspondent bank, in which case the German bank’s US correspondent will route the wire transfer through one of the US’ clearing systems:

If beneficiaries have accounts with the foreign institution, then they may be credited directly; otherwise, the payment is sent to a beneficiary’s financial institution, or it may be sent through a national settlement and clearing system. (Dangelmaier and Smart 51-59)

In the context of international wire transfers, existing national clearing systems initially were designed and set-up for domestic inter-bank payments. Nowadays, the increased volume of cross-border payments means that more and more internationally originated payment transactions are settled by domestic clearing systems. Even ACH, as Kamback and Miner remark, “is being used increasingly for international payments.” (253-261)

In order to cope better with the increased volume of these international transactions,
clearing systems get upgraded and automated. Automation however, as described in more details later in this paper, has the challenge of achieving overall harmonization in line with ever evolving regulations and individual countries' formatting standards. For instance, in the footnote below Dangelmaier and Smart identify the steps financial institutions needed to take in implementing international ACH transactions (IATs). European Union and the United States are enacting consumer protection and anti-money laundering legislation as well as new security and communication protocols/formats on a regular and continuous basis. As such, developers and integrators of information systems (e.g. management, reporting, operational, processing, etc.) have to keep up with the pace of regulatory enactments.

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2 "These [e.g. IATs] are NACHA’s response to the US Office of Foreign Assets Control (OFAC) and anti-money laundering concerns associated with existing cross-border ACH Standard Entry Class (SEC) codes. Gateway operators will be required to classify payments transmitted to or received from financial institutions outside the USA as IATs.” (Dangelmaier and Smart 51-59)
3. Overview of Innovation in Electronic Payment Instruments

3.1 Defining Innovation

In order to define what innovation in Electronic Payment Instruments is, let’s consider what innovation itself is. Innovation comes from “innovate” which means discovering new ways of producing/manufacturing products or services or developing new products, technologies, systems, methods, etc. In the end, it comes from an idea of how to improve the existing base for the purpose of obtaining a better value. Blockley and McDowell define innovation “as ‘creating value by doing things differently’, with Value=Benefits/Costs” (26-41).

Acknowledging the merits and argumentation of Blockley and McDowell’s postulates, it is imperative to recognize that the value created by certain innovation is perceived differently not only by different people (26-41), but also is perceived differently in/by different industries, and may be perceived differently even throughout time. For instance, a good degree of modern day technological environment derived from technological innovation in military applications during the World War II (i.e. advances in the rocket science, jet engine development, nuclear power application, etc). The value of that past innovation is perceived differently today, meaning that the value of innovation varies also in time. Most importantly however, the value created by innovation, as per the above quoted formula, is proportional to the benefits it brings. Most R&D costs however are quite big to condition a particular value in time brought by innovation on the costs to generate the benefits. Developing certain technologies may be much costlier than the immediate benefits they produce or the singular benefits for that matter. For instance, advances
in cancer treatment cost a lot in terms of R&D, and the benefits such bring to one person/family cannot be easily quantified. Even if such benefits were to be quantifiable they are not representative when taken on an individual basis without considering the sum of all the benefits for all the patients that benefitted from that particular innovation at a particular time and thereon into the future until a new innovation comes along for achieving same purpose and which is not based on the previous innovation. Over time, various off-spring applications of a specific past innovation may give a true idea of the full benefits of that original innovation. Hence, the quantification of benefits with just one formula will be quite abstract and subjective.

Notwithstanding that at first glance the above formula for determining the value of innovation states a good approximation of how the incremental value generated by an innovation is to be deduced, the author of this paper would argue that it has certain “approximation” flaws. For instance, it is not clear whether the formula relates to the value of an innovation dependant on the benefits the products of that innovation bring and the costs of using such products (i.e. costs of achieving the specific benefits), or whether it determines the value of the innovation based on the overall costs to develop an innovation. One would also argue that the value of an innovation is not necessarily the ratio of the benefits it creates to the associated costs, but rather the ratio of ratios - between the ratio of benefits and costs brought by the innovation and the ratio of benefits and costs under the old way. This ration however would not be applicable in cases when innovation brings totally new benefits and thus has no comparator base.

Innovation is almost always perceived as technological in nature. However, innovation takes place not only on a technological level. The nowadays financial industry has evolved substantially not only due to technological innovation that allowed for increased convenience or
for old processes to run faster, but also due to innovation in the financial products and services as well – the financial innovation. For instance, Blockley and McDowell define financial innovation in general to mean “the successful introduction of a new product or service, which creates value by reducing costs or risks or provides additional benefits (e.g. speed, convenience), which better satisfy consumer demand” (26-41). However, one could argue that financial innovation goes beyond the “successful introduction of a new product or service,” and might employ new organizational structures, business processes and models, as evidenced by the industry wide adoption of the GTS banking model.

Innovation can be classified into specific categories. In particular, Blockley and McDowell distinguish between product innovation and systemic innovation. Introduction of new products and services by various financial industry players may or may not lead to adoption of such by the competition and thus, such product innovation is not necessarily systemic.

Apart from product and systemic, innovation also can be classified as disruptive or sustaining, incremental or step change. Christensen and Raynor classify innovation that evolves and spreads from the market niches it initially targeted as disruptive innovation (3). Innovation that is achieved incrementally on pre-existing building blocks and which is carried out by the

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3 "It is important to distinguish between innovation types, such as competitive innovation in products and services, and systemic innovation in payments. Product and service innovation can be delivered by individual service providers, who may choose to invest in such innovation in order to gain an advantage over their competitors in the marketplace, such as Bank of America’s Keep the Change programme, whereas systemic changes require the collaborative efforts of multiple players within the payments industry in order for service providers to deliver completely ‘new’ products and services to customers efficiently and effectively across the market.” (Blockley and McDowell 26-41)
industry and not by certain industry players is considered sustaining innovation (Blockley and McDowell 26-41). There is also incremental and step change innovation. As an example consider the evolution of American Express cards combining Costco cards.

The Innovation Matrix presented below (Figure 3.1.1) and developed by Christensen and Raynor renders and interesting classification of the different types of innovation (4-5).

**Figure 3.1.1: Innovation Matrix** (Christensen and Raynor 4-5)

In addition, Table 3.2.2 on page 22 provides a very good classification of innovation with pertinent examples of innovation in EPIs.
3.2 Innovation in Electronic Payment Instruments

Payment instruments stand at the basis of all monetary, financial, and trade flows. Without them, trade within and among countries would not exist. Payment instruments are the foundation of the banking industry. Technological advancement and innovation in payment instruments define the overall progress of the banking industry. However, this innovation is driven by all stakeholders, not just by the banks.⁴

In that order, for the innovation in EPIs to gain ground it needed to get the respective adoption by banks' customers. However, it is only natural to expect stability from the human nature when it comes to money. People in general have certain resistance to change unless they become explicitly aware of the change’s benefits. The awareness does not necessarily come together with advertising. People need to try an innovative solution first and getting them to try it is not always easy. Apart from this obstacle, there is also the issue of picking the most suitable set of solutions for a particular business or application. Different clients have different needs and different infrastructure in place.⁵

Table 3.2.1 below provides a blueprint for selecting the most appropriate method of EPIs by listing the drivers that motivate consumers to choose certain payment instruments.

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⁴ “New technologies and changing needs have fuelled unprecedented payments innovation over the last 60 years. These innovations have been driven by a variety of players: banks, non-banks and regulators.” (Weichert 236-249)

⁵ “Each e-payment method calls for businesses to have the appropriate technology in place before they can send or receive transactions. Businesses must be strategic in determining the best option for yielding maximum benefit — be it from purchase card rewards or from vendor discounts for early payments.” (Jolly 175-181)
Table 3.2.1: The six Cs that drive consumer choice in payments (Blockley and McDowell 26-41)

<table>
<thead>
<tr>
<th>Capability</th>
<th>Some new capabilities add value by changing or shortening channels or payment supply chains. This type of innovation can provide a way of entry for new participants, thereby challenging the role of traditional suppliers and intermediaries. PayPal, for example, is a mediating service facilitating person-to-person transfers without the seller having to register as a merchant, which challenges the traditional credit card players.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Cost would normally be viewed as a strong driver of change. The impact of cost on payment choice, however, is a complex matter. The issue is complicated by consumer expectations and the fact that in most cases the marginal cost to the consumer of making a payment is zero.</td>
</tr>
<tr>
<td>Convenience</td>
<td>Consumers’ expectations in terms of speed, real time, electronic channels, etc. are constantly increasing, especially among the younger generation.</td>
</tr>
<tr>
<td>Coverage</td>
<td>The increase in access to the Internet is also associated with an increase in the use of electronic commerce. Expanding coverage for consumers by making electronic payment options available in the real, as opposed to on-line, world often involves a major investment in systems.</td>
</tr>
<tr>
<td>Confidence</td>
<td>Providers of new, innovative payment systems need to convince consumers that their products or channels will operate as expected, and give confidence that the payment will 'go through'.</td>
</tr>
<tr>
<td>Confidentiality</td>
<td>Providers of new, innovative payment systems face a challenge to convince customers that their products or channels are trustworthy and secure, although new methods/systems that provide consumers with greater security, actual or perceived, of their confidential/personal information have attraction.</td>
</tr>
</tbody>
</table>

Furthermore, for the innovation in EPIs to gain ground it required approval from state regulators. However, notwithstanding the important roles of other stakeholders, banking institutions are the primary drivers of innovation in the EPIs and in the payment systems in
general. Pioneering innovation or innovative ideas in EPIs is futile without the support of the banks.  

The support of the banks is imperative in driving and implementing new ideas in EPIs. An entire army of gadgetry that is appearing on the horizon and that allows for remote or touchless payments (i.e. making payments with smart-phones) will be impossible if it were not for the backing of and co-operation with the banking sector. Banks know best what the limitations of their infrastructures are and if implementation of certain new ideas is possible. Banks know what is and what is not possible, and in this particular respect Blockley and McDowell emphasize correctly that consumers “do not always know what is possible.”

Many new ideas in EPIs even if not generated by banks will have to first be adopted by them and integrated into their payment systems and core platforms. In the end, banks are the ultimate implementers of innovation. At the same time, having this role also means that they may be themselves the boundaries and barriers for innovation. Banks are very conservative in implementing change. Partially it is due to security and risk control. But nothing is too simple in the banking industry and there’s a more comprehensive set of reasons for the banks’ conservative approach to innovation.

First and foremost, there has to be a need for something more than already exists and

---

6 “Banks control the core payments infrastructure, and bank-led innovation is required for changes to underlying payment systems.” (Weichert 236-249)
7 “… financial services providers should exercise caution, as consumers do not always know what is possible. As Henry Ford once said, ‘If I’d asked people what they wanted, they’d have said a faster horse.’” (Blockley and McDowell 26-41)
works quite well. Secondly, information that circulates through the banking communication channels is quite sensitive and confidential. Designing a new payment instrument is impossible without considering its integration into the banking sector’s platforms and that in turn cannot be done without secure communication channels. With all the hacking threats that today’s world is confronted with one can see why banks have a cautious approach. A breach exposing large batches of sensitive personal data can be highly detrimental, if not catastrophic, to any bank. Why would then a bank implement something new that might have only a marginal improvement/benefit when compared to the potential of big security threats and risks?

In addition to the above, there is another rationale standing behind the banks’ conservative stance – the agency theory that dictates a short-termist approach by a bank’s senior management. A meaningful innovation with considerable effect on the market would have to be backed or come from large players in the banking sector. Large banks are publicly listed conglomerates and their top decision-making management is appointed by the shareholders. In large listed companies few individual shareholders or institutional investors, unlike the initial founders, are oriented long-term. Public shareholders value more quarterly performance and have very little tolerance for errors or for large investment costs that bring little benefits in the short run. Senior management is well aware of their responsibility to the shareholders. All of these reasons are the most probable explanation to the banking industry’s incremental approach to innovation, including to innovation in EPIs.8

Looking back at the formula quoted before for determining the value of innovation, it

8 “The adoption of technology in payments is usually an evolutionary rather than a revolutionary process.” (Blockley and McDowell 26-41)
appears to be quite applicable in this particular instance. Take for example the evolution of mobile wireless payments through smart-phones. This new form of EPIs (based on existing credit card payments and some alternative online EPIs done wirelessly) bring additional incremental convenience to their users. In this instance the benefits brought by additional convenience have to outweigh not only the development and implementation costs, but also the carrying cost, cost of maintenance, and intrinsic costs associated with security breach risks or other product failure. Usually, consumers are slow and cautious when adopting new payment instruments. This is due in part to habitual behaviour and security. Although many security concerns come from misconceptions, the risks of hacking and other security breaches at service providers are quite real. The analysis quoted in the footnote below on gradual step innovation in payment instruments being more acceptable by the market is very representative.  

The banking industry sustains significant costs of maintaining its IT/ICT infrastructure. Banks’ legacy IT and core software platforms are not fully interoperable with latest product and process developments (i.e. straight through processing) and in order to support holistic GTS models require many redundant and obsolete solutions that only add to the IT maintenance costs. Hence, trained and expert human capital is imperative in achieving a well-integrated architecture. Banks only recently realized the impact of institutional memory loss and the value of retaining specialized human capital.

9 “Generally, payment innovations that require little change from known and established practices may be more readily accepted by the market than those that are substantially new, unfamiliar and require a change in behaviour by consumers or merchants. Continuous improvements are usually preferred, because they are easier to implement, more tangible, require less complex business cases, are more accepted by consumers and offer lower risk (as they can exit, if required to, with fewer consequences).” (Blockley and McDowell 26-41)
In addition, there are a number of regulatory stipulations imposed by almost every central bank in the world that impose ICT/server/database redundancy (i.e. as part of emergency preparedness, banks have to be ready to switch its main IT/ICT operational hub from one location to another, to have dedicated secondary secured communication channels, secondary redundant servers preserving critical operational and client data, etc). In the footnote below Mackman and Sanders reflect on some of the inefficiencies of the banks’ IT infrastructures. 10

On top of the high IT maintenance costs, developing new EPIs and integrating them securely into the existing core IT platform draws additional resources. Furthermore, the maintenance costs would be quite significant to support the safe and flawless operation of the new EPIs. Innovation in IT that reverberates into classic bank products and new IT/ICT based innovative bank products imposes huge costs, deriving mainly from maintaining large IT departments. This is all not necessarily due to significant benefits that a new product would bring but, more often than not, it is the case of matching competition’s offering of similar convenience features to their clientele. Respectively, notwithstanding the aforementioned costs, the banking industry is slowly, incrementally, and steadily adopting new EPIs. The below Table 3.2.2 provides a series of examples of current innovative EPIs adopted and promoted by certain banks or group of banks throughout the world and classified according to the different types of

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10 “Banks’ IT systems have grown organically over time, with the majority of banks housing multiple systems which do the same or a similar job. Many of the new products introduced have developed their own payment capabilities, which has led to greater duplication and complexity, exacerbated by a lack of connectivity between different systems. Furthermore, few banks have escaped mergers and acquisitions activity over the past ten years or so. These merged banks are typically characterised by an inability to rationalise their systems fully as they originally planned, as sufficient resources or budget (or both) are not available. This has led to a scenario where banks are often wasting money on a complicated and inefficient IT infrastructure, effectively linking the best parts of antiquated systems with high operational costs in order to keep multiple legacy systems going.” (Mackman and Sanders 290-300)
Table 3.2.2: Examples of types of payment innovation (Blockley and McDowell 26-41)

<table>
<thead>
<tr>
<th>Classification of innovation</th>
<th>Examples of payment innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic innovation</td>
<td>• BPAY (Australia)</td>
</tr>
<tr>
<td></td>
<td>• Decoupled Debit (US)</td>
</tr>
<tr>
<td></td>
<td>• Faster Payments (UK)</td>
</tr>
<tr>
<td>Product innovation</td>
<td>• Companion Amex cards on Visa/MasterCard accounts (Australia)</td>
</tr>
<tr>
<td></td>
<td>• Emue card (Australia)</td>
</tr>
<tr>
<td></td>
<td>• Bank of America’s Keep the Change Programme (US)</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>• Barclaycard’s OnePulse combines Credit Card with Oyster Card (London)</td>
</tr>
<tr>
<td></td>
<td>• PayPal via mobile phones (US)</td>
</tr>
<tr>
<td>Step change</td>
<td>• M-PESA SMS based payments (Kenya)</td>
</tr>
<tr>
<td></td>
<td>• Wizzit mobile <em>banking</em> (South Africa)</td>
</tr>
<tr>
<td></td>
<td>• EFTPOS (Australia)</td>
</tr>
<tr>
<td>Innovators</td>
<td>• Smart Cards (France)</td>
</tr>
<tr>
<td></td>
<td>• Octopus Contactless Mass Transit Card (Hong Kong)</td>
</tr>
<tr>
<td></td>
<td>• GCash &amp; Smart Money first commercial mobile payment systems (Philippines)</td>
</tr>
<tr>
<td></td>
<td>• POLi online payment system (Australia)</td>
</tr>
<tr>
<td>Imitators</td>
<td>• Oyster Mass Transit Card (London)</td>
</tr>
<tr>
<td></td>
<td>• e-pump imitating Exxon’s Speedpass in the US (Australia)</td>
</tr>
</tbody>
</table>

As observed in the above table, most of the known EPIs in order to gain their existing market penetration required the adoption by the banking industry at large. Correspondingly, one
other hidden response to why banks, financial institutions and other corporations are cautious and conservative in approaching innovation is the very aspect that in order for an innovation to work, be efficient, profitable, and sustainable it requires to be adopted by the larger market. Furthermore, industry-wide adoption requirement makes building a business case for a specific innovation difficult. Even if the innovation proves successful and profitable, swift replication by the competition is yet another hindrance to building strong internal corporate business cases for new and innovating EPIs. It is quite interesting to note the observation quoted in the footnote below in respect to the high incidence of simultaneous adoption by local competitors in the same or following year.\footnote{This indicates that first mover advantage is not a strong driver for innovation, as many innovations, such as ATMs, do not realise their full value until adopted by a wider network. This factor could hinder the desire of organisations to invest heavily in new, large-scale innovations, as they may be unlikely to provide competitive advantage and therefore financial gains.” (Blockley and McDowell 26-41)}
4. Overview of the Current State of Electronic Payment Instruments

4.1 Evolution and Current State of Electronic Payment Instruments (EPIs)

This chapter will discuss in detail the evolution and current state of electronic funds transfers (i.e. wire transfers), of e-checks, of credit/debit card payments, and of online EPIs. Although many online EPIs are credit card based payments and although processing of credit card payments involve inter-bank settlement and reconciliation through wire-transfers, the author of this paper has categorized them in separate categories due to different industry application standards and due to a different product process innovation afferent to each category.

4.1.1 Evolution and Current State of Electronic Funds Transfers (EFTs)

Throughout the last four decades ever since the abolition of gold as a monetary standard, together with the volatility imposed by floating currency exchange mechanisms, banks have developed various innovative risk-mitigating, or otherwise known as hedging, instruments initially adopted internally and later-on available to customers as products of banks’ keen financial engineering. Later to be known in general as financial ‘derivatives”, these smart bank products provided for a perceived additional security when engaging in riskier transactions. Within large scale investment ventures project financiers and investment bankers would engineer ever more sophisticated mechanisms and instruments to mitigate risks and would cross sell them to various third-party investors not directly related to the investment project but who will have certain recourse rights. As a result of greed, a product of human nature, these instruments gained more and more popularity and contributed to an exploding scale of today’s financial markets.
As past economic crises demonstrate, all the financial instruments that allowed banks to venture into what nowadays would be called investment banking, prove useless when markets collapse. Overnight, cash strapped or otherwise not liquid counter-parties loose access to capital markets and counter-party risks becomes wide-spread. In other words, these are nothing else than term promissory notes collateralized with other term promissory notes. When markets function normally these instruments work as designed. When markets collapse, wide-spread counter-party defaults render most of the derivatives either completely or partially useless, necessitating vast resources to untangle the recourse rights in intertwined and confusing batches and pools of derivatives.

Throughout these last four decades, as a result of economic crises in part triggered by excessive risk taking on part of banks, regulators in the United States have imposed various regulations on banks. Initially, spooked by the disastrous effects on the markets, regulators separated the investment risk-taking function from the classic banking sector. Later, during Clinton’s administration they have allowed banks to engage again in the investment banking sector. Now, there are numerous calls in the legislature to repeal the law that grants the banks the option to engage in investment banking activities.

Regardless of the regulation in effect, in periods when financial and economic crises occur and immediately after, banks adjust their revenue generating strategies towards their primary banking roles: monetary safekeeping, intermediating payments, and collateralized commercial lending. This is what Lavayssière and Vergne observed in their work “Global Transaction Services and the Appeal for Banks in ‘Getting Back to Basics’” on this particular topic:
The worst of the economic crisis may be over, but banks are still deeply mired in managing the impact on their operations and profitability. Stung by their exposure to high-risk products, and urged by regulators to preserve capital, increase liquidity and limit risk, many are shifting ‘back to basics’. In the process, the most fundamental of banking activities — Transaction Services — is garnering new respect as a potential source of more reliable returns and fee-based revenues. (Lavayssière and Vergne 242-252)

In times of economic distress, financial and banking institutions re-orient themselves to cost and risk reduction, and to a continuous, safe and stable revenue generating transactional banking. It is interesting and to the point how Mackman and Sanders, two other prominent industry scholars, regard the banks’ safe and stable fee-based source of income as “staple diet”. 12

As introduced above herein this paper, EFTs stand at the core of EPIs and at the core of banking in general. Every conceivable inter-bank transaction will be supported by one or by a corresponding set of electronic funds transfers. Whether it is a Foreign Exchange transaction or a correspondent account reconciliation, account entries and the movement of funds would be impossible without EFTs. EFTs constitute the most important fee-based bank service that stands at the basis of GTS, a new business model introduced earlier in this paper. GTS, as a concept, business model and strategy is applied by banks on a wide scale both regionally and globally.

12 “The events, which led to the recent banking crisis created the view within the financial services community that transaction banking is a stable source of income in times of crisis. Regarded as the staple diet for many banks, financial institutions are being forced to turn their backs on years of developing exotic products and go back to basics by looking at ways to generate further revenues from payments.” (Mackman and Sanders 290-300)
When times are difficult and the revenue streams dry out, fees generated by transaction intermediation through GTS or through regular transaction servicing become the primary scope in a bank’s sustainable growth strategy.13

Electronic payments and EPIs in general constitute the core basis of any GTS architecture. A multitude of transactional bank services would not have been possible without the existence of EPIs and without the existence of modern day inter-bank communication channels developed throughout the XX-th century for executing funds/wire transfers and other EPIs in a secure way.

In order to maximize the revenue stream generated by GTS applications, banks are streamlining and automating processes, reducing the maintenance and operational costs associated with EPIs. This however, proves to be a more difficult challenge when it comes to the processing of international transactions/payments. Each of the multitudes of existing domestic clearing systems has its own particularities when it comes to field and/or code formatting for automation purposes. As such, banks and financial institutions face automation challenges when internationally generated payments are routed through domestic clearing systems requiring different transaction formatting.14

13 “While the growing volume of global payments represents a long-term source of revenues for banks, it is the fee and operating structure of the GTS business as a whole that is the key to its allure at the moment, when bank margins are being squeezed, and capital is constrained.” (Lavayssiére and Vergne 242-252)
14 “Although many countries have established high and low-value payment systems, these are based upon proprietary communication and security standards rather than global standards, which are lacking.” (Dangelmaier and Smart 51-59)
As mentioned previously in this paper, banks and financial institutions face automation challenges not only because of differing proprietary communication and security standards and formats, but also because of different regulation in each of the countries where a certain payment transaction is processed. The Single Euro Payment Area (SEPA) initiative and the United States Patriot Act are vivid examples of legislation imposing on banks new standards, including reporting ones, that in turn necessitate significant technological upgrades. Some excerpts of the thoughts expressed by Dangelmaier and Smart in this respect are quoted in the footnote below.\footnote{\textit{Moreover, regulatory requirements — both governmental and private — have had a blistering effect on cross-border payments. Implementing processes, procedures and systems to comply with and remain in compliance with such mandates is expensive and generally offers little benefit other than compliance with the financial institution.}}

The fact that the evolving legislation presents an automation challenge is true not only in the case of cross-border payments but also in a domestic processing context. For instance and as reflected earlier in the paper, IATs came to life late in 2009. That implementation process required a significant effort from the US stakeholders in terms of updating their systems and processes to comply with the new standards. Reflecting on the magnitude of the effort that the financial institutions have to make to implement IATs, Dangelmaier and Smart state that “financial institutions will need to update their transaction systems to manage IATs, and systems in all areas — including operations, compliance, audit and customer service — may be affected, adding to the challenges and complexities of enabling IATs.” (Dangelmaier and Smart 51-59)

Along the intra- and inter-bank automation, banks have made the EPIs more efficient for
end-users (i.e. their clients) as well. Today, bank clients have the comfort of managing their account online and execute bank transaction without going to the bank. Large and important customers have dedicated Bank-Client software that communicates with the bank through dedicated secure lines. Some banks offer real time integration of client’s back office bookkeeping, of its accounts receivable and accounts payable, and even of its payroll software modules with their accounts held at the bank. In this way, incoming or outgoing payments are reflected automatically in the client’s back office bookkeeping and are also tracked in the clients accounts payable/receivable programs. However, this integration has its own challenges that derive primarily from standards and platform incompatibility. In order to overcome these challenges clearing houses are introducing new standards in payment formats (Farrar and Hargraves 236-242). The main improvement will be two-fold. First it will allow for more space to describe what the payment is for and secondly, by having the field that describes what the payment is for standardized it will allow customers to integrate easier Bank-Client software with their accounts receivable software.¹⁶

4.1.2 Evolution and Current State of Electronic Checks (E-checks)

Innovation in EPIs has led to emergence of certain EPIs that were just recently unthinkable not only by the bank customers, but by the banking industry itself. For instance,

¹⁶ “The enhancement planned for the Fedwire Funds Service and CHIPS at yearend 2010 will provide the groundwork for corporations to reduce or eliminate the need to research wire transfers, because these payments will have all the information that a corporation needs to apply them to their accounts receivables systems. Small and large firms alike will benefit from this change, but information technology (IT)-savvy corporations have the potential to benefit the most. They will be able to automate the entire wire transfer process, if they so desire.” (Farrar and Hargraves 236-242)
electronic cheques were difficult to envision given their paper-based nature. Electronic cheques constitute an example of EPIs that brings efficiency to both the service provider (i.e. banks) and to the user of the service (i.e. bank customers). Although paper based cheques are still widespread, large companies that embark on a more intensive use of electronic cheques and EPIs have achieved a significant reduction of manual processing costs.\textsuperscript{17}

Innovation in electronic cheques however has limited growth potential as the way it progresses currently leads to overlaps with other EPIs and automated ACH clearing. EFTs, on the other hand, have become more important for the business community and for the banking industry due to the enormously expanding use of these EPIs internationally.

One of the many innovations in e-checks that lately is gaining wider acceptance due to its convenience is the submission, presentment and acceptance of digital copies of checks via secured online communication channels. However, an even more important innovation in terms of direct debit processing and its impacts is the cheque-initiated electronic funds transactions. This is how Gorsline and Hosie describe the effects of cheque-initiated electronic fund transaction:

Based on these innovative changes, banks and merchants can now access consumer cheque account funds without the consumer ever touching or physically signing a cheque. (Gorsline and Hosie 139-156)

Although, the breakthrough in convenience, speed and ease of processing is spectacular,\textsuperscript{17}  

\textsuperscript{17}If a company is collecting payments primarily by cheque, it is almost certainly paying more than if it could move these payments to an electronic alternative. (Coven 60-66)
there are a number of perceived risks associated with this type of e-check related transactions. Regulation pertaining to these transactions is still incomplete and although the technology works very well consumers need more regulatory protection when it comes to addressing the risks the new technology brings along.

4.1.3 Evolution and Current State of Online EPIs

This paper will distinguish online EPIs from online credit/debit card payments. Although online EPIs differ from international EFTs, many online EPIs provide an easy solution for international payments. Kambak and Miner provide a glimpse on why the international payments proliferated so widely. Growing international trade, cross-border acquisitions and expansion, and everything else that derives from such cross-border expansion in the normal course of doing business (i.e. payroll) are provided by Kambak and Miner as examples that lead to the continuous growth in the use of international payments (253-261). In their paper “The Changing Landscape of International Payments,” Dangelmaier and Smart have assessed that international payments will grow by 10.2 per cent yearly.18

However, it could also be argued, that together with the growing international trade flows between/among corporations and together with the growing use of electronic international payments used by multinational corporations, there is also a third factor. Mainly, it is the growth in local, domestic, and international trade between individuals. Advances in ICT have allowed

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18 As more and more business is conducted globally, international payments are increasing at an exceptional rate. In the coming years, these payments are expected to climb at the rate of 10.2 per cent a year globally. (Dangelmaier and Smart 51-59)
individuals to shift from the bounded local newspaper market to online platforms that provide access to regional, domestic, or even to international markets. These platforms have formed the infrastructure for a new type of commerce – the electronic commerce (e-commerce). Vivid examples in this respect are eBay and Craigslist. Lately there was a significant proliferation of online platforms similar to eBay but not as merchandise exchanges but as private stock exchanges like SecondMarket and SharesPost (Pepitone). Although Craigslist is more local and regional, eBay has thrived as a platform intermediating the supply and demand generated by individuals on an international scale. As a result, PayPal has become one of the most prominent EPI platforms used by individuals worldwide. It is important however to stress that many individual sellers around the world do not have access to PayPal yet. There are also many of those that do have access to PayPal but refrain from using it more actively due to certain inertia in accepting it in their trading routine. The stance of EU based online individual sellers constitutes an eloquent example of conservative sellers preferring electronic bank transfers to PayPal. As such, the emergence of eBay, e-commerce in general, and access of people around the world to merchandise sold by individuals worldwide is a third factor contributing to the expanding use of international EFTs.

Online e-commerce is growing fast in spite of the effects of the economic crisis. In his work “Strategic Innovation in Payments Systems: What are the Next Big Things?” Vanetti refers to a study by Forrester Research that shows that, “despite the financial crisis, e-commerce will continue to grow, with a compounded annual growth of 9.8 per cent from 2008 to 2014, reaching c203bn” (17-25). As e-commerce grows, so does the use of online EPIs. The most widely accepted and used alternative online EPIs (i.e. alternative to the online use of credit/debit cards) are PayPal, Moneybookers, DevPay, and Google’s Checkout to name a few. One of the appeals
of these online EPIs is that although the payments are linked to credit cards, online payments made through PayPal for instance do not disclose payer’s card information. This feature is particularly important in the modern computer age mired by the multitude of computer and online identity security risks. This enhanced security feature as well as features of convenience, associated rewards and other will contribute to a steady growth in the use of online EPIs. In this respect, results of a recent study predicting a solid growth of alternative EPIs are quoted in the footnote below.\(^{19}\) For illustration purposes, Appendix A provides a very good list of examples of latest online EPIs.

4.1.4 Evolution and Current State of Electronic Credit/Debit cards

Electronic debit and credit cards are in essence identical when it comes to distinguishing among EPIs. Both credit and debit cards use the same electronic payment processing infrastructure (point of sale processing, processing centres, etc) be it MasterCard, American Express, Visa, Discover or other. When distinguishing between debit and credit card payments, Leinonen observes that “all payments are transfers of funds, i.e. the transport of monetary value from payer to payee” and that “the credit and debit card services are identical as regards their pure payment features” (102-115).

Some analyses with which the author of this paper agrees, view the credit card “as a bundled product consisting of a card payment part, comparable to debit card payment, and an

\(^{19}\) “A recent study from Javelin Strategy & Research in the US found that consumers are rapidly turning away from credit cards for online purchases. Indeed, Javelin is predicting nearly one-third of online transactions will be made using alternative payment methods by 2013, many of which bypass banks and traditional card schemes.” (Blockley and McDowell 26-41)
attached credit service comparable to consumer credit” (Leinonen 102-115). It is true because apart from facilitating the payment process, the credit card also extends credit to the card’s authorized user(s) up to a pre-determined limit. In many respects, similar to Cusumano’s “industry platforms” (24), apart from credit features/services, many credit cards come with other complementary services like buyer protection, insurance, etc.²⁰

The use of debit cards initially and then a wider use of credit cards later required acceptance by all stakeholders - the card users, the card issuers and the merchants accepting the cards as a payment method. In the case of the debit cards, the instrument provided convenience to its users when it came to accessing cash in their current accounts. ATM infrastructure was an imperative promoting asset in this respect. Also, debit cards provided the issuing banks with an increased interest income on current account balances when compared to cash. This occurs primarily because debit card users would not access or withdraw cash from their accounts in advance for a purchase that could be paid for with a debit card. Moreover, although the transactions are reflected in card users’ accounts immediately, it takes additional processing time for the amount to be subtracted from the issuing banks’ accounts for further credit to merchants’ accounts. The compounded effect leads to a rather significant interest based income.

In the case of the credit cards, their wide acceptance and rapid growth was based not only on their convenience to use, but also on the issuing banks’ interest to bundle the extra service (i.e. extending credit to consumer) and on the individual merchants’ desire to accept credit cards and to invest into the additional processing equipment. The latter is particularly important when

²⁰ “Comparing credit card services with ‘pure’ payment instruments would require unbundling of extra services.” (Leinonen 102-115)
it comes to technology penetration. Initially, debit cards were primarily used at ATMs and it took the wider individual merchants’ acceptance of credit cards that provided for the growth in cards’ use as payment instruments. For that to occur, merchants had to realize the intrinsic additional benefits of accepting credit cards in their stores. Credit cards provide credit to their users and as such lead to a higher consumption rate. Respectively, by accepting credit cards merchants increased their sales and that was the most important factor justifying additional capital expenditures into point of sale equipment. Combining all these factors leads to a wider acceptance by all stakeholders involved in a new innovative technology, in this particular case – debit/credit cards.21

Apart from regular debit/credit cards there is a growing trend in the use of purchase cards. Purchase cards or store cards are usually issued by big retailers in the form of an extended credit with a pre-determined spending ceiling. Their popularity was bolstered by the rewards and discounts associated with the use of these cards. Big retailers embarked on accepting and stimulating this type of card payment primarily to boost sales and to use it as a tool in various customer loyalty programs. Jolly’s reflection on the particulars of purchase cards and their growth trend in the footnote below is quite interesting and informative.22

21 "The two-sided market theory, in the case of the payment industry, represents a type of the chicken-or-egg situation for start-up technologies: cardholders become interested in cards when merchants accept them, and merchants’ interest in acceptance and investments increase when there are more cards in use. When the benefits are clearly visible to end users, the transformation occurs faster.” (Leinonen 102-115)

22 "Purchasing cards are popular for the favourable payment terms and reward benefits they offer buyers in return for purchasing activity. They are also designed to collect and report details about purchases using the card networks. In 2010, payment cards will increase to 5 per cent of total non-cash payments.” (Jolly 175-181)
4.2 Evolution and Drivers of Innovation

The 2008 economic crisis has had a worldwide felt effect and many economists still argue whether the cycle curve has turned up towards recovery. Economic crises bring with them immense hardship and thus affect consumption. Times like these dictate cost cutting not only on part of consumers, but also on part of manufacturers and service providers alike. Competition intensifies and the fittest survives. Cost cutting becomes imperative not only for operational efficiencies but also for the ability to sustain operational margins in merciless price wars. Increased competition forces innovation as well. Many prototypes and delayed projects that were thought for future implementation are brought to life when the competition market springs up from its monotonous state. Accelerated implementation is just one of the aspects of innovation in distressed markets. But mainly, in times of economic distress resistance to change is no longer a factor obstructing innovation when it leads to efficiency or market capture – be it a new or an improved product.23

There are many drivers of innovation in EPIs and these drivers differ in importance from one country to another. Blockley and McDowell, identify six key drivers of innovation in their work “Innovation Drivers and Barriers: Implications for Innovators, Imitators and Regulators” and mainly, consumer/merchant demand, profit, competition, technological advancements, level of security, and industry framework (26-41). For instance, the growth of Ebay and of other e-

23 “The financial crisis has strengthened and speeded up the already growing demand for innovation. Indeed, economic uncertainty is a main driving factor for innovating: all market participants (consumers, enterprises, banks) start asking for more resilience, fairness, transparency and efficiency, a global demand which translates into a strong need for innovation, on the one hand, and for regulation, on the other, which can, in turn, generate further innovative thrusts.” (Vanetti 17-25)
commerce platforms led to a need for more convenient and faster EPIs. Bid Pay initially and PayPal later were innovating EPIs that addressed the consumer need. In this respect, please refer to the six “Cs” that drive consumer choice in payments presented earlier in this paper and categorized in Table 3.2.1.

Profit is identified by Blockley and McDowell as another important driver of innovation in EPIs (26-41). Both, financial institutions and merchants alike are strongly motivated to pursue alternatives when it comes to preserving profit margins. Particularly, implementing innovation is attractive when such provides for cost cutting or fends off competition. In some instances innovation leads to new products and new EPIs altogether that generate revenues on their own. However, as Blockley and McDowell point out, development projects tasked with new and innovating EPIs face investment approval challenges due to inherently low levels of ROI associated with these products as compared to other initiatives (26-41).

Reflecting on the other drivers of innovation identified by Blockley and McDowell, competition and technological advancements are two drivers that are inter-related in most of the instances when it comes to EPIs. Security and industry framework are also important drivers of innovation. Without assurances for security, confidentiality and without protection against fraud consumers are not likely to adopt new EPIs. For instance, security is a considerable factor that is hindering the use of smart-phones as a mobile payment method. Together with that, Apple is pioneering this capability and it is widely rumoured that it will be integrated into the new iPhone

24 "Technology adoption, however, has typically become a by-product of broader strategies, such as product differentiation, to obtain competitive advantage or cost reduction." (Blockley and McDowell 26-41)
5. This is a good example when the product differentiation oriented competition driver pioneers technological advancement. Furthermore, since both of these drivers are justified by the profit envisioned to be generated by the pioneering company, one can conclude that innovation is implemented with more ease when more than just one of the drivers is met. In this particular case, a strong technological stakeholder driven by three important drivers will most likely find a solution for the security aspect of the technology.

Industry and regulatory frameworks constitute an important innovation driver in the payments industry. Table 4.2.1 provides examples of how regulatory frameworks impact EPIs.

**Table 4.2.1: Examples of Government Intervention/Assistance Overseas** (Blockley and McDowell 26-41)

<table>
<thead>
<tr>
<th>China UnionPay’s centralized electronic retail payments network in China</th>
<th>Effectively established at the behest of the Chinese Government and the People’s Bank of China.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster Payments in the UK</td>
<td>Developed by the banking industry at the behest of the UK government. The Faster Payments Service enables electronic payments, typically made via the Internet or phone, to be processed in hours rather than days.</td>
</tr>
<tr>
<td>Cheque levy in Ireland</td>
<td>Because no one bank, for competitive reasons, could dissuade consumers/businesses from using cheques and moving to electronic forms of payment, the Irish government instituted a levy on issuing cheques as a direct financial incentive to use more efficient electronic formats.</td>
</tr>
</tbody>
</table>

Furthermore, Blockley and McDowell distinguish among the so-called “deciders” or
factors that encourage or impede innovation (26-41). In particular, market structure, infrastructure, adaptability, cooperation and innovation culture, and the existence of a business case for the innovation are listed as the main factors of encouragement/restriction for innovation in Figure 4.2.1 below.

**Figure 4.2.1: Drivers and Decider of Successful Innovation** (Blockley and McDowell 26-41)

![Diagram of innovation drivers, deciders, and successes](image)

Concluding this overview of past evolution and of the drivers of innovation in EPIs, one could summarize a number of preconditions for an innovation in EPIs to hold ground. First and foremost and as observed by Weichert in her work “Payments Innovation: A Comparison of Banks and Non-Banks and how they can Learn from each Other”, “for any payment solution to work, it must meet the needs of payers and payees” (236-249), and most importantly, it must be
accepted by both sides in a payment transaction. Another pre-condition for a technologically sophisticated EPI would be industry wide-spread adoption. This is particularly important and challenging in an era when cross-border transactions, including international payments, grow at rates unthinkable of just a couple of decades ago. It is challenging not only because a new EPI has to be accepted by the industry at home, but also because it has to be accepted internationally and because it has to meet and comply with a multitude of diverse domestic regulations.

An abridged but illustrative glimpse into the history and past evolution of payments is presented below in the Figure 4.2.2.

**Figure 4.2.2: History of Payments** (Note: several significant payment innovations, including cheques, are excluded from the timeline owing to differing views about the actual timing of the innovation) (Puffer)

4.3 Evolution of technological means of inter-bank communication

Throughout the centuries, as evidenced in the above graphical illustration, technological means of inter-bank communication proliferated only in the XX-th century together with technological innovation in communication that started in the late XIX-th century with the
invention of the telephone. Prior to that, precious metals, paper-based store of value and paper-based carriers of information were the only means to serve as factual exchanges between banks and exchange houses.

Radio, telephony and derivatives of these technologies (e.g. telegraph, telex and teletype) revolutionized, mostly in terms of speed, the then existing inter-bank communication. Telex, for more than half a century up to early 1990s, was the primary secured method of inter-bank communication. Security, as a valid concern was solved at a bilateral level through preliminary exchanges of the so-called “test-keys” which in fact were just tables for coding and decoding. Banks would transmit messages to each other (account statements, account reconciliations, credit and debit advices on nostro/vostro correspondent accounts, etc) by telex and each of the messages would contain a test key that had to be decoded by the recipient party for authentication purposes. This process was cumbersome, was prone to constant technological failures, drew a lot of human resources, involved the human error factor and, although it addressed the problem of fraudulent transmission, it did not address fully the issue of confidentiality. However, telex transmission introduced the first communication standards of inter-bank communication. By the mid 1990s, legacy field numbers and some of the message types were inherited by a new electronic communication platform called S.W.I.F.T. Net, developed by the Society for Worldwide Interbank Financial Telecommunications (S.W.I.F.T.).

Initially, back in the 1970s, S.W.I.F.T. Net was perceived as an improvement of telex transmission for an improved architecture that introduced file-based exchange and excluded the many problems related to truncated message transmission through telex. For instance, an error during the transmission of a telex message rendered the partially transmitted and received
message void and resulted in re-transmission. Apart from line failures, telex equipment on both sides was prone to failure too and required paper-based support. S.W.I.F.T. however, solved not only the technological transmission problems, but also introduced increased confidentiality through message encryption. In addition, S.W.I.F.T. allowed for straight through processing (STP), something that was not initially conceived. More to that, being a computer based platform, S.W.I.F.T. allowed for various integration scenarios with customers’ compatible in-house accounts payable/receivable software. As Knorr observes in his paper “in its new standards creation effort, ISO20022, SWIFT and the financial community are seeking to standardise business processes and how these processes fit into the market space” (6-16). Knorr’s more detailed account in the footnote below of the importance and impact of the development of ISO20022 is very representative of the overall direction of the future trends in S.W.I.F.T. integration. 25

Still, existence of boundaries means existence of different regulation, legislation, communication, and security standards. Linking domestic payment systems to S.W.I.F.T. and adopting national standards in line with international banking industry is still a challenge in some developing countries.

25 “The development of ISO20022 standards was very different from the typical way in which standards have been produced in the past. Development starts with the user case, looking at the end-to-end process and what needs to be accomplished. ISO20022 considers the business process and who needs to talk to whom for what information. Interoperability across different transaction types is possible, thus making standards payment-type agnostic. The same formats can be used for cheque, wire and other payments types. Messages can also be much more data-rich, as there is room in XML standards for more information. ISO20022 is also generic — it covers bank as well as corporate requirements in the payments transaction chain.” (Knorr 6-16)
Foremost, it was the OECD community that pioneered the technological innovation and standardisation in inter-bank communication. Nevertheless, at times varying standards have been adopted on both sides of the Atlantic Ocean. An example to that effect can be chip embedding into cards used in the European Union and the alternative route developed in the United States based on touch-less mobile payments (NFC - Near Field Communication). One other example of standards incompatibility was described by Dangelmaier and Smart in their paper and is presented below:

The Single Euro Payment Area (SEPA) has posed a unique challenge for non-European banks with customers with European trade activity. The SEPA STP requirements call for International Bank Account Numbers (IBANs) and the Bank Identification Codes (BICs) for all wire transfers into the European Union (EU)/European Economic Area. Problems arise when a system requires an IBAN for a country for which no IBAN has been established. (Dangelmaier and Smart 51-59)

Notwithstanding the still existing challenge of different standards and formats that lead to incompatibility, the banking industry is still a for-profit sector and as such, achieving increased efficiency is a priority. As a result of more automation, integration, and straight through processing banks save significant resources. But it is not the banking sector that is the only beneficiary. Banks’ customers are the ultimate beneficiaries that enjoy the fruits of technological innovation in inter-bank communication. Bank customers receive electronic wire transfers much faster than they did merely five years ago. In addition, because of automation and competition wire transfers now cost less. Increased standardization means fewer errors on part of the clients
when they submit a payment for processing which in turn means fewer payment investigations and fewer associated investigation fees. And as of late, due to the already discussed standardization of the field describing what the field is for, corporations can enjoy the fruits of straight through processing on their end as well. Not only is the field expanded to 9000 characters, but it is now also compatible with the EDI-based and the XML-based standards.26

Advances in inter-bank communication not only provide for integration and automation of straight through processing in payments, but also for automation of documentary trade finance transactions (e.g. documentary letters of credit). Since their invention, documentary instruments circulated by courier. Nowadays, documentary letters of credit are transmitted from one bank to another electronically. First attempts in standardizing letter of credit messages and the afferent fields were carried out in telex transmission. S.W.I.F.T. went further in this respect and implemented additional automation and integration by implementing standardized message formats for documentary transactions (e.g. message types (MT) 400 and 700 series).

Financial institutions and banks have yet to achieve full automation of international documentary transactions. For instance, BearingPoint identified a multitude of paper-based documents in international documentary transactions that are yet to be digitized and automated ("The Challenge Of Automating International Trade Documents"). International Chamber of Commerce (ICC), banks, service providers and technology companies are all set on a course of

26 "The new message format contains invoice information that is compatible with both the EDI-based ANSI STP 820 standard and the XML-based ISO 20022 standard. And for those corporations that want to keep it simple, the new format is easily decipherable — the ‘tags’ used for each data element describe what that data element represents, such as ‘invoice’ for the invoice number.” (Farrar and Hargraves 236-242)
bringing about more digitization and automation in documentary transactions. In this respect, ICC has issued a new set of Uniform Customs and Practices (UCP) for Documentary Transactions, Publication No. 600 that stipulates new rules covering digital documentary exchanges and acceptances within Letters of Credit.
5. Bank Intermediation in EPIs

As observed throughout the paper, there are many types of EPIs. All EPIs require bank intermediation at a certain degree depending on each type of EPI. It is important however to distinguish between two clusters of EPIs – unconditional EPIs and conditional EPIs. Unconditional EPIs require the lowest level of bank intermediation. Basically, within unconditional EPIs the banks just execute originators’ payment orders without any further risk mitigating involvement. Conditional EPIs are more sophisticated payment instruments that require a higher level of bank intermediation for purposes of an enhanced commercial risk mitigation.

5.1 Unconditional Payment Instruments

Unconditional payment instruments comprise of EFTs (wire transfers, including international EFTs), credit card payments, payment at sight, advance payment, open account, deferred payment. Credit card payments have been discussed in detail previously in the paper. Although EFTs have been discussed previously as well, the author of this paper finds it noteworthy to recapitulate that intra-bank wire transfers are settled internally within banks’ branch/subsidiary networks. Inter-bank wire transfers are settled through a system of correspondent banks/accounts and may or may not involve processing through a clearing system. In the United States the inter-bank clearing system includes FED Wire, CHIPS, ACH, and lately IAT platforms. In the European Union inter-bank wire transfers in EURO are settled through TARGET-2.
When originated and transmitted through secure inter-bank communication channels (e.g. S.W.I.F.T. Net), a wire transfer will contain such information as amount and currency, value date, beneficiary name, address and account, beneficiary’s bank and its S.W.I.F.T. BIC (bank identification code), beneficiary bank’s correspondent account, beneficiary bank’s correspondent bank, and payment information (i.e. what the payment is for).

Payment at sight, advance payment, open account, and deferred payment are all based on EFTs (wire transfers) and differ only by the timing of the payment made by the buyer of goods – prior to the shipment of goods (i.e. in advance), at the time of the goods’ shipment (i.e. payment at sight), or after the shipment takes place (deferred payment and/or open account). Sometimes, the method of payment may be mixed and may require a portion of the payment to be made in advance of shipping the goods. For instance, a certain commercial contract for the sale of commodities may involve a 15% advance payment, 50% payment at sight, and a 45% deferred payment. Exact payment terms are part of the commercial agreement and are negotiated well in advance of shipping the goods. Open account and deferred payments are similar in nature since open account provides for same deferred payment option for the goods shipped, thus extending a credit to the buyer of the goods. Most of the times, the deferred payment will be agreed upon by the parties to be at anywhere from 30 to 90 days. However, there are instances of prolonged deferred payments at 120 or even 180 days.

5.2 Conditional EPIs

Conditional payment instruments comprise of documentary letters of credit, bankers’ acceptances, and documentary collections. The most important (i.e. in terms of bank-fee
generation and bank intermediation) conditional payment instrument is the documentary letter of credit (L/C). Also, documentary L/Cs are the only conditional payment instruments that have been digitized and thus, have relevance for purposes of this paper (i.e. analyzing electronic PIs – EPIs).

In a few words, the documentary collection is said to be used when the seller or the seller’s bank sends documents, including the title to the goods shipped, to the buyer’s bank on collection. The buyer’s bank is instructed to not release the documents unless it receives the payment for the goods shipped from the buyer of the goods. A banker’s acceptance occurs when the documentary collection contains a draft drawn on the buyer or the buyer’s bank and the latter accepts and endorses the draft for payment. Again, drafts can be drawn for payment at sight or for deferred payment depending on the terms of the agreement signed between the buyer and the seller. In trade finance transactions, by accepting, endorsing and discounting drafts drawn on their clients, commercial banks would extend credit/financing to their clients on both sides of the transaction against their future receivables. The two main types of trade financing (i.e. factoring and forfeiting) depend on whether banks accept drafts with or without recourse to the party on which the draft has been drawn on (i.e. the buyer).

In general, documentary collection is used quite rarely. It is still used in the Middle East and in the South-East Asia (e.g. India). One of the reasons why its popularity has been declining in favor of documentary L/Cs is that documentary collections involve more risks than L/Cs. For instance, if the buyer does not honor the contractual payment obligations the seller would have to encounter costs of retrieving the merchandise from a foreign country. Another risk is that the
buyer may gain access to and ownership over the goods via the set of documents accompanying the goods, circumventing the need to obtain originals from the bank.

The documentary L/C is an obligation of the bank issuing the L/C to pay to the beneficiary of the L/C if the latter executes the terms and conditions of the L/C. The documentary L/C is a conditional EPI because the issuing bank will pay only if the terms and conditions of the L/C are met.

Documentary L/Cs are issued only by banks and financial institutions. Also, documentary L/Cs are issued by banks at the order of their corporate clients (i.e. buyers of goods in commercial transactions) in favor of the sellers of goods. Documentary L/Cs present a good solution to mitigate risks in commercial transactions. Risk mitigation is achieved when the payment is intermediated by a bank which will release the payment only when the seller of goods provides documentation attesting to the shipment of goods in compliance with the terms of the L/C (hence the denomination “documentary”). Thus, banker’s acceptance of documents, including of drafts drawn on the issuing bank, can take place not only within a documentary collection but within a documentary L/C as well.

Documentary L/Cs are considered payment instruments because the payment to the seller of goods is made through the medium of the L/C and is not coming directly from the buyer as in the case of unconditional EPIs discussed above. Also, documentary L/Cs are to be distinguished from standby letters of credit (Standby L/Cs). Standby L/Cs are not payment instruments but rather financial instruments for securing payment if the obligor fails to pay in the normal course
of the transaction. Standby L/Cs are predominant in the US financial industry as a substitute for the predominantly European letters of bank guarantee.

The implementation of the S.W.I.F.T. Net platform, the adoption of standardized message formats for documentary L/Cs (MT 700 series), and the adoption of the ISO20022 standard have all led to an increased automation and integration of documentary transactions with corporate accounts receivable/payable platforms. Also, as discussed previously in this paper, ICC has issued a new UCP for Documentary Transactions, Publication No. 600 that stipulates new rules covering digital documentary exchanges and acceptances within documentary L/Cs.
6. Prospects for the Future

6.1 Current and Future Trends in the Evolution of EPIs

6.1.1 Current and future trends in the evolution of credit/debit cards

Although the credit cards are one of the most innovative breakthroughs of the XX-th century in the evolution of EPIs, the so common cards with black magnetic stripes are on a path of disappearance. Notwithstanding, there have been a number of attempts of outfitting the cards with touch/contact chips but the move was clearly not embraced by the users (and by the vendors for that matter as well). To combat the increased risk of fraud European Union banks have already implemented the chip technology in their card systems.27

The differences described above in the evolution of credit/debit cards in the United States and in the European Union reflect the impact of historic infrastructure trends. To substantiate the impact of past trends, Leibbrandt observes correctly that the “success of new payment instruments depends on the installed base and earlier choices” (Leibbrandt 6-16).

The future trend and evolution of the credit/debit card payments in the United States is linked tightly to the Near Field Communication technology embedded in mobile devices (e.g. smart-phones, portable tablets, etc). It is believed that this technology will stand at the core of future mobile payments. An abridged reflection on future mobile payments follows below.

27 “In 2005, Eurozone banks converted their cards to the “chip and PIN” system, in which a more secure microchip embedded in the card performs most of the security functions.” (Sullivan)
6.1.2 Current and future trends in the evolution of mobile payments

Evolution in mobile payments and digital wallets is envisioned as the most important future trend in the evolution of EPIs. Although the technology is already available and is being used at varying degrees overseas (e.g. South Korea, Japan, UK), adoption in the United States has been slow with behind the scenes battles between stakeholders still on-going.28

Most of the examples of successful implementation and use of mobile payments come from the South-East Asia and Africa. Africa has witnessed a less-sophisticated approach to implementing mobile payments. Text (SMS) messaging technology proved to be a good approach to serving the banking needs of the un-banked. Lately, more advanced applications are being introduced by UK’s Vodafone in conjunction with international money transfer companies (e.g. Western Union) in Kenya (Bernad 183-190). In countries like Japan and South Korea, touchless chips in mobile phones have been introduced since 2004 (Weichert 236-249). Weichert however draws readers’ attention to the fact that implementation was successful due in part to DoCoMo’s “dominant position” in the telecommunications and phone carriers’ market, and that it thus “helped generate support from merchants, credit card companies and banks, resulting in fairly rapid and scale adoption by consumers” (236-249). DoCoMo’s mobile payments are based on short-distance wireless technology developed by Sony for FeliCa Networks Inc. (“Sony Affiliate Creating Global System”). Currently, FeliCa Networks Inc. and Sony are developing a system based on an “international standard for short-distance wireless communications to enable electronic payments to be made with smartphones” (“Sony Affiliate Creating Global System”).

28 “The mobile carriers’ frustration with the banks, some analysts said, was the impetus behind a joint venture by Verizon, AT&T, T-Mobile and Discover to create their own mobile wallet.” (Bernard and Miller)
Other regions around the world, notwithstanding their big market size, have been slower in implementing mobile payments technology. China, for instance, has witnessed a slower growth in this respect. For years, China’s trade restrictions have made it impossible for foreign bank institutions or payment processors to penetrate its financial markets. Although foreign financial and bank institutions are allowed to own stock in Chinese banks such stock holdings have ceiling limits. This has allowed China UnionPay (the Chinese proprietary card issuer and processor) “to become the world's largest card issuer- 2.1 billion payment cards in circulation with acceptance in 92 countries” (Fitzgerald 5). Late in 2010 two payment processing companies – MasterCard and Global Payments made announcements of their plans to enter China (Fitzgerald 5). Although in the case of MasterCard it was only a memorandum with China UnionPay, Global Payments actually gained permission to process payments in China (Fitzgerald 5). Also in 2010, PayPal “announced a collaboration with China UnionPay Co. in which consumers in China may shop online and pay via PayPal” (Bell 38). This particular announcement relates more to Chinese consumers having more freedom and capacity to access international vendors on eBay and other websites accepting PayPal. The other announcement however of PayPal launching on Chinese Alibaba.com Ali Express platform is even more significant in that such co-operation would enable “global merchants … to pay for wholesale merchandise from China” (Bell 38). China’s opening of its trade restrictions coincides or may be prompted by its own expansion internationally. For instance, back in 2010 Chian UnionPay signed mutual acceptance agreements with a number of US based Independent Sales Organizations (ISOs), including U.S. Bankcard Services Inc. (Woodward 35).

India, is another example of a developing country with a very large market. In India however, mobile payments have seen a wider application. India’s mobile payments system is
based on a proprietary smart-phone application and message texting for credit advising. The system was launched in 2010 by the state-owned National Payments Corp. It is essentially an inter-bank funds transfer platform that allows the member banks to provide the services of direct mobile payments over the phone between two parties that have to be customers of the system’s member banks (Chibber 10). A brief description of how the system works is quoted in the footnote below. The implementation of the mobile phone based payment system was prompted by the lack of banking services in the poor and remote areas of India where banking penetration is unwarranted due to high maintenance costs and low returns.

In the United States on the other hand, lack of a dominating position and profit distribution issues between the major stakeholders (e.g. merchants, banks, credit card companies, cellphone carriers, cellphone manufacturers, and other) has proved to be a major impetus in the technology adoption. For instance, at the moment in the United States there are a number of players with individual agendas for their own mobile payment systems based on NFC technology. Out of the multitude of these various players one can distinguish two big groups of promoters of NFC-based mobile payments. Each of the groups is pioneered by different wireless phone carriers. The larger of the two groups is called “Isis” and is being led by larger players

29 “To use the service, customers register with their banks, which will issue them a seven-digit mobile-money identifier and a mobile-banking PIN. To transfer funds, the sender first must download the mobile-money application and enter the PIN, the beneficiary’s mobile-phone number and mobile-money identifier, and the amount to be sent.

The beneficiary receives a text confirmation when the funds are sent, and he may deposit the funds into his account, withdraw them at an ATM, or approach a business correspondent to secure the cash. A business correspondent is a bank-appointed official who assists customers in performing basic banking functions on mobile terminals, mostly in rural areas.” (Chibber 10)
such as AT&T and Verizon. The other group is being led by Sprint on its own, and it is rumored in the specialized media that Sprint might actually be closer to implementing the technology than the other group (Melanson). In addition, recent media rumors indicate that Amazon may be ready to embark on the NFC bandwagon to provide mobile payments service “that would let consumers pay for goods in brick-and-mortar stores using their mobile phones” however, these rumors have not yet been backed by public announcements from Amazon (Kharif and Galante). Google has its own NFC agenda as well. For instance, it has embedded some NFC functions in its latest Android version and has launched an NFC test pilot in Oregon (Kharif).

In a certain way it proves the postulate that the technology is implemented faster when it is being led by one dominant leader. One other interesting observation about the difference between the approaches employed by the two technology groups is that apparently Sprint intends to link the mobile payments directly to a credit card whereas the Isis group’s initial approach was to reflect them on the monthly phone bills (Melanson).

In addition to profit distribution issues, security concerns attributable to radio touch-less communication at points of sale have commanded new encryption solutions and industry wide adoption of such. Although the hardware allowing for the technology to function has been embedded in certain devices for some time (NFC chips), industry common communication and security standards/protocols varies from one consortium of implementers to another.\(^{30}\)

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\(^{30}\) "Bank of America, Wells Fargo, U.S. Bancorp and JPMorgan Chase, working with Visa, are all in various stages of testing wallets that would provide access to some of their own credit or debit cards.” (Bernard and Miller)
Apple is an important stakeholder in this battle and as mentioned, it is widely rumoured that mobile payment capability based on NFC chips will be integrated into the new iPhone 5. Should this be the case, it will be probably the first serious attempt at implementing the mobile payments’ technology in the United States on a wider scale.

6.1.3 Current and future trends in the evolution of online EPIs

Online EPIs present another trend in the evolution of EPIs. Online EPIs will continue to evolve with some big e-commerce traders implementing their own payment platforms. Notable examples in this respect are Amazon with “Amazon Payments” and Google with its “Google Checkout”. Amazon has launched its Mobile Payments Service back in 2009, but the service could be used only for online purchases from Amazon member vendors (“Amazon Launches Mobile Payments Service”). Google introduced its “Checkout” mobile payment system a little earlier in 2006 as a simple and free payment processing service for its advertizing corporate vendors. Once Google started to charge for the service it began to lose its appeal and as Adil Moussa, an industry analyst with Aite Group LLC in Boston, described it “at the end of the day” Google’s Checkout “does exactly what everything else that exists already does for the same price” (Wolfe 1).

At this time it is difficult to assess the viability of this business model (i.e. developing multiple online payment platforms). For instance, Leibbrandt remarks that out of over 150 new EPIs introduced between 1990 and 2003 only PayPal was successful (Leibbrandt 6-16). All of these platforms are linked to existing credit/debit card or bank accounts. As such, consumers already have to keep track of a myriad of online passwords and having yet another online
account with all the credit card and bank data is not exactly appealing when considering the risks of unauthorized access or databank breaches.

6.1.4 Current and future trends in the evolution of EFTs

The current and future trends in the evolution of the electronic funds transfers are linked tightly to the evolution of straight through processing (STP) for purposes of an increased integration with corporate customers’ in-house platforms. In this respect, the ISO20022 standard adopted by S.W.I.F.T. will be an important building block based on such further development and integration will be achieved. Reflecting on the new ISO20022 standards, Knorr points out that owing to the adoption of these standards, “interoperability across different transaction types is possible, thus making standards payment-type agnostic” (6-16). In other respects, the evolution of EFTs will pursue mainly faster transactional speed. The Faster Payments service in the UK is a persuasive example. As Senechal reflects, “this implementation [i.e. of the Faster Payments service] has been watched avidly by the rest of the world, and the demonstration that the model works is likely to establish the Immediate Payment model as the benchmark for future payment developments” (320-332).

6.1.5 Current and future trends in the evolution of the GTS business model

One other important trend in the evolution of EPIs is linked tightly to the GTS business model employed currently by the financial industry. GTS business models would necessitate ongoing investment in IT infrastructure (Lavayssière and Vergne 242-252). In order to achieve compliance with many new regulations (SEPA, IATs, etc) and in order to achieve efficiency in STP, but most importantly in order to harmonize and integrate all services and product lines in
one interoperable platform, banks will have to continue investing in upgrading and developing their IT systems. Building a business case for such investment in IT is a different story. In most instances, IT infrastructure is a supporting and enabling platform for the sale of banks’ other products/services. In the footnote below, Lavayssière and Vergne discuss the challenge the banks face in turning infrastructure investments into profits.31

Consequently, interoperability between customers’ in-house computer platforms and their banks’ payment systems will be one of the most important future trend and driver of innovation in EPIs. As Knorr points out, “the increasingly global nature of the activities of banks and their corporate clients has led to a greater need for interoperability between payment systems (6-16).

Another trend that is gaining more ground in reshaping banks’ GTS models is orientation towards enterprise risk management (ERM). ERM is built up on the existing GTS business model. Banks’ orientation towards ERM solutions has been dictated in large part by the evolving regulation requiring increased transparency, fraud prevention, know your customer (KYC) money laundering prevention, etc. In discussing ERM, Dangelmaier and Smart point out that it (i.e. ERM) “takes a holistic view of a financial institution’s relationship with a customer by collectively viewing every product or service the customer uses”, and that “this enterprise-wide approach protects financial institutions from fraud at every level, from money laundering activity to identity theft to deposit fraud — essentially any type of fraud that causes an institution or its customers monetary loss or potentially damages the institution’s reputation” (51-59). As such,

31 “The real challenge for banks is turning infrastructure investment (mandatory and discretionary) into profits and greater efficiencies, or at least ensuring that the volumes processed are sufficient to cover the amortised cost of the GTS infrastructure (IT, systems and staff) and its long-term fixed costs.” (Lavayssière and Vergne 242-252)
ERM is a new trend adopted by financial institutions in developing and implementing solution-oriented architectures to suit better the needs of GTS business models and to reduce operational risk mitigation costs associated with services’ transparency.

There are some other trends in the evolution of EPIs that have been reflected on throughout this paper. Still, one last but not least important current and future trend in the EPIs industry is the trend of globalisation. As discussed earlier in this paper, banks and financial institutions, large ones in particular, have an economic interest in a cross-border expansion. This trend is driven by a number of factors. There are three important ones however that are deemed to be worth reflecting on. First, cross-border and sometimes cross-industry (e.g. specialized project finance solutions in infrastructure) expansion is intrinsic to the GTS business model. Secondly, GTS as a business model and development strategy has been adopted by most of the large international banks and this in turn drives up competition. The hypothetical example with the corporate subsidiary being established in Russia provided previously is quite eloquent. And finally but not least important, is the banks’ drive towards efficiency. By establishing large networks of branches and cross-border subsidiaries banks create internal intra-bank payment processing hubs that bring them cost-efficiency and a competitive advantage in terms of STP. Please see the observation made in this respect by Dangelmaier and Smart in the footnote below that the author of this paper believes to be both informative and to the point.³²

³²“Furthermore, mega-banks, such as Bank of America, Citibank and HSBC, are creating and operating their own internal global payment networks through which all domestic and cross-border payments flow — right at the bank. These systems allow the financial institutions to reduce per-transaction costs, improve their profits and ensure a consistent level of service across all points of delivery.” (Dangelmaier and Smart 51-59)
6.2 The Role of Public Authorities

Public authorities will continue to effect a significant impact on the current and future evolution in EPIs. The 9.11 events, unexpected bankruptcies induced by corporate fraud at a series of large public companies at the beginning of the last decade (e.g. Enron), as well as the still ongoing effects of the 2008 economic crisis have all prompted enactment of new regulation. Sarbanes-Oxley disclosure provisions, Basel II capital adequacy requirements for banks, the provisions of the United States Patriot Act on anti-money laundering, the provisions stipulated by the Single Euro Payment Area (SEPA) that eliminate unequal pricing for cross-border payments in EURO, Federal Reserve’s implementation provisions on IATs are just some of the examples from a myriad of new regulations enacted on a regular and continuous base. The provisions of the United States Patriot Act on anti-money laundering have a particular importance when it comes to impacting the evolution of EPIs. Enactment of US Patriot Act means that all payment instruments, including EPIs, are more transparent and that banks now have new reporting duties on suspicious transactions. Dangelmaier and Smart conclude that “governments have designed these various mandates and regulations to mitigate the risks associated with international and cross-border payments.” (51-59). As a result, all such new regulation not only will affect the evolution of the inter-bank/bank-client STP process and interoperability with technologically evolving and more standardized clearing systems (e.g. security and communication standards), but also will lead to increased EPIs’ transparency.
## Appendixes

### Appendix A: Payment innovators in Australia (Blockley and McDowell 26-41)

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPAY</td>
<td>The launch of BPAY in 1997 was the first instance of a single bill payment service adopted across the entire banking sector in the world. BPAY is now the most popular bill payment service in Australia. It was originally set up to provide customers with a convenient and secure way to pay their bills over the phone and to create a more efficient, cheaper collection service for billers and financial institutions. Continually enhancements have increased the functionality to include electronic bill payment via the Internet, and BPAY View which allows consumers to receive bills electronically, which they can then pay using BPAY.</td>
</tr>
<tr>
<td>PayPal</td>
<td>Founded in 1998, PayPal enables any individual or business with an email address to send and receive payments online. PayPal's service builds on the existing financial infrastructure of bank accounts and credit cards to create a global, real-time payment service. PayPal now has over 150 million account members worldwide, and is available in 56 countries and regions.</td>
</tr>
<tr>
<td>Paymate</td>
<td>Paymate provides a mechanism for credit card and bank-to-bank transactions to be conducted online. It provides an intermediary service permitting customers to use their credit card or direct debit facility to make a payment to a seller who receives the payment into their nominated bank account.</td>
</tr>
<tr>
<td>POLi</td>
<td>Centricom-owned, Australian alternative payment company POLi recognised the consumer demand for security and alternate payments methods for those without credit cards. It facilitates online debit payments for those who want to shop online, but do not have or want to use a credit card. POLi allows payments to online merchants directly from the customer's bank account via their Internet banking facility, while eliminating the need for merchant to capture and store sensitive customer data. Since its launch in 2007, it has been rolled out in Australia, New Zealand, South Africa and the UK.</td>
</tr>
<tr>
<td>eWay</td>
<td>Australian payment gateway aiming to meet the needs of merchants by offering a more cost effective method than standard merchant service fees. eWAY processes and stores the authority form on the merchant's behalf, allowing instant access in dispute cases. eWAY removed the hassle for merchants of storing the form. While meeting consumer demand for a payment mechanism that allows online payment from a deposit account.</td>
</tr>
<tr>
<td>Tyro (formerly MoneySwitch)</td>
<td>Australian independent, non bank acquiring system offering Integrated IP EFTPOS, ie the ability for POS system to communicate with the Tyro EFTPOS terminal via Internet protocol rather than a phone line. Benefits are realised for merchant through faster, accurate transactions owing to no rekeying of sales amounts or data entry errors.</td>
</tr>
<tr>
<td>Emue</td>
<td>Developed a new product to combat online credit card fraud. They offer a new card equipped with a keypad and number display. When the correct PIN is entered, the card displays a one-off three-digit security code used to complete an online transaction. This unique method of verification ensures that the person performing the transaction is the actual cardholder.</td>
</tr>
</tbody>
</table>
Works Cited


Vanetti, Renzo. “Strategic Innovation in Payments Systems: What are the Next Big Things?”


