

# Future payments – mobile, social or sociomobile?

From email, to mobile phones, to Facebook, the past two decades have seen a revolution in the way people communicate and interact. Yet an important social activity – paying – has been left behind. **Harry Leinonen** looks forward to payments systems and market players catching up

Mobile telephone penetration is growing rapidly all over the world and social media, such as Facebook and YouTube, are gaining worldwide popularity. In such environments, where interaction is electronic, electronic payments are needed. Cash is clearly no longer a suitable payment medium. Although card payments are frequently used in the internet, the underlying business models and technical solutions fail to meet most of the payment needs in the mobile and social-networking spaces. There is therefore a demand for new type of “sociomobile” instruments. This article sets out to answer following questions:

- How are social and commercial networks expanding and their payment needs growing?
- What business impact will network synergies and information and communication technology (ICT)

developments have and what kind of new business patterns are emerging?

- What will the basic payment service requirements be in the network environment and what sort of payment instrument would meet future customer needs?
- Will current service providers be able to answer the new challenges or will their legacy burden and inertia lead to a complete market revamp?
- What roles will authorities play?
- What kind pace and path of development can be expected?

## Global mobile connectivity and the social web-village

The mobile phone is an electronic gadget that, within a very short time span, has achieved the widest diffusion in history. There are now, in mid-2010, about 5 billion mobile phone users (65% of total population), and sales are running at about 1.3 billion new phones per year.<sup>1</sup> Facebook has been able to attract 400m active users in a couple of years, and 25% of these use the service via mobile phones. These services connect people to a global real-time community in which anyone can be reached instantly and everyone seeks global web-pals on a continuing basis. The average active Facebook user spends 40 minutes a day using this social media.<sup>2</sup>

Mobile and social networks will continue to grow, and they will become the main communication channel for the new generation. Payments are part of our daily life and the environment of social media will naturally require payments. Network-based money is needed for buying virtual art, pets, games and other

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goods, but also for transfers between family members (typically from Cretaceous-era parents to web-based youngsters) and friends to settle up for the costs of fishing weekends or concerts. Facebook users need to make person-to-person payments, and they want to do it simply, in the Facebook world.

One of the most frequently used services in mobile phones is the text message, which has also been used for money transfers, especially in developing countries (M-Pesa in Kenya being the most cited success story.<sup>3</sup>) This indicates a strong customer demand. Eventually, as always, demand and supply will meet and consumers will be provided with user-friendly means of mobile, social or sociomobile payment, designed specifically for this new environment. These services will also spread to business-to-consumer usage, just as companies now have opened email and Facebook accounts. For small businesses and entrepreneurs, these could become the most convenient payment solutions for both receivables and payables.

### **Network synergies and new ICT opportunities**

More broadly, as the recent ICT developments have been rapid and have fundamentally changed our daily communication patterns; so we will also see major changes in payments. Looking ahead one can see mobile networks and internet merging to form a single, large wireless broadband network servicing all kinds of communication needs. Bandwidth requirements for payments will be negligible, hardly worth mentioning compared to the other traffic. PC and (smart) phone-technology will also merge, and consumers will find different communication platforms with user-interfaces (screen size, keyboards etc) adapted to their particular needs. All networks will operate in real-time and process requests, orders etc instantaneously; for example, a video-stream sequence may be delivered, paid for and consumed directly. The storage capacity in the network is limitless for payment needs. Compared to what normal Facebook usage requires in storage capacity, payment needs are only marginal, even if the users were to provide abundant payment remittance information or even pictures of purchased goods, in order to identify the payments later. Will this not be a huge drain on processing? The instant service

processing model will in fact release ICT resources, as the capacity need is spread over global timezones and a large park of servers instead of huge capacity peaks from periodic batch-processing in main frames reprocessing same transactions several times and with complex error-handling procedures.

### **Emerging business patterns**

It is difficult to predict all the big changes in our business habits that will come with the new mobile and social environment. No one could foresee, for instance, the wide and diversified usage that was triggered by the very simple SMS text-message service. What will happen when internet is available to everyone everywhere? Some changes however are already becoming visible. Much more information is readily available with a few clicks: product information, user experiences and price information. Digitisable products and services will be ordered and delivered over the internet: for example, music, films, books, software, information, tickets, insurance and banking. Regarding non-digitisable products and services like transportation, accommodation, renting and mail-ordering, the ordering process itself will shift (in some cases, has already shifted) almost totally to the internet. Services like e-auctions can reach a global audience, unlike the traditional auctions. There will soon be hardly any service providers, from hairdressers to plumbers, who can conduct their business without web-presence. Companies have started to open Facebook pages in order to be part of the community. Police forces and the religious communities have hired special social media personnel to participate in activities on the internet.

Some emerging changes in business patterns:

- successful businesses and services monitor and actively manage their web presence and provide easy-to-use and valuable network services and interfaces in different formats (two clicks should be sufficient);
- network power has become very strong, resulting in either a natural monopoly, as smaller networks/providers are pushed out of the market (for example, Facebook pushed out similar national services) or in open networks, with larger numbers of distributed interoperable service providers (for example, the email community);

### The Wild Web?

One important aspect requiring greater attention is the security concerns regarding Internet. Currently, we face a kind of Wild West situation, with a lot of freedom for the majority of decent community members, but abused by a limited number of “outlaws” due to the scarcity of sheriffs and their deputies and their outdated weapons. The more valuable the content of Internet becomes, the greater the need and interest in better e-protection. This can clearly be seen as an increase in organised criminality in the web; for example, the very sophisticated Trojan Horse malwares like Bancos and Bebloh are capable of taking control over bank customers’ pcs and emulating multiple banks’ internet-pages in several countries, activated when customers begin to engage in e-banking transactions and are able to make fraudulent credit transfers bypassing changeable password controls [for details, go for example to [www.fssecure.com](http://www.fssecure.com)]. This requires deep ICT knowledge, planning, a huge amount of programming, program updating and organisation for exploiting fraudulent fund transfers. Network protection requires improved e-identification and encryption services, but also increased monitoring and higher probabilities of catching network criminals, which requires some generally accepted limits on network freedom.

- true globalisation in which the whole web-community is one borderless society;
- considerably lower service distribution and customer contact costs compared to traditional distribution channels, resulting in smaller distribution cost mark-ups;
- exploiting network synergies when a large customer base can be used for marketing a range of network products directly or via cooperation among network service providers; and
- many free services, provided voluntarily or based on advertisement revenues, and the clash with traditional views on intellectual property rights (some do not respect them and some do not want to protect their own rights but would rather serve the community and get their work published, even for free).

The successful business models in the new sociomobile environment will differ greatly from those in the legacy world. The payment industry faces a major technology shift affecting business patterns and drivers. In future the main revenues will probably stem from seigniorage, small flat fees, advertisements, security services, synergies and other value-added services,

which will be sufficient to cover the new lower cost level of completely electronic self-service payments.

Payments and banking are available on the internet, but in a “non-indigenous” way. The available services are mostly legacy-style services uneasily adapted to the Internet and thus carrying legacy burdens, for example sending and receiving several awkward SMS-messages or staggering through several web-pages. Banks have completely refused to provide easy-to-use and low-cost global person-to-person means of payments by limiting cards to consumer-to-merchant payments only. The current credit transfer, although possible to initiate via internet, is processed at speeds far removed from instant experience of the web. Only a few banks have started to provide modern internet transfers among their internal customers, see for example a Facebook associated service, Hyves, offered by Rabobank, a major Dutch retail bank.<sup>4</sup> There thus seems to be a lack of supply, which at some point will be filled by payment services developed according to the new business patterns of network services.

Whoever – old service provider or new entrant – wants to fill the network payment demand will need to develop a solution following the basic requirements for payment instruments regarding user-interfaces, addressing, enclosed data content, security etc based on the available technology opportunities, which are described in the following subsections.

### The case for real-time simplicity

*User-interface simplicity.* Payments need very few basic processes in the real-time world. A “show-balance” icon/button could reveal the account balance(s). An “accept/make payment” icon/button could initiate an immediate credit transfer from payer to payee, by stating the payee account address and payment details, which, in the case of a merchant payee, would be prefilled by the merchants website. “Show me received and sent payments” in any order to/from given receivers/senders during given time periods, would need to become normal browse functions. For synergy purposes, these would be the same functions, except for the balance request, which would be available via email. Just as with email, the service providers could top up with other services.

The basic need in real time is the credit transfer from one account to another, as the available genuine mobile and internet-payment services demonstrate. Banks and credit card companies are fixed on their legacy card and other services, and are not apt to recognise the re-engineering need and the opportunities afforded by customers' mobiles, such as, for example: access to immediate balance information, immediate acceptance and confirmation (no need for later reconciliation), complete transaction records available continuously, back-up information on everything that can be downloaded over-the-air, data input using near-field-communication (NFC), security processors (see below), camera for data capture and identification, internet and other long-distance communication channels. In the network environment, "digitised" card information stored and used within the phone in the same way as SIM-card information can provide access to a completely new range of services compared to the legacy plastic cards, even when these are equipped with chip and contactless NFC communication.

### Meeting basic needs at lower costs

*Cost level and charging.* The costs of web-services are marginal compared to legacy services and/or with a considerable service difference. Compare email vs snail-mail, downloaded music vs CDs, web-radio/TV vs cable/antenna-radio/TV etc. In a monopoly set-up, as Facebook-money would be, the service provider will only need a large receivables/payables file, in which transfers are made between accounts and balances are updated.<sup>5</sup> Making these transfers and even adding a lot of information to the transfers could be done with very marginal changes to the current operating costs of Facebook. Web-payments will be, when successful, a bulk service operating at low cost and with small margins. Lower cost would probably to some extent increase current payment volumes, because it would make smaller mini/micro payments also viable. Users' payment budgets could be split into smaller transfers, but the overall budget is largely fixed. Payments will become e-bulk commodities, simply an electronic format of cash. The future low level of service provision costs will make these coverable via e-seignorage, advertisement revenues and charges for value-added extra services like security solutions and archiving services.

*Network structure.* There seem to be two main alternatives for network structures: monopoly or open network. In case of monopoly, a single dominant service provider would capture the market. Currently, there are, practically speaking, just one YouTube, one Facebook and one Twitter service. In the case of open networks, the structure would resemble that of email or website services, with multiple competing providers in an open-standardised environment. The momentum of PayPal has slowed, arguably because its offering has not been sufficiently interesting. Banks could provide an open e-payment network service if they were to decide to start designing from scratch according to future requirements. Telcos could be another strong institutional network candidate for providing network-based payment services, and they have a synergetic advantage (see below).

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*Globalisation and addressing.* Facebook relationships are global and so are the payment target-locations in the web. For global reach, an international addressing scheme is required. Banks have been successful in creating an international card numbering standard, but have excluded its use for person-to-person payments and non-card payments, for example credit transfers and direct debits. The IBAN (International Bank Account Number) has been designed, but it lacks international implementation. The only truly international network addresses operating today are the email address and the telephone number. That is why PayPal, Facebook and many other service providers are piggybacking on email-addresses instead of creating their own addressing standards. A successful web-based payment service must use one of the available addressing schemes or design and implement its own

alternative; but creating one's own alternative is expensive in comparison to piggybacking.

### **Improved data content and portability**

*Increased data content.* Service providers require basic payment processing information to be able to book transactions (account numbers, amount, currency etc), but payments also contain customer-to-customer data necessary for customer processing. The situation can again be compared to emails, where the message content itself is just for customer-to-customer purposes. In the new native web-based payments, the amount of customer-to-customer data attached to a payment could be without practical limitations and divided into four categories based on content structure (structured or non-structured) and encryption (encrypted or non-encrypted). Customers could send each other free format information and encrypt the information when extra security is necessary. Normal structured remittance information like reference coding or e-invoicing could be sent, as now, in non-encrypted format, while valuable ticketing information would require encryption. There is a clear synergy for customers when sufficient information facilitating straight-through-processing is attached to payments. The cost of transporting abundant extra information as part of the payment transaction information will be close to nil in native web-services.

*Portability and ownership of data.* An open competitive network structure will require data and address portability. In order to promote competition, customers must be able to transfer easily both their data and network address to a new service provider. It will be difficult for customers to inform all their business and other payment parties about their new account address, if addresses must be changed whenever the account is moved for any reason to another bank or another country. A portable logic address connected to an absolute cross-referenced address would also benefit banks in the long-run, due to lower operative costs for address changes. The portable telephone-numbers and web-addresses (for example, URL or Uniform Resource Locator) use cross-reference tables to locate the actual network address, on request.

Customers will also become more dependent on any stored information in the network emails, pictures or payment details. Customers own their data and may want

to transfer these data to another service provider at some point of time. What rights will customers have regarding transfer of data and at what cost? What responsibilities do service providers have for intact storage of payment information and for how long? That is, can the service provider destroy customer data or make it inaccessible without customer consent?

### **Many services on a single secure platform**

*Network and service synergies.* A future payment account could be an email account with a balance field, a Facebook account with a payment service part or a telephone SMS-account. The more services you have behind the same network address and service provider, the easier it is for the user and the lower the costs. Future broadband services will combine all text, voice and picture communication needs. Future services could also link the different "account" services to the same service platform. It is just our old legacy habits and business models that keep these separated. ICT developments seem to form continuous cycles between centralised and decentralised computing, depending on processing and communication resources. The current development phase seems to be towards centralised service provision, as customers find it cumbersome to maintain different software packages, necessary back-ups, revision changes, access rights, additional hardware requirements like storage capacity etc.

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There is therefore a large amount of synergy to be achieved by moving all customer "account" services to a single centralised platform with a common user-interface using standardised workstations of different sizes (from phone to super wide TV-screen) and just clicking in the same way for everything. What will be the roles of banks, Telcos and other traditional separate account-service providers in this synergistic account-service environment? Another form of

synergies is achieved using direct real-time links between different account entities in large linked processing chain. Customers' payables, receivables, bank accounts, ordering systems, service databases etc can all be updated in one large chained process, when manual and batch interfaces are eliminated.

*Security and identification.* Customers want to secure their valuable data in the network. Facebook content and identity require protection. Money and payments cannot, of course, be processed without proper security. E-identity will become more important with each new personal web-service and as personal content increases. E-identity presents a many-to-many problem, as all senders would want to identify all receivers and vice versa simply via their own e-identification provider. A global e-identification solution thus requires either a monopoly service provider or a network of trusted service-providers, as for all other network services. Mobile or sociomobile payments cannot function without proper security. The security technology is available to all service providers, but it is the actual implementation that counts, and Telcos now seem to have an advantage due to the widespread SIM card employment.

### End of the legacy burden

Several times in this article I have referred to "legacy burdens". The legacy burden stems from the manual era and limitations, which were transferred to the batch processing era, when systems were designed to replace old manual processes one-by-one while maintaining the old structures. Everything was based on "store-and-forward", which was how large organisations functioned. Payment processing remains in most countries a huge network of linked batch-processes with an even larger number of batch exception processes. These will require much monitoring and exception handling.

Very few people have a broad overview of all the different sub-processes in the payment systems. Changes are difficult to effect, as they often require the whole chain of processes to be updated in a highly coordinated manner. It is difficult to achieve synergies via linkages between systems, as batch chains are difficult to separate into interdependent paths, and as transactions are not handled individually but in large groups. Immediacy is impossible in batch systems. The costs of online systems have decreased so rapidly that

large batch systems are currently more expensive to run because of their greater complexity. Current batch solutions are based on domestic or regional payment solutions, and updating these to global standards would require enormous resources and lengthy timetables (compare with Single Euro Payments Area, Sepa, timetables for European harmonization).<sup>6</sup>

Using modern technology for payments in the same way as for email and Facebook would cut costs and timetables to a fraction of the current level even with the required higher security standards for payments. The only viable solution seems to be to start from scratch by removing completely the legacy burden and striving, at the same time, to achieve as much synergy benefit as possible. In this scenario, legacy service providers need to rethink completely their role in the future web-payment service environment.

### Roles for the authorities

Authorities will face difficult decisions regarding these mobile and social developments. What are the general requirements for the new system and service designs? What roles will the authorities play? I look at four aspects.

*Global services vs national authorities.* New social media services are almost without exception global. Old domestic services just fade away. However, the authority mandates are still mainly national. Global authorities are few and, for example, the International Monetary Fund, World Bank and Bank for International Settlements' mandates on banking and payment services are unclear and more of a coordinative nature. Global authority cooperation has begun in the area of payment services, but is still only embryonic regarding retail services.

*Synergic efficiency vs closed segmented industries.* Payments have often been seen and even regulated as a banking service. However, the remittance service and different kinds of digital and network money schemes have generally fallen outside the regulatory requirements, as has telephone bill-based service charging. Regulating payments strictly as banking services and limiting the scope of banking services will reduce the synergistic benefits from other types of network services. Providing the un-banked with efficient electronic means of payment will probably be more costly via a legacy banking network than via

the Telco mobile phone customer network, as M-Pesa is demonstrating. Synergistic efficiency would require industry regulations to be converted to service area regulations that enable different types of entities to provide payment services if they meet the specific requirements for payment service provision, the payment funds are ring-fenced, and re-investments are controlled (the payment institution license of the European Payment Service Directive 2007/64/EC seems to be a step in this direction.)

*Open service competition vs regulated industry stability.* Payment services are central to the modern society. Daily activities are highly dependent on a smoothly functioning payment system. The network effects and economies of scale are generally so large that only large systems will survive over time. Major payment systems entail systemic risks which, if crystalised, could cripple the economy for a long time. In a systemic crisis, the system operations or the operations of major participants are interrupted for technical, financial or other reasons. The systemic risks are greater in completely open competition, as the service providers have no incentive or possibility to invest in external risk prevention. The authorities have an interest in using regulatory means to ensure that systemic risk and other external requirements are forced on the service providers, in order to ensure the smooth functioning of key payment services also in special circumstances. Network-based sociomobile global services will have new requirements compared to the national legacy solutions.

*Individual freedom vs enforced e-identification.* The Internet community highly values individual freedom and, as a corollary, anonymity. For example, many Facebook and email accounts use pseudonyms. Knowing your customer, identifying access rights and transaction traceability are keys to secure banking and payment services based on long experience of customer fund management and authority requirements. A larger amount of physical money has to be protected by vaults and guards. Electronic money will require similar forms of e-vaults and e-guards. Authorities have provided for paper-based identification solutions, and they will probably also have a significant role in developing a general e-identification solution. Because authorities are generally expected to protect citizens from major losses, authorities must also define at least

the minimum requirements for e-security in the field of payment processing and fund management. Anti-money-laundering and anti-terrorist financing rules for legacy payment services are considered important for protecting the society, and there cannot be any regulatory “havens” in the sociomobile payment environment.

### **Development pace and the path to a long-term solution**

Looking at what is a truly global web-service, none of its constituents has emerged on a slow evolution path based on step-by-step development of legacy services. SMS messages, web-pages, emails, YouTube, Facebook, Twitter etc have all based their success on true electronic network innovations. There is therefore very little support for a step-by-step development scenario for payments. The general ICT developments seem to be continuing at a rapid pace in line with Moore’s law.<sup>7</sup> The gap between legacy service and potential socio-mobile services will therefore widen rapidly. Customer uptake of other new socio-mobile services has been remarkably rapid and it seems to be speeding up with each new service. It is therefore somewhat strange that we still lack a truly global native network-based payment solution. The legacy barrier seems to be quite formidable, but demands are piling up against it. Legacy systems cannot hold out. This pressure could force a rapid and massive change in which the market is provided with a successful truly network-based sociomobile payment solution. In order to become a long-term viable solution, however, it must fulfill the basic payment service requirements and deliver the technology and synergy effects of re-engineered network services; that is, it has to be simple, integrated, global and stable. Only then will there be real money in the virtual world. □

1 [www.wikipedia.com](http://www.wikipedia.com).

2 [www.facebook.com](http://www.facebook.com).

3 [www.safaricom.co.ke](http://www.safaricom.co.ke).

4 See [www.hyves.nl](http://www.hyves.nl).

5 This is in fact what PayPal already is; see [www.paypal.com](http://www.paypal.com).

6 [www.sepa.eu](http://www.sepa.eu).

7 Capacity is doubled at same cost level within 18-24 months.