The European Perspective on Mobile Payments

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Abstract

Mobile payment is an exciting domain, which will rapidly evolve in the years to come. A mobile Europe vision demands that services such as a payment capability will be seamlessly available for its citizens in an open cross-country form that will respect the user requirements and will not restrict the business side creativity. Several actions have been done on the European Union domain to realise this vision, but there is still a long way ahead. This paper provides a brief overview of these efforts and refers to some critical issues that have to be taken into account for successful take-up of a pan-European mobile payment service.

1. Introduction

Any payment where a mobile device is used in order to initiate, activate and/or confirm this payment can be considered as a mobile payment. This definition includes a wide palette of approaches, and points out the fact that mobile payments do not restrict themselves to payments via the mobile phone but virtually any mobile device such as a smartphone, PDA, tablet PC or even merchant-operated mobile terminals.

Several research institutions predict that in the next few years, payment by mobile phone will become a common activity. Some go even further naming mobile payment as the future killer application for mobile commerce in a 2.5G and beyond infrastructure. Mobile payment is expected to boost both m- and e- commerce, as users will be able to pay for e/m content. Some interesting facts/speculations include:

- 118 million Europeans, 145 million Asians and 22 million Americans intend to use their mobile phone for paying small purchases (TowerGroup [2]).
- The volume of mobile business will reach $225 Billion by 2005 (The United Nations Conference on Trade and Development [3]).
- The size of the mobile Internet based mobile payment market will grow from around 5 billion Euros in 2002 to nearly 55 billion Euros in 2006 (Wireless World Forum [6]).
- Forty-four percent of 5,600 mobile phone users on four continents surveyed in the February 2002 global Mobinet study [5] would like to use their mobile phones for small cash transactions.

As we can see the interest on mobile payments is there. However, it can be witnessed that today there is lack of a global mobile payment system that has established itself. What we have witnessed are sporadic local efforts to do mobile payments, but these usually failed in one or another way and either still serve a very limited customer base or have ceased to exist.

2. Standardisation efforts

Currently there are several efforts at European Union (EU) as well as at international level in order to accelerate and solidly support emerging mobile payment solutions. Most of the heavyweight companies that deal with hardware or software products for the mobile market, as well as others such as the mobile network operators (MNO) and financial service providers try via international fora and consortia to define the guidelines such a system should follow. The aim is to produce an approach that is widely acceptable and that it would reach a global audience and not address just a specific customer base or isolated scenarios. Towards this end the following consortia have aroused:

- Mobile Network Operator driven: Simpay (www.simpay.com), Starmap Mobile Alliance, GSM Association (www.gsmworld.com), ETSI (www.etsi.org), UMTS forum (www.umts-forum.org).
- Bank driven: Mobey Forum (www.mobeyforum.org).
- Cross Industry driven: Mobile Payment Forum (mobilepaymentforum.org), Mobile Payment Association (mpa.ami.cz) and Paycircle (www.paycircle.org).
- Device Manufacturer driven: Mobile electronic Transactions (www.mobiletransaction.org).
- Technology driven: Open Mobile Alliance (www.openmobilealliance.org) and Infra-red Data Association (www.irda.org).
- Identity driven: Radicchio (www.radicchio.org) and Liberty Alliance (www.projectliberty.org).

Apart from these “pure” mobile payment consortia whose work directly affects the mobile payments, there are also other actors that indirectly are evolved with the mobile payment area, and come from the financial/banking sector.

Since none of these organisations has dominated the market, it is common that the same companies take part in more than one of these consortia. It also has to be

pointed, that although all of them aim to standardise and develop mobile payment approaches, there are differences in the requirements they set. For instance the IrDA consortium focuses only on payments that can be accomplished over infra-red, others such as the Mobey Forum require dual chip phones (a SIM card and a payment chip card), while also some of them focus on security scenarios and identity management rather than specific mobile payment scenarios (e.g. OMA). Significant impact is expected to come also from the newly announced (June 2004) Open Mobile Terminal Platform (OMTP – www.omtp.org) initiative that aims to define standardised open application interfaces for mobile devices, as this will minimize the learning curve of the user for interaction with new services such as mobile payment.

3. Commercial efforts in Europe

Within the past years, several mobile payment solutions have been developed. Some of them even managed to leave the prototype level and enter the commercial market. Unfortunately, not all of them managed to survive the .com technology crash; therefore not all of them are still in operation today.

Indicative examples include:

- Germany: PayBox (www.paybox.net), StreetCash (www.streetcash.de), Firstgate Click&Buy (www.firstgate.de)
- Spain: Mobipay (www.mobipay.com),VISA Movíl,
- Finland: Electronic Mobile Payment Services (EMPS)
- The Netherlands: MoxMo (www.moxmo.com)
- Denmark: BeamTrust (www.beamtrust.com), Orange/Mobilix mobile payment (www.orangemobilbetaling.dk), Metax (www.metax.dk)
- France: “Paiement CB sur mobile”
- Sweden: Telia Payit, Mint (www.mint.nu)
- Switzerland: Swisscom Sicap
- Norway: MobilHandel (www.mobilhandel.no)
- Italy: Easybuy by i-Tim (www.tim.it), MobilMat (www.mobilmat.it)
- Czech Republic: Oskar
- Ireland: mpark (www.mpark.ie)
- United Kingdom: M-till (www.m-till.com)

Of course the above systems are indicative and not all of them target general mobile payment scenarios. Some are pretty general (e.g. MoxMo) while others are scenario-specific such as mobile ticketing (e.g. mpark in Ireland). Also most of the MNOs active within EU now offer prepaid Top-Ups for their users via mobile payment procedures based on SMS/WAP/Internet interfaces as well as purchases of a limited number of intangible goods. Further info on the European and international efforts exists [8][9].

4. The European Commission’s efforts

The European Commission (EC) itself has recognised the value of mobile payments and their advantages once a pan-European mobile payment infrastructure is in place. Therefore efforts are done mainly towards these directions:

- Support research, design and development of new innovative mobile payment services.
- Adjust the legal and regulatory framework in order to ease pan-European mobile payment services

The first goal is tackled mainly by supporting several projects under the Information Society Technologies (IST - www.cordis.lu/ist/) program. Several mobile payment related projects have been supported in this context recently. Indicatively we mention:

- The Secure Mobile Payment Service (SEMOPS - www.semops.com) aims at developing a universal, standard-compliant open mobile payment system that will be able to handle national and international, micro, mini and macro payments. Privacy, security, trust, openness and flexibility are driving forces of this approach. The open business model is based on the cooperation MNOs and financial service providers such as banks.
- The Secure Mobile PAYments and Services On Chip (Sm-PaySoc - www.smPaymentsoc.org) aims at realizing mobile and trusted secure access to information services by developing a novel smartcard-based service platform that allows the mobile fruition of services such as mobile payment.
- Telepay [7] stands for the “Telepayment system for Multimodal Transport Services using Portable Phones”. Telepay is developing a payment system allowing transport service payments using mobile devices (for example, public transport, tolling for motorways, and the like). Virtual “e-tickets” in mobile phones and e-tolling using SMS, WAP and short-range communication technologies are within project’s scope.
- @DAN stands for “@DvANced and high secure mobile platform to support the digital economy” and is another European Union project that develops a PC-based platform for applications based on digital signatures and secure payment over UMTS handsets.

The second EC objective is barely scratched and actions have only been initiated within the last years. Regulatory clarity on mobile payments and lowering of the current regulatory barriers for mobile network operators are needed in order to provide prosperous ground and attack new investments in mobile payment services. A blueprint [4] on mobile payments that provides more insights has also been developed.

5. A Europe-wide mobile payment service

Mobile payment is considered worldwide by experts as a critical factor for the success of mobile commerce. Almost all existing solutions that have been developed target a local market and barely consider cross-country

payments since these are hindered by several factors such as technology, cost, and legal framework.

As one can easily anticipate, a Europe-wide mobile payment service has to successfully tackle the requirements arising from the main actors in such a scenario i.e. the users, the merchants, the mobile operators and the financial service providers. This task is not trivial, mainly due to the heterogeneity of the European markets. For a service to be accepted, a critical mass must be achieved in a context compliant with the European Commission's vision of a mobile Europe, where its citizens freely move among the EU countries, and seamlessly enjoy services coming from the communication, banking, government and health domains. The trend within the next years is simply to provide convergence products and services that go beyond the national borders and tightly couple to a not only financially united Europe.

The last years there have been considerable efforts done in order to harmonise the European market. The introduction of euro as a common currency dissolved one of the main problems, mainly the need to present the customer with a value on his local currency, one that he is familiar with and can assess. For the remaining countries that have not yet joined the euro currency, a real-time automatic conversion to the local currency is needed, which should be trivial since the financial service providers have been doing this for years. Furthermore recently the European Commission, in the effort to enhance financial services among its member states set that any transaction costs from cross-country money transfers should be as cheap as in the home country. The last is seen as a boost in inter-EU country commerce as costs can be minimized. For instance in Germany a common transaction type is the "Lastschrifteinzugsverfahren", a kind of direct debit approach that is free of charge for the end-user, and based on that fact most German banks nowadays offer money transfers to other European countries with zero commission. It can be seen that any cross-country mobile service can benefit from such a regulatory framework.

One of the aims behind these actions is also the need to market several easily-identifiable cross-country services by using a common strategy that would offer maximum revenues with limited risk and cost. Mobile payment is one of these services and consortia like Simpay are targeting exactly that. Of course new business models that target the differentiating factors in each country are needed and expected to arise from such multi-national consortia. The built-up of alliances or consolidation in the mobile operator as well as the banking sector, that are present in almost all European countries points out also the trend towards an effort for better market positioning at a Europe-wide level.

Security, trust and privacy are critical to the take-up of a mobile payment service. Security has to be guaranteed from the technology as well as the legal framework in Europe. Protection and control of privacy as well as trust on the service itself need also to be tackled efficiently. The European Commission has taken actions via directives that provide guidelines for harmonisation of the legal framework including the privacy protection on a pan-European level. For instance one of the methods to promote trust and security are the digital signatures, a matter that is addressed in Directive 1999/93/EC of the European Parliament. Lately several discussions are done with regard to the implementation of the EU e-money directive. Full compliance with European Commission's strict e-money regime could make much existing and planned m-commerce projects unviable, as issuers are obliged to redeem unused e-money balances into cash on request, and are restricted in terms of the other business activities. Of course the issue of a directive, its interoperable implementation at European level and the adaptations that will be needed for mobile payment scenarios remain a challenging task.

The role of the European Commission is seen as critical, and there is an ongoing debate on the actual role that it should undertake. Many would like to see European Commission as a facilitator acting in an advisory role, an approach that would promote the dynamicity and creativeness on the business side, rather than strictly defining the framework in which mobile payments should operate. Critical voices also point out that standardisation problems need firstly to be tackled within the European Commission itself, as there are several departments involved in regulating transactions with overlapping impact on the mobile payment area. For instance the policy development department (DG IS) deals with some areas of mobile payment regulation (i.e. policy regulation), while the Directorate General Health and Consumer Affairs (SANCO) deals with others such as distance selling regulations), and there is even the Directorate General Internal Market (DG MARKT) department that regulates other financial and security issues. Since mobile payment domain gets affected at different grades from so many sources, even within the European Commission itself, these have to be clarified before proceeding with defining policy and regulatory issues on the mobile payment area.

A multi-national and multi-cultural Europe poses also the need to support multilingual services. Therefore a user-friendly service would interact with the user in his mother language, even though he might not be in his home country. Furthermore other cultural specialties need also to be taken into account, in order to guarantee the success of the service. So the localisation factor is critical and needs to be carefully tackled in a non-homogeneous area like the European Union.

Apart from the aforementioned thoughts that mainly address the European Union domain, developing a global mobile payment service, even beyond the European borders is the ultimate target. In our previous work [12] we have also taken a closer look of where we are today, why mobile payments are not there where most experts had predicted a couple of years ago, and lay our views on how this interesting area will advance.

6. The SEMOPS approach

As aforementioned, SEMOPS [11] is a European Commission co-financed project under the IST Programme. SEMOPS is developed with the aim to address effectively most of the matters mentioned in this paper, and develop an open, cross-border secure mobile payment service. It has fifteen participants from four European Union member states and its business model is based on the cooperation of financial service providers such as banks and mobile network operators. The service concept is built on the real-time credit push concept. SEMOPS takes into account the different requirements of the actors, and addresses them in an innovative way. Trust, security and privacy have been tackled [10] in order to comply with visions of mobile Europe. In SEMOPS each user (customer or merchant) interacts with his trusted payment processor e.g. home bank or mobile network operator only. Therefore, the users trust their bank or mobile network operator who can timely provide information and manage the transactions on their behalf, and they do not need to trust the foreign transacting party. The banks use their existing trust relationships among them. Also the legacy systems of the bank and the merchant are integrated in the SEMOPS infrastructure and are used as usual. The service is universal as it enables payment for mobile, Internet and point of sale (POS) transactions. The possible mobile transactions, the SEMOPS payment model can be applied to, include: POS transactions, in band purchases – Internet and WAP-, P2P payments, purchases made at vending machines and bill payments. The payments are not limited by values either as micro, mini and macro payments can be performed.

Further issues like open architecture, multilingualism, real-time interaction, multiple platform support, user-friendliness, cross-border support, open business model etc have also been addressed. SEMOPS has been implemented and presented in several standardisation bodies and international events, including commercial ones such as CEBIT 2004 (www.cebit.de). The aim is to continue with the testing and demonstration scenarios in major European Telco and bank co-operations, enhance further such a promising approach and launch a commercial pan-European mobile payment service in the mid-term.

7. Conclusions

We have witnessed that the mobile payments are a promising area, complementary to exiting payment schemes [1], that will further contribute not only to the economic integration of the European member states, but will provide a powerful tool at the hands of the European citizens in order to settle their economic transactions with government, industry and among themselves in an open, secure and flexible way. Efforts are done on international as well as European level in order to tackle standardisation, policy and regulatory. Promising global mobile payment efforts such as SEMOPS, point us that the vision of an open pan-European mobile payment service will eventually materialise.

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