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Pan-European Peer-to-Peer Payment by Mobile Phone including considerations on technical and commercial implementation options

Background

The increasing proliferation of faster/instant payments and of mobile phones begs the question whether money can not be transferred more easily, quickly and safely between people than with current methods. Today people hand each other cash, write out cheques, initiate online bank transfers using bank account numbers (such as IBANs), enter card details (16-digit numbers with added security codes) into little web browsers and more. Would it not be better to send money by clicking on a mobile contact? We all have the mobile number of our contacts (unlike the IBAN) and initiating a payment from our ever present mobile devices – if done securely and conveniently – is surely the future.

Over 50 such mobile peer-to-peer payment (mP2P) solutions have emerged in Europe in recent times. However, these are typically local, working only in a particular geography (e.g. Swish in Sweden, PayM in UK etc). Under the Single European (Digital) Market it seems apposite to think of pan-European solutions allowing anyone in Europe to send money to anyone else independent of either's geography. Thus it is only consistent that the European Retail Payment Board (ERPB), composed of representatives of all key payment stakeholders and chaired by the ECB, has identified the promotion of pan-European mP2P as one of its two current strategic initiatives.

This article discusses some of the considerations in setting up such a pan-European mobile payment service.

Approach

A solution could be based on many infrastructures (cards, ACH, etc), initiation/identification methods (QR-codes, phone numbers, social media handles etc) and technologies (tapping phones together, sending SMS, etc). However, since bank accounts and mobile phones are likely the most pervasive across Europe we here consider only initiating a bank transfer via a mobile phone number. For this a mapping service has to be set up that maps any mobile phone number to any bank account (IBAN) in Europe. This would mean that users of local solutions could then not only send and receive money within their local community (e.g. within UK), but could in future send and receive money anywhere in Europe – with their accustomed local solution. This would enable not only classical cross-border mP2P payments (e.g. paying a friend in Portugal from Germany) but also allow a traveler to pay in a foreign country (e.g. a visitor from Italy to pay a French colleague whilst in Brussels or a tenant from the UK to pay the landlord of his French holiday home). This leverages the advantages of SEPA.

Motivations for adopting mP2P are manifold. Each community may have different rationales for adopting it and different business models. Some countries (e.g. Nordics) have government initiatives in place to reduce cash – and thus see mP2P as a viable electronic alternative. Some see mP2P as a stepping stone towards mP2B (payment of merchants) with attractive business cases. Some consider mP2P as a strategic initiative to put bank accounts back into the centre of (e/m)commerce – and not leave the critical topic of payment (and its data) to non-bank third parties.

User experience

The typical paradigm in mP2P is that a user invokes a payment app on his smartphone where he enters the amount to be transferred and selects the intended recipient from his contact list. "Behind the scenes" this mobile number is translated into a destination bank account. This is typically done by a database service currently mapping local phone numbers and accounts, but in future a distributed mapping service accessible from anywhere in Europe.

For practical reasons it may be best to map not only the phone number into an account number, but also return the name of the account holder. Thus when the user selects a mobile number to send to, the system will return to him – before the payment is initiated – the name of the person that the system has associated with that number. The user can then verify that this is indeed the person he intends to send the money to and then press "send money" and thus be sure to reach the right recipient. Any manual "typos" in the mobile number, accidentally selecting the wrong contact, outdated mobile numbers in contact lists on the personal mobile, a user who has forgotten to deregister his mobile from his local directory, the telco which has reassigned an unused number to another user etc then do not cause erroneous payments to the wrong recipient. This avoids frustration to the users and expensive dispute resolution procedures for the providers.

Some communities – with very stringent privacy policies – have elected not to return the name of the user from the lookup. Other communities consider returning the photo of the payee to be less sensitive than a name – so different communities are making very different choices. Maybe this issue of what is considered private and what is not will be better resolved once we have more harmonised privacy legislation across Europe.

The above already indicates the need to look at the topic of mP2P not only from a technical perspective (e.g. database mapping service) but also – more importantly – from the many non-technical perspectives.

How does one reconcile different privacy preferences across communities and users? What is the business model? Who decides who can take part in the system? Who can change entries in the mapping service? What happens if something goes wrong – i.e. how to resolve disputes and define liabilities? How does one communicate the pan-European solution to users? If two accounts are associated with the same mobile number which one is to be used? Who decides these rules according to which criteria? These are some of the many important, non-technical questions.

Some of these issues are already covered in the underlying payment scheme (e.g. SEPA Credit Transfer) at least as far as the interbank sphere is concerned. As it makes sense to base the new mP2P solution on existing standards (ISO20022, ePI, etc), existing solutions and existing governance structures, one should clearly re-use as much of existing schemes as possible.

We here single out only a few such considerations of particular relevance to these non-technical changes/additions vs the basic SCT scheme relevant for mP2P.

Privacy

Clearly the system needs to conform to local and European data protection legislation[1]. In particular any data in any system must only be made accessible to those actors and for those purposes authorized and agreed with the user. Data can only be used/inserted/edited after explicit consent by the user. No data may be retained beyond its need and no data beyond what is needed stored. There must be a right to be forgotten. And further requirements will have to be considered.

One consequence of this is that it will likely not be possible to enroll users automatically into the mapping service – even if this were technically possible (the bank typically already having both the customer's IBAN and his mobile number).

Thus although it would aid the uptake of the mapping service immeasurably if everyone were automatically registered (with the possibility to opt-out), this can not be recommended for privacy and data protection reasons. Instead the explicit consent of each consumer must be sought, whether he is ready to accept that his mobile number be associated with his IBAN and made available to those seeking to send him payment. Many solutions in the market have failed by not implementing the enrolment process legally, elegantly, conveniently while making the advantages (and risks) clear to the user and must thus be a point of very special attention.

The solution that balances both convenience and know-your-customer/privacy may be found in modern bank-based solutions: the user has already been vetted and can thus, with a simple "tick" in his mobile banking app – once – confirm that he is interested in receiving money from others and thus enrol conveniently into the system. It must be made clear, of course, than in so doing he is making his name potentially visible to anyone who has his phone number and is thenceforth subscribing to the terms and conditions of the service.

Security

Since the pan-European mapping service contains the account numbers and mobile phone numbers of many people[2] in Europe it will be a "honeypot" for hackers.

Thus all conceivable security measures must be adopted to ensure that no unauthorized party can access any lookup service, modify any entry or harvest database information. Thus only special selected parties (who need to be specially vetted, maybe even licensed, and continuously monitored) can be allowed to access the mapping service and manage the mapping between phone numbers and account numbers through a standard, highly controlled interface.

Of course, not only external access (e.g. capturing of IBAN by unauthorized parties) but also the "internal system" of the solution must be heavily protected against cyberattacks e.g. database pollution, unauthorized modification of entries, etc.

Liability/Dispute Handling/Branding/ Governance/Business model etc

Since any of the above topics can "go wrong"[3] it is necessary to have a structured dispute handling process to assess where the problem is, how to resolve it and who is liable to redress any damage. It is to be evaluated whether a pan-European mP2P service needs a brand to make it recognizable across Europe. It needs to be decided who bears the costs for the governance structure, the maintenance of the local data and the distributed service. It must be assured that any mP2P specifics (e.g.

[1] Including, but not limited to, the data protection clauses of Article 8 of the 2000 EU Charter of Fundamental Rights, the EU Data Directive of 1995 up to the coming EU General Data Protection Regulation (GDPR).

[2] Ideally, if such a service takes off as envisioned, then a large proportion of Europe's hundreds of millions of consumers will be registered.

[3] e.g. a user may feel that he has been registered without his consent/knowledge, another user may feel he has been unfairly excluded, a database may be corrupted with money being sent to the wrong person, the system may not be available at a critical moment etc.

lower limit than normal online banking) that suggest themselves for risk and compliance be implemented. And certainly, further questions need to be resolved.

In short all elements of an underlying (e.g. SCT) scheme need to be reviewed to see whether any adaption for the mP2P solution may be necessary. It should be the goal to have as few changes to the standard scheme as possible.

One critical non-technical decision that will have to be taken in this context is who to assign the management of the pan-European mapping service to and what the governing body should be. Having several parallel European mapping services (whilst welcome from a competition point of view) may lead to fragmentation and customer confusion so this evolution should be monitored with care. In any case the governing body of any solution will surely wish to opt for multiple technical providers for competition and redundancy reasons.

Future of mP2P

Once the above considerations are in place and a safe, secure, easy to use pan-European payment system is emerging, it will surely not be long before the "person-to-person" scenario is extended to paying the babysitter, the window cleaner etc and then merchants in general – and more.

Mobile P2P may become integrated into mobile phones (e.g. having a "pay" button during a call to send the person on the line money immediately). Another version of "integrated" mP2P payments we will surely see in the future is to have the mobile P2P payment function integrated into third party applications. Rather than explicitly initiating a payment with a dedicated payment/banking app, the payment is part of a more complete solution including much more of a holistic workflow than just the payment step.

For example someone advancing a restaurant bill may use a "bill splitting app" into which she will enter the contacts that attended the dinner. The app will then calculate how much everybody owes her, automatically request this amount from each contact, wait to be paid by each diner (using integrated mP2P in the guests' bill splitting apps), remind tardy guests and finally show completion to the host when all have paid. One single app to solve a whole problem.

Further integrated solutions (as opposed to stand alone banking apps) may be expected in the area of P2P lending or anywhere else in the "sharing" economy (sharing cars, sharing flats, sharing money, …) up to the "internet of things" where M2M payment will surely emerge (e.g. a car paying a toll gate as it passes through) all integrating payment as part of a wider process.

Technically the way such integrated solutions will likely be implemented is by banks or payment service providers offering open APIs[4] for mP2P payment services to third party developers. Then anyone who can program an app can implement a function to initiate a payment from any bank account in Europe to any other. This functionality can then be integrated into a whole host of new applications, mobile phone operating systems, wearables and machine-to-machine scenarios that integrate mP2P payment into a wider, complete solution.

Summary

- There are many motivations to implement mobile P2P payment (convenience to users vs IBAN, potential for cash reduction, strategic placement of bank accounts in digital commerce etc). Clearly this must be done in a harmonised way across Europe, leveraging the advantages of SEPA.
- A promising way, that leverages the pervasive banking infrastructure and mobile device coverage, is to build a pan-European mP2P payment solution that is based on a mapping service from a mobile telephone number to an account

[4] A large new trend in banking and other industries to allow third party innovation – going way beyond what is required in PSD2.

identifier (e.g. IBAN) and account holder name.

- In order to implement such a pan-European mapping service in a practical way one should leverage existing local community mapping services (of which over 50 already exist in Europe).
- Setting up such a pan-European mapping service raises a number of technical issues where existing, tried solutions and standards should be employed.
- Managing such a system will require non-technical political, policy and commercial decisions to be made beyond the technical issues. For this one should re-use existing solutions/schemes and governance structures and only extended these as far as is strictly necessary for mP2P.
- Links to other relevant regulations (PSD2/API ("payment initiation from account"), SeCure Pay (mobile authentication), etc) will need to be explored.
- Particular attention must be paid to ensuring that the mapping service conforms to all regulatory, technical and consumer issues especially to the here particularly critical topics of privacy, security and data protection.
- Mobile "peer-to-peer" payment solutions will likely evolve into person-to-business and other solutions and may become integrated into mobile phones as a standard feature and become the basis for more holistic solutions incorporating payment using API technologies.
- Above all it is to be ensured that the system is
  - open to all who wish to participate (technically, commercially) if the rules laid down by the governance structure are committed to (security, privacy, liability etc)
  - no-one is forced to use this system but free competition and an open market are assured.

If the above basic recommendations are followed, we will have a convenient, practical, secure way of paying eachother all across Europe.

Author

Dr Michael Salmony, Executive Adviser Equens SE, is an internationally active leader on business innovations especially in the internet and financial services space. He is BoD-level advisor to major European banks, industry associations and European finance bodies. Previous positions include Director Business Development of leading national central bank and Director Media & Communications at IBM for many years. He studied at the University of Cambridge to begin a long international management career in the application of Innovation to Business Value.