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Pan-European Mobile Person-to-Person Payment - and beyond

Michael Salmony, 19 November 2015

Abstract

This paper aims to lay out why Europe-wide person-to-person payment may be attractive to end-users and banks. It does not have the ambition to answer all questions in this regard (especially commercial and implementation), nor does it aim to suggest that this will be easy and all problems are solved. However it does aim to shed some light on why – for strategic and business reasons – so many mP2P solutions are emerging by banks and third parties, given that for many there does not seem to be an immediate business model.

The paper then drills down into some of the key considerations in setting up a pan-European mapping service between proxy identifiers and accounts, which is considered to be a key challenge in making pan-European mobile payment a reality.

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 person-to-person 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). 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 home country or current place of residence.

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 current top strategic initiatives.

However this grand scheme of convenient, pan-European mobile payment will surely only fly if there is a benefit to all parties concerned and if those asked to invest in building such an infrastructure have a business case for doing so.

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

Approach

The user need for mobile P2P payment is not further discussed as 50 solutions in Europe as well as the extraordinary success of Venmo¹ in US etc document the clear demand by users. Also mobile payment clearly sits at the crossroads of the current “hottest” topics in payments:

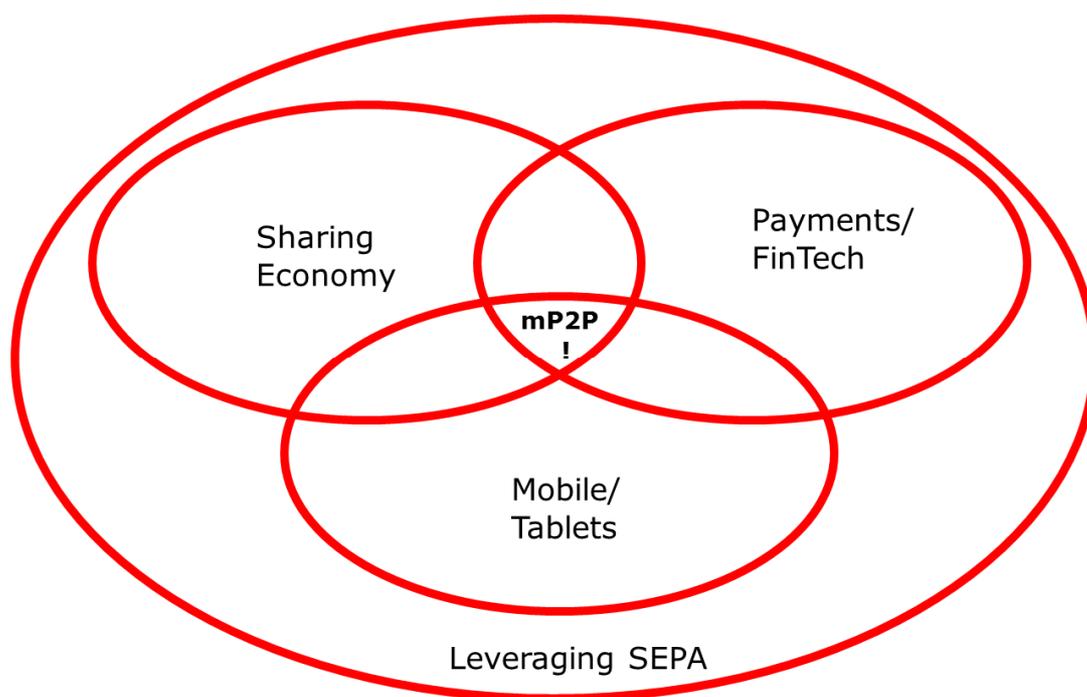


Fig 1: Mobile P2P at the epicenter of the hottest topics in payments

A P2P 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 most consider only initiating a SEPA bank transfer via a mobile phone number. It should however be borne in mind that other infrastructures (e.g. cards networks) and technologies may offer even better reach and business cases.

Regardless of infrastructure a mapping service has to be set up that maps any mobile phone number to any account (IBAN or Card number) 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 solution². 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 Tokyo or a tenant from the UK to pay the

¹ a company, acquired by PayPal, which has even dethroned the previous mobile payment champion (Starbucks wallet)

² i.e. a PayM user can pay someone not only in the UK but exchange funds with anyone across Europe still using his accustomed PayM app. No new “European” payment app is necessary – the user can continue with his established local solution. The country code “+49 ...” in the mobile number/addressing allows PayM to connect to other solutions/countries as outlined in the paper.

landlord of his French holiday home). This leverages the advantages of SEPA and international card schemes.

Motivations for adopting mP2P are manifold. Each community currently has different rationales for adopting it and different business models, for example

- Some countries (e.g. Nordics) have government initiatives in place to reduce cash³ – 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 and more (a topic to be explored later, see Fig 3)
- 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 parties⁴.

In any case it must be clear to all, that providers of the underlying service and infrastructure (typically banks) can not be expected to pay for the investment in such a pan-European system if there is not a strategic reason to do so and a business case. Since P2P is typically a free service, this raises serious economic and strategic questions.

The commercial aspects of mP2P are not discussed further here since they are very much in the competitive space but care should be taken amidst all the enthusiasm for modern technologies to propose only viable (and financially viable) ways forward. A good commercial principle is that those who stand to gain, should be those called upon to invest.

³ If mP2P can help to reduce only a little bit the 86bn€ cash handling costs that fall especially on banks and merchants every year, a business case surely seems viable. On average ca 80% of all retail transactions in Europe are still cash.

⁴ For example banks may be interested in letting users pay directly from the bank account and receive money directly into their bank accounts – without intermediate wallets, third party accounts etc.. This is also more convenient to users who may prefer not need to set up/authenticate/manage extra funds repositories – if they can get the same convenience of use at the mobile. Thus the smart consideration is not only for convenience but for the strategic positioning of bank accounts back in the centre of (e/m)commerce.

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. Before he sends the amount, he is informed of the balance available on his account – a critical issue for many payers.

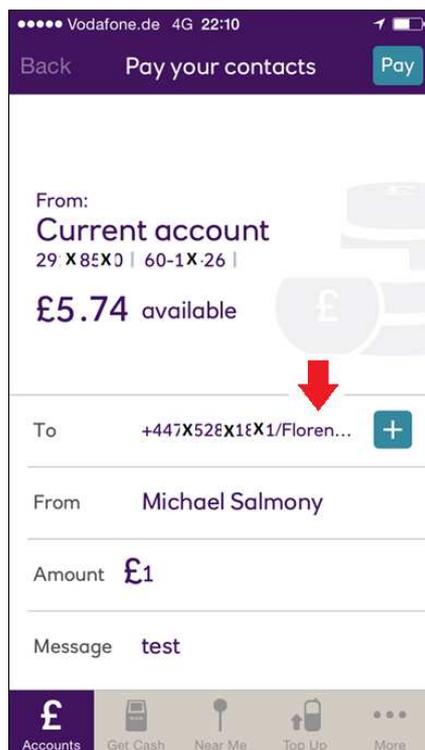


Fig 2: user experience when sending money to mobile contact

“Behind the scenes” this mobile number is translated into a destination bank or card account. This is typically done by a database service currently mapping local phone numbers and accounts, but in future could be a distributed mapping service accessible from anywhere in Europe or the world.

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 (see arrow in Fig 2). 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 choices⁵. 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.

We here single out only a few such considerations of particular relevance to these non-technical changes/additions vs the basic underlying funds transfer scheme (ACH/card/etc) relevant for mP2P.

Privacy

Clearly the system needs to conform to local and European data protection legislation⁶. 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

⁵ One may indeed question whether it is the state(s) that should make a decision on what data/photos/names users wish to share. Legislators do not always have a good track record on getting this right (some, for example, see the Cookie Popup legislation only as annoyance which reduces acceptance of eCommerce and seems to serve little public good for any party). Maybe it is better to let the individual user freely choose his privacy preferences on a case by case basis and regardless of where he lives in Europe. This does, however, require a practical means of legally enforcing the excellent principle of "informed user consent" (i.e. not clicking a tick on a "I accept all 53 pages of T&Cs" box)

⁶ 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).

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 enroll 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 people⁷ 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 IBANs or card details 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/Competition etc

Since a number of topics can “go wrong”⁸ 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. 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/card) 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 underlying scheme as possible⁹. Also mechanisms of underlying schemes (e.g. refund from merchant) should be reused rather than re-inventing them at this mP2P layer.

⁷ Ideally, if such a service takes off as envisioned, then a large proportion of Europe’s hundreds of millions of consumers will be registered.

⁸ 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.

⁹ e.g. maybe only a flag added to the SCT rulebook to signal that this transfer was initiated via a mobile

One critical non-technical decision that will have to be taken in this context is who to assign the management of a pan-European mapping service to and what the governing body should be. These control the adherence to the topics discussed here and manage the future evolution and are thus of paramount importance to the success.

Having only one European mapping service would be akin to a monopoly and potentially a large security and availability risk. Thus it is surely to be welcomed to have several parallel European mapping services to promote competition, improve availability and choice and reduce exposure to concentrated privacy and security incidents. However this multiplicity of services must not lead to customer confusion or market fragmentation. Finally the market for pan-European mapping services needs to be fair (not force anyone to join who does not want to, not exclude anyone who wishes to join).

Future of mP2P

The above considerations show that it will be challenging to set up a safe, secure, easy to use pan-European payment system that complies with all regulations and opens a fair market. However should these challenges be overcome (and 50 local solutions and some international ones may be evidence of this), it will surely not be long before the “person-to-person” scenario is extended to paying the babysitter, the window cleaner, the street hawker ... and then merchants in general - and more.

P2P may be a good place to **start** ...

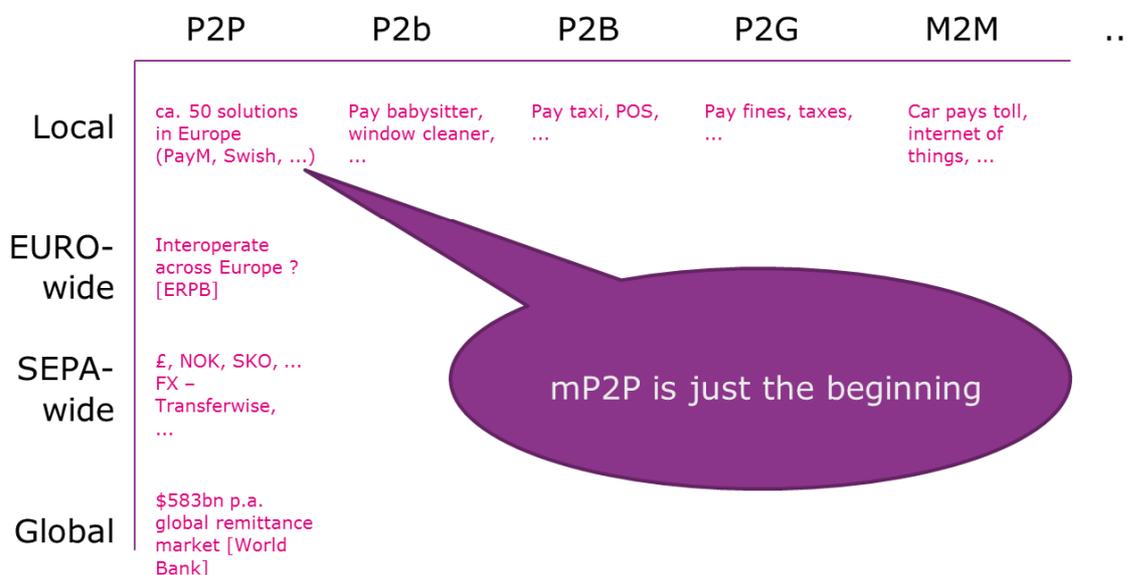


Fig 3: Mobile person-to-person will likely grow in geography and users

However the move from P2P to P2B is not to be underestimated. A person-to-person payment system is relatively simple compared to a merchant solution. Merchants typically require guarantees, SLAs, refund procedures, commercial models, reconciliation data, fraud support, limits, screening, funding, risk management, invoicing and much more. Thus a P2P can not be a P2B solution – neither technically nor commercially.

However once people are used to paying each other by mobile, surely it will become normal for people to pay merchants and buy goods with a mobile, to pay fines to the government by mobile and for mobile cars to pay toll gates. Thus the migration along the horizontal axis is inevitable and only a question of time, implementation, commercial model and political will.

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).



Fig 4: Payment naturally integrated into mobile phone call

This is a very natural scenario – unlike many contrived mobile payment scenarios trying to justify the need for mobile payment – here the user is already using his mobile and connected to the payee and can send money to his son easily and conveniently.

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, card schemes or payment service providers offering open APIs¹⁰ 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 and Recommendations

- there are **many motivations** to implement mobile P2P payment (convenience to users vs IBAN, potential for cash reduction, strategic placement of bank accounts in the centre of digital commerce etc).
- thus many solutions are emerging **across Europe**. These could be connected to leverage the advantages of SEPA.
- such a pan-European solution must clearly be done in a **commercially fair and viable** way with all those who benefit sharing the cost. This raises a number of serious business challenges.
- technically, a promising way that leverages both the pervasive banking and card infrastructures and the mobile device coverage, is to build a **distributed pan-European** mP2P payment solution that is based on a **mapping service** from a proxy (e.g. mobile telephone number) to an account identifier (e.g. card or IBAN) and account holder name.



Fig 5: connecting islands in Europe

¹⁰ a large new trend in banking and other industries to allow third party innovation - going way beyond what is required in PSD2, see "Access to accounts: Why banks should embrace an open future" in Journal of Payments Strategy & Systems, vol. 8 no. 2 pp 157-171 May 2014

- this distributed – not centralized – solution for mapping proxy identifiers to accounts may be based on a **similar architecture to the distributed DNS mapping service** (mapping URLs to IP addresses) that is serving well across the internet.¹¹

- this approach **leverages existing local community mapping services** (of which over 50 already exist in Europe) and is thus much to preferred over a greenfield approach.

- 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**. Making the service **useable** and convenient given these boundary conditions will be a challenge and **critical success factor**.

- links to **other emerging relevant regulations** (PSD2/API (“payment initiation from account”), SeCure Pay (mobile authentication), General Data protection laws etc) will need to be explored.

- setting up such a pan-European mapping service raises a number of **technical issues** where existing, tried solutions and standards (e.g. ISO20022, ePI) should be employed as far as possible. More challenging will be the **non-technical** issues: usability, political, policy, commercial, governance etc. decisions to be made beyond the technical issues.

- for both technical and non-technical topics it is important to keep a **clear separation** between the new mP2P service and any underlying infrastructure layers. The new pan-European service should be separated **architecturally** (e.g. mP2P should be able to run over any suitable funds transmission infrastructure) and functionally (e.g. not mingle transport and service elements).

- in future mobile “person-to-person” payment solutions should be open to 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

a) **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)

b) **no-one is forced** to use this system but free competition and an open market are assured.

The above recommendations may show some indications on overcoming the challenges on the way to a convenient, practical, secure and funded way of paying each other all across Europe.

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¹¹ A local solution, that is asked to send money to a foreign mobile number can thus call an API of such pan-European mapping service to have the destination account resolved. This can happen in a number of ways, for example by returning the BIC of the bank that will give the IBAN of the person holding that mobile number