Cross-industry Preferences for Development of Mobile Payments in Switzerland[1]

Jan Ondrus & Yves Pigneur
HEC Lausanne, University of Lausanne, Switzerland

Abstract

In this paper we present a study that unveils the technological and organizational preferences of various industries towards mobile payment developments in Switzerland. Despite the expected success, mobile payments remain at an early stage of development in most countries. At this point, there is a real necessity to better understand the factors hindering the deployment of mobile payments. We conducted several series of interviews involving key Swiss experts to elicit the preferences of the different industries involved in the mobile payment market. The findings indicate that card-based solutions are still preferred to mobile phone-based solutions from an industry point of view. However, in terms of industrial settings, the situation is not as clear for determining the dominant actors who would lead mobile payments solutions in the future. At this stage, this study already reveals some weak market signals concerning the future developments of mobile payments in Switzerland.

Introduction

We define mobile payments as any wireless transaction of a monetary value from one party to another using a mobile device. As any future success of mobile payments depends on multiple stakeholders, coordination between them is crucial. Thus far, various independent mobile payment solutions have been launched in efforts to overcome this barrier. Given the relatively low number of actors supporting the initiatives, the market has witnessed more failures than success. However, there are notable exceptions, especially in Asia. NTT DoCoMo is a prime counter-example. With the constant evolution of their "Osaifu-Ketai" wallet service, NTT DoCoMo managed to involve JR East (i.e. East Japan Railway Company, one of the largest passenger railway company in the world) with Mobile Suica and bitWallet with the Edy system. They also established strategic alliances with Aeon Co. (large retailer), LAWSON (large chain of convenience stores), Mizuho Bank, and Tokyo's largest taxi fleet operators. This demonstrates the importance of involving different partners from various industries in order to increase the customer and merchant base.

In the US, financial institutions (i.e. banks, card companies, payment service providers) are also working on mobile payments. If contactless payment are considered as mobile payments, Visa, MasterCard and American Express already propose a version of their credit card with an RFID chip to enable contactless payments. However, in terms of phone-based systems, the market is rather immature in the US. At Atlanta's Philips Arena, Visa is exploring the potential of NFC (i.e. Near Field Communication) as a mobile payment technology. However, financial institutions are still launching pilots while others are already proposing independent mobile payment schemes (e.g. PayPal Mobile, MobileLime, Obopay, Billmycell, TextPayMe, PayWi).

In Europe, there are disparities between countries. For example, in Austria, Mobilkom and ONE are using Paybox as a common mobile payment platform, which enables them to offer this service to a large customer base. In Switzerland, there are not any national mobile payment schemes available. Most solutions are still in trial while those that do exist are only found in niche markets (e.g. parking, mobile digital content, vending machines) (Ondrus and Pigneur 2006a).

Again, there are two crucial success factors for mobile payment solutions: (i) a great number of participants (i.e. customer and merchant base) and (ii) a high volume of transaction. One possible way to partially solve these issues would be to involve relevant merchants (e.g. retailers, public transportation companies) during the development and launch process. Moreover, a consensus in terms of technology and business model is needed in order to enhance the potential success of a mobile payment initiative.

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The research question we want to address in this paper is to unveil the cross-industry preferences for the development of mobile payments in Switzerland. For this purpose, we conducted several series of structured interviews involving Swiss key experts from different industries. We managed to involve the great majority of current decision-makers involved in the mobile payment market in Switzerland. As the interviewees greatly influence the development of mobile payments, collecting and analyzing their preferences enables us to assess the Swiss market in a very convincing manner. In terms of methodology, we used a multi-actor multi-criteria approach to build the model in order to capture the experts' preferences. Based on this approach, we developed a tool to support our data collection and model computations.

The paper is structured as follows. The next section discusses some of the related work done in mobile payments. Then, we present the methodology used. Further, we expose our results and analysis. Finally, we draw some conclusions and propose further possible research.

Related work

A considerable amount of research focusing on mobile payments was devoted to study the adoption of mobile payments using a consumer centric approach (Dahlberg et al. 2003; Mallat 2006; Pousttchi et al. 2003; Zmijewska et al. 2004). Most of these research efforts led to a better understanding and describe the adoption factors influencing the consumer in its intention to use the payment solution.

The success of mobile payment solutions depends considerably on the merchants. Some researchers studied merchant adoption in order to better comprehend this important side of the market (van der Heijden 2002; Mallat and Tuunainen 2005).

Research aimed at surveying and classifying mobile payment solutions was also conducted in order to evaluate the different mobile payment models and their impact in terms of collaboration (Karnouskos 2004; Kreyer et al. 2003).

Several studies were done to evaluate mobile payment technologies with adoption criteria (Zmijewska 2005) and with technological, economic, and social criteria (Chou et al. 2002).

We believe that there is still a need to conduct research on mobile payments with a multi-perspective approach. The aim to understand and evaluate the impact of the different technologies and the different organizational models was previously presented by Ondrus and Pigneur (2005). However, to deepen the analysis, it is crucial to involve practitioners in order to be relevant. A large amount of the research is based on secondhand information to analyze the mobile payment market. There is a real need to get firsthand data to get a better and more relevant picture of current situation.

To the best of our knowledge, mobile payment research focusing on the industry preferences is still very scarce and should thus be further explored. The success of a mobile payment solution depends considerably on the coordination of industry. Therefore, studying the supply side of the market is a very important task in order to understand the factors hindering the deployment a standard mobile payment scheme.

As mobile payment solutions will not emerge directly from the consumers, industry needs first to establish standards for mobile payment and only then will consumers be able to adopt. There is no doubt that understanding the factors of consumers' adoption remains important to aid in designing a solution that fulfills the consumers' needs. However, it is also extremely important to study the side of the potential mobile payment providers with a rigorous approach.

Methodology

As presented by Porter (2004), there are many techniques to study future technology. Different research approaches includes scenario management, technology roadmaps, Delphi study among others. Salo et al. (2003) suggested that multicriteria methods are good candidates for technology foresight and concluded that there is potential "in terms of lending rigor and transparency to foresight process". Moreover, Stewart (1992) considers MCDM (multi-criteria decision making) to be largely concerned with the deployment of systematic methods to help address problems characterized by incomparable objectives, multiple stakeholders and conflicting interests.

To build our model we primarily adopted the MCDM method ELECTRE I (Benayoun et al. 1966), initially designed for decision-making. In addition, by using a group decision extension proposed by Bui and Jarke (1984), we were able to search a consensus between all the experts. The objective was to capture the individual preferences of the experts and the consensus between them. In our case, the rationale behind using an MCDM method was not for decision-making but for technology assessment and foresight. To support our analysis, we developed a tool (Ondrus et al. 2006a) that computes the ELECTRE I algorithm and then produces outranking relationships. As the data collected were compatible with other MCDM methods, we also implemented and used the Weighted Sum Model (WSM) (Fishburn 1967), which enables the computation of a ranking of the best alternatives based on the preferences collected. We also emphasized on the development of visualization interfaces for data cross-analysis.

ELECTRE I

ELECTRE I allows the decision maker to reveal the ideal alternative with a maximum of advantages and a minimum of inconveniences in the function of various criteria.

ELECTRE I gives the possibility of modeling a decision making process by using the concordance and discordance indexes and outranking relations. The concordance index measures the degree of dominance of one action over another, based on the relative importance weightings of the decision criteria. The discordance index measures the degree to which an action is worse than another (Rogers and al. 2000). In summary, concordance and discordance indices can be viewed as measurements of satisfaction and dissatisfaction that a decision maker senses when choosing one action over another. Outranking relations are usually obtained with a combination of a high level of concordance and a low level of discordance. These levels are fixed by a concordance and a discordance threshold used as a measure of severity over and under which an action could outrank another.

The results could be presented with outranking graphs that are easily understandable. If technology A outranks B, an arrow will go from A to B (A $\rightarrow$ B). When there are not any outranking relationships between two alternatives, it means that they are incomparable. In other words, we cannot indicate which one dominates the other. If an arrow goes from A to B and B to A, it just means that the two alternatives are equivalent.

The complete description of all the algorithms used for this analysis and the following one can be found in (Ondrus and Pigneur 2006a).

Weighted Sum Model

The Weighted Sum Model is probably the best-known and most widely used MCDM method (Hwang and Yoon 1981). The basic logic is to compute a weighted sum of the evaluations of each alternative over all criteria. The greater the weighted sum, the more preferred is the alternative (Fishburn 1967).

Cross-analysis visualization tools

To visualize the data from different perspectives, we implemented a Proximity Maps tool which helps to represent the preferences of the alternative and the actors on a 2D plane. The maps are computed by the algorithm presented by Quinn (1979). Actors and alternatives, represented on a 2D map, are linked by invisible “springs” or “forces” and dynamically arrange themselves. Skupin and Fabrikant (2003) suggest that proximity data can be effectively translated into spring models.

We also added different graphical features that summarize and combine individual preferences. This was done to fully exploit the richness of the collected data.

The sample

To ensure that the study was relevant, we managed to contact experts working for major and representative companies in Switzerland. Moreover, the experts were supposed to be the persons responsible for mobile payments in their company. Therefore, if there would be a mobile payments project launched, these experts would be decision-makers who could greatly influence the solution chosen.

We focused on five industries which could influence the future developments of mobile payments in Switzerland. We interviewed the major financial institutions (i.e. banks, payment service providers) concerned with mobile payments. We met experts responsible for mobile payments for the three national mobile network operators. On the side of the merchants, we included the major retailers and public transportation companies. Several technology providers were involved as they have special interests in mobile payments. Several rounds of interviews were organized between 2005 and 2006. The first round took place in June 2005. We interviewed six companies to test our approach. The experts were asked to answer only the technology-based study. Once our approach was well adjusted, we started a larger campaign of interviews taking place between November 2005 and March 2006. Companies were represented by one to three experts. Due to time constraints, we had to meet certain experts several times to collect the data for both analyses (i.e. technology and organizational). Table 1 depicts the name of the companies participating in the study.

Table 1: List of the companies interviewed

Financial institutions	Mobile telcos	Public transportation	Retailers	Technology providers
Credit Suisse Corner Bank Datatrans PostFinance Telekurs Multipay UBS Viseca	Orange Sunrise (TDC) Swisscom Mobile	SBB (National Railways) TL (Lausanne) ZVV (Canton of Zurich)	Coop Migros McDonald's MyOne	Crealogix link-u Polyright (Kudelski group)

The data

To be able to compute the ELECTRE I and WSM algorithms, we needed to establish a number of alternatives. Thereafter, each expert created a list of criteria to evaluate the alternatives. Each criterion was weighted in percent corresponding to the importance given (i.e. priorities). Finally, the alternatives were evaluated by the experts for each selected criterion using a five-value scale (weak, fair, average, good, excellent). With this, we obtained a multi-criteria model (a matrix) that provides the evaluations of the various alternatives for each criteria, which are weighted according to their relative importance.

The collection process

The MCDM methods require a large number of data and the time granted by the experts was somewhat short. Thus, we had to find a way to collect the data in a very easy process for the experts. We opted for the use of the "Pack of Cards" technique proposed by Simos (1990) and later improved by Pictet and Bollinger (2003). The idea is to give to the experts cards with the name of each criterion inscribed. Then, we asked the expert to manipulate these cards, rank them, inserting blank cards to reinforce ranking differences. It appears that the active participation by the decision-markers in the procedure gives them an intuitive understanding of the approach (Rogers and al. 2000).

After a few interviews, we realized that the manual card game was not the most effective method to collect data. Thus, we developed and integrated a computerized "Pack of Cards" technique. The data could be inserted automatically in our tool. Moreover, the results could be found in real-time which improved speed and interaction with the experts. More explanations about the use of this method can be found in (Ondrus and Pigneur 2006a).

The cross-industry preferences models

In this study we explored two important aspects of mobile payments: (i) the technology and (ii) the organization. The specific focus on these two dimensions is based on previously published research (Ondrus and Pigneur 2005, 2006b). The experts had to evaluate different payment technologies and industry settings of mobile payments solutions.

Technology-based model

This model comprises a number of potential alternative technologies for payment schemes. We selected three types of cards: (i) Smartcards (chip-based), (ii) Contactless cards (RFID-based), and (iii) Magnetic

cards (with magnetic strips). We included two phone-based technologies, one using a phone remote network (e.g. GSM, GPRS) and another one based on phone proximity networks (e.g. Bluetooth, RFID, Infrared). We also included money (i.e. cash) for benchmarking purposes.

To evaluate the technologies, a first set of criteria was proposed to the experts. From this set, they had to select the relevant criteria and eliminate the others. They could also add other criteria if desired. We emphasized that the experts had to use criteria to evaluate technologies and not existing solutions (i.e. business cases and models). The alternatives and criteria list chosen by experts is in Table 2. More justifications of these criteria can be found in (Ondrus and Pigneur 2006a).

Table 2: Technological-based model

Alternatives	Criteria
Money Regular cash (i.e. coins, bills)	**Ease of use** This criterion refers to "*the degree to which a person believes that using a particular system would be free of effort*" (Davis 1989).
Magnetic card Plastic card with a magnetic stripe.	**Cost** It regroups direct costs (e.g. cost of the technology, cost of implementation) and indirect costs (e.g. infrastructure operation and maintenance).
Smartcard Plastic card with a chip	**Reliability** The purchase process should be flawless as it involves a financial transaction.
Contactless card Plastic card equipped with an RFID chip	**User/Market Acceptance** This criterion represents the degree to which the user and the different stakeholders are already consenting to accept a technology for payment purposes.
Mobile phone "remote" Mobile phone using a remote network (e.g. GSM, GPRS, UMTS). The payment transactions transit through a mobile network infrastructure. This could be done using SMS, Premium SMS, USSD, WAP.	**Security** Implicit security features (e.g. embedded encryption) and ease of securing the implementation of the technology.
	Flexibility Degree to which the technology can be adapted in many different applications.
	Value proposition improvement Improvement in value a technology could bring to the customer.
Mobile phone "proximity" Mobile phone using proximity networks (e.g. Bluetooth, Infrared, RFID). The payment transactions transit through a locally established wireless network.	**Maturity** Development state of the technology.
	Speed Implicit speed of the technology for payment processes.
	Scalability Ability to grow. Usability in small and large environment.

Organization-based model

This model contains various organization alternatives for mobile payment solutions (Table 3).

As the focus was placed on mobile payments, we asked the experts to evaluate the different alternatives in this context. However, during the interview process, it is quite possible that the experts also unconsciously evaluated the potential of the alternatives to become classic payment service providers. This is acceptable as we also wanted to uncover why and how classic payment service could be threatened by independent and consortium solutions.

Selected alternatives included different settings of actors who could become a mobile payment service provider. The first two alternatives represent the Self-organized solutions (Independent, Consortium) and the three remaining alternatives, the Operator-driven solutions (Financial, Telco, F&T).

We also established an initial list of criteria from numerous comments we collected during previous interviews and from the literature. This was done to accelerate and ease the selection of criteria. As usual, the experts could add or remove any criterion to fit the perspectives they judge as relevant.

Table 3: Organization-based model

Alternatives	Criteria
Independent solution (Independent) This solution is provided by one merchant or an independent alone. Usually, this type of solution is customized for a specific industry (e.g. prepaid cards for public transportation, Galaxy in Lausanne).	**Cost** Profitability for the merchant (financially)
	CRM Performance in terms of customer relationship management
Consortium solution (Consortium) This solution is provided by multiple merchants. The idea is to accept a common payment instrument in partner shops to improve customer relationship and loyalty (e.g. MyOne card in Switzerland).	**Differentiation** Competitive advantage gained with the solution
	Flexibility Capacity to adapt the solution to the needs
Financial institutions solution (Financial) This solution is typically provided by financial institutions such as banks and card companies (e.g. Visa, Mastercard, Maestro, ...)	**Interoperability** Ease of integration with other systems and actor
Telcos solution (Telco) This solution is provided by a single telco (i.e. MNO) or a group of telcos. The telco can charge the consumer using the normal monthly bill (post-paid) or directly debit the prepaid card. Therefore, they can bypass the financial institutions.	**Risk** Financial risk for the merchant
	Scale Number of potential participants and capacity to grow
Financial institutions & Telcos solution (F&T) This solution is provided by one or various financial institutions and telcos. Financial institutions and telcos both have some expertise to share in order to bring a standard to the market (e.g. m-Maestro).	**Security** Perceived security, trust, and privacy from a customer point of view

Results Analysis

Due to the large amount of data collected and results computed, we provide only a selection of relevant illustrations. An alias-mode had to be implemented to anonymize the results, as some companies were sensitive about the information given. Therefore, we identify the experts by numbers in their respective industries. As a reminder, we divided the experts in five groups (i.e. industries): the financial institutions, the mobile network operators (MNOs or telcos), the retailers, the technology providers, and the public transportation companies.

Results for technology preferences

From the results obtained, it is quite clear that card technologies are preferred to phones for payment purposes. The general ranking obtained with WSM shows that cards, especially smartcards and contactless cards, are preferred (Table 4).

Table 4: Rankings of the different industries

All Actors	Financial institutions	Mobile telcos
1. Smartcard (3.8 / 5)	1. Smartcard (4.2 / 5)	1. Money (3.7 / 5)
2. Contactless (3.6 / 5)	2. Contactless (3.5 / 5)	2. Contactless (3.6 / 5)
3. Money (3.5 / 5)	2. Magnetic (3.5 / 5)	3. Smartcard (3.5 / 5)
4. Magnetic (3.3 / 5)	4. Money (3.2 / 5)	4. Phone-Remote (3.1 / 5)
5. Phone-Remote (2.8 / 5)	5. Phone-Remote (2.5 / 5)	4. Magnetic (3.1 / 5)
6. Phone-Promixity (2.7 / 5)	6. Phone-Promixity (2.5 / 5)	6. Phone-Promixity (3.0 / 5)
Retailers	**Technology providers**	**Public transportation**
1. Money (4.1 / 5)	1. Contactless (4.1 / 5)	1. Contactless (3.5 / 5)
2. Smartcard (3.8 / 5)	2. Smartcard (3.9 / 5)	1. Smartcard (3.5 / 5)
3. Magnetic (3.5 / 5)	3. Money (3.5 / 5)	3. Money (3.3 / 5)
4. Contactless (3.2 / 5)	4. Magnetic (3.3 / 5)	4. Magnetic (3.1 / 5)
5. Phone-Remote (2.8 / 5)	5. Phone-Remote (3.1 / 5)	5. Phone-Promixity (2.9 / 5)
6. Phone-Promixity (2.5 / 5)	6. Phone-Promixity (2.6 / 5)	6. Phone-Remote (2.6 / 5)

Some results need to be commented on as they reflect very well the current status of the Swiss market. In general, the smartcard and contactless cards have a high ranking. The position of the smartcard can be confirmed by the shift from magnetic cards to more secure cards. Concerning the contactless card situation, it is more surprising as there are not any national payment schemes proposing contactless cards. This might be a weak signal that the market will slowly move toward the contactless cards scheme, especially with the support of the technology providers and the public transportation companies. This can be logically explained as there are already many successful contactless payment schemes in the world such as Octopus in Hong Kong (Poon and Chau, 2001) and Suica in Japan. Moreover, card companies (Visa, Mastercard, and American Express) are already issuing contactless cards in other countries.

Phone-based solutions remain in last position of most industry rankings. This could be explained as mobile phone-based payment schemes are still in a very early stage of development. There is still progress to be made in terms of ease of use, cost, reliability, and user / market acceptance (i.e. awareness). However, phone-based schemes already perform well in terms of flexibility and value proposition improvement. The three national mobile network operators consider value proposition improvement to be an important aspect, which explains why they believe that mobile phones have some future as a payment instrument.

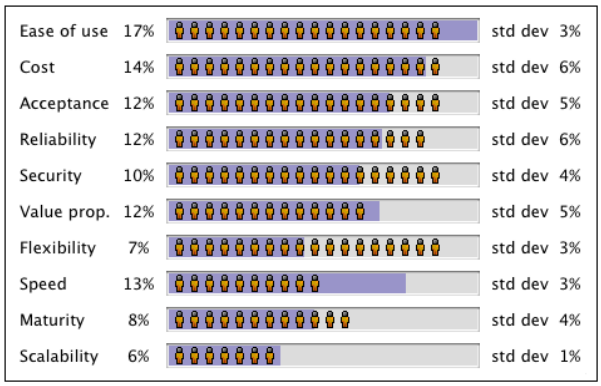

Figure 1: The average weights comprising all the experts – technology

Figure 1 shows the average priorities of all the experts. As the experts did not all use the same criteria, each "person icon" represents one expert. Due to the low standard deviation and the relatively high weight, we can state that the ease of use seem to be very important for all the experts. The standard deviations are generally rather small and there are not many differences between the industries.

For the financial institutions, smartcards perform quite well compared to mobile phones. This reflects well their current position on the market. In fact, financial institutions are replacing their magnetic cards with smartcards (see Figure 2). This proximity map comprises the financial institutions and the technology alternatives. The logic is that the closer an actor is to a technology, the better preferred is the technology. The proximity maps only approximate the distances. However, in general, this map represents relatively well the preferences of the financial institutions towards the different possible technologies for payment solutions.

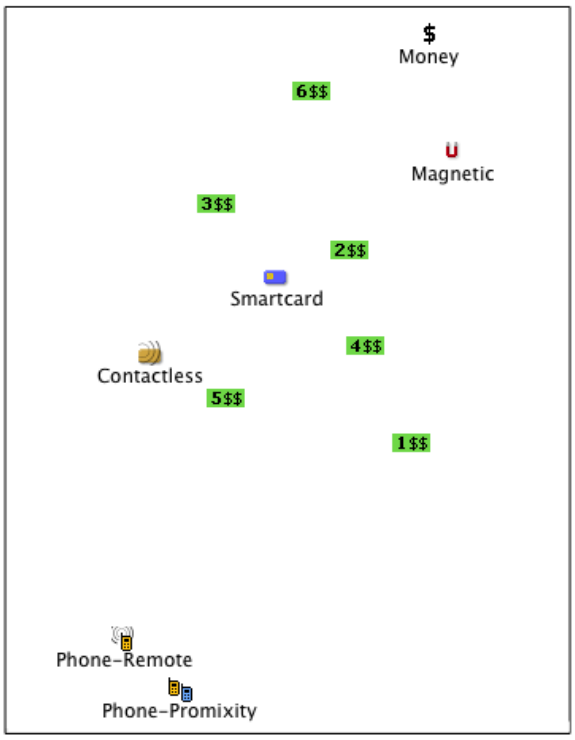

Figure 2: The proximity map of the financial institutions – technology

On their side, retailers still evaluate money as a very good payment instrument. Experts working for retailers among others estimated that money was easy to use, well accepted, cheap, reliable, and mature.

Results for organizational preferences

In terms of the preferences concerning the potential actors involved in a mobile payment solution, none of the alternatives stand out clearly. The active participation of financial institutions is likely to be preferred for the development or implementation of a payment system (Table 5). On the other side, a Telco solution seems to be one of the least preferred alternatives. However, if the telcos collaborate with financial institutions (i.e. F&T), the payment solution is more likely to be preferred.

Table 5: Rankings of the different industries

All Actors	**Financial institutions**	**Mobile telcos**
1. Financial (3.4 / 5)	1. F&T (3.4 / 5)	1. F&T (4.3 / 5)
2. F&T (3.3 / 5)	2. Financial (3.3 / 5)	2. Financial (3.5 / 5)
2. Consortium (3.3 / 5)	3. Consortium (3.1 / 5)	3. Consortium (3.2 / 5)
4. Independent (3.1 / 5)	4. Telco (2.8 / 5)	3. Telco (3.2 / 5)
5. Telco (2.9 / 5)	5. Independent (2.7 / 5)	5. Independent (2.7 / 5)
Retailers	**Technology providers**	**Public transportation**

1. Independent (3.9 / 5) 2. Consortium (3.3 / 5) 3. Financial (3.2 / 5) 3. F&T (3.2 / 5) 5. Telco (3.1 / 5)	1. Consortium (3.7 / 5) 2. Financial (3.3 / 5) 3. Independent (3.0 / 5) 4. F&T (2.9 / 5) 5. Telco (2.7 / 5)	1. Financial (3.5 / 5) 2. Consortium (3.3 / 5) 3. Independent (3.1 / 5) 4. Telco (2.7 / 5) 5. F&T (2.6 / 5)

One very interesting result is the ranking similarity between the experts working for the financial institutions and the telcos. They have exactly the same ranking. Moreover, they seem to both agree that collaboration between them is the preferred alternative. This could mean that both groups of experts are likely to collaborate instead of competing. However, Financial remains the preferred alternative on average. This explains why banks are very important actors for the development of mobile payments in Switzerland. However, the other groups (retailers, public transportation companies, and technology providers) do not seem to agree much on the other alternatives. F&T performs quite badly and they seem to prefer solutions that are organized by merchants or independents, while Financial is still considered to be a good alternative. This situation seems to be well aligned with the reality of the current market.

In line with the previous results of WSM, the outranking graph of the three national mobile network operators obtained with ELECTRE I by consensus (Bui and Jarke 1984) shows that telcos would prefer the F&T alternative to Telco or Financial (Figure 3). As a reminder, an arrow from alternative A to alternative B means that A is significantly preferred to B. Moreover, no arrow between two alternatives means that the alternatives are not comparable as they have not enough benefits and too many drawbacks to be preferred to one another. The alternatives that are not outranked belong to a kernel (in our case: F&T, Independent, Consortium) of the best potential alternative. At this stage, it is not possible to state which alternative is best (only a group of best alternatives, if there was a choice to make between two or more alternatives).

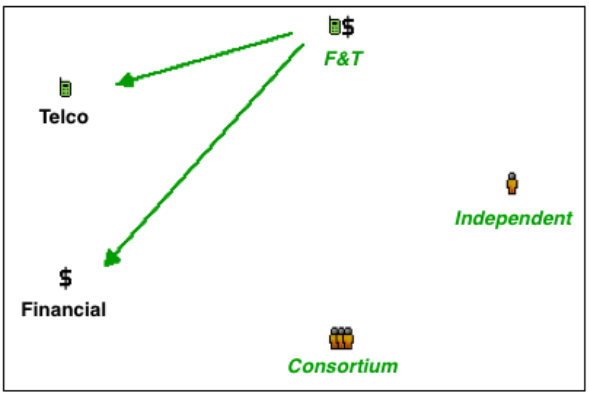

Figure 3: The common outranking graph of the telco – organization

Figure 4 shows the percentage of experts having an outranking relation between two alternatives. The table must be read horizontally. For example, 12% of the experts obtained an outranking relation for Independent versus Consortium. In other words, 12% of the experts prefer significantly Independent to Consortium and 35% of the experts have an opposite preference.

	Independent	Consortium	Financial	Telco	F&T
Independent	-	12	0	12	12
Consortium	35	-	12	24	18
Financial	6	0	-	47	53
Telco	6	12	29	-	29
F&T	0	6	29	53	-

Figure 4: The percent of outranking relations – organization

Figure 5 shows that cost is the most important criterion. The other criteria are almost equally important, except differentiation considered as less crucial to evaluate mobile payment service providers.

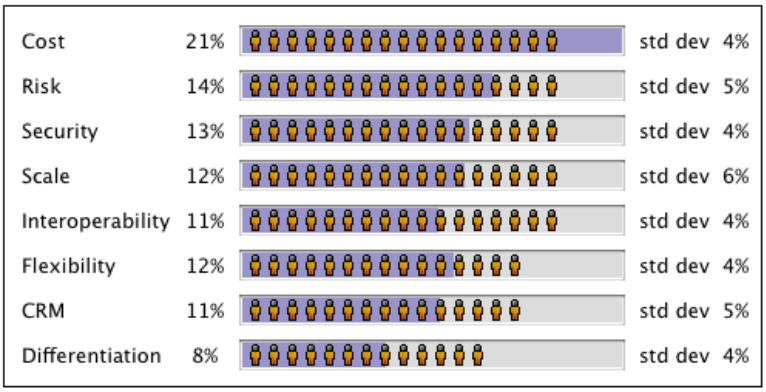

Figure 5: The average weights comprising all the experts – organization

To explain the generally good performance of the financial alternative, most experts evaluated the criteria risk, scale, and security as excellent or good. The Independent alternative was very well evaluated by the retailers. This preference could be explicated by the positive evaluations for cost, interoperability, flexibility, differentiation, and CRM. Some retailers have issued their own payment scheme (e.g. Ikea card) and some joined a consortium (e.g. MyOne). A large merchants' base accepting the solution is very important in order to benefit from economies of scale and network externalities.

Other experts do not seem to agree on the cost of an independent solution (Figure 6). This disagreement could be again explained by the fact that these retailers have enough customers and stores to benefit from economies of scale. Moreover, the commission merchants have to pay to the financial institutions is a recurrent issue. This could be the reason why retailers would be likely to design their own payment schemes or participate in a consortium with other merchants.

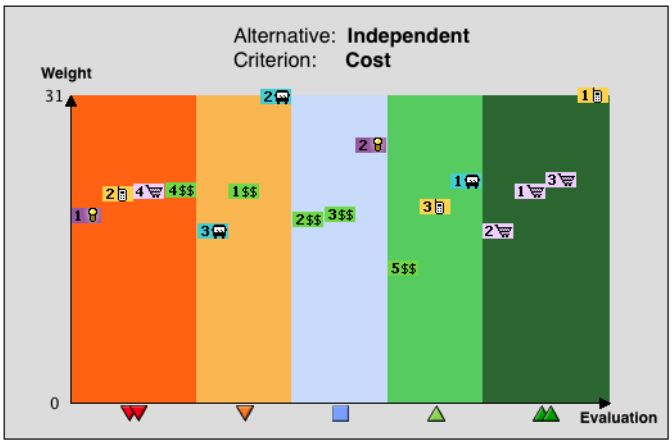

Figure 6: The cost for independent – organization

An obvious reason could explain why the Telco alternative is not performing well: Telco are not currently seen as payment services providers in Switzerland. The general knowledge concerning their capabilities in this business area is rather limited. To illustrate this unfamiliarity, Figure 7 shows that experts did not agree on security. Flexibility, risk and interoperability are also subject to disagreements. It is quite interesting to mention that in Japan and South Korea (Shin and Lee 2005), telcos are the major actors in the mobile payment market. The local market structure probably plays a great role in each country.

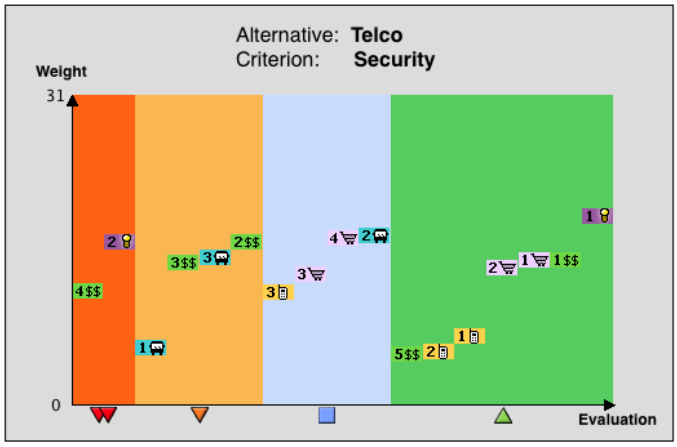

Figure 7: The security for Telco – organization

Conclusions and Discussion

Our structured approach helped us confirm current trends and unveil several preference conflicts that hindered the development of mobile payments in Switzerland. Moreover, the tool we developed for this study greatly enhanced the analytic and visualization processes. It also helped us collect the data and insert them in the model during the interviews. Its real-time computing capabilities also improved the interaction with the experts.

Kreyer et al. (2003) proposed four types of relevant mobile payment scenarios (i.e. m-commerce, e-commerce, stationary merchant, and C2C scenarios). For our study, we did not particularly focus on a type of mobile payment scenario. When we asked the experts to evaluate different technologies, we did not provide them a specific context of purchase. The objective was to analyze the technologies in general for mobile payments, even though the experts were certainly influenced by their respective backgrounds. This could be considered a limitation as no focus could create ambiguity on the subject of study and experts would have to make tradeoffs for their evaluations. However, all the experts selected the criterion "flexibility". This criterion was used to measure if a technology could be used efficiently in the various payment scenarios proposed by Kreyer et al. (2003).

Conclusions for technology preferences

In terms of technology, the results show that card-based systems remain preferred from an industry point of view. Moreover, in Switzerland, money (i.e. cash) continues to perform quite well which might delay the deployment of e-/m-payment schemes. Swiss consumers still prefer to use cash for most of their purchases and retailers do not seem to be against this situation. Some experts working for the retailers calculated the cost of money. They obtained a cost of 0.2% of the purchase amount, as a consequence of optimal business processes (mostly concerning money handling). Compared to the commissions collected by the financial institutions (for credit cards, varying between 2% to 4%) and due to the low profit margin of the retailers on many goods, this preference could be justified. Nonetheless, mobile phones are still seen as a natural evolution of the current payment instruments.

Conclusions for organizational preferences

In terms of organizational preferences, the situation is not as clear for determining the dominant actors who would lead mobile payments solutions in the future. Some weak signals indicate that self-organized solutions should not be underestimated. As financial institutions and telcos seem to move quite slowly, it gives the opportunity for newcomers to enter the market with fast reaction time and good flexibility. Start-up companies with a good product could bring together the actors they need (i.e. financial institutions and telcos) and impose themselves as the de facto standard in the Swiss market. However, with the clout of the Swiss banks and telco, newcomers are likely to work more in a collaborative than a competitive mode. However, a clear motivation is to be the first to propose an open standard. The first mover advantage is important for many business aspects such as staying in control of the payment solution.

All the experts believe that collaboration would lead to the best solution. In fact, most of the experts already know each other and some are already working together. Collaboration seems to be unavoidable for a standard to emerge.

Discussion

As we demonstrated in this study, there are still disparities and disagreements between industries and experts. However, there is hope that collaboration is possible. The development of mobile payments is not currently seen as a priority for most of the companies interviewed. However, with upcoming technologies such as NFC, many experts have great expectations concerning the new mobile services they could offer to their customers (payment, couponing, and ticketing).

The market is still at an early stage of development. Experts from different industries are already working on their next payment scheme and mobile payments seem to be in their plans. In terms of technologies, the current trend shows that cards are preferred. With the arrival of NFC, this situation might change. Our further research will add NFC in our model to see how market preferences react to it. Therefore, we might be able to predict if NFC would be a disruptive technology in the Swiss market. Furthermore, to overcome one of the limitations of our research, we strongly believe that studying consumer preferences towards new payment systems is needed in order to improve the current understanding of the mobile payments development in Switzerland.

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