STAKEHOLDERS' EXPECTATIONS: THE CASE OF MOBILE PUBLIC TRANSPORT TICKETING IN SWEDEN

Apanasevic, Tatjana, Wireless@KTH, KTH Royal Institute of Technology, Electrum 229, 16440, Kista, Sweden, tatjanaa@kth.se

Markendahl, Jan, Wireless@KTH, KTH Royal Institute of Technology, Electrum 229, 16440, Kista, Sweden, janmar@kth.se

Arvidsson, Niklas, Department of Industrial Economics and Management, KTH Royal Institute of Technology, Lindstedtsvägen 30, 10044, Stockholm, Sweden, niklas.arvidsson@indek.kth.se

Abstract

One of the main areas of mobile payment application in Sweden is mobile public transport ticketing. The main stakeholders involved in this service are mobile network operators, mobile payment service providers, SMS ticket's "technology solution" providers, public transport companies, and consumers.

Traditionally, mobile operators have had a strong position in this niche since the mobile phone bill or pre-paid subscriptions were used for end-user billing. Due to financial regulation, this situation was changed in February 2013 when new SMS payment solutions were introduced for all public transport companies in Sweden. A number of new actors entered the scene, and the position of existing actors changed dramatically. At the same time, the Swedish mobile operators formed a joint venture, 4T Sweden, offering a new mobile payment solution – WyWallet.

The main focus of this paper is on the change of expectations of different stakeholders taking part in provisioning of SMS payment services. Analysis has been performed by comparison of the initial expectations before the introduction of the new SMS payment system and the real outcome in approximately half a year time. Analysis revealed the fact that expectations of a number of stakeholders about mobile payment services did not come true. Moreover, due to barriers set by the mobile payment solution, mobile payment transactions in public transportation is dramatically lower than what SMS payments were before the market changed.

Keywords: Mobile Payment Services, Public Transport, Public Transport Ticketing, m-Ticketing, SMS ticketing, Consumer Expectations of a Service, Stakeholders' Expectations.

1   Introduction

One specific characteristic of the Swedish public transportation system relates to its fragmentation. There are separate public transport companies operating in different regions of Sweden: StorStockholms Lokaltrafik (SL, in Stockholm), Upplands lokaltrafik (UL, in Uppsala), Östgötatrafiken (Linköping/Norrköping), Västtrafik, and Skånetrafiken. A lack of cooperation between them has resulted in different transport rules, different prices, and diverse types of ticket systems. Due to the specifics of the public transportation and the lack of unified solutions, the results of this research study cannot be generalized to another country. The cases in this paper illustrate the current reality in mobile public ticketing and payments in Stockholm and Uppsala. The study addresses the question of how new technologies are adopted by consumers.

Historically, a unified mobile public transport ticketing and payment solution in a form of premium SMS payments was functioning for the whole country for a number of years. The main reason for the introduction of mobile payment services was the goal of cash replacement for single public transport tickets that was pushed by the work environment authority ("Arbetsmiljöverket") and the labour unions. SMS payments were used for purposes of mobile public ticketing until February 2013. The main stakeholders involved in the implementation and deployment of SMS mobile payment services are mobile network operators, smaller mobile payment solution developers focused on SMS payments and tickets for public transport, payment service providers, public transport companies, and consumers.

Public transport companies in Sweden also have a shared plan to increase public transport usage within the five coming years. One route to realizing this objective is to not only to increase the number of trips for ordinary users but also to attract new customers. Today, SL, the public transportation company in Stockholm, has identified the following customer segments:
- *Everyday users* make use of public transport on a daily basis (39% of customers in Stockholm).
- *Changing users* often and easily switch between different means of transport: car, bicycle, and public transport (26% of customers in Stockholm).
- *Car drivers* seldom make use of public transport and most of the travelling is done by car (35% of customers in Stockholm).

The company sees the opportunity to increase the public transport usage by attracting non-frequent public transport users, i,e, attracting the changing users and the car drivers. One of the ways to achieving this could be a simple and easy-to-use payment service that lowers barriers for non-frequent public transport users. A mobile payment service is seen as such a solution because it, additionally, could integrate payments with supportive real-time, location-related information systems on public transportation as well as additional services (e.g. discounts, coupons, and other services).

A number of changes have happened after February 2013 including a change in legislation and introduction of a new mobile payment service using the mobile wallet. This has led to our research questions:
- *How do different stakeholders' expectations on services in public transportation change over time?*
- *Why do expectations of different stakeholders change?*

The objective of this paper is to contribute to a better understanding of expectations and needs of different groups of stakeholders that affect acceptance and use of mobile payment services. In addition, the research is studying driving forces and motivation for travellers to replace one ticketing and payment solution with another. This is illustrated by a situation when one type of payment solution was replaced with another. In the old SMS payment system, there was a clear ecosystem of business actors with clear roles, responsibilities and business models as well as usage by customers. The introduction of the new system resulted in different mobile payment services in different regions,

which led to an increased fragmentation of the market. And actual usage of mobile ticketing in each region decreased by up to 60–70 percent.

In summary, the old mobile payment ecosystem represented a reasonably big "island" of solutions and actors. The new system consists instead of a multitude of smaller "islands", and the total size of the market is much smaller due to decreased usage. In addition, the incentives for both merchants and consumers to use any of these mobile payment solutions are low since they only can be used for a limited number of services. It is difficult or even impossible to use the same solution in several regions and they can often only be used for public transportation services.

We see similarities with other sectors when it comes to adoption of a new technology. In short, technical solutions are developed and tested without taking the business context or user perspective into account. Some examples are from Smart cities and IoT services where the technology works as expected but where the user benefits are low or unclear, and where the business models and roles of actors are very unclear (Markendahl and Laya, 2013). Other examples are NFC services applied for access control or payments and aiming to replace traditional credit cards and access cards. Technically solutions work but provide a very low additional value compared to existing systems (Apanasevic et al., 2014). Hence, the multitude of solutions is a barrier in itself[1].

The paper is organized as follows: the literature review is presented in the next section of the paper. The methodology, data collection methods, research approach, and analytic framework are presented in the third section. Then an overview of findings and the analysis are given. Finally, we discuss different aspects of stakeholders' expectations about mobile payment.

2   Literature Review

Mobile payments have been analyzed from different perspectives. In this section, the literature review is focused on studies dedicated to stakeholders in the mobile payment system and especially to the stakeholders' expectations of the services.

A study that is the most relevant to the current research has been performed by Au and Kauffman (2008). Researchers have developed a theoretical framework for analysis of mobile payment industry and its stakeholders. They specify the following mobile payment stakeholder categories: (i) technology producers; (ii) sellers (merchants) or business intermediaries; (iii) end-users, consumers, buyers; and (iv) government and regulators. In addition, a number of economic theories are incorporated in their model and are related to different stakeholders: (i) *consumer demand and choice* in the process of maximizing utility, and the *technology acceptance model* (TAM) that is common in analysis of "ease of use, usefulness and usage" of mobile payments for consumers; (ii) *network externalities* explaining "value creation in the networked economy"; (iii) *switching costs* of services that are factors explaining customers' loyalty to a brand and their resistance to change the choice of service provider; (iv) *complimentary goods* when increasing demand of one increases demand for the other; (v) *information technology value* that companies sometimes cannot fully achieve; (vi) *economics of technology adoption and diffusion* in the market depends on such aspects as "market structure, firm size effects, when to launch a technology product, and the period for return on investment".

It is possible to specify a big number of empirical studies looking into analysis of factors affecting the acceptance of the mobile payment by consumers applying TAM model and its extensions (Constantiou et al., 2006; Goeke and Pousttchi, 2010; Kim et al., 2010; Shin, 2009; Wu and Wang, 2005). Overall,

---

1 For more example of barriers related to NFC services see: Apanasevic, T., (2013). Factors influencing the slow rate of penetration of NFC mobile payment in Western Europe. In Proc. of the 12th International Conference on Mobile Business (ICMB2013), Berlin, Germany, 10-13 June, 2013.

the contribution of these studies is in identification and quantitative tests of factors affecting the intention to use mobile payments. The most commonly tested factors are perceived ease of use of the service, trust in mobile payment service provider, perceived risks, perceived security, perceived usefulness, and cost of the service. Schierz et al. (2010) identified that the factor "perceived compatibility" of the TAM model has a substantial effect on customer intention to use mobile payment services. Specifically, Finnish researchers (Mallat et al., 2009) were looking into adoption of mobile ticketing and have specified the following factors affecting service adoption: ease of use, perceived usefulness, compatibility, mobility, and use context. In addition, Arvidsson (2013) found that the most important factor explaining whether consumers are likely to use a mobile payment service is ease of use. In addition, relative advantage, high trust, low perceived security risks, higher age, and lower income were associated with a positive view on adopting the service. He also concluded that companies aiming to launch mobile payment services must understand that consumers put high importance on reliability of such services and that trust in services is built via learning process. If consumers learn to use the service, the probability they also start to trust it increases. This means that the launch of services must be designed as learning processes for consumers and merchants.

Mobile payment services can be seen as a platform providing mobile services and bringing together two groups of users: retailers or merchants (as service providers) from one side and customers from another side. These two different groups are linked to each other by the network effect phenomenon and represent a two-sided market (Eisennman et al., 2006). Hence, availability of ubiquitous infrastructure is one of the most critical factors for the wider penetration of an innovative payment solution. In terms of the *theory of network externalities*, mobile payment is an example of "network goods" and deals with an infrastructural dilemma or the "chicken and egg" problem (Van Hove, 1999). On one hand, merchants are not willing to invest in the development of infrastructure without critical mass of consumers while consumers, at the same time, will not adopt mobile payment services if they cannot be used everywhere (Mallat, 2007).

Furthermore, a change of one payment method to another implies *service switching costs*. They affect different aspects of the service like compatibility with existing devices; transaction and economic costs which appear when switching suppliers like new service activation fees; costs of learning to use a new service; uncertainty about the quality of a new service or a brand; and psychological costs of switching (Klemperer, 1995).

However, there has not been many studies addressing problems of organizational technology acceptance when mobile payments are integrated with m-commerce or related areas. Obstacles to the adoption of business-to-business applications using the example of e-markets are explored in works implemented by Johnson (2009; 2010). The author specified the following barriers: risk perception, lack of knowledge, trust, the size of a firm, and readiness of organization to adopt a new service.

One study of expectations of some groups of stakeholders – in this case mainly customers – it that of Lidén and Edvardsson (2003). The authors investigated customer expectations on service guarantees in public transport in Stockholm. The study confirmed that consumer expectations are affected by the situation in the industry, service characteristics, and the service guarantee.

The main contribution of the reviewed literature lies in insights about the expectations of different stakeholders. This was used and applied in the development of our research framework. The reader may argue that most of the related work comes from the years 2005–2009, and that the contribution of the paper should be seen in the light of more recent papers. However, the amount of new studies about mobile payments relevant to our problem remains limited compared to previous years.

3   Methodology

A qualitative method utilizing the multiple case study approach has been used for the research. Hence, the main data collection methods have been interviews, questionnaires, and observations (Eisenhardt,

1989). The selection of a case study approach can be justified by an opportunity to perform analysis on different levels, for example, within case and cross-case analysis (Eisenhardt, 1989; Yin, 1984).

The research is focused on mobile payment services applied in the public transport industry using SL, the public transport company in Stockholm and UL, the public transport company in Uppsala, as cases.

3.1   Data Collection

Interviews with different types of actors dealing with mobile payment services and solutions have been conducted since 2009. The main groups of actors are: (i) public transport companies making use of mobile payment solutions; (ii) providers of mobile payment and ticketing services; (iii) providers of technology solutions (that may also provide services); and (iv) consumers.

The first round of interviews was conducted during 2010–2011. The main aim was to understand the market position and plans of different actors. The results are reported in a study by Markendahl (2011). During 2011, mobile payment solutions, drivers, and obstacles were discussed in-depth with Swedbank, the mobile operators Telia and Tele2, and the payment service providers PayEx and Payair.

In 2012 the second round of interviews was carried out with the aim of understanding: (i) the objective and scope of different pilot projects and trails, (ii) strategies and plans for both solution providers and users of the upcoming "new" SMS payment services. Overall, about 15 interviews were carried out with:
- The regional public transportation companies in Stockholm (SL), Uppsala (UL), Linköping/Norrköping (Östgötatrafiken), and Veolia.
- Providers of mobile payment, ticket and/or security solutions and services: Accumulate, Nets, Payair, PayEx, Samtrafiken, Seamless, Swedbank, Unwire, and WyWallet.

In February 2013, after a change in SMS ticketing for public transportation, around ten interviews were carried out with public transportation companies in the five major cities/regions of Sweden (SL, Västtrafik, Skånetrafiken, UL, and Östgötatrafiken) and with some of the providers of the ticket and payment solutions: IPX, Mobill, PayEx, Samtrafiken, Seamless, and WyWallet.

The interviews with different stakeholders served: (i) to understand their expectations of new mobile payment solution, and (ii) to discuss the outcomes of the new service.

3.2   Focus group discussions

In August 2013 and February 2014, we have collected primary data about consumer attitudes towards existing mobile payment solutions that can be used to pay for public transport tickets. As mentioned, we based these interviews on the customer market segmentation used by SL:
- *Everyday users:* travel by the public transport daily and have a good knowledge about the public transport, its ticketing, and pricing.
- *Changing users:* switch between different means of transport: car, bicycle, and public transport.
- *Car drivers:* mostly travel by car, and seldom use public transport.

Input from consumers has been collected during focus group interviews. According to recommendations on focus group execution (Adams et al., 2007; Morgan, 1996), the following aspects were considered: (i) focus groups were composed of homogeneous people representing the same market segment of users; (ii) the size of each focus group was up to eight people (the segments everyday users and changing users were represented by seven people each, and car drivers by four people); (iii) three researchers participated during the discussions, one was facilitating the discussion and the others were taking notes of important observations; (iv) in addition, the discussion was recorded; (v) discussion time was limited to one hour and a half.

Questions for focus group discussion were developed to reflect the analytic criteria defined in section *3.3 Research Approach and Analysis Framework*. The procedure of the focus group discussions was as follows: (i) in the beginning the moderator briefly presented the research purpose and discussion group aims; (ii) then focus group participants briefly introduced themselves, and (iii) discussion of proposed questions was facilitated. The main discussion points were: (i) attitudes on public transport in general and experiences of SL in particular, and (ii) discussions of ticket and payment solutions including pricing.

3.3 Research Approach and Analysis Framework

To identify expectations of different groups of stakeholders involved in a provisioning of mobile payments, a conceptual framework used by Weinberg and Garnsey (2010) has been adapted and applied for the research purposes. These researchers used the framework to study expectations of different stakeholders participating in mergers and acquisitions of small firms. One of the benefits of the framework is the opportunity to reflect a change of expectations over time.

Main dimensions of the framework have been identified while performing literature review and during interviews with representatives of different stakeholders. The main groups of mobile public transport ticketing stakeholders are mobile network operators, mobile payment service providers, public transport companies, and consumers. In addition, in the case of mobile public transport ticketing, companies participating in the service provisioning represent different sectors: public and private. Expectations of these stakeholders regarding introduction of mobile payment can be discussed as initial research assumptions (see *Figure 1*).

Private sector companies, i.e. mobile network operators and mobile payment providers, operate in a competitive market environment. The analysis of such dynamic and uncertain environments and consequent development of strategies become a background for development of "expectations about future value of strategy" and "strategic resources" (Barney, 1986). The most common expectations of strategy implementation are the following: improved efficiency, uniqueness of a product or provided service, profit maximization, and financial strength (Barney, 1986). Hence, we propose that mobile payment service providers expect a successful application of new technology (*Technology*); an opportunity to attract new consumers (*Growth*); increasing network of merchants accepting the payment with increasing number of consumers (*Network*); and *Return on Investment (ROI)* regarding a developed solution.
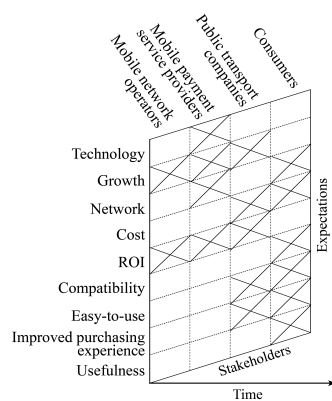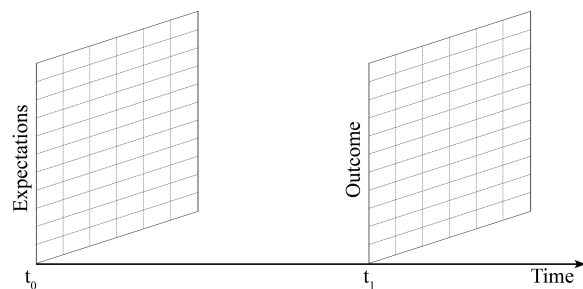

Figure 1.   *Analysis framework.*   Figure 2.   *Snapshots of expectations over time.*

The interviews with mobile network operators have shown that with the help of mobile payment they expect to attract new consumers by increased range of services (*Growth*) and to get additional revenue for provisioning of a communication channel and infrastructure (*Return on Investment, ROI*).

Interviews with the public transport companies have revealed the following expectations: a *growth* of number of public transport users; lower payment transaction fees (*Cost*); *ROI* regarding the integration of a new SMS ticketing solution; an *easy-to-use solution* that does not require too big installation, registration, and learning costs; and *improved purchasing experience* because of a convenient service, a quicker and easier purchasing process, and time-saving on queuing.

Finally, a concept of *customer expectations* can be defined as "pre-trial beliefs about a product … that serve as a standard or reference points against which product performance is judged" (Zeithaml and Parasuraman, 1993). In their article researchers argue that customer expectations of a service exist in two levels: a desired level as a service "should be", and an acceptable level of a service, or an adequate service. "The difference between desired service and the level of service considered adequate" (Ibid) represents the *zone of tolerance* or a range of acceptable service levels.

The expectations of consumer have been identified using results of the previous studies based upon TAM model, theories of *network externalities*, and *switching costs* (Arvidsson, 2013; Au and Kauffman, 2008; Goeke and Pousttchi, 2010; Kim et al., 2010; Mallat et al., 2009). The following criteria have been identified: a developed service infrastructure (*Network*), a small or zero service transaction fee (*Cost*); *compatibility* of the service with handsets; *easy-to-use solution* that does not require too big installation, registration, and learning costs; *improved purchasing experience* because of a convenient service, a quicker and easier purchasing process, and time-saving on queuing; and added value services and functionality of a solution (*Usefulness of service*).

These initial research assumptions about expectation of different stakeholders have been used as a starting point (t_0) and compared against the outcomes of mobile payment solution introduction (t_1), as presented in *Figure 2*. This will allow identifying and comparing a change in stakeholder expectations. Results and findings are presented in the next section of the paper.

4   Findings from Interviews and Focus Groups

4.1   Change of SMS Payment System and Involved Actors

In Sweden, SMS payments were introduced in the public transportation sector more than five years ago. Public transport companies were satisfied with SMS payments as a replacement for cash, and consumers seemed to like and use this solution, although it was more expensive than other ticketing solutions. The solution was provided by mobile network operators in cooperation with SMS service providers. Mobile operators included the payments in mobile phone bills, this can be referred as an "old SMS – operator billing system". Starting from February 2013, due to EU directive, payments for non-telecom services cannot be included in mobile operators' bills (Markendahl, 2013). Currently, in order to perform SMS payments, users have to register for mobile payment service, and to provide personal data. This can be referred as a "new SMS payment system".

The mobile operators formed a joint venture, 4T Sweden, offering a mobile payment service called WyWallet. Operators had a strong belief that WyWallet would take over all SMS payments. Important assets were the customer base and the business relations with merchants, vending machine companies, and public transport companies. However, the public transport companies initiated a public procurement process for the "new SMS payment system".

As a result, new actors entered the scene and got most of the public transport deals. Payment providers like Seamless, PayEx, and Klarna took over end-user billing. Providers of the "technology solution", i.e. to produce, deliver, and validate the SMS ticket itself, include companies like Plusdial, Unwire, and Mobill. After the procurement of the "new SMS payment system", Mobill has a stronger position due to contracts in most of the regions.

After the initial round, contracts in the four major cities in Sweden were awarded to four different mobile payment service provider teams with different solutions. Hence, consumers have to register with different providers in these cities. Initially, WyWallet provided the solution in one region (Skåne), but it does not provide SMS tickets in any region after March 2014.

4.2   Needs of Public Transportation Companies

The main focus of the case is on two public transport companies: SL in Stockholm and UL in Uppsala. We also make use of input from interviews with Östgötatrafiken and Skånetrafiken.

In general, the public transport organisations want to double the usage of the public transport during the next coming five years. In terms of the customer segments, this means that new users should be recruited from the groups called *car drivers* and *changing users*. In order to do this, payment and ticket solutions should be simple meaning low barriers for new users. In addition, to be a cashless solution mobile payment was seen as one way to lower these entry barriers. The interviews with the public transport organisations also revealed a number of other aspects important for the selection of a provider of mobile payment solutions:
- The mobile payment solution should be easy to use for consumers.
- The transaction fees should be reduced from the current 15–20 percent.
- It would be beneficial to use mobile payments not only for single tickets.
- The public transport companies wanted the mobile payment solution to be an integral part of their own payment and ticket solutions in order to maintain the main contact with the own customers. Hence, some companies considered the WyWallet concept as less attractive since the customers needed to register service accounts with another actor, a middleman.

4.3   Consumer Perception of Public Transport

The implemented focus group discussions revealed that all market segments: *car drivers*, *everyday* and *changing users* are mainly satisfied with the performance of the public transport service in general. Customers consider public transport as a reliable service with buses and subway mainly being on time. Online and mobile tools are used for a travel planning, checking schedules, and finding real-time information about transport situation.

Focus group discussions helped to identify some essential problems. So, the respondents expect more flexible ticket pricing for *changing users* and *car drivers* travelling on short distance and more convenient SMS ticketing. The *everyday users* are unsatisfied with a lack of more flexible ticketing solutions for longer periods – around 15–20 days. They also found the ticket's price too high.

Previously, the prepaid paper strip (*remsa*) was used but now this solution is replaced by the pre-paid plastic contactless "blue card" (SL Access card). The paper strip, however, was seen as very good solution by the travellers in our study:
- It was clear how many coupons that were used and how many trips that could be done.
- It could be used by several persons at the same time, e.g. a family.
- It could easily be used for travels over different zones using different number of coupons.

The new pre-paid solution, where money are loaded on the SL Access card (*reskassa*), is perceived as a bad solution in all aspects mentioned above, even though the remaining amount of money can be checked at ticketing machines and bus readers. The only advantage of this solution is an opportunity to pass subway gates and readers at buses quicker.

Summing up, the current system is inconvenient for the users. In addition, the current system is not flexible and hard to understand for consumers. This leads to consumer dissatisfaction and low loyalty in the segment of *changing users*.

4.4   Consumer Perception of New SMS

The introduction of the "new SMS payment system" has received a lot of criticism from consumers used to the old SMS billing system. The main comments are about confusion caused by the multitude of providers, the need to register new accounts and to provide personal data for micro-payments. As a result, there is a significant drop in sales of SMS tickets of up to 60–80 percent. Another disadvantage of the solution is a need to purchase a SMS ticket in advance because consumer identification takes some time. So, before the introduction of the "new SMS payment system", SMS tickets constituted for about 5–10 percent of the overall amount of sold tickets, after the introduction the share dropped down to 1–2 percent.

Hence, the new SMS ticketing sets additional barriers to an increased use. This solution is perceived as bad, too complicated, user-unfriendly, and inconvenient. Such criteria as convenience, ease of use, price, and value are currently unsatisfactory and result in negative consumer experience. In order to increase the use of the new SMS ticketing and mobile payment service, it should be less complicated.

At the same time as the SMS payment system was changed, other changes in the payment and ticketing systems were introduced. As mentioned above, SL replaced the prepaid paper strip with a contactless card. UL introduced credit card payments for single tickets at city buses. Hence, the new SMS payment system requiring some additional effort more or less "competed" with other payment solutions. The barrier to register for the new SMS payment system was seen as larger than the barriers associated with the other new solutions. Only one person in the focus groups had registered for the new SMS payment solution, a car driver who found it very complicated to register and use.

5   Analysis of Stakeholders' Expectations

Time point t_0 can be defined as the time of expectations before the introduction of the "new SMS payment system", and t_1 is a moment approximately half a year after its introduction. Changes in stakeholders' expectations over time are illustrated in *Figure 3*. According to the description of actors involved in mobile ticketing provisioning (section 4.1), stakeholders in the mobile payment provider group should be classified into three sub-categories:
- The mobile operators and their joint venture company, 4T Sweden, which did overtake the mobile network operators' business within mobile payments.
- The new mobile payment and end-user billing service actors (Seamless, PayEx, and Klarna).
- The SMS ticket's "technology solution" providers (Plusdial, Unwire, and Mobill).

All expectations of the new payment providers (Seamless, PayEx, and Klarna) seemed to be successful. They entered the SMS payment market and took over end-user billing. By doing so, these actors have totally replaced mobile network operators.

Actors providing the SMS ticket's "technology solution" (Plusdial, Unwire, and Mobill) remained the same. However, their market position has dramatically changed: Unwire has lost the big contract with SL; Plusdial still has some contracts; and Mobill has strengthened its position. However, due to the substantial decrease in SMS payment market, it is difficult to say if Mobill is a winner or not. Hence, it is possible to define a change of expectations about the *growth*, development of the *network*, and *ROI*.

As discussed, when switching from the "old SMS – operator billing system" to the "new SMS payment system", mobile network operators and WyWallet did not manage to keep the SMS payment business and their dominating position. After the public procurement process of the new payment services, they were more or less excluded from the service provisioning for public transport.

The expectations of 4T Sweden to overtake SMS payments proved to be wrong. The WyWallet solution was initially used only in one region and from March 2014 it is not used anywhere. Hence, the initial expectations about *growth* of consumer base and network of merchants accepting the mobile

payment solution did not come true. Due to unwillingness of consumers to use the service, expectations about quick *ROI* have not proved to be successful.
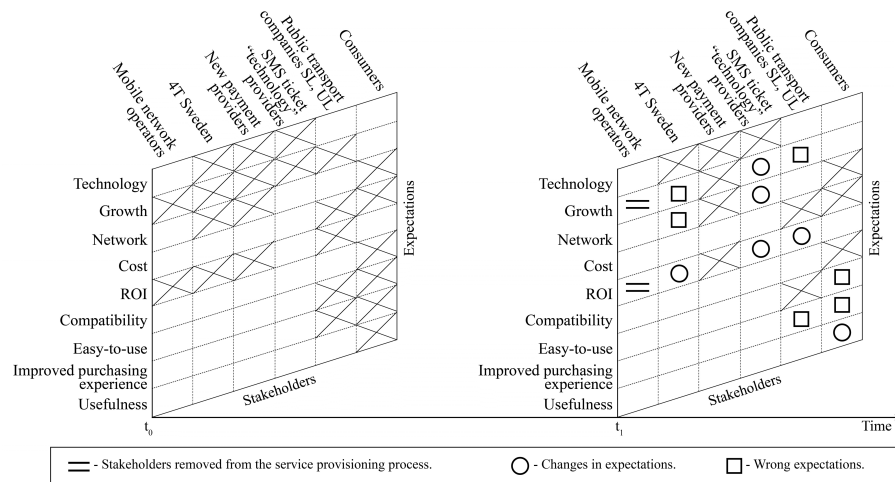

Figure 3. *Snapshots of expectations of stakeholders involved in mobile public transport ticketing over time.*

The public transport companies – SL and UL – have not got an expected *growth* in number of users because of the introduction of a new system, which supposed to be simple and user-friendly. Expectations about *ROI* of the integration of the "new SMS payment system" have not really proved. Drop in SMS ticket sales showed that mobile ticketing does not *improve purchasing experience* but rather becomes a barrier for consumers.

Consumers regard the WyWallet service as too complicated and not user-friendly (not *easy to use*). Indeed, WyWallet requires a separate service account and provisioning of personal data. Meaning, that purchasing of SMS tickets cannot be spontaneous and requires time to set the service for usage. In addition, a SMS ticket should be bought in advance, because the registration of the ticket in the data base takes time. Being so complicated, it does not provide *improved purchasing experience* and additional value services to users. So, there are doubts about *usefulness* of the solution: some consumers prefer using alternative ticketing solutions that are much simpler and a bit cheaper.

6   Discussion

Expectations of different stakeholders involved in mobile payment services and change of these expectations were illustrated using the case of mobile public transport ticketing implemented in Sweden. The expectations of stakeholders related to the introduction of the "new SMS payment system" were compared to the practical outcomes.

The analysis of expectations led us to conclude that the practical experience of mobile payment use has been disappointing, and a number of expectations of different stakeholders did not come true. The introduction of the "new SMS payment system" resulted in elimination of the mobile network operators from the service provisioning. In addition, the expectations of 4T Sweden to overtake SMS payments did not come true. Expectations of the new mobile payment providers seem to come true. However, there is a change in expectations of the technology providers due to lost contacts and reduced SMS payment market.

At the same time, the "new SMS payment system" does not help to attract more public transport users, and, by this, does not serve the purposes of the public transport companies. The complicated service was rejected by consumers. Most selected to choose alternative ticketing solutions instead.

According to the initial expectations, mobile payment were supposed to be simple and enhancing consumer experience of the service. However, in practice, it created additional barriers for service use. In order to lower the barrier, the service should be simplified. In addition, it should be oriented to the needs and expectations of consumers by provisioning of additional services like micro-payments, discounts and coupons, access and informational services. This type of user-friendly solution would increase the level of mobile payment penetration and number of users interested in the service.

There are a number of reasons explaining the change in expectations of stakeholders. First of all, some changes were predetermined by the external market environment and could not be controlled by market actors. These are changes in regulation and legislation. Another reason that could be specified is pushing consumers to use the service and to provide personal data. Finally, there is an unsuccessful realization of the solution that consumers perceived as too complicated in comparison to the "old SMS – operator billing system". Everything resulted in a reduced SMS payment market.

7   Conclusions

The purpose of this paper is to analyse and track a change of expectations of different groups of stakeholders taking part in provisioning of mobile payment solutions applied in public transportation industry. The identified stakeholders are mobile network operators, mobile payment solution providers, public transport companies, and consumers.

Our analysis has shown that expectations of a number of stakeholders about mobile payment were not fulfilled or have changed. So, mobile network operators were excluded from the service provisioning, the joint mobile operators' company, 4T Sweden, did not succeed in keeping the dominant position in the market. Some of the expectations of the technology providers did not come true. Expectations of public transport companies to increase the public transport usage have not been met. Finally, consumers do not accept the service. Only the expectations of the new mobile payment providers that entered the market seem to come true.

Overall, it is possible to state that mobile payment services have not met the expectations of stakeholders. Moreover, due to barriers set by mobile payment solution, the SMS payment market has dramatically decreased. However, user-friendly and easy-to-use solution developed keeping consumer needs in minds and integrated with additional value services may increase the level of mobile payment penetration and acceptance.

The major contribution of this paper lies in the attempt to track a change of expectations of different groups of stakeholders taking part in mobile payments. Another contribution is in addressing a new under-researched area of driving forces and motivation for travellers to use one or another ticketing and payment solution.

The major limitation of the paper is in limiting the analysis of mobile application to only one industry's sector. This limitation could influence the estimation of common trends and generalization of the research results. However, this led to a separate paper focused on mobile payment services applied in retail industry in Sweden by two of authors. Another limitation is a small sample of respondents and a small number of focus group discussions. This could affect and bias the results.

The paper presents initial results of preparatory work for future research. These results were discussed with representatives of public transport companies (i.e. SL, UL, Östgötatrafiken, and Skånetrafiken). Moreover, the results support findings of these companies. The future work would be focused on consumer acceptance and perception of the mobile payment service and further implementation of focus group discussions with SL and UL consumers. Another domain of future work is analysis of a bigger number of mobile payment use cases in other sectors like retailing and parking. This will give a bigger picture of stakeholder expectations of mobile payment.

8   Acknowledgment

References

Adams, J., Khan, H.T.A., Raeside, R., White, D., (2007). Research methods for graduate business and social science students. Sage: New Delhi.

Apanasevic, T., Popescu, R., and Markendahl, Jan, (2014). An adoption of NFC services using mobile phones – Initial findings from practical user tests. In Proc. of the 3d Cashless Society Roundtable, May, Stockholm

Apanasevic, T., (2013). Factors influencing the slow rate of penetration of NFC mobile payment in Western Europe. In Proc. of the 12th International Conference on Mobile Business (ICMB2013), Berlin, Germany, 10-13 June, 2013.

Apanasevic, T., Popescu, R., and Markendahl, Jan, (2014). An adoption of NFC services using mobile phones – Initial findings from practical user tests. In Proc. of the 3d Cashless Society Roundtable, May, Stockholm.

Arvidsson, N. (2013). Consumer attitudes on mobile payment services – results from a proof of concept test. International Journal of Bank Marketing, 32(2).

Au, Y.A. and Kauffman, R.J. (2008). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application. Electronic Commerce Research and Applications, 7 (2), 141–164.

Barney, J.B. (1986). Strategic factor markets: Expectations, luck, and business strategy. Management Science, 32 (10), 1231-1241.

Constantiou, I.D., Damsgaard, J., and Knutsen, L. (2006). Exploring perceptions and use of mobile services: user differences in an advancing market. International Journal of Mobile Communications, 4 (3), 231-247.

Eisenhardt, K.M. (1989). Building theories from case study research. The Academy of Management Review, Vol. 14 (4), (Oct., 1989), pp. 532–550.

Eisennman, T., Parker, G., and Van Alstyne, M.W., (2006). Strategies for two-sided markets. Harvard Business Review, Vol. 84 (10), pp. 92–101.

Goeke, L. and K. Pousttchi. (2010). A scenario-based analysis of mobile payment acceptance. In: Proceedings of the Ninth International Conference on Mobile Business / Ninth Global Mobility Roundtable, 2010.

Johnson, M., (2009). Barriers to innovation adoption: A study of e-markets. Industrial Management and Data Systems, Vol. 110 (2), pp. 157–174.

Johnson, M., (2010). Industrial e-market adoption: an exploratory study of organizational change issues. International Journal of Business Innovation and Research, Vol. 4 (6), pp. 535–559.

Kim, C., Mirusmonov, M., and I. Lee., (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, Vol. 26, pp. 310–322.

Klemperer, P., (1995). Competition when consumers have switching costs: an overview with applications to industrial organization, macroeconomics, and international trade. The Review of Economic Studies, 62 (4), 515-539.

Li, X.(R.), Lai, C., Harrill, R., Kline, S. and Wang, L. (2011). When east meets west: An exploratory study on Chinese outbound tourists' travel expectations. Tourism Management, 32, 741-749.

Lidén, S. B. and Edvardsson, B. (2003). Customer expectations on service guarantees. Managing Service Quality, 13 (3), 338-348.

Mallat, N. (2007). Exploring consumer adoption of mobile payments – A qualitative study. Journal of Strategic Information Systems, 16, 413-432.

Mallat, N., Rossi, M., Tuunainen, V.K., and Öörni, A. (2009). The impact of use context on mobile services acceptance: The case of mobile ticketing. Information and Management, 46, 190-195.

Mallat, N. and V.K. Tuunainen. (2005). Merchant adoption of mobile payment systems. In: Proceedings of the International Conference on Mobile Business (ICMB'05), 347–353.

Markendahl, J. (2011). Mobile Network Operators and Cooperation – A Tele-Economic Study of Infrastructure Sharing and Mobile Payment Services. PhD thesis, KTH Royal Institute of Technology, Stockholm.

Markendahl, J. (2013). Change of market structure for mobile payment services in Sweden – The case of SMS tickets. In Proc. of the 12th ICMB (International Conference on Mobile Business), Berlin.

Markendahl, J. and Laya, A., (2013). Business challenges for Internet of Things: Findings from e-home care, smart access control, smart cities and homes. In Proc. of the IMP 2013 Conference, Atlanta.

Morgan, D.L., (1996). Focus groups. Annual Review of Sociology, Vol. 22, pp. 129–152.

Schierz, P.G., Schilke, O., and Wirtz, B.W. (2010). Understanding consumer acceptance of mobile payment services: An empirical research. Journal of Electronic Commerce Research and Applications, 9 (3), 209-216.

Shin, D., (2009). Towards an understanding of the consumer acceptance of mobile wallet. Computers in Human Behavior, Vol. 25 (6), pp. 1343–1354.

Van Hove, L. (1999). Electronic money and the network externalities theory: lessons for real life. Netnomics, 1, 137-171.

Weinberg C., T. Minshall and E. Garnsey (2010). Small firm expectations from Acquisition in the ICT industry: A conceptual framework for stakeholder analysis. Is a part of: New technology-based firms in the New Millennium. (eds. Oakey R., Groen A., Van Der Sijde P., and Cook G.). Emerald Group Publishing Limited, 8, 111-132.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1993). The nature and determinants of customer expectations of service. Journal of the Academy of Marketing Science, 21 (1), 1-12.

Yin R., 1984. Case study research. Beverly Hills, CA: Sage Publications.

Wu J. and Wang S., (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. Information and Management, Vol. 42 (5), pp. 719–729.