Challenges Related to the Introduction of Innovative Services in the Market

Mobile Payment Services in the Swedish Retail Industry

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Abstract

Mobile payment services are expected to be the next step of the electronic payment evolution. However, the level of penetration in European countries is lower than expected. The focus of most academic research has been in two main areas: (i) mobile payment adoption by consumers and (ii) technical aspects of the service. Consequently, a number of themes remain under-researched. In order to expand knowledge on reasons that affect the wider penetration of mobile payments, challenges related to the introduction of mobile payment services in the market have been explored in this thesis.

More specifically, this research has addressed two problem areas: (i) why mobile payments have not been widely adopted by merchants; and (ii) what effects that the introduction of mobile payments has had on the business networks of the involved actors. As an example, we use the mobile payment services applied in the Swedish retail industry. The study is focused on the main groups of stakeholders – the mobile payment providers, the retailers, and the consumers.

First, this study has helped to identify what different stakeholders expect of mobile payments and how these services correspond to their needs. In order to analyse the expectations of stakeholders, we have developed an analysis framework based on the theory of diffusion of innovations, the Technology Acceptance Model (TAM), and the theory of network externalities. The analysis highlights the expectations of stakeholders and helps to understand what kind of mobile payment service merchants expect and are willing to adopt. One key finding is that existing mobile payment services for retailing could be further improved in order to ensure an enhanced purchasing process for consumers.

Second, the research has explored the impact of mobile payment services on the business networks. In order to analyse the relationships and cooperation between business actors, and changes in business strategy and network structure, we used the approach proposed by the Industrial Marketing and Purchasing (IMP) Group. The performed analysis illustrates the following changes in the structure of business networks for the traditional payment solutions (bank cards): (i) emergence of new business actors (i.e. independent mobile payment providers); (ii) new roles and activities of business actors; and (iii) exclusion of traditional business actors (i.e. banks) from the mobile payment systems.

All these changes lead to increased complexity of relationships and increased level of interdependence between business actors within the networks. The following changes in the strategies of involved actors have been identified: (i) mobile payment providers seek to achieve a control over the business network; (ii) the retailers affect strategies of the mobile payment providers; (iii) the marketing strategies of business actors include cross-

marketing in different sectors. All these changes result in additional value and enhanced quality of service for consumers.

In order to analyse a complex and multidisciplinary area such as mobile payments, it is beneficial to use more than one analysis approach. A combination of different complementing methods helps to explore different aspects of the phenomenon and provides a more comprehensive overview of several research aspects.

This work contributes to the academic research of mobile payment service adoption by merchants through proposing a theoretical analysis framework. More specifically, the research addresses a new area – expectations of retailers when new solutions are introduced. The framework consists of the following criteria and aspects: technological feasibility, economic benefits, lower service costs, added value of services, network externalities and the problem of critical mass, and finally, ease of use. This framework helps to identify what merchants can expect of mobile payment services.

Another area of contribution is the analysis of the effect that mobile payments make on the actors and business networks of traditional payment services. The introduction of new services results in emergence of new business actors, a need to establish new relationships, and increased complexity of a business network. Moreover, in order to succeed, cooperation between all network actors is needed. As a result, business actors have to adjust their services and strategies according to needs of others.

Sammanfattning

Mobila betalningstjänster förväntas bli nästa steg i utvecklingen av elektroniska betalningar. Användningen av mobila betalningar i Europa är dock lägre än förväntat. Fokus i den akademiska forskningen har legat inom två huvudområden: (i) användning och spridning av mobila betalningar bland konsumenter, och (ii) tekniska aspekter av tjänsterna. Följaktligen är det flera områden som förblivit tämligen outforskade. För att öka kunskapen om orsakerna till den begränsade användningen av mobila betalningar så har olika utmaningar för införande av mobila betalningar undersökts i denna avhandling.

Forskningen har inriktats på två frågeställningar: (i) varför mobila betalningslösningar inte har blivit brett spridda bland olika handlare, och (ii) vilken effekter som introduktionen av mobila betalningar har på affärsnätverken för de inblandade aktörerna. Vi använder de mobila betaltjänster som tillämpas i den svenska detaljhandeln som exempel. Forskningen inriktas på de viktigaste grupperna av aktörer – leverantörer av mobila betalningslösningar, detaljhandeln samt konsumenterna.

För det första har denna forskning resulterat i insikt kring vad olika aktörer förväntar sig av mobila betalningar och hur dessa motsvarar deras behov. För att kunna analysera aktörernas förväntningar, så har vi utvecklat ett analytiskt ramverk baserat på "spridning av innovationer", den s.k. Technology Acceptance Model (TAM), samt på teorin om nätverksexternaliteter. Analysen betonar förväntningarna på aktörerna och bidrar till förståelsen av vilka mobila betalningslösningar handlarna förväntar sig och är villiga att använda. En viktig slutsats är att befintliga mobila betalningslösningar kan förbättras genom utveckling av själva processen vid köp i detaljhandel.

Vidare har forskningen studerat inverkan av mobila betalningssystem på affärsnätverk. För att analysera relationer och samverkan mellan aktörer, förändringar i affärsstrategier och nätstruktur, används den metod som utarbetats av IMP gruppen (Industrial Marketing and Purchasing group). Den utförda analysen illustrerar följande strukturförändringar av affärsnätverken för de traditionella betalningssystemen (kortsystemen): (i) uppkomsten av nya aktörer (till exempel oberoende mobila betalningsleverantörer); (ii) nya roller och aktiviterer för aktörerna; och (iii) hur traditionella affärsaktörer (dvs. banker) kan uteslutas från mobila betalningssystem.

Alla dessa förandringar leder till mer komplicerade relationer och ökad nivå av ömsesidigt beroende mellan aktörerna inom nätverken. Följande förändringar i strategier hos inblandade aktörer har kunnat identifieras: (i) mobila betalningsleverantörer strävar efter att nå kontroll över nätverket med aktörer; (ii) handlare påverkar strategier hos de mobila betalningsleverantörerna; (iii) marknadsföringsstrategier av aktörer innehåller marknadsföring inom flera sektorer. Alla dessa förändringar medför ökat mervärde av tjänsten och förbättrad kvalitet för konsumenterna.

För att kunna analysera ett komplext och tvärvetenskapligt område som mobila betalningar är det fruktbart att använda mer än ett angreppssätt. En kombination av olika kompletterande metoder bidrar till att utforska olika aspekter av fenomenet och ger en mera komplett överblick av olika forskningsaspekter.

Det utförda arbetet bidrar till akademisk forskning kring användning och infördande av mobila betalningar i detaljhandeln genom att föreslå ett teoretiskt ramverk. Specifikt behandlar forskningen ett nytt område – förväntningar hos detaljhandeln vid införande av nya lösningar. Ramverket består av följande kriterier och aspekter: teknisk genomförbarhet, ekonomiska vinster, lägre servicekostnader, mervärdet av tjänster, externa nätverk och problemet med kritisk massa, samt slutligen, enkel användning. Detta ramverk hjälper till att identifiera vad handlare kan förvänta sig av mobila betaltjänster.

Ett annat bidrag är analysen av den effekt som mobila betalningslösningar har på aktörer och nätverk för traditionella betalningstjänster. Införandet av nya tjänster leder till uppkomsten av nya aktörer, ett behov att skapa nya relationer samt ökad komplexitet i nätverk av aktörer. För att lyckas krävs dessutom samarbete mellan alla aktörer i nätverket. Följaktligen måste aktörer anpassa sina tjänster och strategier enligt andras behov.

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Contents

List of Abbreviations

ANT	–	Actor-Network
ARA	–	Actors, Resources, and Activities
B2B	–	Business to Business
B2C	–	Business to Consumer
IMP	–	International Marketing and Purchasing
GDP	–	Gross Domestic Product
MaaS	–	Mobility-as-a-Service
NFC	–	Near Field Communication
P2P	–	Person to Person
PDA	–	Personal Digital Assistant
PoS	–	Point of Sale
QR-code	–	Quick Response Code
R&D	–	Research and Development
SMS	–	Short Message Service
TAM	–	Technology Acceptance Model

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Chapter 1

Introduction

Technological evolution in mobile communications results in a significant growth in the development of new mobile services. These services become available to a bigger segment of consumers. This situation results in the development of new mobile solutions for payment services. Mobile payments could replace bank cards and cash and make payment safer and faster at a smaller cost. However, the process of mobile payment adoption has not been as fast as expected. Many researchers have tried to explain this problem by studying issues related to consumer adoption. Meanwhile, the area of adoption of mobile payments by another key party – retailers – remains under-researched.

In this thesis, we seek to contribute to the academic research in mobile payments. This is achieved by trying to provide an answer to the question: 'why have mobile payment not happened on a wider scale?' through analysing the problem from the retailers' perspective. The main contributions of this research have addressed two problem areas:

- **Adoption of mobile payments by retailers.** The novelty of research is in the analysis of retailers' expectations of mobile payment services.

- **The effect of mobile payment services on business networks.** The main contributions include the analysis of: (i) changes that mobile payment services make on traditional payment business networks; and (ii) changes in relationships within business networks.

In this chapter we present the current situation in mobile payments and the overview of the academic reseach in the area. Then we discuss motivation towards our research and present our research questions. Then we set the scope and delimitations, provide a brief summary of contributions, and discuss the thesis outline.

1.1   Background

The amount of new services based on mobile communication has increased during the last decade. The appearance of multifunctional smartphones and their further advancement has considerably extended the application areas of mobile services. One prospective application area is payment. Currently, mobile payments represent one of the recent technological innovations and are referred to as 'innovation' and 'innovative service' in this thesis.

Mobile payment services are expected to be a next step of the electronic payment evolution (Kim et al., 2010a). It is expected that global annual growth in the number of mobile payment transactions will reach 60.8% through 2015 (with a total of 47 billion transactions) (Capgemini and RBS, 2014). An increase in mobile payment use can be explained by growing rates of smartphone penetration, advancement of smart devices, availability of the mobile internet, and an increasing range of new mobile services (Capgemini and RBS, 2014). Banks account for the major share of mobile payment transactions (forecasted as 39.9 billion globally in 2015) (Capgemini and RBS, 2014). However, a noticeable growth in the mobile payment sector attracts actors from the non-banking sector worldwide. Some examples are Starbucks with the Starbucks App; Google with Google Wallet, Apple with Apple Pay; PayPal; AT&T, T-Mobile and Verizon with ISIS.

Mobile payments can provide additional benefits to different parties. Retailers might benefit because of faster transaction time, integration of loyalty programmes, and an improved company image (Karnouskos and Fokus, 2004). Consumers may expect a convenient and cheap service that is independent of time and location (Karnouskos and Fokus, 2004; Mallat, 2007). The benefits of mobile payment providers (banks, mobile network operators, or independent companies) are a new business case, a new revenue channel, and an opportunity to improve customer loyalty (Karnouskos and Fokus, 2004).

Some successful examples of mobile payment services

In some countries (e.g. Japan, South Korea, Singapore, Kenya, and Philippines), the penetration of mobile payment services has already started. Well-known examples are (i) the multifunctional mobile wallet Osaifu-Keitai in Japan, and (ii) mobile money transfer service M-Pesa in Kenya.

Osaifu-Keitai was developed by a leading Japanese mobile network operator, NTT DoCoMo (Bockisch and Alejandro, 2010). The service represents a mobile wallet installed in a mobile handset using the contactless FeliCa technology. The service can be used to make payments, to buy and store public transport tickets, to store loyalty programmes, access keys, and IDs (Milner, 2009). Osaifu-Keitai was launched in July

2004, and the number of users that activated the credit card reached 2.6 million in about a year (Ondrus and Pigneur, 2009). In 2012, the number of users reached 17 million, and the number of service readers installed in Japan reached 560,000 (Clark, 2012). Quick penetration of the service can be explained by a use of a unified technology standard, a range of additional services which are attractive to consumers, and strategic alliances with financial companies (Bockisch and Alejandro, 2010). However, the service still faces interoperability problems (Ondrus and Pigneur, 2009).

In Kenya, due to an undeveloped bank service infrastructure and lack of literacy, a large percentage of the population has no access to bank services (Dibia, 2014). In addition, the cost of banking services is very high (Wooder and Baker, 2012). The introduction of the M-Pesa service addressed a need for an alternative financial service. This service was introduced in 2007 by Safaricom, a Kenyan mobile network operator (Dibia, 2014). The value proposed by the M-Pesa service to end-users is money transfers which overcome the cost and delays 'in moving funds to another mobile user' (Dibia, 2014:6). Additional benefits are microfinance services and the opportunity to pay bills to different institutions (e.g. healthcare, educational, and corporations) (Dibia, 2014). Fourteen months after the service launch – in May 2008 – there were 2.7 million service users (Flores-Roux and Mariscal, 2010). M-Pesa became the key revenue driver for Safaricom. The percentage of M-Pesa revenue in the total structure of Safaricom revenues increased from 4 percent in 2009 (Dibia, 2014) to 15 percent in 2014 (Safaricom, 2014). The amount of active users in 2014 reached 12.2 million (Safaricom, 2014). Service convenience, reasonable cost, and the provisioning of a money transfer service to an unbanked population are the main service success factors.

The situation in Europe and most developed countries

In Europe and most developed countries the rate of adoption of mobile payment services is still lower than expected (Mallat, 2007; Dahlberg et al., 2008a; Ondrus et al., 2009). A big number of different mobile payment services have been trialled and tested over the last decade. The results of trials have proved a good performance of used technological solutions, needed level of security, and service usability. However, there is a big number of mobile payment services that were terminated or closed after entering the commercialisation stage. Some examples are PostFinance and m-Maestro in Switzerland (Ondrus et al., 2009), Telia Mobil wallet (Telia, 2012) and Bart in Sweden (SvD, 2014), and O2 Wallet in the UK (Clark, 2014).

Many researchers relate slow rate of mobile payment penetration to the issues of customer service perception and experience. The examples of such issues are a lack of additional value (Ondrus et al., 2009; Augsburg and Hedman, 2014), complicated service interface (Mallat, 2007; Balocco et al., 2008; Arvidsson, 2014), a lack of trust to the

service provider (Mallat, 2007; Arvidsson, 2014; Shaw, 2014), perceived security and privacy risks (Mallat, 2007; Schierz et al., 2010; Yang et al., 2012; Arvidsson, 2014), and a high service cost (Mallat, 2007; Balocco et al., 2008; Dahlberg et al., 2008a; Mallat and Tuunainen, 2008).

Situation in Sweden

Sweden is an example of a country which is moving towards a cashless society. Currently, available payment methods in retail stores and restaurants at point of sale (PoS) are cash, bank cards, and, to a smaller extent, mobile payments. The most popular payment means in retail stores are bank cards which account for two thirds of all payments at PoS (Sveriges Riksbank, 2013). The average value of card payments went down from SEK 700 in 1998 to SEK 400 in 2011 (Sveriges Riksbank, 2013). Thus, there is a trend to substitute cash with cards when paying smaller amounts. Overall, the existing card payments are good enough for retail, but 'their transaction costs are too high to be profitable in micropayment transactions' (Mallat, 2007:413).

Average cash payment is about SEK 100. The amount of cash in circulation has gradually reduced from l0 percent of GDP in 1950 to 2.6 percent of GDP in 2011 (Sveriges Riksbank, 2013). Additionally, the economic cost of cash equals about 0.3 percent of GDP (Sveriges Riksbank, 2013). Hence, mobile payments might replace cash and bank cards at PoS and result in economic benefits for society.

At the same time, in Sweden the penetration of smartphones is 'above or well above 60 percent' (Ericsson, 2014:2). This creates a demand for different mobile services. The market of mobile payment solutions is rather fragmented. Different business actors have introduced a range of mobile payment services which are applied for different use cases. For instance, Swedish mobile network operators in cooperation provide mobile wallet service WyWallet which is dedicated to SMS payments, person-to-person (P2P) money transfers, and purchases online and in the shops. Klarna and EasyPark provide solutions for parking payments. iZettle provides a mobile payment service for credit card payments with the iPhone. The Swedish banks have developed a P2P money transfer service called Swish. Regional transport companies (e.g. public transport company in Stockholm (Storstockholms Lokaltrafik, SL) and Uppsala (Upplands Lokaltrafik, UL)) have developed their own mobile ticketing apps. Payair provides a mobile service for online payments and in printed advertisement. The taxi companies Taxikurrirs and Taxi 020 have introduced a mobile app, Cabonline, for ordering a car and conducting a payment with a PayPal account. Finally, Swedbank and Seamless have introduced mobile payment services for the retail industry, and these services are the focus of this research.

1.2 Previous Work

1.2.1 Definition of Mobile Payments

There are a number of different definitions of mobile payments. One of the earliest definitions of the mobile payment is: 'Any payment where a mobile device is used in order to initiate, activate, and/or confirm this payment can be considered a mobile payment' (Karnouskos and Fokus, 2004:44).

Mallat (2007:415) defines mobile payments as 'the use of a mobile device to conduct a payment transaction in which money or funds are transferred from payer to receiver via an intermediary, or directly, without an intermediary'.

Dahlberg et al. (2008b:165) have provided the following definition of mobile payments: 'Mobile payments are payments for goods, services, and bills with a mobile device (such as a mobile phone, smart-phone, or personal digital assistant (PDA)) by taking advantage of wireless and other communication technologies'.

Goeke and Pousttchi (2010:371) define a mobile payment as 'a type of payment transaction processing in which the payer uses mobile communication techniques in conjunction with mobile devices for initiation, authorization, or completion of payment'.

Hence, all of the provided definitions specify a mobile payment as a payment transaction procedure implemented through using a mobile device and mobile communication technologies. Possible mobile payment use cases are PoS payments, P2P money transfers, public transport and event ticketing, and parking fee payment (Malat, 2007)). The stakeholders of mobile payment services are mobile network operators, banks and financial companies, device manufacturers, software developers, service providers, customers, and merchants (van der Heijden, 2002; Karnouskos and Fokus, 2004; Au and Kauffman, 2008).

1.2.2 An Overview of Academic Research in Mobile Payments

Academic researchers have been studying the subject of mobile payments for more than a decade. Indeed, mobile payments as an academic research area is a multidisciplinary domain which can be analysed from different perspectives. This is illustrated in the literature overview performed by Dahlberg et al. (2008b). The authors have reviewed 73 articles that were published during the period from 1999 to 2006. The researchers have developed the analysis framework that includes: (i) the main actors in the mobile payment market: mobile payment providers, customers, and merchants; (ii) substitutes of mobile payment that are traditional payment systems and new services; (iii)
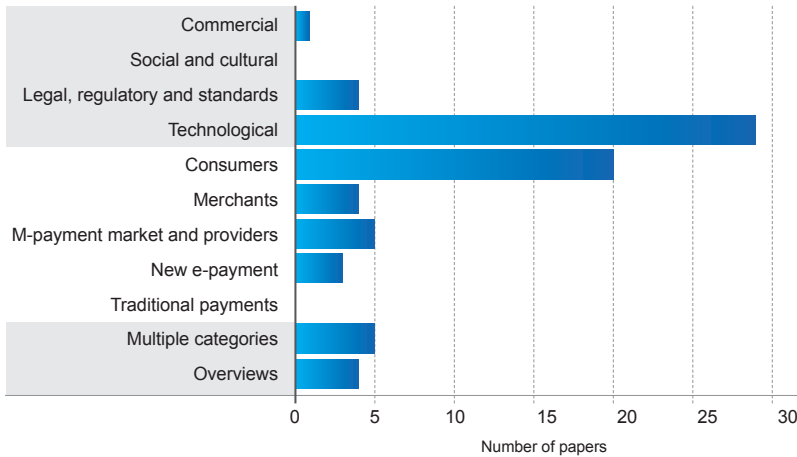
Figure 1.1:   Overview of the main themes in mobile payment research (based upon Dahlberg et al. (2008b)).

external environment factors affecting the market (i.e. social/cultural, business, legal and regulatory, and technological factors). These publications have been categorised according to these criteria as presented in Figure 1.1.

As illustrated in the above figure, the most common research direction is the analysis of technological aspects of mobile payments. The same trends can be found in more recent publications. For example, Ondrus and Pigneur (2009) have performed an evaluation of NFC (Near Field Communication) technology for mobile payments. Different types of mobile payment service architectures have been proposed by different researchers, for example, Kousaridas et al. (2008), Zhang et al. (2008), Popescu (2009), and Fan and Huang (2010). Ou and Ou (2009) and Kadambi et al. (2009) have been looking into the development of transaction protocols. A large number of researchers (e.g. Lin et al., 2008; Wang et al., 2008; Lei et al., 2009; Popescu, 2009; Kadambi et al., 2009; Yang et al., 2010; Fan and Huang, 2010; Zhu et al., 2012; Almuairfi et al., 2014) have been focused on security issues and privacy protection.

According to Dahlberg et al. (2008b), the second most studied factor is consumer adoption of mobile payment services. The attention to this study area remains very high in contemporary research (Mallat, 2007; Chen, 2008; Mallat et al., 2009; Shin, 2009; Goeke and Pousttchi, 2010; Schierz et al., 2010; Kim et al., 2010a; Yang et al., 2012; Advidsson, 2014; Augsburg and Hedman, 2014; Duane et al., 2014; Shaw, 2014, etc.). A more detailed overview of literature on consumer adoption is presented in Section 4.1.

Dahlberg et al. (2008b) have specified that the remaining factors have been analysed in just a few papers or remained completely unaddressed. The current situation is similar. For example, several new publications (Lim, 2008; Choo, 2013; Kemp, 2013) have addressed legislation, regulation, and standardisation problems.

A few papers have addressed the theme of mobile payment markets and providers. For example, Au and Kauffman (2008) and Ozcan and Santos (2014) have addressed the commercial aspects of mobile payments. Markendahl et al. (2010), Gaur and Ondrus (2012), and Ok et al. (2013) have analysed the role of different market players in mobile payment eco-systems. Pousttchi et al. (2009) and Juntunen et al. (2010) have analysed issues related to business models.

Dahlberg et al. (2008b) have found only three publications which address the problem of mobile payment adoption by merchants. One more recent article was published in 2008 (Mallat and Tuunainen, 2008). A more detailed overview of literature on merchant adoption is presented in Section 4.1.

Through this, the literature review reveals the fragmentation that exists in the academic research in mobile payments. It has also pointed to existing research gaps and topics for future research. The key aspects are adoption of mobile payments by retailers, the effect of mobile payments on traditional payment systems, and business-related issues.

1.3 Research Motivation and Research Questions

The main purpose of this thesis is to contribute and broaden the existing knowledge about 'why have mobile payments not happened on a wider scale?' This is done by addressing several research topics that require more detailed investigations, according to the conducted literature overview. Thus, the following areas are focused on in this thesis:

- Adoption of mobile payment services by merchants.

- The effect of mobile payments on business networks.

Adoption of mobile payment services by merchants

Available publications on merchant adoption of payment systems and mobile payments are scarce and were published before 2009. However, the main findings of these studies seem relevant to use, especially taking into account a lack of research in this area.

The key categories of stakeholders of mobile payments are mobile payment providers, merchants, and consumers. The long-term success of mobile payments depends on the service acceptance by merchants and consumers (Plouffe et al., 2000). Hence, the mobile

payment providers have challenging tasks in the following areas (van der Heijden, 2002; Srinivasan et al., 2004):

1. To develop and market a service network (i.e. to attract merchants accepting the payment solution).

2. To attract new service customers by marketing a service.

Moreover, in order to be used on continuous basis, a new payment system should meet the expectations of the key stakeholders. Hence, the following questions will be addressed:

> What do different stakeholders expect of mobile payment services? What should mobile payment services offer in order to be accepted by different categories of stakeholders? Do new services meet their expectations and, if so, how do they achieve this?

This set of questions leads to the first research question:

RQ1: *Why have mobile payment services not been widely adopted?*

Chapter 4 is dedicated to answering RQ1. The overview of the corresponding literature, developed research framework, research approach, research findings, discussion, and conclusions are presented in this chapter.

The effect of mobile payments on business networks in retail payment

There are two major challenges that are associated with business-related aspects of mobile payments. These challenges are cooperation issues between business actors providing mobile payment services (Dahlberg et al., 2008a; Andersson et al., 2013) and a need to change the existing business model (Dahlberg et al., 2008a; Mallat and Tuunainen, 2008). Indeed, the process of service introduction in the market is complex, and we will focus on the following questions:

> What are the issues that mobile payment providers have to deal with when introducing mobile payment service in the market? How does it affect the business network of traditional payment service, business strategies, cooperation between business actors?

This set of questions leads to the second research question:

RQ2: *How does the introduction of mobile payments affect business networks in terms of structure and strategies?*

Chapter 5 is dedicated to answering RQ2. The overview of the corresponding literature, theoretical foundation for research, explanation of the research approach, research findings, discussion, and conclusions are presented in this chapter.

1.3.1   Research Approach

The identified research questions address different aspects of mobile payment research. This causes certain challenges because the analysis requires applying several complementary analysis approaches.

In order to answer RQ1, we have developed an analysis framework based upon the theory of diffusion of innovations, Technology Acceptance Model (TAM), and the theory of network externalities (see Section 4.2). This set of theories can be applied to the analysis of stakeholder expectations. However, it does not provide information on the cooperation and dynamics within business networks. For this purpose, and in order to answer RQ2, we use the IMP (Industrial Marketing and Purchasing) Group's thinking approach (see Section 5.2 and Section 5.3). More specifically, we used the Actor – Resource – Activity (ARA) framework: (i) for analysing relationships within business networks, and (ii) to show the changes in the business network after the introduction of mobile payments.

This way, the application of two different methods shows a more comprehensive picture of the issues related to mobile payment introduction in the market. More insights on general methodological choices and data collection are provided in Chapter 2.

1.4   Scope and Delimitations

The current research is focused on the analysis of mobile payment services applied to PoS payment services. This study was performed during the period from 2012 to 2014.

The analysed mobile payment cases have been implemented in Sweden. There are a number of reasons to focus on the Swedish mobile payment market. First of all, this is a unique market which has a number of available mobile payment services that address different areas of application (P2P transactions, services for retail, solutions for public transportation and taxi, and services for parking payments). Secondly, different market actors (i.e. banks, mobile operators, independent mobile payment providers, and technology providers) have made attempts to develop PoS mobile payment services. In this thesis we focus on two mobile payment services developed by Seamless and Swedbank because these cases provide the best evidence and have been introduced in the market.

However, it might be complicated to transfer the Swedish experience to other markets due to different market contexts. The differences are defined by the diversity in social, economic, regulation and legislation, cultural, and technological aspects. Lessons and experiences that can be generalised and applied in other markets are a general approach of service introduction and stakeholders' expectations of this kind of service.

There are some technological challenges and issues related to mobile payment service development and deployment. However, as mentioned, many researchers relate the slow

penetration of mobile payments to adoption (Mallat, 2007; Ondrus et al., 2009; Schierz et al., 2010; Yang et al., 2012; Arvidsson, 2014; Augsburg and Hedman, 2014; Shaw, 2014) and business issues (Dahlberg et al., 2008a; Mallat and Tuunainen, 2008; Andersson et al., 2013). That is why the main focus of this study is on mobile payment service adoption and business challenges, and there is no focus on technology.

1.5   Summary of Contributions

As discussed through our research questions, the major contributions of this thesis are in the following areas:

- **Adoption of mobile payment services by merchants.** The research in this domain has been rather scarce and is limited to several journal publications. The current research gives insights into the expectations of different stakeholders of mobile payment services. A big part of the findings is related to the expectations of merchants and what kind of services they are willing to adopt.

- **The effect mobile payments have on business networks in retail payment.** This includes: (i) analysing the change that a mobile payment makes on traditional (bank card-based) payment business network in terms of cooperation and business network structure; (ii) analysing the changes in relationships within the network, and (iii) analysing the roles of different business actors.

More details on the contribution of this research can be found in Section 6.2.

1.5.1   Overview of Publications

This thesis is based on five peer-reviewed publications and submitted papers. The papers cover two major problems: (i) mobile payment service adoption by merchants, and (ii) the effect of mobile payment services on the business network of retail payments. The contribution of papers and the relationships between them are illustrated in Figure 1.2.

Adoption of mobile payment services by merchants

   Paper 1: Apanasevic, T., Markendahl, J., and Arvidsson, N. (n.d.), 'Stakeholders' expectations of mobile payment in retail: Lessons from Sweden', *International Journal of Bank Marketing*, to be published, submitted June 2015.

   The main purpose of Paper 1 was to investigate the adoption of mobile payment services by merchants or retailers. This was done by investigating the expectations of
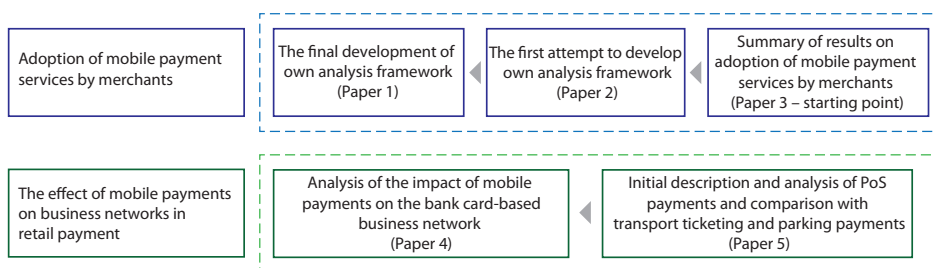
Figure 1.2: Overview of the contribution of the papers.

different stakeholders of mobile payment services. This paper extends research presented in Papers 2 and 3, and proposes an elaborated research framework applicable for the analysis of stakeholders' expectations. The main contribution of this paper is in addressing previously under-researched area of stakeholders' expectations.

The author of this thesis conducted the research on mobile payment services at PoS, collected the initial data, acted as the main author for Paper 1, wrote the initial draft of the paper, and developed the theoretical framework applied for research. Data collection on the initial banks' expectations of mobile payment has been performed by Jan Markendahl and Niklas Arvidsson in 2010–2013.

> **Paper 2**: Apanasevic, T. and Markendahl, J. (2014), 'Stakeholder's expectations: Mobile payments in retail in Sweden', In: *Proceedings of The 13th International Conference on Mobile Business (ICMB 2014)*, London, the UK, 4-5 June, 2014.

We attempted to map the changes in stakeholders' expectations of mobile payment services in Paper 2. This paper presents the first attempt to develop our own analysis framework. In the paper we compared the initial stakeholders' expectations of the services before its deployment and after. The analysis is based on three cases of mobile payment services and helped to identify some obstacles to the wide-scale penetration of mobile payment services.

In Paper 2, the author of this thesis acted as the main author, collected the initial data, formulated the research problem, developed the theoretical framework and applied it for analysis of data, and wrote the initial draft. Jan Markendahl contributed by providing data on the initial banks' expectations of mobile payment and giving valuable insights and comments.

Paper 3: Apanasevic, T. (2014), 'Mobile payments: Main trends in the retail industry', In: *Proceedings of The 25th European Regional Conference of the International Telecommunications Society (ITS)*, Brussels, Belgium, 22-25 June, 2014.

The main objectives of Paper 3 are (i) to investigate the main obstacles and driving forces which make an impact on mobile payment service adoption by merchants, and (ii) to present the initial research results. We have applied the theory of diffusion of innovations for the analysis and the main analysis criteria are: adopter characteristics, supplier marketing activity, perceived innovation characteristics, social networks, and environmental influences. As the final outcome of the research, these criteria were classified as obstacles or forces which facilitate the adoption of mobile payment services by merchants.

The effect of mobile payments on business network in retail payment

Paper 4: Apanasevic, T. (2014), 'The effect of innovation on business networks', In: *Proceedings of the 30th Annual IMP Conference*, Bordeaux, France, 1-6 September, 2014.

The main purpose of Paper 4 is to examine the effect of innovation (i.e. mobile payment services) on business networks in retail payments. Business networks and relationships between business actors were modelled using the ARA framework. The impact from the introduction of mobile payment services on the traditional (bank card) business network in retail has been analysed from the perspective of interdependency, dynamism, and variety.

Paper 5: Markendahl, J. and Apanasevic, T. (2013), 'Trends towards fragmentation of the mobile payment market in Sweden', In: *Proceedings of the 29th Annual IMP Conference*, Atlanta, USA, 30 August - 2 September, 2013.

In Paper 5 we present the initial description and analysis of PoS and P2P payment services and a basic level of comparison of mobile payments with transport ticketing and parking payments. Business networks and relationships between business actors were modelled using the ARA framework. The author of this thesis collected the initial data on P2P and PoS mobile payments and wrote the description of cases and their analysis. Jan Markendahl did the remaining work.

1.5.2   Other Related Papers

Several papers address the same problems, however, are not included in the thesis.

Adoption of mobile payment services by merchants

1. Apanasevic, T. (2013), 'Obstacles to investments in mobile payments: The perspective of merchants ('Work in progress')', In: *Proceedings of the CMI International Conference,* Aalborg University Copenhagen, Denmark, 28–29 November, 2013.

This paper presents the results of a desktop analysis of the market of mobile payment services for retail.

Mobile public transport ticketing

2. Apanasevic, T., Markendahl, J., and Arvidsson, N. (2013), 'An exploratory study of consumer attitudes towards mobile ticketing in Sweden' ('Work in progress'), In: *Proceedings of The 24th European Regional Conference of the International Telecommunications Society (ITS)*, Florence, Italy, 20-23 October, 2013.

3. Apanasevic, T., Markendahl, J., and Arvidsson, N. (2014), 'Stakeholder's expectations: The case of mobile public transport ticketing in Sweden', In: *Proceedings of The 13th International Conference on Mobile Business, ICMB 2014*, London, the UK, 4-5 June, 2014.

In the two papers listed above we present the results of research on stakeholders' expectations on mobile public transport ticketing. Hence, in these papers, consumers are the focus of analysis.

NFC-based services

4. Apanasevic, T. (2013), 'Barriers to further commercialization of NFC pilots in Western Europe', In: *Proceedings of The Second Cashless Society Roundtable*, Dublin, Ireland, 17-18 April, 2013.

5. Apanasevic, T. (2013), 'Factors influencing the slow rate of penetration of NFC mobile payment in Western Europe', In: *Proceedings of The 12th International Conference on Mobile Business (ICMB),* Berlin, Germany, 10-13 June, 2013.

These papers mainly focus on problems of adoption of NFC-based services. The analysis addresses business-related issues of the NFC service provisioning.

1.6   Thesis Outline

The thesis consists of six chapters. The methodology is presented in the next chapter. Chapter 3 is dedicated to the overview of the selected mobile payment cases. The stakeholders' expectations of mobile payment services are discussed in Chapter 4. This is followed by a discussion on the effect of mobile payment services on business networks. Finally, the conclusions, contribution, and further work are discussed in Chapter 6. This is followed by the reprints of the selected publications.

Chapter 2

Methodology

2.1   Methodological Choices

We applied a *qualitative multiple case study* approach in this study. Qualitative research 'employs methods of data collection and analysis that are non-quantitative, aims towards the exploration of social relations, and describes reality as experienced by the respondents' (Adams et al., 2007:26).

A case study is a common method used in social science. Its main purpose is to study a specific phenomenon in its natural environment (Adams et al., 2007). Case studies are often used in order to determine if 'a certain approach works in a particular setting' or to identify the 'best practice' (Adams et al., 2007:112). A case study can be defined as 'an in-depth study which explores issues, present and past, as they affect one or more units (organization, group, department or person' (Adams et al., 2007:112). In case studies it is common to use both primary and secondary information sources, such as 'archives, interviews, questionnaires, and observations' (Eisenhardt, 1989:534). This approach provides rich and contextualized data about the phenomenon of interest (Bhattacherjee, 2012). The multiple case study approach allows several levels of analysis: single case-based and cross-case (i.e. comparative analysis across few cases) (Eisenhardt, 1989; Yin, 1984).

This research is based upon qualitative data, and we analysed and compared two cases. Hence, a qualitative multiple case study suits the aims of the current research. We have applied this method in order to explore (i) the perspectives of different business actors on mobile payments, and (ii) the changes in the business networks of retail payments caused by the introduction of mobile payments. The comparison of the cases helps to identify the 'best practice' of the introduction of a new payment system in the market.
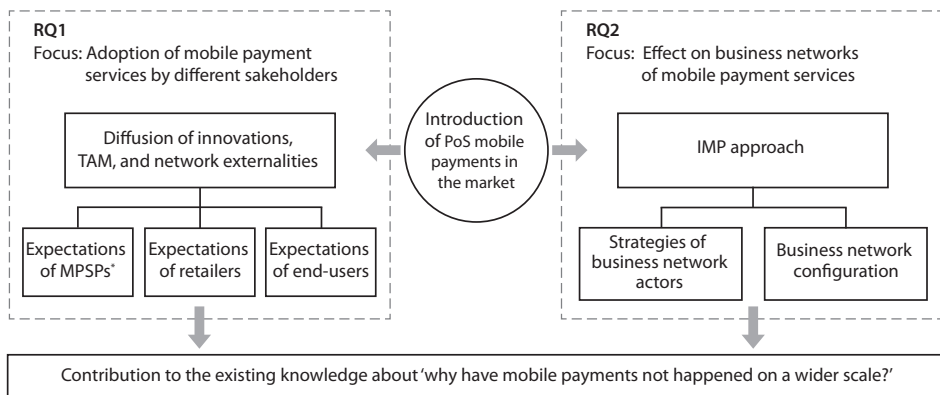
* MPSP – Mobile payment service provider

Figure 2.1: Methodological framework with the two approaches used to answer
              the two research questions.

In order to analyse challenges related to the introduction of mobile payment services in the market, we need to consider both the expectations of different stakeholders and business-related aspects. In order to analyse these different perspectives, we have applied two different methods: (i) a combination of the theory of diffusion of innovations, TAM, and the theory of network externalities, and (ii) IMP Group's thinking.

In order to answer RQ1, we used a combination of several theories: diffusion of innovations (Rogers, 2003), TAM (Davis, 1989), and network externalities. These theories are commonly used to explore the problems related to service adoption by different research units (i.e. organisations and consumers). A more detailed overview of the mentioned theories is provided in Section 4.1. We have used the most referred constructs of these theories and applied them in order to study the expectations of different stakeholders. Our developed analysis framework is discussed in Section 4.2.

We used the IMP Group's thinking in order to answer RQ2. The IMP school proposed ARA model can be applied in order to conceptualise the interactions between different actors within the business networks. This model is used to discuss the outcomes of interactions in terms of activity links, resource ties, and actors bonds (Håkansson and Snehota, 1995). The theoretical background of this method and the ARA framework are described in Section 5.1. Analysis criteria used for research are presented in Section 5.2. The research approach is presented in Section 5.3.

Consequently, the use of two methods discussed above allows a more throughout analysis of different perspective of challenges related to the introduction of mobile payments in the market. The methodological framework is illustrated in Figure 2:1.

2.2   Data Collection

Primary information

We have collected the primary data using different approaches: interviews, questionnaires, and through attending various retail events and conferences. In 2014, we conducted 'a number of in-depth personal interviews with top- and middle-level managers representing mobile payment service providers (Seamless and Swedbank) and the retailer (Axfood)' (Apanasevic et al., n.d). The interviews were organised in a semi-structured form. The discussion themes included the following:

- The process of mobile payment service development and introduction in the market.

- Main partners and cooperation strategies.

- 'The initial expectations that contacted stakeholders had before the service deployment' (Apanasevic et al., n.d).

- Assessing whether the mobile payment service met the expectations.

Each interview lasted between one and two hours. We recorded the interviews and transcribed them.

We developed a questionnaire addressing the problem of mobile payment adoption and sent it to a number of retailers including McDonald's, a fast-food restaurant chain, and Davids, an e-shop. Within this study, we have used the answers provided by McDonald's. The questionnaire is presented in Appendix A.

Finally, we attended a number of events dedicated to retail, such as Retail Day 2013 (Retaildagen), Retail Forum 2013, Cashless Society Roundtable 2014, and Mobilize Your Business 2014. The main aim was to attend the presentations given by representatives of companies of interest. The summary of primary data is presented in Table 2.1.

The data gathered during the previous studies have been used in this research. Jan I. Markendahl and Niklas Arvidsson organised a number of meetings with major stakeholders

Table 2.1: Research data gathering (The source: Apanasevic et al., n.d).

Type of the meeting	Attendees
Presentation and private communication during Retail Forum 2013	Seamless, Regional manager
Interview	Swedbank, Bart service developer
Interview	Axfood, Middle-level project manager
Interview	Seamless, Middle-level project manager
Questionnaire	McDonald's, Middle-level manager
Presentation and private communication during the Cashless Society Roundtable 2014	Seamless, Top level manager

in 2010–2013. The main discussed themes were solutions of mobile payments, obstacles and drivers to the service development, deployment, and adoption. Specifically, findings regarding expectations of Swedbank on mobile payments were included in this study.

Secondary information

We have used the secondary data in order to understand the background situation in the market and to track the development of services. The main sources were press releases, reports, and other documents related to the companies of interest.

2.3   Data Analysis

As mentioned and motivated above, two different complementary analysis approaches are used. In order to answer RQ1, an analysis framework based on the theory of diffusion of innovations, TAM, and the theory of network externalities is used. The business network-oriented ARA framework is used in order to answer RQ2.

These two approaches and their application within this research are described in more detail in Chapters 4 and 5. These chapters also include an overview of the corresponding literature, the developed research framework, the chosen research approach, the research findings, and conclusions.

Chapter 3

Description of Cases

There are two services that are suitable for payments in retail in the Swedish market. Namely, these services are SEQR provided by Seamless and Bart provided by Swedbank. These services have been introduced in a number of retail and restaurants chains.

3.1   Mobile Payment Service Bart

Prehistory

The Bart service was developed by Swedbank. The idea of the Bart service came from loyalty cards and prepaid cards used for payments in the late 1990s, such as prepaid cards for petrol stations. Another example would be a loyalty system used by **Best Western Hotels**. Guests of the hotel chain were getting a stamp for each visit at any of the chain's hotels. When ten stamps were collected, the guest could stay one night free of charge at any hotel. Loyalty cards were used to collect stamps. This system is the example of optimised payments that were used to fund the 11th free night and which carried minimum credit risks and administrative work.

Service idea and implementation

The idea of Bart became feasible with a wider penetration of mobile phones and mobile internet. In 2010, the service developer proposed the high level of the system design. The service was seen as a replacement for bank cards. The idea was to provide additional services before and after payment. Before the payment there could be information about the week's discounts, product price, self-scanning, or order placement. After the payment

Figure 3.1: Initial idea of Bart.

there could be loyalty systems. These additional services were a part of the service idea and could make the purchasing process easier, as payment in the context (see Figure 3.1).

However, only the payment option was implemented. Additionally, it was possible to save bills. This way, the service 'was directly related to consumer's bank account and acted as a bank card on a mobile phone' (Apanasevic et al., n.d). In order to make a payment, consumers had to use a separate payment application. The service registration consisted of several steps: (i) downloading the Bart app, and (ii) connecting it to a bank account. This process was supposed to take about 5 minutes of a consumer's time.

Technologically, the main idea behind the Bart service was making purchases offline because the network may be insecure, stores may have bad connections inside, or the connection could be down. The Bart service used the Visa and MasterCard infrastructure and required a separate payment terminal. The service was highly secure with no sensitive information being sent.

Service introduction in the market

Swedbank introduced the service in the market in 2011. Axfood, the third largest Swedish retailer, was interested in this service because it was matching retailer's needs. Additionally, Axfood wanted to test and use a new technology. Before that Swedbank worked with Axfood for 17 years, and there was a high level of trust between companies. Other merchants took 'wait and see' position.

Axfood took part in the service development. In November 2012, Axfood started a pilot project trying Bart in three shops in Stockholm (Axfood, 2012). The service worked well and in June 2013 the introduction of Bart in 400 stores of Axfood's 'grocery chains (i.e. Hemköp, Willys, Willys Hemma, and PrisXtra) all over Sweden (Swedbank, 2013)' (Apanasevic et al., n.d) was announced.

In the beginning, the service was open only to Swedbank's customers, who were also Axfood's customers. Later, Bart became available to clients of other banks. The service had a separate website: www.bart.se.

The service was operational until the 28th of February 2014. After that Bart was ceased due to the low number of users (about 20,000) (SvD Näringsliv, 2014).

3.2   Mobile Payment Service SEQR

Prehistory

The mobile payment solution SEQR was launched in spring 2012 by Seamless. Before development of the SEQR solution, Seamless was providing a mobile top-up service in stores. The service's idea was to purchase vouchers in a store to top-up a mobile phone account. The company had a mobile transaction switch and integration for this service. The company considered how it could adapt this technology for mobile payments.

Service idea and implementation

Seamless has developed a separate service network using the internet. Hence, their solution does not depend on consumers' banks or the Visa or MasterCard infrastructure. In 2013, SEQR became an integral part of the cashier system LS Retail. As a result, service installation does not require additional equipment in stores.

The SEQR service is a QR-code based solution. In order to perform a payment, a consumer has to start the SEQR app and scan a QR-code sticker located next to each cash register. The sticker contains information that identifies the shop and the cash register. This information is sent to the service transaction switch. At the same time, the cash register sends the sum of the purchase. This information is matched and payment is registered. The service is very secure and no sensitive data is sent during the transaction. Furthermore, the user does not identify himself to the merchant, as compared to card payments where merchants can access information including the customer's name, bank, bank account, and card number.

Together with the payment function, SEQR offers a number of additional services. They are saved bills, P2P payments, 'parking payments, p-commerce (purchases in printed advertisements), and public transport ticketing in one region of Sweden' (Apanasevic et al., n.d). The service functionality is illustrated in Figure 3.2.
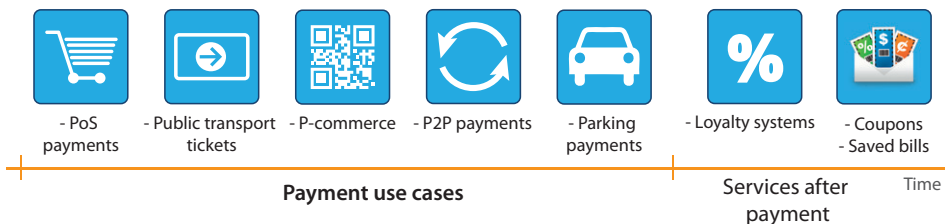
Figure 3.2:   SEQR service functionality.

Service introduction in the market

Seamless launched SEQR in spring 2012. The service is provided in collaboration with financial service and credit companies Collector and Gothia. These parties are responsible for managing payment transfers and issuing monthly bills to the consumers. Thus, all SEQR users need to open 'a credit account at one of these companies' (Apanasevic et al., n.d).

Since the service launch, Seamless has actively developed their network of merchants. In order to create a business case for them, Seamless proposed a service transaction fee which is 50% less than bank card fees. In addition, the service roll out is free. By the spring 2014, there were more than 100 retail chains accepting the service at more than 800 stores, and the number of merchants is constantly growing.

In order to attract consumers, the SEQR service was upgraded with new functionalities at the end of 2013. First of all, loyalty programmes for Axfood grocery chains (Hemköp and Willys) and Appoteksgruppen have been integrated with the payment application. Furthermore, Seamless suggests that consumers can '[e]arn money paying with SEQR'. This new feature is a 'cashback payment where the consumer gets money back when paying with SEQR for some certain products' (Apanasevic et al., n.d).

Two retailers were selected for the case: Axfood, the third largest Swedish retailer, and McDonald's, a global fast-food restaurant chain. The SEQR pilot project was launched at several Axfood stores in spring 2012. By December 2012, the service was rolled out at all Axfood's grocery chains. A pilot project of SEQR ran at four McDonald's restaurants in Stockholm during summer 2012 (Thoresson, 2012). After the pilot, the service was installed in all restaurants. 'In spring 2014, Axfood (about 400 stores) together with McDonald's (about 220 restaurants) represented a considerable share of stores (out of about 800) accepting the SEQR service' (Apanasevic et al., n.d).

Chapter 4

Stakeholders' Expectations of Mobile Payments

In this chapter we will discuss RQ1: why mobile payments have not been widely adopted. Specifically, we will focus on the issues related to mobile payment adoption by retailers. As it is mentioned in Section 1.2.2, this question lacks attention from the academic researchers. The major part of academic research is exploring problems of mobile payment adoption by consumers. However, in order to explain why the rate of mobile payment penetration is lower than expected, understanding issues related to consumer adoption is not enough. Merchants are the second key category of stakeholders that affect the adoption of payment services (Plouffe et al., 2000; Karnouskos and Fokus, 2004).

Adoption of mobile payment services depends on the degree to which these services correspond to the expectations of different stakeholders. In our analysis we focus on the retailers' view and expectations of mobile payments. This is a new area of study which is implemented in this study and contributes to academic research. Indeed, by understanding stakeholder expectations, this 'will help to define what mobile payment services are lacking in order to meet the needs of stakeholders in the best way possible' (Apanasevic et al., n.d).

In order to analyse the expectations of the stakeholders of mobile payments, we have made a number of propositions and developed a conceptual framework based on the theory of diffusion of innovations, TAM, and the theory of network externalities. We have also used findings of research on adoption in similar domains (e.g. electronic payment services, electronic and mobile financial services, electronic and mobile commerce).

4.1 Literature Review

In this subsection, only the main theoretical concepts needed for further development of an analysis framework are summarised and highlighted. A more extended literature review on the acceptance of mobile payments and related services by both consumers and organisations can be found in Paper 1, Section 2.2.

The adoption of mobile payments by consumers

The most common theories that are used in the analysis of mobile payment adoption are the theory of diffusion of innovations and TAM (Dahlberg et al., 2008b). According to the theory of diffusion of innovations, the innovation gradually spreads or diffuses in the population over time (Rogers, 2003). Rogers (2003) has specified the main characteristics of innovation that make impact on the adoption process:

- '*Relative advantage*: the degree to which an innovation is perceived better than the old practice.

- *Compatibility*: the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters.

- *Complexity*: the degree to which an innovation is perceived as difficult to use.

- *Trialability*: the degree to which an innovation can be experimented on prior to its adoption.

- *Observability*: the degree to which the results of an innovation are visible to others' (Apanasevic et al., n.d).

The TAM model has been used to study the adoption of technology by individuals in organisations. The main variables are (Davis, 1989:320):

- '*Perceived usefulness*: the degree to which a person believes that using a particular system would enhance his or her job performance.

- *Perceived ease of use*: the degree to which a person believes that using a particular system would be free of effort' (Apanasevic et al., n.d).

In numerous studies on the adoption of electronic and mobile financial and payment services, researchers combined the constructs of both frameworks and extended the models by additional factors, for example, 'security (Kim et al, 2010b), trust to service providers (Shin, 2009; Kim et al, 2010b; Duane et al., 2014), habit and price (Venkatesh et al., 2012), and use context (Mallat et al., 2009)' (Apanasevic et al., n.d).

Table 4.1: Factors influencing the adoption of mobile and electronic services by consumers (Based on: Apanasevic et al., n.d.).

Factors affecting adoption	References
Ease of use	Arvidsson, 2014; Chen, 2008; Constantiou et al., 2006; Duane et al., 2014; Gefen et al., 2003; Goeke and Pousttchi, 2010; Harrison et al., 2014; Hsu et al., 2011; Kim et al., 2010a; Mallat 2007; Mallat et al., 2009; Schierz et al., 2010; Shaw, 2014; van der Heijden, 2002
Perceived usefulness	Chen, 2008; Duane et al., 2014; Gefen et al., 2003; Goeke and Pousttchi, 2010; Hsu et al., 2011; Kim et al., 2010a; Schierz et al., 2010; Shaw, 2014; Wu and Wang, 2005
Compatibility	Chen, 2008; Gerrard and Cunningham, 2003; Mallat, 2007; Mallat et al., 2009; Schierz et al., 2010; Szmigin and Bourne, 1999; Wu and Wang, 2005; Yang et al., 2012
Relative advantage	Arvidsson, 2014; Gerrard and Cunningham, 2003; Mallat, 2007; Püschel et al., 2010; Szmigin and Bourne, 1999; Yang et al., 2012
Perceived risks (security and privacy)	Arvidsson, 2014; Chen, 2008; Gerrard and Cunningham, 2003; Harrison et al., 2014; Hsu et al., 2011; Kim et al., 2010b; Luo et al., 2010; Mallat, 2007; Plouffe et al., 2000; Schierz et al., 2010; Shin, 2009; Szmigin and Bourne, 1999; van der Heijden, 2002; Yang et al., 2012; Wu and Wang, 2005
Cost	Constantiou et al., 2006; Harrison et al., 2014; van der Heijden, 2002; Venkatesh et al., 2012; Wu and Wang, 2005; Yang et al., 2012
Network externalities, Lack of merchant adoption, Lack of critical mass	Goeke and Pousttchi, 2010; Kauffman et al., 2000; Mallat, 2007

The summary of the most important factors that proved to have a significant influence for consumer adoption of mobile and electronic services is presented in Table 4.1. These include: (i) financial services, (ii) commerce, and (iii) payments. From a technological point-of-view the most important factors for mobile service adoption by consumers are compatibility of mobile services with mobile devices and lack of security and privacy risks. Other important factors are the service cost, perceived usefulness, ease of use, and extended network of merchants accepting mobile payments (networks externalities).

The adoption of mobile payments by retailers

Another influential category of stakeholders that has a crucial impact on the level of penetration and spread of mobile payment services are merchants or retailers. In this case, we have to deal with analysis of technology acceptance at an organisational level.

'The main approach used in studies of organisational adoption is the theory of diffusion of innovations (Rogers, 2003). However, the number of studies addressing problems of organisational technology acceptance in the mobile payment, m-commerce, and related areas is not extensive. This could be explained by the general complexity of the question

Table 4.2: Factors influencing the adoption of a new payment system by retailers.

Factors affecting adoption	References
Technical feasibility (integration, interoperability, scalability, remote access, integration, infrastructure, complexity, etc.)	van der Heijden, 2002; Plouffe et al., 2000; Mallat and Tuunainen, 2008
Perceived risks (security, privacy, investment)	Mallat and Tuunainen, 2008; van der Heijden, 2002
Perceived benefits and a need for an alternative payment system	Mallat and Tuunainen, 2008
Cost (Transaction fee)	Mallat and Tuunainen, 2008; Plouffe et al., 2000; van der Heijden, 2002
Network externalities, lack of critical mass	Mallat and Tuunainen, 2008; van der Heijden, 2002
Cost	Constantiou et al., 2006; Harrison et al., 2014; van der Heijden, 2002; Venkatesh et al., 2012; Wu and Wang, 2005; Yang et al., 2012
Ease of use	van der Heijden, 2002

because the study should consider two levels: organisational and intra-organisational (Frambach and Schillewaert, 2002). The main factors affecting innovation adoption at the organisational level are adopter characteristics, supplier marketing activity, perceived innovation characteristics, social network, and environmental influences. On the intra-organisational level important factors include personal characteristics, internal facilitation, social usage, personal innovativeness, and attitudes towards innovation' (Apanasevic et al., n.d.).

Only a few empirical studies addressing the question of organisational technology acceptance have been conducted in the domains of electronic services and related areas (Mahler and Rogers, 1995; Chwelos et al., 2001; Lapierre and Denier, 2005; Oliveira and Martins, 2010; Johnson, 2009, 2010). Plouffe et al. (2000) have conducted research which is focused on problems of adoption of a new payment technology (i.e. smart cards) by merchant and consumers. van der Heijden (2002) and Mallat and Tuunainen (2008) have explored the adoption of mobile payments by retailers. In most of the reviewed studies, authors used the framework of the theory of diffusion of innovations for analysis purposes. The summary of significant factors affecting acceptance of new payment systems by retailers is presented in Table 4.2.

Network externalities and critical mass

According to the findings of studies on adoption of different electronic and mobile payment instruments (van Hove, 1999; Plouffe et al., 2000; Mallat, 2007), network externalities are an important obstacle to a wider penetration of payment services. Due to network externalities, growth rates of a new product are delayed and a company gets a lower profit (Goldenberg et al., 2010). The effect of direct network externalities means that an increasing number of service or product adopters increases the value of this

service or product for all users (Economides, 1996; Song et al., 2009), such as in the case of telephones and fax machines.

Mobile payments are subject to indirect network externalities (Economides, 1996; van Hove, 1999) because these services should be adopted by both merchants and consumers (Plouffe et al., 2000). Hence, service adoption by merchants depends on service adoption by consumers, and vice versa (Plouffe et al., 2000). This situation, also known as the 'chicken and egg' dilemma, is challenging for mobile payment service providers. A new payment service without a critical mass of consumers is not attractive for merchants' investment, and consumers will not adopt a new payment method without ubiquitous service infrastructure (van Hove, 1999; Mallat, 2007). Critical mass is 'the minimum number of adopters of an interactive innovation for the future rate of adoption to be self-sustaining' (Mahler and Rogers, 1999:721). Previous studies (Szmigin and Bourne, 1999; Plouffe et al., 2000; van Hove, 2001) have provided empirical evidence that shows that a lack of critical mass is a factor which leads to the failure of payment systems.

4.2   Theoretical Foundation for Research

The developed conceptual framework is based on the literature review analysis. The main dimensions are stakeholders and expectations. Due to the fact that the developed framework is an important part of the theoretical contributions of this study, the reasoning and motivation behind each of the analysis factors it is taken from Paper 1.

'**Stakeholders**. In Sweden the main stakeholders of POS mobile payment services are mobile payment service providers, banks, financial companies, merchants (i.e. retail and restaurant chains), and consumers. Historically, mobile network operators were not interested in these services.

Expectations. In order to be adopted in the market, mobile payment system needs to meet the expectations of the banks and financial institutions, merchants, and consumers (Karnouskos and Fokus, 2004). For our analytical framework we have selected six criteria (technological feasibility, economic benefits, lower service cost, added value of services, network externalities and critical mass, and ease of use) as they are the most frequently referred to in the literature.

Technological feasibility

The main technical issues of mobile payment systems are standardisation, a lack of interoperability, transaction security, privacy, and integration of a new payment system into the overall business environment (Au and Kauffman, 2008; Mallat and Tuunainen, 2008; Barbuta et al., 2012).

Banks expect a secure and trusted service and integration of a new payment into the existing infrastructure (Karnouskos and Fokus, 2004; Barbuta et al., 2012). Factors affecting mobile payment system acceptance by merchants are independence (i.e. no need for specialised hardware and software), scalability, and security (van der Heijden, 2002). A payment system should also be standardised, easily integrated, interoperable, and trusted (Karnouskos and Fokus, 2004). In addition, merchants expect mobile payment transactions to be faster than bank cards (Karnouskos and Fokus, 2004).

End-users expect interoperability between devices (Karnouskos and Fokus, 2004), anonymity of transactions (similar to paying with cash) and privacy (Karnouskos and Fokus, 2004), and a secure high-quality service (van der Heijden, 2002; Karnouskos and Fokus, 2004; Constantiou et al., 2006). Customer-perceived security positively affects trust in services and the intention to use a payment system (Kim et al., 2010b).

Technological feasibility of a service is important for banks, merchants, and consumers. This leads us to the following proposition:

> *Proposition 1. Banks expect a mobile payment service to be secure, trusted, and easy to integrate into the existing infrastructure. Merchants also expect a new mobile payment service to be easily integrated with other payment services and back-end systems, and that the service is fast, reliable, scalable, and secure. Consumers expect a fast, reliable, secure, and trustworthy service with guaranteed privacy and anonymity.*

Dimensions of relative advantage

The essential contribution of the previous studies is in the attempt to define the relative advantage of mobile services (i.e. mobile commerce, banking, and payment). Convenience and independence of location and time are the main factors which affect the intention to use mobile services (Frolick and Chen, 2004; Constantiou et al., 2006; Laukkanen and Kiviniemi, 2010). Similarly, Mallat (2007:427) has defined the relative advantage of mobile payments for consumers as 'the perceived independence of time and place, availability to avoid queues, and the ability to complement traditional services (cash payments)'. It is possible to specify several dimensions of relative advantage: economic benefits, lower service cost, and added value of a service.

Economic benefits are one of the most important factors of relative advantage. When entering the payment market, mobile payment providers expect to gain their market share by attracting more merchants and consumers. Banks expect to find new business cases (Karnouskos and Fokus, 2004; Mallat and Tuunainen, 2008). Merchants expect to increase their transaction volumes and revenue, to attract new segments of consumers,

and to increase the number of impulse purchases (Chen, 2008; Mallat and Tuunainen, 2008). We propose that economic benefits are important for companies:

> *Proposition 2. Banks and financial companies expect to find new business cases from the introduction of mobile payments. Mobile payment providers expect to gain a bigger share of the payment market. Merchants expect that a new mobile payment service will serve to increase the number of impulse purchases, to increase the transaction volumes, and to reach new market segments.*

Lower service costs. Cost factor is a construct of relative advantage (Rogers, 2003). However, in a number of studies on the adoption of mobile commerce, financial and payment services (Mallat, 2007; Hsu et al., 2011; Arvidsson, 2014), researchers treat it as a separate variable. According to the findings, the price of mobile services is the most important factor for service adoption by consumers (Constantiou et al., 2006) and negatively affects consumers' intention to use the service (Mallat, 2007). Indeed, cash payment has no cost for consumers, and they expect the cost of a mobile payment service to be low or zero (Karnouskos and Fokus, 2004).

Merchants represent a group of stakeholders who pay the payment system provider for the service (van der Heijden, 2002). Merchants will perceive a mobile payment service as an attractive alternative if it can ensure lower transaction costs compared to bank card systems (van der Heijden, 2002; Karnouskos and Fokus, 2004; Mallat and Tuunainen, 2008; Chen, 2008). Furthermore, the cost of investment in the service infrastructure is also expected to be low or zero (Karnouskos and Fokus, 2004). An additional category of costs for merchants is personnel learning and training costs (van der Heijden, 2002). We propose that the cost factor is important for merchants and consumers:

> *Proposition 3. Both groups of stakeholders expect that mobile payment services will ensure lower service and operational costs.*

Added value of a service. Mobile payment services compete with cash, bank cards, and other means of payment. In this context, a key success factor for mobile payment providers becomes delivering value added services to customers (both retailers and consumers) (Laukkanen and Kiviniemi, 2010).

Researchers (Frolick and Chen, 2004) have defined mobile commerce as a channel that can be used to enhance customer relationships for direct marketing and for promotional activities. Ondrus and Lyytinen (2011) have specified loyalty schemes and promotion options as value for merchants. The introduction of mobile payment services has potential to improve a company's image and branding (Karnouskos and Fokus, 2004; Mallat and Tuunainen, 2008), customer loyalty (Karnouskos and Fokus, 2004; Chen, 2008), and to

enhance customer service (Chen, 2008). Additionally, merchants have the possibility to customise the service by adding loyalty schemes to the mobile payment service and to simplify payment procedures (Karnouskos and Fokus, 2004).

Service convenience and access to information (Frolick and Chen, 2004; Chen, 2008) and integration with other mobile services (Ondrus and Lyytinen, 2011) are the added value of mobile commerce for consumers. Other added value services of mobile payments are service personalisation (Constantiou et al., 2006); person-to-person transactions, overview of real-time transaction status, and the ability to pay 'anywhere' and 'anytime' (Karnouskos and Fokus, 2004; Mallat, 2007).

We propose that expected added value of a service is important for merchants and consumers:

> *Proposition 4. Merchants expect to improve the company's image and customer loyalty, to enhance customer service, to simplify and speed-up purchasing processes, to integrate loyalty schemes, and to use the service for direct marketing and promotional campaign purposes. Consumers expect a convenient, personalised service integrated with other mobile services (e.g. ticketing, loyalty schemes, etc.).*

Network externalities and critical mass

Previous studies on the adoption of new payment systems like smart cards (Plouffe et al., 2000) and mobile payments (van der Heijden, 2002; Mallat and Tuunainen, 2008; Au and Kauffman, 2008) emphasise the interdependence of two major groups of stakeholders – merchants and consumers – in the service's adoption and use. Consumers can benefit from a payment service only if it is accepted by an extended network of retailers, merchants, and restaurants (Plouffe et al., 2000; Karnouskos and Fokus, 2004; Goeke and Pousttchi, 2010). Merchants are interested in the service deployment only if there is a critical mass of consumers (Plouffe et al., 2000; Mallat and Tuunainen, 2008). Mobile payment providers can benefit if both networks are big (Karnouskos and Fokus, 2004) and, thus, there is a considerable number of transactions. This leads us to the following proposition:

> *Proposition 5. Mobile payment providers expect to attract a big network of merchants who will accept the payment service, and consumers who will use it. Merchants expect that there will be a critical mass of consumers. Consumers expect a ubiquitous mobile payment service infrastructure.*

Ease of use

Findings from previous research (Constantiou et al., 2006; Goeke and Pousttchi, 2010; Kim et al., 2010a; Hsu et al., 2011; Duane et al., 2014) have shown that ease of use is crucial for adoption of mobile services. Moreover, ease of use contributes to the overall consumer satisfaction from mobile services (Constantiou et al., 2006) and influences whether consumers are likely to use a mobile payment service (Arvidsson, 2014). According to Kim et al. (2010a), knowledge, innovativeness, reachability, and convenience are relevant factors which can explain an ease of use variable. Service simplicity, a user-friendly interface, and minimum or zero learning effort also are very important (Karnouskos and Fokus, 2004). From the perspective of merchants, the service should be easy to use for personnel (van der Heijden, 2002).

> *Proposition 6. Merchants expect an easy to use mobile payment service, which does not require large learning costs and is user-friendly for their personnel. Consumers expect a simple and user-friendly solution'* (Apanasevic et al., n.d).

Table 4.3: Analysis framework (The source: Apanasevic et al., n.d).

Expectations	Mobile payment service providers	Banks	Merchants	Consumers
Technological feasibility (P1)		●	●	●
Economic benefits (P2)	●	●	●	
Lower service cost (P3)			●	●
Added value of a service (P4)			●	●
Network externalities and critical mass (P5)	●	●	●	●
Ease of use (P6)			●	●

'We have summarised our propositions (P1 – P6) in Table 4.3. These assumptions were (i) validated during interviews with stakeholders; and (ii) assessed whether they were fulfilled or not' (Apanasevic et al., n.d.).

4.3   Research Approach

The analysis of stakeholders' expectations was mainly based on the interview data. We used the developed analysis framework (see Table 4.3) to categorise the expectations of stakeholders. Then, we validated and assessed our propositions (P1 – P6) and performed a cross-case comparison. As a final step, we compared our findings with findings from the previous research.

4.4   Findings: Stakeholders' Expectations of Mobile Payment Services

The main categories of stakeholders are the mobile payment service providers (Swedbank and Seamless), the retailers (Axfood and McDonald's), financial companies and the end-users of the services. The stakeholders for both cases are listed in Table 4.4.

Table 4.4: Stakeholders of Bart and SEQR mobile payment services.

Stakeholders' categories	Bart	SEQR
Mobile payment providers	Swedbank	Seamless
Retailers	Axfood	Axfood and McDonald's
Financial and credit companies		Collector and Gothia
Consumers	First: Customers of Swedbank and Axfood Later: Customers of other banks	Customers of retailers

Technological feasibility

The summary of stakeholders' expectations on technological feasibility of Bart and SEQR services is provided in Table 4.5. In terms of technical performance, the Bart and SEQR services proved to be secure and trusted, with no sensitive information being sent during the transaction.

The expectations of retailers were partly met. Both services were easy to integrate into the existing infrastructure and performed well. The services were secure, reliable,

Table 4.5: Stakeholders' expectations on technological feasibility (P1).

Stakeholders' categories	Bart	SEQR
Retailers	Axfood => Expectations partly met (+) Good technological performance meets the expectations (+) Secure, reliabile and fast service (+) Easy integration with the existing infrastructure (–) Separate hardware (the Bart reader) needed (–) For non-experienced service users the payment procedure took more time	Axfood, McDonald's => Expectations partly met (+) Good technological performance meets the expectations (+) Secure, reliabile and fast service: transaction is 'much faster than a card transaction' (+) Easy integration (+) No need for a separate hardware (–) Impossible to use SEQR in some of Axfood's stores due to problems with Internet access
Consumers	Consumers => Expectations met (+) Service compatible with all devices (+) Secure, trusted, and reliable service (+) Quick for experienced users	Consumers => Expectations met (+) Service compatible with all devices (+) Secure, trusted, and reliable service (+) Fast service

and fast. However, Bart's weaknesses are: (i) a need for separate hardware which takes 'very valuable' space around the cash register; and (ii) a long duration of the payment procedure for non-experienced users. SEQR payment is performed online. In some of Axfood's stores there are problems related to Internet access and it is impossible to use the service there.

It is reasonable to say that most of the consumer expectations were fulfilled. The services proved to be secure, trusted, reliable, compatible with all smartphones, and fast for experienced users.

Economic benefits

The summary of stakeholders' expectations on the economic benefits of Bart and SEQR services is provided in Table 4.6. Swedbank's expectations about the economic benefits of Bart were not met and the service was closed. In contrary, Seamless is gradually developing the network of merchants and gaining a bigger market share of the payment market.

Table 4.6: Stakeholders' expectations on economic benefits (P2).

Stakeholders' categories	Bart	SEQR
Mobile payment providers	Swedbank => Expectations not met (–) The service did not meet the expectations about economic benefits and was closed	Seamless => Expectations met (+) The network for merchants is growing, consequently, the market share of Seamless is also growing
Retailers	Axfood => Expectations not met (–) Expectation 'to reduce the amount of cash' and risks associated with its handling was not met due to a small number of users and transactions	Axfood, McDonald's => Expectations not met (–) Expectation 'to reduce the amount of cash' and risks associated with its handling was not met due to a small number of users and transactions
Financial companies		Gothia and Collector => Expectations met (+) Increase in the number of customers due to new SEQR clients

Both retailers (Axfood and McDonald's) deployed mobile payments in order 'to reduce the amount of cash' and the risks associated with its handling. These expectations were not met due to a small number of users and a small number of transactions.

The financial companies receive new clients. Hence, the expectations on economic benefits of Collector and Gothia are met.

Table 4.7: Stakeholders' expectations on lower service cost (P3).

Stakeholders' categories	Bart	SEQR
Retailers	Axfood => No information (?) No information if the expectation of a 'lower transaction cost' compared to bank cards came true	Axfood, McDonald's => Expectations met (+) 50% lower transaction fee compared to bank cards (+) Competitive transaction fee is attractive for retailers and the network for merchants is growing
Consumers	Consumers => Expectations met (+) Service free of charge	Consumers => Expectations met (+) Service free of charge

Lower service cost

The summary of stakeholders' expectations on lower service cost of the Bart and SEQR services is provided in Table 4.7. There is no information if the Bart service met the expectation of Axfood about a 'lower transaction cost'. In the case of SEQR, having its own service network allowed it to set a competitive transaction fee. Currently, it is '50% less than the one offered by credit card companies' which is an attractive offer for retailers. In addition, the service does not require additional investment in hardware or service infrastructure (according to the McDonald's representative). Retailers have no concerns about return on investment due to free service roll out (according to the Axfood's representative).

Both services are free of charge for consumers and meet the expectations of a lower service cost.

Added value of a service

Swedbank made the Bart service available for clients of other banks and considered this an added value to customers. Seamless improved the SEQR service with new functionalities and additional services (e.g. cashback payment and loyalty programmes for some retailers). The summary of stakeholders' expectations on added value of a service is provided in Table 4.8.

According to the Axfood's representative, the main benefits of Bart service introduction are: (i) getting more experience in offering the service; and (ii) the attention from national and regional media. However, Bart lacked 'extra services' for consumers.

Both retailers (Axfood and McDonald's) see SEQR as an opportunity to learn how to provide this type of service. In addition, introducing a new service results in attention from local and national media. Additional value for Axfood is the integration of Hemköp's and Willys' loyalty cards with the service. Cashback payment promoting the merchants' and products' brands is another additional service that can result in the increase in purchase

Table 4.8: Stakeholders' expectations on added value of a service (P4).

Stakeholders' categories	Bart	SEQR
Retailers	Axfood => Expectations partly met (+) Learning how to offer the service (+) Attention from national and regional media (–) No additional services	Axfood, McDonald's => Expectations met (+) Learning how to offer the service (+) Attention from national and regional media (+) Additional services (cashback payments, integrated loyalty programmes) (+) Improved perception of company's brand (+) A range of accepted types of payment
Consumers	Consumers => Expectations not met (–) Just payment, no additional services	Consumers => Expectations met (+) Range of additional services

volumes. Introduction of new payment services is also an opportunity to improve the company's brand perception ('modern brand') and allows the company to offer a range of payment types (according to the McDonald's representative).

Consumers can use SEQR in different payment situations (P2P transfers, p-commerce, purchases online, transport tickets, and parking payments). New service functionality – integrated loyalty cards and cashback payments – allows consumers to save money when buying certain products.

Network externalities and critical mass

The summary of stakeholders' expectations on network externalities and critical mass is provided in Table 4.9. The Bart service did not meet the expectations of all stakeholders. The service was accepted by only one retailer and there was an insufficient number of consumers.

Seamless 'realised a need to develop a network of merchants before the consumers would come.' In order to create 'a business case for merchants', Seamless offered a

Table 4.9: Stakeholders' expectations on network externalities and critical mass (P5).

Stakeholders' categories	Bart	SEQR
Mobile payment providers	Swedbank => Expectations not met (–) Only one retailer deployed the service (–) Insufficient number of users	Seamless => Expectations met (+) The network of retailers is growing (+) The number of end-users is increasing (+) The market share of Seamless is growing
Retailers	Axfood => Expectations not met (–) Small number of users: '20,000 users is too few'	Axfood, McDonald's => Expectations not met (–) Small number of users
Consumers	Consumers => Expectations not met (–) No network of retailers accepting the service	Consumers => Expectations met (+) The network of retailers is growing

Table 4.10: Stakeholders' expectations on ease of use (P6).

Stakeholders' categories	Bart	SEQR
Retailers	Axfood => Expectations not met (–) There were educational and informational problems in the stores (–) When the transaction is rarely performed cashiers 'forget or become unsecure how to do it'	Axfood, McDonald's => Expectations met (+) Easy to use
Consumers	Consumers => Expectations not met (–) Service was not easy to use	Consumers => Expectations met (+) Easy to use

competitive transaction fee and a free service roll out. As a result the network of retailers is growing, and this is in line with Seamless expectations. At the same time, Seamless offers attractive additional services for consumers.

Retailers would like to see a bigger number of SEQR users. However, a lack of critical mass is not a problem 'since no investment was needed'.

The expectations of consumers are met because the network of retailers accepting the service is growing.

Ease of use

The summary of stakeholders' expectations on ease of use is provided in Table 4.10. The Bart service was complicated and did not meet the expectations of the retailer and the consumers. Because the transactions were seldom performed, cashiers forget how to do it. Hence, there were educational and informational problems in the stores. The service was complicated for consumers as well. In contrast, the SEQR service is easy to use for both personnel and consumers.

The summary of expectations of the main categories of stakeholders (mobile payment providers, retailers, and consumers) about mobile payment services are presented in Table 4.11.

Table 4.11: The summary of stakeholders' expectations.

Expectations	Mobile payment service providers		Retailers		Consumers	
	Bart	SEQR	Bart	SEQR	Bart	SEQR
Technological feasibility (P1)			Partly	Partly	Yes	Yes
Economic benefits (P2)	No	Yes	No	No		
Lower service cost (P3)			?	Yes	Yes	Yes
Added value of a service (P4)			Partly	Yes	No	Yes
Network externalities and critical mass (P5)	No	Yes	No	No	No	Yes
Ease of use (P6)			No	Yes	No	Yes

4.5 Discussion and Conclusions

In this chapter we tried to answer the RQ1 and to understand the reasons preventing mobile payments from reaching a wider scale of adoption. More specifically, we have analysed if mobile payment services meet the expectations of different stakeholders. In order to answer this question, we have developed and validated the analysis framework based upon theory of diffusion of innovations, TAM, and network externalities.

'We have proposed that a good technical performance of mobile payment services is important for banks, merchants, and consumers (*Proposition 1*). The findings show that there are no major problems related to the **technical feasibility** of mobile payment services. The developed services have met expectations of stakeholders in terms of security, reliability, scalability, ease of service integration in the existing infrastructure, and speed of transactions. These findings confirm *Proposition 1* and are in line with the previous study which is focused on merchant adoption of a mobile payment system in Finland (Mallat and Tuunainen, 2008). Additionally, the results of our research propose that mobile payment services best meet the expectations of retailers when there is no need for separate infrastructure and hardware.

Within this research, we have defined **relative advantage** with the help of dimensions of economic benefits, lower service cost, and added value of a service. Overall, it is possible to conclude that the Bart service did not provide a sufficient relative advantage to stakeholders and a number of stakeholders' expectations were not fulfilled.

Our findings have validated *Proposition 2* stating that companies expect to improve their economic performance and to increase profit by introducing mobile payments. In terms of **economic benefits**, Swedbank could not make use of a new business case that could have potentially become a new source of revenue. In contrary, the independent mobile payment provider, Seamless, tries to take advantage of this new service. The company actively develops networks of retailers and consumers, and increases its share of the payment market. Economic benefits of the mobile payments include an increase in the volume of impulse purchases which leads to an increase in revenues (Mallat and Tuunainen, 2008). However, in both cases retailers' expectation to reduce in-store cash transactions did not happen due to the small number of mobile transactions. Overall, SEQR is moving towards the realisation of mobile payment potential through newly introduced features (loyalty cards and cashback payments). These service features could bring new service customers.

According to *Proposition 3*, one of the major expectations of retailers and consumers about mobile payment is a **lower service cost** (van der Heijden, 2002; Karnouskos and Fokus, 2004; Mallat and Tuunainen, 2008; Chen, 2008). During the interviews, it was not disclosed if the Bart service cost was lower than the bank's card transaction fee.

However, the service required investment in infrastructure and additional equipment. In turn, Seamless realised that in order to be accepted, the mobile payment service should provide a business case for merchants. SEQR meets expectations of retailers about a zero investment cost in service infrastructure and a lower service cost compared to credit card transaction fees. Both services have met consumer expectations of a zero service cost. These findings are in line with *Proposition 3*.

Previous studies (Laukkanen and Kiviniemi, 2010; Mallat and Tuunainen, 2008; Plouffe et al., 2000) have highlighted the importance of having **added value of a** mobile **service** for merchants and customers (*Proposition 4*). Indeed, 'the pure convenience and novelty elements' (Plouffe et al., 2000:121) of a new payment service are not enough for service acceptance. A mobile payment service should provide something more than just payment in order to be more attractive than a credit card. In this context, Bart's value for retailing is questionable because the service acted like a credit card on a mobile phone and did not provide any additional service for either the consumers or retailers. This relates to the observation that banks forget to provide 'the compelling reason for a consumer' to use a new payment service on a *continuous* basis (Plouffe et al., 2000:112).

The SEQR service provides a different example. This service has a range of services for consumers (such as person-to-person payments, transport ticketing, parking payments, loyalty programmes, and cashback payments) and for retailers (e.g. cashback payment promoting retailers' and products' brands). In addition, retailers decided to introduce the mobile payment service because it could positively affect the company's image and enhance the customer purchasing experience by making the overall process simpler and quicker. These findings are in line with a previous study on merchants' adoption of mobile payments (Mallat and Tuunainen, 2008) and validate *Proposition 4*.

The empirical findings of previous studies on mobile payments (van der Heijden, 2002; Plouffe et al., 2000; Mallat and Tuunainen, 2008) have highlighted the importance of **network externalities and critical mass**. Their main effect is interdependence existing between all involved stakeholders when 'critical mass in one area would certainly impact critical mass in another area, and vice versa' (van der Heijden, 2002:438). Thus, merchants expect a critical mass of consumers, consumers expect a wide network of merchants, and mobile payment providers expect to attract both merchants and consumers (*Proposition 5*).

According to our findings, Bart failed to reach a critical mass of end-users. Indeed, in order to reach a return on investment, banks need a considerable number of customers (Laukkanen and Kiviniemi, 2010). In contrary, Seamless has minimised the impact of network externalities and critical mass on service adoption by retailers. This is achieved by offering a zero investment cost and a lower service price. Indeed, according to Goldenberg et al. (2010), a lower product price tends to minimize the effect of network externalities. Hence, although retailers would like to see more service users and an increase in transaction

volumes, an insufficient critical mass of consumers and investment risks do not affect service acceptance. This finding differs with findings by Mallat and Tuunainen (2008:46), which have defined 'a wide user base' as 'a precondition' for merchant adoption. Hence, our *Proposition 5* regarding critical mass is only partially supported.

According to previous research (van der Heijden, 2002), **ease of use** and a user-friendly interface are other important expectations of merchants and consumers on mobile payment services (*Proposition 6*). Bart is an example of a complicated service. In addition, shop cashiers tended to forget how to accept mobile payment as time passed by. Our finding is in line with a previous study (van der Heijden, 2002). In contrary, SEQR is a user-friendly service and greater meets the expectations of personnel and consumers. Therefore, our *Proposition 6* has been validated.

Our overall findings have shown that even a successful mobile payment service still does not meet all the expectations of the main stakeholders. In addition, existing services only partly enhance the purchasing process through making it faster. Mobile payment service providers could take the next step towards providing an opportunity of self-scanning, where consumers scan prices while shopping in the store and could pay just by pressing a button before leaving the store. This is what retailers expect from the enhanced purchasing process' (Apanasevic et al., n.d).

Chapter 5

The Effect of Innovation on Business Networks

In this chapter we will discuss RQ2 and analyse how the introduction of mobile payments affects the structure of business networks and strategies of business actors. Specifically, we will focus on: (i) business-related aspects of mobile payments, and (ii) how mobile payments effect traditional payment systems. These topics have not been sufficiently studied in academic research:

- The list of publications on business-related aspects of mobile payments is not extensive. Pousttchi et al. (2009) and Zolnovski et al. (2014) have analysed business-related aspects of mobile payments from the perspective of business models. Tobbin (2011) and Ok et al. (2013) have studied ecosystem of mobile and NFC services. Roles of different stakeholders were explored by Au and Kauffman (2008), Ondrus and Pigneur (2009) and Gaur and Ondrus (2012).

- Researches have seldom studied the effect that mobile payments make to traditional payment systems. To some degree, Mallat (2007) and Mallat and Tuunainen (2008) have compared the use of mobile payment services and cash in the discussion of mobile payment services adoption by consumers and merchants. However, the impact of mobile payments on bank card-based payment systems was not studied.

The effect of innovation on business networks could be discussed using methods of entrepreneurship. However, traditional literature on innovation usually addresses innovation and its development from the perspective of a single company (Chesbrough and Rosenbloom, 2002; Katila et al., 2012; Zott and Amit, 2007) or an entrepreneur (Bird, 1988; Hmieleski and Baron, 2009). It is important to highlight that the success of mobile payment services in the market depends on collaboration of different market actors (e.g. banks, mobile network operators, retailers, etc.) (Ondrus et al., 2009; Tobbin,

2011; Andersson et al., 2013; Silic et al., 2014). In order to analyse the effect of mobile payments on business networks and answer RQ2, it seems reasonable to apply the IMP approach because its main focus is studying of cooperation, relationships, and interactions between actors in a business network.

5.1 Literature Review

5.1.1 Background Ideas of the IMP Thinking Approach

One of the key ideas highlighted by the IMP Group researchers is: 'no business is an island' (Håkansson and Snehota, 1989). Thus, a single organisation has no needed resources to provide a service or produce a product alone. In order to access the external resources of other business parties, organisations participate in business networks (Håkansson and Snehota, 1989; Håkansson et al., 2009). 'This affects resources and activities of other actors involved in the network. Company's resources are 'partly controlled by demands and requirements of counterparts, while 'external resources' owned by counterparts, are partly controlled' (Baraldi et al., 2007) by the company' (Apanasevic, 2014). Due to interrelated relationships, a company is embedded in its environment and has no defined boarders (Håkansson and Snehota, 1989).

The main components of a network are actors, resources, and activities (ARA framework). IMP researchers commonly use the ARA model to describe and analyse interactions in business networks (Andersson et al., 2011; Ford et al., 2008; Håkansson et al., 2009; Håkansson and Snehota, 1995):

- *Actor layer* is about links developed between individuals, groups, and organisations involved in a business network.

- *Activity layer* is related to links between activities of two actors, their integration and coordination. Examples of activities are: production, administration, delivery, and information handling. Activities of companies 'become integrated and linked together' (Ford et al., 2008).

- *Resource layer* represents how resources of actors are linked and adapted together. Resources can be both tangible and intangible (e.g. knowledge).

The benefits of being in business networks for companies are the opportunity to access new knowledge, information, technology, and markets, to learn and share R&D costs, and to reduce uncertainty (Arias, 1995; Corsaro et al., 2012; Håkansson, 2006). Negative outcomes of business networks are related to their complexity, an increased level of interdependency within the business network, and a need to adjust a business model (Arias, 1995; Baraldi et al., 2007; Håkansson, 2006; Håkansson and Ford, 2002).

The IMP approach has been applied in order to investigated roles and responsibilities of different business actors in NFC services and SMS-based payments and transport ticketing services by Markendahl et al. (2010). Andersson et al. (2011) have analysed the formation of new business ventures in mobile payment and ticketing services. Markendahl (2013) has investigated the impact from the change of regulation on mobile payment market and business networks.

5.1.2 Innovation in IMP Research

Håkansson and Olsen (2012:81) have specified a duality of innovation processes:

- They are a result of new ideas and creative processes.

- They are a result of 'material and social interactions'.

In order to produce a positive economic result, the innovation should be adjusted and combined with existing resources, activities, and actors in a network. IMP researchers have analysed different aspects of innovation. For example, Håkansson and Eriksson (1993) have conceptualised innovation management issues:

- '*Getting and giving priority to potential partners.* This is a mutual process that can be based on e.g. having a good reputation, technical competence, being connected to other actors within the field, confrontation of different knowledge bases which can have a complementary effect.

- *Synchronization of activities and resources.* Smooth coordination of this process is a success factor due to possible conflicts, differences in ideas, and 'power struggles'.

- *Timing* is critical when implementing innovative projects, because sometimes projects tend to take more time than it was planned.

- *Mobilising customers* is very important, because their acceptance is critical for innovation to penetrate in the market' (Apanasevic, 2014).

Arias (1995) has investigated the obstacles and driving forces for innovations in networks. Corsaro et al. (2012) have conducted a study on 'the impact of different network configurations on the characteristics of associated value aspects' and analysed the differences between these network configurations.

Research by Syson and Perks (2004) has been focused on the development of new services and the innovation within networks. Rusanen et al. (2014) have investigated what types of resources 'companies seek for service innovation'. At the same time, the researchers have analysed 'the nature of relationships and access strategies employed to access each type of resources'. Four strategies have been identified: absorption (by one of network actors), acquisition (through market transaction), sharing (exchange between network actors), and resource co-creation by network actors.

Hoholm and Olsen (2012) have developed and proposed an innovation process model based on Actor-Network (ANT) and IMP research, and have applied this model to study (i) the contrary forces of innovation processes, (ii) how the interactive process of innovation evolves over time, and (iii) how knowledge is transformed in this process.

Håkansson and Olsen (2012) have proposed a framework for analyzing the interdependency between business actors, dynamism of resources, and a variety of actors and resources.

5.2   Theoretical Foundation for Research

A company develops relationships with different types of organisations while performing business activities (Ritter et al., 2004). Companies in the networks may have 'different types of relationships and network management situations' (Ritter et al., 2004:177). Moreover, they might participate in several business networks simultaneously. There might be situations when companies are in a power position and control the network. In other situations, they might be controlled by others, or have influence over each other.

One of the possible extremes is the situation of a monopolist (Ritter et al., 2004). Company's management of relationships will be affected by its power position. In this case, the company can select partners and have a control over the relationship development.

However, a more typical situation is the interdependence of companies in a network, when each company has some influence over the other (Ritter et al., 2004). In this case, a single company has less freedom in selecting partners. Management of relationships with other actors might be affected by earlier interactions defining 'how things are done' (Ritter et al., 2004:177) or by conflicting aims of other business network parties. Ford et al. (2003) and Gadde et al. (2003) have specified three strategic questions that company's management has to address:

- Business relationships in networks.

- Control over a network.

- Influencing others and being influenced by them.

Business relationships in networks

Relationships between companies are affected by a number of factors, for example, previous collaboration and its outcomes, new factors affecting current relationships with both new and old partners, expectations of the future interactions, and events and processes happening in a wider network of relationships (Håkansson and Ford, 2002). Changes in one relationship will to some degree affect all other relationships. This leads

us to one of the strategic questions that companies which perform in networks have to
address:

- *Establishing appropriate relationships with partners*. Prioritisation of relationships
  among different counterparts can be redefined in accordance to a company's need
  of resources (Gadde et al., 2003; Ford et al., 2003).

Control over a network

Company's control over a network is related to its network position and the network
structure. At the same time, aims and activities of all network's companies and
relationships between them make an impact on the network's structure (Håkansson and
Ford, 2002). Companies should focus on:

- *Setting reasonable ambitions of control over the network surroundings* and
  relationship management in order to reach its own objectives. In this case, strategic
  issues are related to management of activities, i.e. linking activities between
  different actors and mobilising others (Håkansson and Olsen, 2012).

Influencing others and being influenced by them

A company influences other companies through relationships. However, other companies
use the same relationships to influence the focal company. Hence, another strategic
question for companies to address (Håkansson and Ford, 2002) is:

- *Selecting a right balance between influencing others and being influenced*. An
  ability to influence others depends on actors – a companies and their network
  position. Therefore, the network position of a company is consistent with 'how
  the company relates to the firms with which it actually is involved in business
  exchanges' (Gadde et al., 2003). The 'network position' of a company consists of
  a portfolio of relationships, activity links, resource ties, and actor bonds that arise
  from them (Gadde et al., 2003:7).

5.3   Applying IMP Perspective for Analysis Purposes

We analyse the effect of innovation on business network using previously specified
criteria. More specifically we will examine the following aspects:

- *How do mobile payment providers establish appropriate relationships with different
  partners (i.e. retailers, financial companies, and consumers)?*

- *How do mobile payment providers set control over the network surroundings?*

- *How do mobile payment providers select a balance between influencing others and being influenced?*

The network perspective implies an analysis of relationships between the company and its environment. In order to show the links between different business actors we use the ARA framework. Many IMP group's researchers (Håkansson and Snehota, 1995; Ford et al, 2003; Andersson et al., 2011) have proposed and used this model. In this thesis, we have used the ARA model in order:

- To model business networks of bank card payment and mobile payment capturing links between different actors.

- To understand the cooperation between different business actors, roles and activities of each business actor in value creation. For this purpose, we use the ARA framework to show both actors and activities in the same model. An example is presented in Figure 5:1.
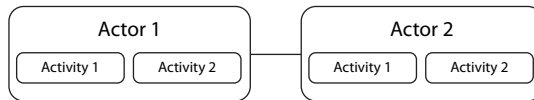

Figure 5.1:   An example of ARA model.

- To understand the effect that the introduction of mobile payment services has on payment business network. The ARA model helps to examine the dynamics of business networks (Syson and Perks, 2004).

In summary, the IMP approach provides a useful tool to study relationships and interactions between actors within business networks when introducing new mobile payment services. Additionally, a network approach helps to analyse the aspect of value creation in the network.

5.4   Findings

In order to discuss the effect of mobile payments on the structure of a business network and strategies of business actors, we show how changes in the payment business network happen over time. First, we explain the business networks of traditional payment system (i.e. bank card payment) and mobile payment services Bart and SEQR. Based on that, we provide a model of the retail business network and show its dynamics.

5.4.1 Bank Card Payment

The bank card payment system has a ubiquitous infrastructure in Sweden, and the majority of merchants accept bank cards. The business network of bank card payments involves banks, card operators, retailers, and consumers. This business network is presented in Figure 5.2.
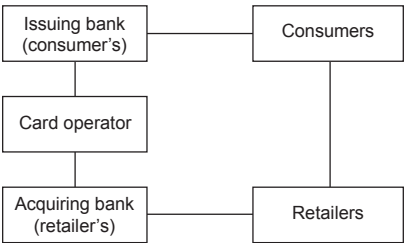

Figure 5.2: Business network of the bank card payment system.

Corresponding activities of mentioned business actors are presented in Figure 5.3. When a consumer confirms a purchase by entering a PIN code, the retailer's bank connects to a card operator. The main actions of a card operator are to validate and authorise the card and to approve the payment. Then the clearing system of a card operator sends purchase information to a consumer's bank. Finally, within several days, a settlement between the merchant's and consumer's banks is performed with payment statements and bills sent to merchant and consumer retrospectively.
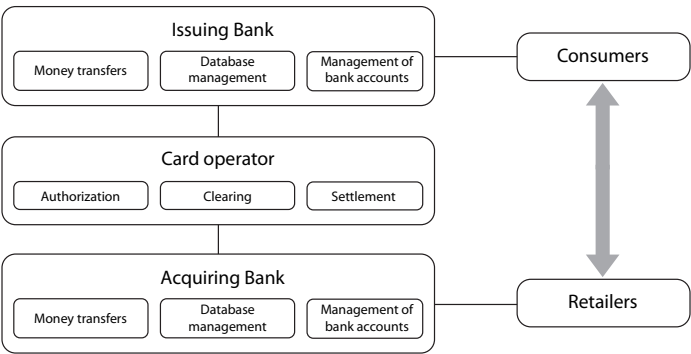

Figure 5.3: ARA model of bank card-based payment system.
The grey arrow indicates the 'billing relationship'.

5.4.2 Mobile Payment Service Bart

The main involved business actors are the mobile payment provider Swedbank, the retailer Axfood, and consumers. The business network is presented in Figure 5.4.
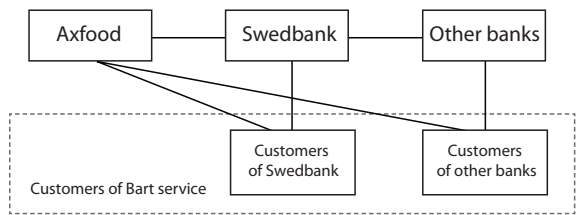

Figure 5.4: Business network of the bank card payment system.

The activities of the previously mentioned business actors are presented in Figure 5.5. Swedbank, as the mobile payment provider, performs a new activity: (i) provisioning of payment interface and app, and (ii) customer billing; and the bank's activities: (i) payment transfers, and (ii) customer database management. The bank has a direct relationship with the consumers. The Bart service consumers were customers of Swedbank (and later customers of other Swedish banks) that also were customers of Axfood's grocery chains (Hemköp, Willys, and PrisXtra).
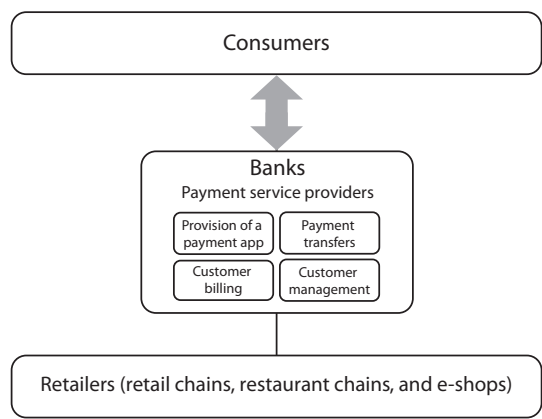

Figure 5.5: ARA model of Bart mobile payment system.
The grey arrow indicates the 'billing relationship'.

5.4.3   Mobile Payment Service SEQR

The main involved business actors are the mobile payment provider Seamless, the financial companies Gothia and Collector, the retailers Axfood and McDonald's, and consumers. The business network is presented in Figure 5.6.
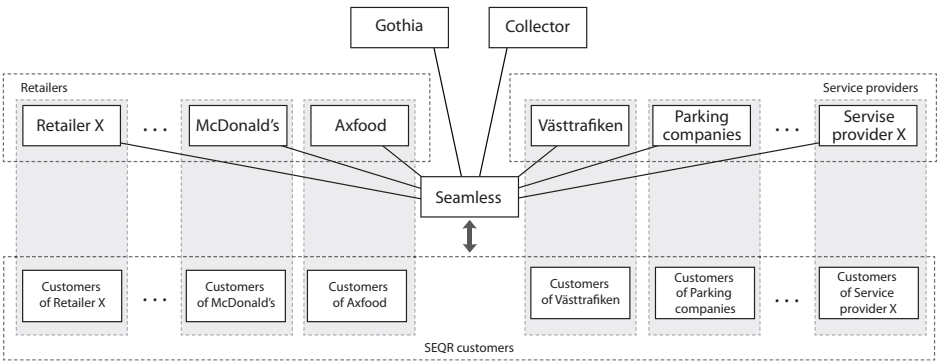

Figure 5.6:   Business network of the mobile payment service SEQR.

Seamless, as the mobile payment provider, performs new actions: (i) provisioning of payment interface and app; (ii) customer relationship management; and (iii) management
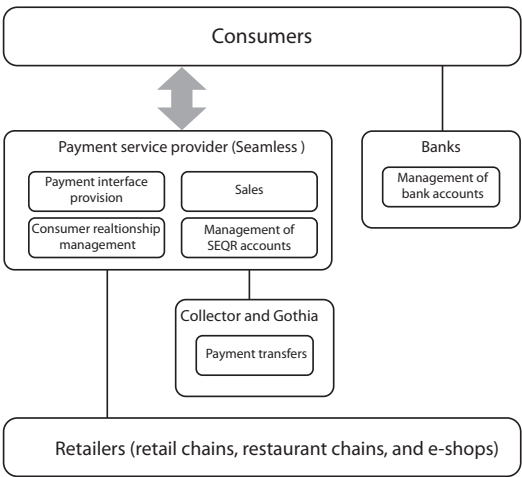

Figure 5.7:   ARA model of SEQR mobile payment system.
The grey arrow indicates the 'billing relationship'.

of SEQR accounts. The main action of the financial companies Gothia and Collector is conducting payment transfers. This includes customer database management and customer billing. Due to the fact that Seamless had none of its own customers prior to entering the mobile payment market, the SEQR customers are customers of retailers and other service providers that are willing to use the service. Banks are indirectly involved in the service provisioning. The actors and their activities are presented in Figure 5.7.

5.5   Discussion

Business relationships in networks

The effect that mobile payment services have on business networks and their structure can be illustrated by comparing traditional (bank card-based payment system) and emerging mobile payment business networks. First of all, we can build a simplified model of a mobile payment business network based on the described cases. As we can see, when developing a mobile payment service, Swedbank used already existing resources – card payment infrastructure, contact with the retailer, and its own customers. The service provisioning did not require making any new relationships.

In the case of Seamless, the introduction of the new mobile payment service resulted in a need to establish new relationships with new business actors (financial companies Collector and Gothia), and retailers. Moreover, relationships with retailers were needed in order to build the consumer base of the SEQR service, since Seamless did not have its own customers. A conceptual view of relationships in this network is presented in Figure 5.8.

The next step is to combine the business networks of bank card and mobile payments together in the model. This model shows that the main actors (mobile payment providers Swedbank and Seamless and retailers Axfood and McDonald's) are parties of a bigger network (see Figure 5.9). The introduction of mobile payment services has brought new actors into the network. The new actors are Collector, Gothia, and Seamless. Moreover, Seamless performs new activities. Additionally, Swedbank has a new role as a mobile payment provider and has performed new activities.

Due to the introduction of mobile payment services, retailers had to establish a new relationship with a new company (i.e. Seamless cooperating with financial companies). As a consequence, these new relationships increase the complexity of the business network of retail payment and division of activities amongst these actors.

A final snapshot of the retail business network is presented in Figure 5.10. The service provided by Swedbank did not succeed in attracting consumers and was closed. Because of this, banks have not taken part in the mobile payment service provisioning since March 2014.
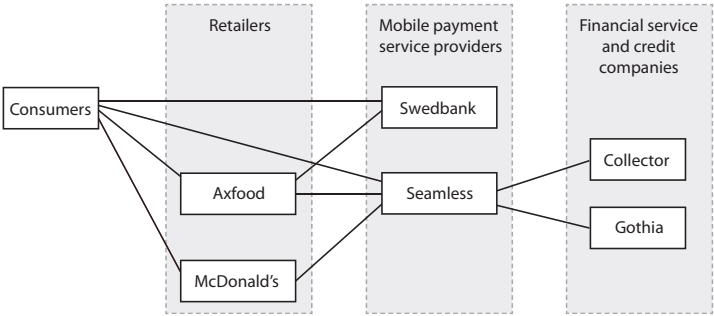
Figure 5.8: A simplified mobile payment business network.
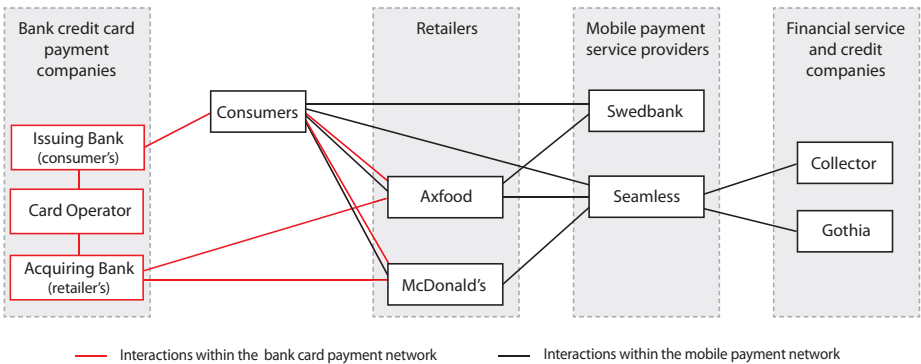

Figure 5.9: A simplified model of a business network of retail payment based on analysed cases.
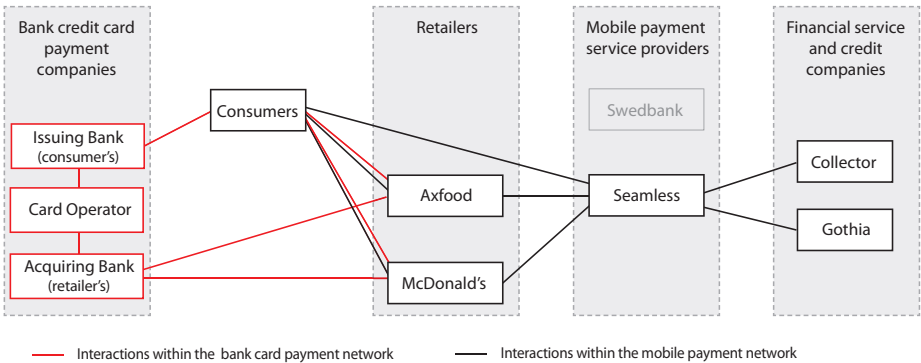

Figure 5.10: A simplified model of a business network of retail payment since March 2014.

Ambitions of control over a network

It is noticeable that in terms of control over the network, the ambitions of both mobile payment providers were the same. Swedbank and Seamless preferred to have an independent service infrastructure which allowed freedom to set a service fee.

When developing a mobile payment service, Swedbank used already existing resources – Visa and MasterCard payment infrastructure. Hence, the bank could control the mobile payment network in the same way as traditional bank card payments.

In order to control the network surroundings and to be independent of Visa and MasterCard network's infrastructure, Seamless has developed its own mobile payment service network. Due to this, the company can set a lower transaction fee compared with bank cards and compete with banks in the retail payment market.

Setting a balance between influencing others and being influenced

1. The importance of mobile payment service provider's role. A mobile payment provider needs to orchestrate the network in order to integrate a new service with existing actors, resources, and activities. The influence of others becomes important in order to get a deeper understanding of the needs of other business actors and to adjust the service accordingly.

2. Service advancement and adjustment. The evidence of the analysed cases shows that after a service is introduced in the market it has to be adjusted according to the needs of other business parties. This can be illustrated by the SEQR case. In the beginning the service could only be used for payments. However, in order to make the SEQR solution more attractive for retailers, the service has been improved by options that are useful to retailers: loyalty cards and coupons (included in cashback payments). This resulted in enhanced added value for business network actors and an improved quality of the service. The Bart service was a replacement for a bank card and this raises the question about a real competitive advantage that this solution could propose.

3. Service value proposition in B2B domain. . Analysed cases have shown that retailers are interested in mobile payment services under some conditions: if these services can guarantee a lower transaction fee compared to bank cards; if there is no need to invest in infrastructure; if the solution can be easily integrated with the existing retailer's payment infrastructure, and if the service provides some added value. SEQR offers transaction fees that are 50% smaller than bank cards, free service roll out, and no additional infrastructure, while Bart required a separate payment terminal. Hence, the SEQR service is preferable to Bart. More importantly, the added value provided by SEQR increased considerably after the integration of loyalty cards and the introduction

of cashback payment services. These options provided an opportunity for retailers to market their own brands and to promote brands of the products in the payment service. In turn, retailers in their marketing campaigns promoted the SEQR service as a payment option. That is an example of how changes in marketing strategy and the application of cross-marketing approaches can be seen as a result of increased interdependency (Hoholm and Olsen, 2012).

4. Service value proposition in B2C domain. Mobile payment providers use different strategies in order to attract the end users. Evidence coming from the Bart case shows that a mobile payment service should provide something more than just a payment. More likely consumers will prefer a service like SEQR that offers additional services and can be used for a bigger range of payment use cases. Further, an extended network of retailers which accept a mobile payment service is an additional value for consumers. This is something that Bart did not succeed in achieving, but which is something that the Seamless management realised. In the case of the SEQR service, cooperating network parties were able to co-produce new value of the service and create value for consumers. Normann and Ramirez (1998) have highlighted the importance of this. It is also important that a service is provided at low or zero cost to customers.

5. Consumers as a common resource. In the settings of a collaborative network, consumers should be treated as a vital resource that is highly important to all of the parties involved. Indeed, a bigger number of consumers will affect all parties: retailers will benefit from smaller transaction fees, mobile payment providers will get a bigger share of the payment market, and all this will result in a success of innovation, i.e. a higher rate of mobile payment service penetration. In addition, all network parties commonly acquire consumers. This is a reason for business actors to change strategies and highlights the importance of cross-marketing.

5.6   Conclusions

In this chapter we tried to answer the RQ2 and to understand the implications of the introduction of mobile payment services on business networks in terms of structure and strategies. We have illustrated this using the example of mobile payment cases applied in the Swedish retail industry. The IMP thinking approach was applied for the analysis.

Analysis helped to identify a number of reasons leading to changes in strategies within cooperative networks when introducing innovative services. One of them is a need to cooperate with new business actors and to establish new relationships. As the discussed cases illustrate, this might result in a change of network structure and exclusion of the traditional actors (i.e. banks).

Another interesting finding is that mobile payment service providers selected a strategy of network control. This is achieved through the development and use of an independent service infrastructure.

Finally, strategic decisions about creating a right balance between the influence of others and being influenced are very important. An inability to react to others' influence might lead to a failure of the service. In the case of Bart, Swedbank, being an incumbent, had all chances to succeed. The bank had all needed resources, payment infrastructure, trust of other parties, experience in providing payment services, and long-term relationships with retailers. Despite all these advantages, the service failed.

In contrary, appropriate reaction to the needs of others and adjustment of the services accordingly leads to a better quality of the service and greater value for other business actors. In the case of SEQR, Seamless, being a newcomer, performed better by timely adjustments of the service by creating additional options which were attractive for both consumers and retailers.

The SEQR case also illustrates how the introduction of a new service affects marketing strategies of involved business actors and leads to cross-marketing. At the same time, the collaborative work results in a certain service value for consumers. This has a positive impact reaching a higher level of service penetration.

Chapter 6

Conclusions

6.1   Concluding Remarks

The main purpose of this study is to broaden the understanding of the reasons that have prevented mobile payment services from reaching a wider scale of penetration. In order to do this, we have focused the analysis on the challenges related to the introduction of the mobile payment service in the market. Based on that, we have identified the following research questions:

> *RQ1*: *Why have mobile payment services not been widely adopted?*
>
> *RQ2*: *How does the introduction of mobile payments affect business networks in terms of structure and strategies?*

The answers to these questions were discussed in Chapters 4 and 5. The main findings are summarised below.

RQ1: *Why have mobile payment services not been widely adopted?*

In order to answer this research question, we have focused the analysis on the issues related to merchant adoption. More specifically, we have explored retailers' expectations of mobile payment services. We have found that retailers expect mobile payment services to be secure, fast, easy to integrate, reliable, and, preferably, to not require a separate service infrastructure. By using mobile payment services, retailers expect to reduce the amount of cash in the store, and to increase the volume of purchases. According to the

expectations of retailers, mobile payments should offer a lower transaction fee compared to bank cards, and a small or zero investment cost in service infrastructure. This kind of offer is highly attractive for retailers and minimises the impact of network externalities and a lack of a critical mass of consumers. Mobile payment services should provide additional benefits for both retailers and consumers and be easy to use. In addition, available services should still be improved and better meet the expectations of retailers. The services could be extended through having an information service and a self-scanning option when shopping in stores.

RQ2: *How does the introduction of mobile payments affect business networks in terms of structure and strategies?*

In order to provide the answer to this research question, we have focused the analysis on the effect that the introduction of mobile payments has on business networks in terms of structure and strategies. The performed analysis has helped to identify the following implications of a mobile payment introduction in the market on the structure of business networks:

- Emergence of new business actors and a need to establish relationships with them.

- New roles of the traditional actors (i.e. banks) or their exclusion from the mobile payment network.

The analysis has helped to identify the following changes in the strategies of business network actors because of the introduction of mobile payments:

- Mobile payment service providers select a strategy for gaining a control over the network.

- Retailers represent an important party in mobile payment networks. For this reason they have a lot of influence on the strategies of mobile payment providers and affect the long-term success of a mobile payment service.

- The introduction of mobile payments and a need to cooperate affect the marketing strategies of involved business actors and lead to cross-marketing.

- Collaboration within a business network provides a certain additional value and enhanced quality of service for consumers.

A researcher conducting a multidisciplinary study deals with the challenge of combining different methods to help describe and analyse the phenomenon in focus. In this study, we have used different complementing research approaches in order to

answer the research questions. We have used diffusion of innovations, TAM, and network externalities in order to explore the adoption issues as well as the IMP thinking approach in order to reveal the processes happening within business networks.

The use of these complimentary and incompatible methods results in a more comprehensive overview of different aspects of the phenomenon in focus. For example, the diffusion of innovations theory and TAM do not cover the business aspects. In turn, the IMP approach is focused on relationships between network actors, but does not help to understand expectations of different stakeholders and specifics of adoption processes.

6.2   Contribution

Discussion of the research contribution is provided in this subsection. Both theoretical contributions and practical implications are discussed.

6.2.1   Theoretical Contribution

Benefits and shortcomings of mobile payment services for retail have been analysed using the example of several services deployed and used in Sweden. The analysis addresses different aspects of the service including technology, economic benefits, costs, offering added value services, ease of use, and the problem of critical mass and network externalities.

Adoption of mobile payment services by merchants

Compared to previously implemented studies, this research has contributed to the theory development in the area of mobile payments and mobile services in several ways. First of all, as it is illustrated in Section 1.2.2 and Section 4.1, academic research in the area of organisational adoption of information and telecommunication technology has been rather scarce. Previous studies have addressed some issues related to general organisational adoption of telecommunication and information services (Mahler and Rogers, 1999; Chwelos et al., 2001; Lapierre and Denier, 2005) and the adoption of some specific services, such as e-business and e-markets (Oliveira and Martins, 2010; Johnson, 2009; 2010). Thus, the current research contributes to a better and deeper understanding of under-researched aspects of organisational adoption of innovative services.

Further, only several researchers (van der Heijden, 2002; Mallat and Tuunainen, 2008) have explored the specific problem related to the adoption of mobile payments by merchants. For example, van der Heijden has found that most market actors were sceptical

about the successful launch of mobile payments in 2002. Additionally, this researcher has highlighted the importance of network externalities (i.e. interdependence between critical mass of consumers and critical mass of retailers). Finally, the main factors that negatively affect both customer and merchant acceptance of mobile payment services are service costs compared to substitutes and a perceived risk. One positive effect on mobile service acceptance is the relative ease of use compared to substitutes.

Mallat and Tuunainen (2008) have explored the driving factors and obstacles to merchant adoption of mobile payments. Four prerequisites were identified: wide mobile phone penetration, a viable technical infrastructure for mobile payments, knowledge of mobile payment systems, and merchants' need for a new payment system. Increase of impulse purchases, enhanced customer service, increased availability of products and services, opportunity to introduce new content or services, addressing new segments of customers, positive effect on company image, and lower transaction fees have been identified as the main driving forces for mobile payment adoption by merchants. In contract, the main obstacles are incompatibility of mobile payment with existing business models, lack of standardisation, lack of suitable charging model for current mobile payment systems, complexity, high cost of mobile payments, a lack of critical mass, and trust and security issues.

Plouffe et al. (2000) have been investigating issues affecting retailers' and consumers' adoption of a new payment system (smart card-based retail PoS system) provided by a bank. The major identified obstacles to the adoption of smart cards are a lack of critical mass, a transaction fee that did not benefit either merchants or consumers, issues related to privacy and security, and technological and interoperability problems.

Hence, this research is only one of a few which addresses the area of mobile payment service adoption by retailers. The summary of finding of the previous work and contribution and findings of this research are presented in Table 6.1.

Another contribution is the proposed theoretical framework that has been developed and used in this research. It has been built based on the diffusion of innovations theory, TAM, and network externalities, and further validated and tested by the executed qualitative research and proved to be significant, as presented in Paper 1. Hence, the proposed analysis framework can be used as a base for further research.

The effect of mobile payments on business networks in retail payment

One of the theoretical contributions of this study is the attempt towards a better understanding of the ways a new technology changes and transforms traditional payment business networks. Another contribution is the analysis of relationships between actors in the network. Moreover, the analysis has been focused not only on B2B relationships,

Table 6.1: Factors influencing the adoption of mobile services by retailers.

Factors	Related factors	References	Contribution of this research
Technical feasibility	Integration, Interoperability, Standardisation, Scalability	van der Heijden, 2002	There are no problems with technical feasibility of mobile payment services Mobile payment services are secure and do not send any sensitive information
Economic benefits	New business case, Increase in revenues and purchase volumes, Impulsive purchases	Mallat and Tuunainen, 2008	Economic benefits for retailers in combination with lower service cost are drivers to mobile payment service adoption by retailers
Cost	Transaction fee	van der Heijden, 2002; Mallat and Tuunainen, 2008	This research has confirmed the importance of the cost factor for mobile payment adoption. The service cost should be lower than of other payment systems in-use
Added value of a service		Mallat and Tuunainen, 2008	This research has confirmed the importance of added value services for mobile payment adoption
Ease of use	Simplicity, User-friendly interface	van der Heijden, 2002	Ease of use proved to be an important factor. Service should be easy to use for personnel
Network externalities	Critical mass	Plouffe et al., 2000; van der Heijden, 2002; Mallat and Tuunainen, 2008	There can be a situation when absence of critical mass does not affect adoption of mobile payment service by retailers

but has also highlighted the importance of B2C relationships. Indeed, consumers are commonly acquired by all network actors and can be seen as an importance resource.

6.2.2   Practical Implications

The results of the conducted analysis provide a number of important practical implications. The most significant research insights are addressing the overview of several different scenarios of mobile payment service introduction in the market. Indeed, in order to succeed, mobile payment providers need to build networks of both merchants and consumers. As illustrated by the overviewed cases, the selected strategy regarding service introduction and its further adjustment according to the needs of different categories of users (both retailers and end users) might lead to further service development or withdrawal.

Further, the research findings help to clarify characteristics of a mobile payment service that are important for retailers. A service should be secure and fast, require no additional hardware, have a low transaction fee, result in an increase in the number of

impulse purchases, and reduce the amount of cash transactions (Apanasevic et al., n.d.). Furthermore, the service should: (i) provide additional services like loyalty programmes and coupons; (ii) serve to improve the company's image, and (iii) be convenient and easy to use. This is illustrated by comparing the empirical evidence from the Bart and SEQR cases. The service that provides only mobile payment function, requires separate hardware, and is complicated to use does not meet the needs and the expectations of retailers despite perfect technical performance and having a high security level. Consequently, the main prerequisite for mobile payment adoption is meeting needs and expectations of retailers in the best possible way.

Finally, the study of dynamics within business networks when introducing new services might be useful for practitioners. The comparison of managerial decisions and strategies about cooperation, levels of influence, and control over the network, in both cases might be valuable lessons for mobile payment service providers.

6.3   Further Work

In this thesis we have studied the challenges related to the introduction of PoS mobile payment services in the market. There could be several possible directions of future research.

1. To extend the current research

As a part of this study, we analysed the expectations of retailers of mobile payment services. Future research can be focused on the in-depth analysis of expectations of stakeholders. This study could include a larger number of retailers. In addition, this research could become a longitudinal study which would examine if mobile payment services meet the stakeholder expectations in a long run. The work can also be extended to cover other countries. The results of this research can then be compared with the situation in:

- Other European countries.
- Developing countries.

2. To widen the scope of the current research

Another possible direction of future research and PhD study could be analysis of the same aspects (i.e. expectations of different stakeholders and cooperation models of involved business actors) of other mobiles payment services that are provided and
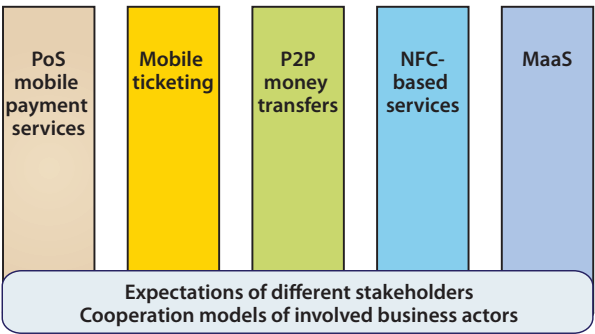
Figure 6.1:   A wider scope of future research.

used in Sweden. Possible services to address are: PoS payments, mobile ticketing, P2P money transfers, NFC-based services, and Mobility-as-a-Services (MaaS) (as illustrated in Figure 6.1). MaaS is associated with new ICT-based integrated smart city services which aim to address different public issues. The examples of these services are smart and on-demand public transport, car rental, car-sharing, taxi, bicycle system. Here the opprotinities and benefits with mobile payment solutions can be analysed including mobile order placement, mobile ticketing, and mobile payment functionalities.

As it was discussed in this thesis, in some cases the main stakeholders of PoS payments – the mobile payment service providers and the retailers – manage to cooperate. In mobile ticketing cases, previous cooperation between public transport company in Stockholm (SL) and mobile payment provider (4T Sweden) was not successful. As a result, several Swedish public transport companies have developed their own mobile ticketing and payment applications. All Swedish banks in collaboration provide P2P money transfer service Swish. ICA, the first largest Swedish retailer, uses NFC-based services to a limited degree. MaaS can be seen as integrated mobile payment services applied for a smart city environment.

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Appendix A

Questionnaire

Organisation strategy

1. How could a company's overall business strategy be characterised?

2. Is it open to adopting new products or services?

Characteristics of mobile payment solution

1. When making a decision about the deployment of a mobile payment, what was seen as the potential benefits?

2. What kind of relative advantage was expected of the deployment of a mobile payment service?

3. Does the deployment of a mobile payment solution meet the company's expectations?

4. How does the deployment of a mobile payment correspond to the values of your company?

5. How does the deployment of a mobile payment correspond to the needs of your company?

6. Is a mobile payment solution used for payment in the physical shops?

6a. If yes, were any problems encountered when personnel had to learn and start using the mobile payment solution?

7. What is the economic factor of mobile payment deployment?

8. Is the option to pay with a mobile payment solution visible to the customers? How?

9. What are the results of using a mobile payment solution in shops? What is its advantage?

10. Does the company feel any uncertainty about the mobile payment solution?

Marketing efforts of the mobile payment provider

1. Who initiated the idea of deployment a mobile payment solution at your company?

2. What were the main factors behind selecting X company as a mobile payment provider?

3. How did the mobile payment provider communicate about mobile payment solution?

4. Were any risk reduction measures proposed by the mobile payment provider?

Social networks

1. For your company, how important was the use of different social networks in order to get additional information about the mobile payment solution?

2. Did it have any impact on the final decision to select the mobile payment provider?

Influence of market factors

1. Was the 'chicken and egg' dilemma an important problem when considering the deployment of the mobile payment solution?

2. Was the decision to deploy a mobile payment affected by similar decisions from competitors?