Contactless mobile payments in Europe: Stakeholders’ perspective on ecosystem issues and developments

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Contactless mobile payments in Europe:
Stakeholders’ perspective on ecosystem issues and developments

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Abstract

A progressive shift from cash and card–based in-store payments, towards contactless mobile payments, is currently in the making on the European market. This shift would imply payments in stores to be performed in a fast, simple, secure and preferably less costly manner, between a consumer’s mobile phone and a merchant’s payment terminal. Technologies such as Near Field Communication (NFC) and the use of Quick Response (QR) –codes, both facilitate such contactless payments, and have already built momentum in many European countries. This implies an undoubtedly very tempting new payment experience by the use of mobile phones. However, this shift entails several uncertainties and issues regarding the crystallization of the new “industry” that is forming. These issues regard social, organizational as well as market –related aspects, and adhere to stakeholders on both the provider- and user- side of contactless mobile payment products and services.

It has been found that there is a great need for new research on this matter, from a more holistic perspective, where theories on industrial dynamics, developments and user adoption could be used to guide and explain these new industry-impeding issues as well as reveal new ones. This master thesis aims to answer this call – by using such theories in conjunction with a multi-stakeholder perspective from a wide base of empirically gathered data – in order to find, interpret and shed new light on key issues that impede the development and adoption of contactless mobile payments on the European market.

It was deemed necessary to first conduct a thorough literature review on the current mobile payments landscape in Europe, in order to find out which key issues seem to be existent on the European market (adhering to both providers and users of mobile payment solution), with the intention to presuppose from those issues for further guidance of choices in theories and construction of empirical data gathering methodology. The theoretical framework was in such way built upon five different but highly interconnected theoretical concepts on new industry evolvement, strategy and adoption. The empirical data was gathered from a two-day conference on mobile payments in Europe, as well as from 10 in-depth interviews with different key stakeholders on the Swedish and European market. The theoretical framework and the empirical data was later merged for analysis purpose, in order to find, interpret and shed new light on these and other issues on contactless mobile payment development and adoption on the European market. This has led to some key findings or conclusions.

Firstly, the literature review on the current mobile payments market in Europe revealed some key issues. On the provider-side of the stakeholder spectra; issues mainly revolve around collaboration and competition, where business models are hard to standardize due to the unevenly distributed control and power over the users. This was seen to relate heavily to the NFC Secure Element (SE) -placement, holding the consumers’ payment credentials, since different stakeholders prefer different SE -placements (on the SIM –card or integrated in the mobile phone). Some big actors have also created their own – more of end-to-end - contactless payment solutions, complicating the evolvement even further. This might further lead to issues related primarily to; early and late movers among providers, alternative mobile payment solutions, as well as issues related to interoperability between
solutions/technologies as well as across borders. Security concerns have also been highlighted in the literature as a prioritized matter. Among the user-side of the stakeholder spectra; key issues relate to the adoption of in-store contactless mobile payments, such as investment costs for merchants to implement new hardware and/or software (terminals, mainly NFC-compatible), security concerns, reluctance in behavioral change among consumers’ payment habits, and uncertainties in the perceived added value through these new types of payments compared to foremost card payments.

Secondly, after merging the theoretical framework with the empirical data for analysis purpose, it was revealed that the uncertain role of mobile network operators creates tensions in the ecosystem on various levels and to various extents. Secondly, preemption strategies utilized by indigenous firms in European countries shows the possibility of hampering payment interoperability, and first-movers risk hurting not only themselves, but the entire mobile payment ecosystem, if security breaches are discovered due to technological uncertainties. This is one strong reason for banks to move slower, but they might contradictively risk losing some of their high trustworthiness towards other stakeholders if being too passive. Moreover, two additional trade-off issues were discovered (technology/business model standardization versus innovation, and too many features in the provided offering versus too few features in the provided offering). The first of these trade-offs is further damaging for the ecosystem since there are strong differences in opinions on the matter, as well as what might increase adoption speed. The second trade-off is important to take into consideration where payment card penetration-rate is high. An additional factor carrying issues was the explicit focus of providers on only one side (consumers) in a two-sided market (consumers and merchants). Also, merchants cannot be seen as a homogenous group. Finally, the “chicken and egg” problem seem do not seem to be such a big of a problem after all.

**Key-words:** Contactless mobile payments, proximity payments, NFC, QR, Europe, First second mover advantages, Network externalities, Switching costs, Diffusion of innovations, Ecosystem issues
Aknowledgements

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Rasmus Englund

David Turesson

Stockholm 2012-06-07
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<th><strong>Full Form</strong></th>
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<tr>
<td>API</td>
<td>Application Programming Interface</td>
</tr>
<tr>
<td>B2B</td>
<td>Business to Business</td>
</tr>
<tr>
<td>B2C</td>
<td>Business to Consumer</td>
</tr>
<tr>
<td>CMP</td>
<td>Contactless Mobile Payment</td>
</tr>
<tr>
<td>EMV</td>
<td>Europay, MasterCard and Visa</td>
</tr>
<tr>
<td>EPC</td>
<td>European Payments Council</td>
</tr>
<tr>
<td>GSM/GSMA</td>
<td>Global System for Mobile Communication</td>
</tr>
<tr>
<td>MNO</td>
<td>Mobile Network Operator</td>
</tr>
<tr>
<td>NFC</td>
<td>Near Field Communication</td>
</tr>
<tr>
<td>PIN</td>
<td>Personal Identification Number</td>
</tr>
<tr>
<td>PoS</td>
<td>Point-of-Sale</td>
</tr>
<tr>
<td>PSP</td>
<td>Payment Service Provider</td>
</tr>
<tr>
<td>P2P</td>
<td>Person-to-Person</td>
</tr>
<tr>
<td>QR (-code)</td>
<td>Quick Response (-code)</td>
</tr>
<tr>
<td>RFID</td>
<td>Radio Frequency Identification</td>
</tr>
<tr>
<td>RIM</td>
<td>Research In Motion</td>
</tr>
<tr>
<td>SE</td>
<td>Secure Element</td>
</tr>
<tr>
<td>SEB</td>
<td>Skandinaviska Enskilda Banken</td>
</tr>
<tr>
<td>SEPA</td>
<td>Single Euro Payments Area</td>
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<tr>
<td>SIM</td>
<td>Subscriber Identity Module</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message System</td>
</tr>
<tr>
<td>TSM</td>
<td>Trusted Service Manager</td>
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<tr>
<td>WAP</td>
<td>Wireless Application Protocol</td>
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1. Introduction

The first chapter of this master thesis will provide a background of the chosen subject, and why it is of importance to investigate further. The objective and purpose of the study will be clarified and delimitations will be drawn.

1.1 Background

The vision of the future where the mobile phone becomes the consumer’s wallet, providing a seamless customer experience, is currently a heavy debated and rapidly advancing phenomenon all over the world. In the developing world – Africa, Latin America and the majority of the Asian continent – mobile payments have already been well adapted to the prevailing and unique market characteristics with high penetration of mobile phones, limited banking infrastructure, and lack of alternative solutions. These circumstances have led to a clear value propositions for the users, and mobile payment services tapping users equipped with low-value phones and distant money transfer needs have seen great adoption and successful implementation. These needs of distant mobile money transfers created by this market contexture are however highly specific and far from the ones encountered in the developed world. Therefore, it is not possible to transcribe the learning from these services to launch better mobile payment solutions in, for instance, the European market.

In the developed though fragmented European market, highly sophisticated mobile phones (smartphones) using contactless technologies such as Near Field Communication (NFC) have been predicted as bringing about the next breakthrough shift in the payments landscape. This shift would imply payments in stores to be performed in a “wave and go” –manner, between a mobile device and a payment terminal, in order to contactless progress the payment in an efficient way between consumers (i.e. the payers) and merchants (i.e. the payees). This facilitates the idea of a quick, easy, secure and/or possibly (preferably) less costly payment experience - which is undoubtedly very tempting. Even so, mobile payments in the developed world is not a novelty to the extent of the developing world – which has leapfrogged to a great extent – from cash to mobile. Debit and credit cards already supports a quite satisfying payment process on the European market, and the only way to make the customers change their payment method is to make mobile payments even more appealing by offering added value. Therefore, services surrounding the mobile payment experience have also emerged as supportive means to transfer the users’ payment behaviors to the mobile phone. This added value must also be created for the merchants, which need incentives in order to adopt the potentially costly contactless payment hardware and software (payment terminals) in their stores to enable such payments. On the other side of the stakeholder spectra – opposite from the users – are the providers of the many products and services needed to enable contactless mobile payments. These stakeholders include banks, mobile network operators, mobile device manufacturers and numerous technical- and service- providers that span across different and heterogeneous industries never truly integrated in the past. The complex and problematic nature of emerging collaborations, business models and rivalry are therefore highly relevant to understand and resolve for a sustainable contactless mobile payment development. Furthermore; governments, regulatory agencies, legislation and policymakers can be seen as a third group of stakeholders; surrounding the providers and users by framing and guiding the developments. All these interconnected stakeholders with its surroundings are highly dynamic, where both competition and cooperation are simultaneously present. The term ecosystem will be used throughout this thesis to refer to this dynamic structure of entities. Sometimes, industry will be used as well, to implicitly refer to this arena and sphere of stakeholders and interconnected systems.

Thus, the mobile payment ecosystem mainly centers round a two-sided stakeholder segmentation – users and providers – and as much of our understanding of the future of mobile payments has been refined enormously over the last years, it generally seems as if the stakeholders has arrived at consensus on most of the “what” and “why” in the contactless mobile payments ecosystem. However, the stakeholders now seem to have intensified their focus to the “how” – i.e. how to approach common constraints in order to fully capture the future payment opportunities. Some critical questions remain, and perhaps most essential; what does it mean to effectively catalyze the development of a mobile payment ecosystem? What does this process require? Even if contactless mobile payment trials are
presently taking place in most European countries, much remains to be done in order to reach a critical user mass; the point at which an industry has gained sufficient penetration among users for a momentum to be self-sustaining.

### 1.2 Problem formulation

The shift towards contactless mobile payments in the European market entails several uncertainties regarding the crystallization of the new industry. What roles the current incumbents in the field of financial transactions will take, as well as major new players from different backgrounds, is a subject of vast speculation in contemporary research, newspapers, web-forums and magazines. At the same time, the user’s value proposition for a successful adoption cannot be ignored. Despite mobile payments promising soon-to-be future there are in that sense several social, organizational, market and industry challenges that remain before mobile payments will take off for real. The dynamics in the field of mobile payments are evolving with somewhat ambiguous directions. On one side, there are the many kinds of providers of mobile payment services and various sorts of technology and mobile device manufacturers. On the other side, there are the consumers and merchants necessary for the new infrastructure of payments to take off and evolve.

The developing world has, as mentioned, clearly proved that the wider term of mobile payments indeed can be implemented with successful results. But the context dependent markets – most profound and visible between the developing world’s need of remote payment services and the developed world’s progression of contactless in-store proximity payments – does not quite allow success stories and lessons to be extrapolated between the markets. One might therefore question; how is it possible to find answers for many of the challenging issues surrounding the stakeholders in the ecosystem? The use of theories in industrial dynamics have acted as a powerful tool to understand some of the issues and shed new light on this subject in the European contactless mobile payments ecosystem. Over the past years, the phenomenon has been studied from several perspectives. However, most academic research in the field have either emphasized factors from a customer-centric perspective such as adoption, or from a technological perspective, such as security or interoperability barriers and issues concerned with system architecture. All these efforts have led to discoveries, but as the literature from prominent authors reveals; there is still a limited theory backed-up holistic understanding of the phenomenon. Since the focus of most literature is aimed at mobile payment users, there has been highlighted a need for consideration of the other side of the market, which incorporates the providers of mobile payments products and services, in order to provide a more correct understanding. Most investigations covering such aspects have been carried out in the form of ‘white papers’ and other unofficial articles. These have not looked at the mobile payment landscape in a dynamic nor theoretical manner but, with few exceptions, merely aim to explain the present situation, static picture and future estimated numbers of the mobile payment industry on an annual basis. The complexity of the contactless mobile payment ecosystem therefore requires adopting a multi-stakeholder perspective and dynamic approach in finding and interpreting key issues in the forming ecosystem.

### 1.3 Objective and purpose

With the given background and problem formulation, the objective of this master thesis is therefore to: *“From a multi-stakeholder perspective, find and analyze key issues that impede the development and adoption of contactless mobile payments in the European market.”*

The purpose of the master thesis is *“To identify and interpret key issues in the forming European contactless mobile payments ecosystem, by drawing upon a combination of acclaimed theories and qualitative data analysis, covering both the provider- and user-side of the stakeholder spectra.”*
1.4 Research questions
In order to seek an answer to the objective, two research questions (RQs) have been formulated;

- **RQ1**: Which key issues on development and adoption can be identified as the most prominent in recent literature on mobile payments, with regards to the stakeholders on both the provider- and user- side in the European contactless mobile payments ecosystem?

- **RQ2**: In what ways can theories of new industry evolvement, strategy and adoption help explain – and possibly identify additional – key issues regarding the evolvement of the European contactless mobile payments ecosystem?

1.5 Delimitations
First of all, it is not possible to precisely frame this research regarding neither mobile payment types, technologies nor stakeholders involved. This is due to the already discussed vast complexity of this new ecosystem, where payment infrastructure and its actors are highly interconnected. No one today knows how this development or direction of evolvement will progress. A rough delimitation would be that this master thesis focuses on contactless in-store mobile payments between merchants and consumers on the European market, where stakeholders under treatment are primarily those located on the provider and user side of these new products and services. However, a more narrow and definite scope of investigation is necessary to clarify the relevancy of this research, which now follows.

This master thesis delimits its scope to primarily look at stakeholders at the provider and user side of the mobile payments ecosystem (see section 3.4), and those that are active on the European market only. Hence, market characteristics of the European market will also be taken into account. Regulatory agencies and governmental influences, often seen as a third stakeholder group, are not explicitly emphasized in this thesis, although they could play an important role in the development of interoperability and standardization for example. These stakeholders tend to play an even more essential role in remote payments where payments are made across countries or even continents, but since their presence and influence can not be completely ignored, they will be treated to some extent.

Further, primarily contactless payments (defined in section 3.1.2) between merchants and consumers (B2C) is treated, i.e. in-store payments, also referred to as payments at the Point-of-Sale (PoS). Technologies in focus are foremost Near Field Communication (NFC) and Quick Response (QR) – codes (defined in section 3.2) since these contactless payment technologies so far undoubtedly have been the ones most discussed and used on the current European market. Hence, Person-to-Person (P2P) contactless money transfers (see section 3.1.2) are not particularly considered, as the aim is to provide insights on how the current payment infrastructure – consisting of (and concerning) primarily cash-purchases and purchases with debit-or credit cards – are being challenged by the arrival of contactless mobile payments. Worth noticing is that contactless mobile payments are the primary investigation subject throughout this thesis, but other types of mobile payments such as remote payments (defined in section 3.1.2) and online payments are considered to a certain extent as well. This is again due to the vast complexity of this forming ecosystem, where payment types tend to blend and have joint-effects on the development. Thus, the thesis delimits its scope to focus on (but not solely investigate) the replacement of the current utilization of card payment terminals with foremost contactless NFC –compatible terminals used by the stakeholder referred to as merchants. In the same manner, the replacement of mobile devices (primarily mobile phones) in the traditional sense, with those compatible with contactless NFC technology, used by the customers, is treated. Also, it is notable to emphasize on the deviation from what generally is referred to as mobile banking (defined in section 3.1.1).
1.6 Thesis outline

This first chapter (Introduction) has provided a background discussion on the topic, why it is important to investigate further, as well as the objective, purpose, research questions and delimitations that will guide the remainder of this thesis.

The second chapter (Research Methodology) will describe the chosen research methodology and choice of methods used to help answer the research questions. The research paradigm and data collection approach will be explained and justified, as well as the validity and reliability of this work.

The third chapter (The Mobile Payment Ecosystem explained) aims to explain the current state of the European mobile payment ecosystem, by reviewing prior and recent literature in the field, foremost from so called “white papers”, extensive consultancy reports, news- and dominant mobile payment actors’ websites and technology explicated articles. Mobile payments in general – and contactless mobile payments in particular – is defined, categorized and explained in relation to technologies and functionalities. The uniqueness of the European market in contrast to other markets is discussed, and stakeholder roles and definitions on both the provider and user side are listed. Finally, prominent key issues for the European contactless mobile payment ecosystem are extracted, which answers the first research question (RQ1), see section 1.4. The clarifications and essence of this comprehensive chapter will work as a knowledge foundation of the current European mobile payment market and its development impeding challenges, in order to put the advancements described in the rest of the thesis into perspective. In that sense, this chapter will help answer the first RQ, which in order will be used to guide and construct a relevant and comprehensive theoretical framework (chapter 4) to be used in conjunction with the empirical data gathering (chapter 5) for the purpose of analysis (chapter 6) to be able to answer the second and for this thesis very essential research question (RQ2), see section 1.4.

The fourth chapter (Theoretical Framework) constitutes the theoretical framework; including compiled descriptions and key aspects from numerous scientific journals linked to each of five theoretical concepts chosen as the most apt theories to interpret the stakeholder actions and issues with regards to the new ecosystem evolvement, as seen in the third chapter. The theories concerns (1) First- and Second- mover Advantages/Disadvantages, (2) Network Externalities, (3) Switching Costs, (4) Diffusion of Innovations, and (5) Ecosystem Evolvement, and appeal with relevance to both the provider and user side of the stakeholder ecosystem. After describing each of these five concepts in more detail, they have all been merged in a comprised theoretical framework at the end of the fourth chapter. This provides the reader with a solid and complete map as well as overview of the “key factors” found in each of the five theoretical concepts, which explain issues or actions in relation to the developments or adoption of new technologies or industry evolvement, such as the emergence of contactless mobile payments. The comprised theoretical framework will later be used in conjunction with the empirical data for analysis purpose.

The fifth chapter (Empirical Investigation) will present the empirical gathered data from a conference on mobile payments (Nordic Payments Forum 2012) that was attended, as well as from 10 in-depth interviews with various key stakeholders (as defined in section 3.4). A majority of the conference spokespersons as well as the interviewed stakeholders have connections to mobile payments spanning across many borders, especially on the European market, which makes their contribution and insights to this thesis very relevant. The questionnaires used to guide the semi-structured interviews were built on the five theoretical concepts, and the answers were translated in aspects of its relevancy for this thesis.

The sixth chapter (Analysis) constitutes the analysis part of this thesis. The comprised theoretical framework with all its “key factors” will in this chapter be used in conjunction with the empirically gathered data to extract which of the “key factors” that is most applicable to the key issues regarding the evolvement of the European contactless mobile payment ecosystem.

The seventh chapter (Discussion) is foremost a discussion, which will use these extracted “key factors” to explain and shed new light on the most prominent issues in relation to the development and adoption of contactless mobile payments on the European market. More explicitly, this chapter will
illuminate the most important factors from the comprised theoretical framework and use them to
discuss and potentially find new key issues regarding the evolvement of the European contactless
mobile payments ecosystem; which will be essential in order to answer the second research question
(RQ2), see section 1.4.

The seventh chapter (Conclusions) summarizes the findings throughout the thesis, in order to present
the answers to the two research questions in an easy, clear and understandable way.

The eighth and last chapter (Further Research) will suggest some topics on further research.
2. Research Methodology

This chapter explains the methodology and choice of methods used to process this master thesis. First, research paradigm and data collection approach is explained and justified. Second, the data gathering methodology that aims to help answer the research questions is described. Finally, the validity and reliability of the research is treated.

2.1 Research paradigm and data collection approach

The chosen research paradigm for this study is of the interpretivistic approach; with a view to provide interpretive understandings of the stakeholders and their roles and challenges within the mobile payment ecosystem. This paradigm is preferred since the specific research is context bound and has a goal to understand, describe and see patterns. The collected data was of the qualitative kind, implying soft ‘nominal’ data, often gathered from a small number of respondents (Collis & Hussey, 2009). This was gathered through 10 semi-structured in-depth interviews. Additionally, a two day conference; the Nordic Payments Forum 2012 was attended where a range of stakeholders openly discussed the European mobile payment ecosystem. Since the mobile payment arena is not yet mature to the point where hypotheses can be tested upon empirical reliable facts - preferable in the positivistic paradigm - this more open and holistic approach of the interpretivist paradigm was chosen. Further, the stakeholders on the provider-side are still not of sufficient scale in Sweden to enable a big enough sample size of data to represent an unbiased population used in quantitative ‘numerical’ data gathering through the use of for example surveys. Since the purpose of this thesis is to describe and analyze the presently very complex phenomena of the mobile payment ecosystem, we argue that our study is designed in such a way so that a qualitative method will be most beneficial, based on the interpretivistic paradigm. Hence, such method will be used in this thesis.

2.2 Data gathering methodology

In order to answer the research questions, a comprehensive literature review was first conducted on the current European contactless mobile payments state in order to grasp the challenges, prerequisites, roles and market preferences tied to the involved stakeholders. The secondary source data that build up this literature review stem from foremost recent so called “white papers”, extensive consultancy reports, as well as technology explicated articles. Since the mobile payment ecosystem is currently witnessing an undoubtedly very turbulent state with literally new key events taking place every week, some information had to be gathered from various websites, press releases and similar. However, when such sources were used, they were validated as being of high relevance and trustworthiness, with clear information on original sources.

From the literature review on the current mobile payment state in Europe, some key issues in relation to the two stakeholder groups and ecosystem evolvement could be extracted, which in turn suggested the most appropriate and useful choice of theories to be used in order to eventually find an answer to the second research question. This theoretical base was chosen to be built upon five interconnected theoretical concepts that have been shown to be of importance in evolvement of previous industries of the same kind; where numerous actors enter simultaneously, where technological change and network effects have been prevailed, and where user adoption patterns needs to be changed. The five concepts hence adhere to both the provider and user side of the stakeholder spectra, and includes (1) First- and Second- mover Advantages and Disadvantages, (2) Network Externalities, (3) Switching Costs, (4) Diffusion of Innovations and finally (5) Ecosystem Evolvement. Each theoretical concept was densely compiled after thorough scanning of numerous old and new scientific articles and journals by well cited and relevant researchers’ work on each specific theoretical concept. These five compiled concepts were later merged in a comprised theoretical framework to provide an easy overview of all important factors found in the five concepts.

The theoretical framework, in combination with primary source data collected from the 10 in-depth interviews and the Nordic Payments Conference 2012, constitute the foundation for analysis purpose in this master thesis. The in-depth interviews were conducted with representatives of 10 key stakeholders in the mobile payment arena, namely; Lars Aase and Stefan Hultberg (Accumulate),...
Staffan Ljung (Payair), Emil Wikström (Seamless), Jan Forsell (SEB), Anne Sundqvist (Swedish Bankers´ Association), Jussi Koskinen (PayPal), Ola Larsén (Research In Motion –RIM), Johan Ragnevad (WyWallet), Tobias Wallhuss (Point) and Bengt Nilervall (Swedish Trade Federation). The stakeholder roles of these companies will be clarified in chapter 5; Empirical Investigation, of this thesis. The timeframe for each interview was set to at least one hour in order to be able to treat questions with relation to all five theoretical concepts. However, some interviews lasted for two hours and even more. The interviews were built on a semi-structured basis, in order to attain as much relevant in-depth information as possible from each stakeholder but still connect the empirical data with the theoretical concepts. In semi-structured interviews, a list of subjects and questions are prepared which should be answered by the respondent. It is however necessary that the researchers are open and let the respondents develop their ideas, by leaving room for development of their own aspects and standpoints (Collis & Hussey, 2009). The focus with the interviews was to extract the respective respondents´ perception of current and future issues in the mobile payment ecosystem. A complete list of questions used during the interviews can be found in Appendix A, at the end of this thesis.

Further, a working relationship was established with the Swedish company Accumulate; a developer of a very comprehensive mobile financial service platform. Since Accumulate recently have gained a great deal of attention and expanded globally due to their innovative and highly secure platform, they have been able to establish and sign important contracts with leading actors in the field of mobile payments. Such contacts have been vital for our data gathering process through the interviews we could set up with the help of Accumulate. The company´s strong position and deep insights in the business as an intermediate in the mobile payment ecosystem, was also of great value in the gathering of primary source data throughout the work on this thesis.

2.3 Limitations of research methodology design

The limitations outline any weaknesses or deficiencies in the research. It often treats two main factors; reliability and validity (Collins & Hussey, 2009). Since the interpretivistic approach and qualitative data gathering through in-depth interviews have been used, reaching a high reliability can be an issue. High reliability refers to the absence of differences in the results if the research were to be repeated. The in-depth interviews will be problematic to replicate in an accurate way, since they are semi-structured and have an exploratory and descriptive angle to them. However, we argue that the broad and reliable theoretical base which is completely referenced could be used in the same way to interview the same people again at a later stage. These interview respondents have not been anonymized since no confidential data has been requested, thus making it possible to target the same group of respondents again. Further, by letting the respondents talk freely based on some basic questions, our own subjective influence was held to a minimum considering the circumstances. What is more, the empirical data gathered at the Nordic Payments Forum 2012 was not affected or directed in any way by our own opinions or questions. The analysis part however, can naturally be very problematic to interpret and process the same way, since no explicit and exact guidance have been indicated, and since our own treatment of this has been highly subjective. Therefore, the reliability could not be considered particularly high due to the methodological approach that was chosen, but at least held high at the best of efforts.

The validity on the other hand, i.e. the extent to which the research findings accurately reflect the phenomena under study, should be considered high since the interpretivistic approach focuses on capturing the essence of the phenomena by extracting data that provide rich and detailed explanations on the subject. The aim of the in-depth interviews was to gain full access to the knowledge and meaning of the respondents, and it is important not to prevent this by asking the wrong questions, also implying questions that may build on highly confidential responses (Collins & Hussey, 2009). This was avoided to our best ability. To minimize the risk of the respondents having different perceptions only due to misinterpreted definitions of key concepts, we were clear with defining these concepts when necessary. Also, a brief summary on the theoretical concepts were sent to the stakeholder participants in advance of the interviews to prepare them if desired. The questions were however asked in such a way that the participants did not need an appreciable understanding of the theoretical
concepts prior to the interviews. A few questions might still have needed a very brief introduction to a specific theory. Even so, there tended to be different opinions on what constituted a mobile payment with the use of NFC, since these can both be processed with the help of so called NFC stickers, as well as with a fully NFC-compatible mobile devices. The two alternatives imply differences in terms of applicability and utilization. Therefore, such implications have been clarified if any ambiguousness in the matter was suspected during the writing of the empirical chapter. Our supervisor Niklas Arvidsson has also helped us in the process of developing the questionnaires, which add to the validity of the research through his deep knowledge in the subject on mobile payments. What is more, the general data gathered from Accumulate provided us with unique and essential primary source data that will further strengthen our thesis in terms of high validity on certain technical or functional specifications related to mobile payments. A final remark can be made on the reliability of the investigation of the European market, since some firms from which we have drawn empirical data only operates on the Swedish market. To be able to make generalizations on this matter, we have emphasized during the interviews on the European context and how it might differ and affect the results from Swedish standpoints. Also, the majority of the conference spokespersons as well as the interviewed stakeholders have connections to mobile payments spanning across many borders, especially on the European market, which makes their contribution and insights to this thesis highly relevant in this matter.

2.4 Research contributions

This master thesis will contribute with new key insight within many areas of the emerging new contactless mobile payment ecosystem and its stakeholders. This will be done by not only collecting, analyzing and comprising the existent academic foundation on mobile payments (in the form of scholar articles as well as numerous white papers), but also by an extensive empirical investigation consisting of several firms and different stakeholders operating over many borders. The merging of this empirical insights with the five highly relevant and descriptive theoretical concepts never used or optimized together before, constitutes for an extensive analysis and multi-stakeholder view on key issues impeding the developments and adoption of contactless mobile payments. According to the authors of this master thesis, this is one of the most ambitious attempts on identifying and interpreting such key issues in the contactless mobile payments landscape, that has been done until today’s date. The contributive findings adhere, and should therefore provide interesting and useful insights, to all stakeholders in the forming ecosystem on contactless mobile payments on the European market as well as on a global scale.
3. The Mobile Payment Ecosystem explained

This chapter aims to explain the mobile payment ecosystem by reviewing prior and recent literature in the field. The aim is to provide an understanding of primarily the current state of the European mobile payment ecosystem, with focus on contactless payments between customers and merchants at physical stores. This chapter works as a knowledge foundation in order to be able to put the developments described in the rest of this thesis into perspective, as well as to provide an answer to the first research question (RQ1), see section 1.4.

3.1 Mobile payments defined and classified

A lack of clear definitions surrounding the mobile payments arena adds to the confusion and hinders the understanding of important issues and aspects. Therefore, this first section aims to clarify some key concepts used in this master thesis, by reviewing existing literature and provide clear classifications and definitions of such concepts. Although this thesis is delimited to only consider so called Point-of-Sale (PoS) payments – payments between consumers and merchant at physical stores – by the use of contactless technology such as Quick Response (QR) -codes and Near Field Communication (NFC), it is still important to explain some basic terms and definitions outside of this scope. This is due to the fact that the mobile payment ecosystem is highly complex and interconnected, where customer habits and market characteristics as well as technological and security aspects along with product/service infrastructure all bled together to create different prerequisites and possibilities to adopt certain types of payments and technologies (e.g. SEPA, 2012; Mobey Forum 2012; ISACA 2011; Lai & Chuah, 2010; Goeke & Pousttchi, 2010). For example; other types of mobile payments not emphasized in this thesis can still work as important facilitators for the adoption of contactless PoS payments. For that reason, a few key terms outside the scope of this thesis will also be explained in brief in the following sections.

3.1.1 Mobile payments defined

First of all, there tend to be confusion and overlap between what generally is referred to as mobile payments and mobile banking. This is due to the fact that financial transactions can be performed through the mobile phone for multiple purposes, closely related to each other (Mobey Forum, 2011). Mobile banking can generally be defined as access to banking functionality through the mobile phone, similar to activities that are already being provided by banks over the internet. Examples include viewing account balances and transaction history, or transferring funds between private accounts (Zhou, 2011). This is not to be confused with mobile payments, generally meaning that the mobile phone is used to transfer funds in return for goods or services. By confusing such terms, stakeholders of the industry is diluting and blurring the specific needs and identification of financial functions. This misinterpretation is important to avoid, especially in-between the stakeholders (see section 3.4) in the payment ecosystem. For example, many banks in the developed world have already offered various mobile banking services to their customers for many years, since early 2000 (Huili & Chunfang, 2011).

When focusing on mobile payments, there does not exist any precise or universal definition of the term. The well-cited author and researcher Jan Ondrus (2003) defined mobile payments as ‘payments carried out wirelessly via a mobile device’. Such definition does not explain the meaning of either “payments” or “mobile device” and makes it in that sense incomplete when applied to its context. The same author, in conjunction with others, later redefined the term as ‘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” (Dahlberg et al., 2008). Such definition is based on the fact that mobile payments, as all other payments, generally falls under two main categories; payments for daily purchases and payments of bills, i.e. credited payments. However, payments of bills are indirect payments of services or goods meaning these should not be excluded from those as a separate kind of payment. To clarify; credited or debited (as well as prepaid) payments should therefore all be included in the term payment. A more recent definition include that from ISACA; an independent global association of knowledge and practices for information systems. They define a mobile payment as a "payment for products or
services between two parties for which a mobile device, such as a mobile phone, plays a key role in the realization of the payment” (ISACA, 2011). This definition is ambiguous in terms of both payment device and its role in the realization of the transferred fund. Some researches use a more narrow definition to overcome this ambiguity by emphasize on the payer as involved in both the initiation, the authorization and the confirmation of the payment (Karnouskos & Fokus, 2004; Goek & Pousttchi, 2010; Lai & Chuah, 2010). To clearly add an easy and central understanding for a more precise definition, a mobile payment will in this master thesis therefore be defined as follows;

“A mobile payment is a transfer of monetary means (prepaid, debit or credit-based) in return for a good or service, processed by a mobile and wireless device (meaning any portable device that has access to telecommunication networks but most commonly a mobile phone) and where the payer is involved in the initiation, authorization and confirmation of the payment.”

In this definition, the location of the payer and the supporting infrastructure is not important. The payer may be on the move (mobile) or at a Point-of-Sale (PoS), i.e. in a physical store making a direct purchase at the counter. The technology used to process the payment is further not specifically defined, and can in that sense include numerous options such as Near Field Communication (NFC), Quick Response (QR)- and bar-codes, premium SMS and similar. This allows the definition stated above to be narrow in the sense of the users’ role, equipment and his/hers intent with the payment, while at the same time be wider in the sense of mobile payment technology used or the actual location of the payer and the payee since such factors can differ to a great extent.

3.1.2 Two types of mobile payments and their technologies

In the literature, two distinct types of mobile payments have been defined; proximity payments (also known as close payments or contactless payments) and remote payments (also known as distant payments) (e.g. Lai & Chuah, 2010; Goek & Pousttchi, 2010; ISACA 2011; SEPA, 2012; Mobey Forum, 2012). These two types of mobile payments needs to be differentiated, since they are affected by different aspects of technology, usability, acceptance, markets, business models, security and payment scenarios. These aspects are in turn interrelated and interdependent, which leads to the high complexity of the mobile payment ecosystem (Goek & Pousttchi, 2010). As already emphasized in the introductory chapter, this thesis will focus on, investigate and analyze contactless payments (proximity payments) and leave remote payments out. Although – for clarification – both types of payments will now be explained in brief.

For proximity payments, sometimes more known as contactless payments or “contactless mobile payments” (CMP), the consumers’ and merchants’ equipment are generally in the same location and communicate directly with each other using contactless technologies for data transfer exchanged over the air. When processing a payment in stores at merchants this way, the payment is said to take place at the Point-of-Sale (PoS). The focus of this thesis therefore lies in “CMP at PoS”, which will be the terminology of choice throughout this paper. Although NFC technology (see section 3.2.1) so far has proven to be most extensively used and discussed in the European landscape so far when discussing CMP at PoS, there are numerous technologies that enable this such as mobile internet, Bluetooth, radio frequency waves generated by the mobile speakers or QR-codes (Mobey Forum, 2011). When talking about NFC, a dedicated NFC payment terminal (similar to existing card payment terminals) is most commonly used by the merchant to receive the payment, and the consumer only needs to swipe or hover the NFC-compatible mobile device over the terminal to initiate and complete the payment. This allows consumers to make “wave and go” –transactions, sometimes also referred to as “tap and go” –transactions (Lai & Chuah, 2010).

However, since these NFC-compatible mobile phones are still very rare on the European market, the emergence of so called “NFC stickers” or “NFC tags” (similar in appearance as ordinary stickers) have facilitated for a way to overcome this problem. These NFC –stickers are “passive” and have no power on its own, but can still transmit small amounts of data when being in proximity of an “active” NFC device, such as an NFC-compatible payment terminal (NFC Forum, 2012). A NFC sticker can hence be placed on a non-NFC mobile device, and still be able to process a payment towards an NFC terminal. These NFC stickers have also been used a lot the other way around, for example by placing
them on posters (so called smart posters) to send information on offerings to NFC –compatible mobile phones at short distances. But in the subject of payments, these stickers are attached to the mobile device itself. The general term NFC, sometimes called “real NFC”, instead implies that the NFC is integrated in one way or another in the mobile device, holding the payers payment credentials on a so called Secure Element (further described in section 3.2.1). NFC in this sense is not “passive”, but “active”, meaning that the device can communicate both ways, to receive and transmit information, and not only small amounts of data as with passive NFC. This opens up many other possibilities, for example numerous P2P features such as exchanging media, receive and use loyalty points, coupons etc. as well as the ability to process payments in “card emulation mode”. The “card emulation mode” is used to process CMP at PoS between NFC-compatible mobile phones and terminals (NFC Forum, 2012) and it is towards this type of CMP the ecosystem slowly seems to strive. At least that seems to be the well-provoked vision. With this in mind, the remainder of this thesis will implicitly refer to “real NFC” when the term NFC is used, and NFC stickers when these are under subject of discussion. Sometimes, the term “terminal-based NFC” will also be used to explicitly refer to real NFC in order to not confuse it with alternative NFC solutions such as NFC stickers. More specific descriptions of these implications will follow as this thesis proceeds.

In addition to payments at PoS, the general term proximity payments (or CMP) also include Person-to-Person (P2P) payments performed directly between two mobile devices, since the mobile device itself can send and receive data when compatible with NFC technology as just mentioned. As the examples shows, CMP can hence be performed both between consumers and merchants/businesses (C2B), and between consumers alone (P2P) (ISACA, 2011). What is more, major players such as Visa and MasterCard have progressively started to use contactless NFC technology in their credit and debit cards instead of the traditional magnetic stripe and chip. Due to these players’ power and traditionally huge market penetration within the payment sector, they refuse to be left outside in the battle of mobile payments (Mobey Forum, 2012). However, they can not truly qualify under the definition given by mobile payment in this chapter, since these cards are not connected to any telecommunication network in that sense, although the payee (merchant at a PoS) is so. But as we will see, contactless cards and foremost their developers (the payment scheme owners), will most likely still come to play a major role in the formation of the ecosystem, and will for that reason be treated throughout this master thesis.

For remote payments, the transaction is conducted over telecommunication networks such as GSM, 3G or the internet, and can be made independently of the payer’s location and his/her equipment (SEPA, 2012). The mobile device is often used to authenticate personal information from a resident software application or a mobile web browser (ISACA, 2011). Remittances, i.e. transfers of funds from a foreign worker to his/hers home country, form a huge market for remote payments, especially in the developing world and countries such as India, China, Mexico and the Philippines (Mobey Forum, 2011). A main facilitator for this type of payment in these markets is the lack of banking infrastructure and available alternatives. Remote payments via the mobile browser or software application are also commonly used for purchases of goods or services online. Buying applications (apps), games and music in such a way is currently one of the fastest growing areas within the mobile payments sphere (Mobey Forum, 2011). Most adoptive technologies that enable remote payments include Short Message Service (SMS) and its related Universal Integrated Circuit Card (UICC), Unstructured Supplementary Service Data (USSD), Interactive Voice Response (IVR) and Wireless Application Protocol (WAP) (ISACA, 2011). To facilitate an easy read throughout this thesis, the SMS -abbreviation will be used but could also incorporate UICC technology.

In Figure 1, the different payment options have been illustrated depending on the payment type (proximity or remote) and whether the payment is processed between consumers/persons themselves (P2P) or between consumer and merchant/business (C2B). The focus of this report is represented in the square marked with the number 2; contactless mobile payments at PoS – a proximity payment B2C; between consumers and businesses (merchants). However, as mentioned, there might very well be spill-over effects and facilitators for mobile payments development and adoption in-between two or more of these groupings that could affect the complex entity as a whole. Therefore, focus will be on
CMP at PoS (square 2), but other payment categories (1, 3 and 4) might still be treated to some degree.

<table>
<thead>
<tr>
<th>Proximity</th>
<th>Remote</th>
</tr>
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<tbody>
<tr>
<td><strong>P2P</strong></td>
<td><strong>C2B</strong></td>
</tr>
<tr>
<td>Contactless payments</td>
<td>Contactless payments, payments as PoS</td>
</tr>
<tr>
<td><img src="image1.png" alt="Figure 1" /></td>
<td><img src="image2.png" alt="Figure 1" /></td>
</tr>
<tr>
<td>Mobile money transfers</td>
<td>Mobile online payments (m-commerce, digital goods)</td>
</tr>
</tbody>
</table>

**Figure 1.** Mobile payment categories 1-4 depending on payment type and origin of payer/payee. This master thesis focuses on the 2nd square in the matrix. *Source: Adopted but modified from Innopay – MobeyForum, 2011.*

### 3.2 Enabling contactless PoS payments

This section will briefly explain the most adopted technologies enabling CMP at PoS as of today, as well as the value they bring to the payment process. Near Field Communication, or simply NFC, has been the technology on most people’s lips when discussing CMP at PoS, and seem to play a huge role in the years to come. However, other technologies have also been widely adopted, mostly since these makes mobile payments possible today and not in a near future where NFC-compatible phones probably will dominate new phone distribution. One of the most prominent technologies in this CMP at PoS category has proven to be the utilization of Quick Response (QR) codes.

#### 3.2.1 The progression of Near Field Communication (NFC)

As many researchers and stakeholders in the forming new ecosystem argue; NFC is most likely to become the common standard for CMP at PoS, and has as of today already built huge momentum in the European landscape. To sum the essence of NFC up; it is the technical enabler of a radio communication establishment between two units by bringing them into close proximity without physically be in contact with each other. This enables contactless transactions and other data to be exchanged between a mobile device and the PoS terminal at the merchant. The information can not only be payments based as stated but can include any kind of information, making it suitable for complementary services such as sharing business cards, accessing information from smart posters or receiving loyalty points and coupons for example, right in the mobile device. Transit authorities throughout Europe have also realized the potential of NFC by incorporating the technology in travel cards on busses, trains, subways etc. due to its efficiency (NFC Forum, 2012). NFC builds upon Radio Frequency Identification (RFID) by allowing two-way communication but at shorter distances (about 4 cm). This is advantageous when used in mobile devices due to security reasons. Other great appeals with NFC are its compatibility and interoperability with other current systems, e.g. transit (as mentioned) and security, as well as the existing financial payments processing infrastructure. In essence, it is not a new technology and works with existing hardware, Secure Elements and communication protocols (Abraham, 2012; Contini et al., 2011). The Secure Element (SE) is essentially the component within the mobile device that provides the application, the network and the user with the appropriate level of security and identity management to assure the safe delivery of a particular service (Paypers, 2012). As we will see, the modular placement of the SE in the mobile device can vary, and will come to play a central part in the forming CMP ecosystem built on NFC technology.
From the literature, it is further emphasized that NFC-enabled mobile payments have the potential to be the universal CMP technology if necessary stakeholders have the incentives to adopt it, and so far many stakeholders on the provider-side seem to do so. There is however almost no NFC compatible mobile devices on the European market at the time of writing, which undoubtedly impedes the adoption of CMP at PoS. Although, mobile device manufacturers such as BlackBerry, HTC, LG, Motorola, Nokia and Samsung have showed a few mobile phone models that will offer NFC capabilities in the near future, and the number of NFC operational devices to enter the future market in the next couple of years are supposed to increase even more (NFC World, 2012b). The most sold NFC-compatible phone on the market today and bearer of the Google Wallet (see section 3.3.1), will most likely enter the European market soon as well (NFC Times, 2012b). Several analysts have also estimated how many phones will ship with NFC-capability by 2015, all indicating an explosion of growth in NFC use. According to some of the estimates, about 30 percent of all phones globally will have NFC built-in within the next four years, enabling CMP at selected merchants’ PoS. Figure 2 takes a look at a typical forecast developed by market research company iSuppli in late 2011 (iSuppli, 2011).

Even if the market exploitation of NFC phones is predicted to increase exponentially, the presently low supply of NFC devices is currently one of the big obstacles for a rapid European CMP adoption. This tend to result in merchants unwillingness to invest in costly NFC payment terminals as well, since there are no phones compatible with the technology to take advantage of the terminals, even if they were deployed. In the same way, many manufacturers and consumers are not eager to develop or get equipped with an NFC device since the majority of merchants do not have NFC payment terminals in their stores. One possible boost in the NFC rollouts is however argued to lie in the hand of the American multinational corporation Apple, since the company’s fifth generation iPhone is predicted to act as a huge momentum for an accelerating NFC drive if it possesses the technology. However, at the time of writing, this is not officially determined (PCWorld, 2012).

As already being hinted in this section, the placement of the NFC Secure Element (SE) is a major subject in current strategic decisions concerning developing of both mobile payment hardware and software. More essentially and according to the literature, the SE placement will come to affect much of the business model structure and potential revenue streams among the stakeholders on the providing side of CMP solutions (e.g. Mobey Forum, 2011; Abraham, 2012, Innopay 2012; SEPA 2012). This is due to the fact that the SE holds the users payment credentials (passwords, codes, license keys etc.) and the stakeholder owning those will also have a huge power and control, with the possibility to cut other stakeholders out of the ecosystem and resulting revenue streams. The NFC SE in itself can be

![Figure 2](image-url). Mobile phones with built-in NFC capability estimated to ship until 2015. Source: Adopted from iSuppli, 2011.
placed on different locations in mobile devices, where the three most prominent according to the literature are (i) SE in the SIM card, (ii) SE embedded/integrated in the hardware of the mobile device, and (iii) SE on an external memory card in the mobile device (e.g. micro SD card). Different CMP stakeholders therefore naturally want to see the SE placement to be standardized in their own favor, also making collaboration among some stakeholders very problematic. The NFC SE placements therefore result in different business models and value chain mappings among the stakeholders in the CMP ecosystem. A few more apparent business models are often mentioned. Chaix & Torre (2011) identified four of the most characteristic ones; (i) the bank centric –model, implying that a bank is the central node and manages the transactions and distributes the property rights, (ii) the operator centric –model, implying the same scenario with the operator in the strategic role, (iii) the collaborative –model, implying that financial intermediaries and mobile operators collaborate in the managing tasks and share cooperatively the proprietary rights, and finally (iv) the independent service provider –model, implying that a third party of confidence operates (e.g. Google and PayPal) as an independent and “neutral” intermediary between financial agents and operators. Many CMP initiatives today have however combined and restructured these distinct business models in numerous ways, making it almost impossible to identify and map the many types of value chains on CMP. It is however constantly found throughout the literature, that NFC SE placement on the SIM card is (not shockingly) favored among operator –centric business models, whereas embedded or integrated NFC SE placements are favored among bank –centric and other business models. Since the placement of the SE will impact the amount of control the stakeholders have on the users, this question is essential for the forming ecosystem and will as mentioned make cooperation incentives alter (Forum, 2011; Abraham, 2012, Innopay 2012; SEPA 2012). To sum up; the NFC value chain includes a number of stakeholders, each of which has its own interests and business model to follow. Ensuring cooperation between all these parties where needed to, may prove to be one of the most difficult tasks of the CMP mass-market deployment.

3.2.2 Other ways to pay contactless at PoS

As mentioned, NFC still has some ground to break before being seen as the only viable enabler of CMP at PoS. As noted in section 3.1.2; Bluetooth or QR-codes (for example), can also be used to pay contactless, although these technologies have not received near the amount of media hype or attention as NFC when talking CMP at PoS (Mobey Forum, 2011). A strong facilitator to use these other contactless technologies (where QR-code solutions have shown to be the strongest contender) is their possibility to be used with existing equipment. In other words, these technologies make CMP at PoS possible without being equipped with a NFC –compatible mobile phone for the consumer, nor being able to exchange payment terminal hardware for the merchants (small hardware/software add-ons might however still be needed). Most people today that are equipped with a mobile device can use these technologies to pay at selected merchants. QR-code (essentially a 2D –bar code) -solutions only need a camera functionality to operate, and is almost always prevalent on current smartphone models. The QR –codes can be scanned through smartphone softwares (such as downloadable applications or “apps”) and opens up many possibilities in relation to both CMP, remote and online -payments as well as other value added services. Another facilitator for QR-code solutions is the bypassing of issues related to the complexity of the NFC ecosystem (SE placement, standards etc.). As mentioned earlier, NFC stickers are also used as a way to overcome the issue of the current low supply in NFC – compatible phones.

Even so, both customers and merchants must see some sort of added value before even thinking of utilizing CMP instead of cards or cash. NFC is according to many sources seen as the technology that maximizes this added value through their possibility to make “wave and go” payments (see sections 3.1.2 and 3.2.3) and by adding extensive additional service possibilities and combine this in a quick, simple, and efficient way (Mobey Forum, 2011; Innopay, 2012; Paypers 2012). Other types of payments, such as remote or online payments, might also diffuse and incorporate towards contactless payments, making the predictions of surviving technologies contra payment types very hard to make. Other highlighted issues in relation to this are the development of standardized and interoperable CMP solutions at PoS (Paypers, 2012).
3.2.3 Why CMP at PoS?

The real beauty of CMP is its ability to enhance the payment experience compared to cash and card payments. Ultimately, this is however up to the merchants and consumers to decide. NFC is one technology that opens up such possibilities by enabling various forms of communication and transaction in a very comfortable and user-friendly way according to most researchers (Mobey Forum, 2011; Innopay, 2012; Paypers 2012). Chaix & Torre (2011) argue that the three most required conditions for CMP at PoS to become operational are safety, speed and simplicity. Hayashi (2012) emphasized on convenience, cost, security and merchant acceptance. All these factors are however very interconnected, for example; if CMP gets quick, safe and simple to use, the customers will probably consider adopting it, preferably resulting in faster/larger turnover rate for merchants which will save costs.

Concerning safety and security (as many researchers agree upon); CMP transactions can not be less secure than that of existing payment cards if users are to consider and adopt mobile payments. In Europe, cards with “chip and pin” (EMV chip cards) are widely distributed and have reached a high level of security and acceptance, making this objective everything but crude. Security issues discussed around CMP concerns both the mobile devices and the back-end systems involved, making both the merchants and consumers reluctant to different degrees. Other security threats come from skimming, eavesdropping or tracking (Innopay, 2012). Most CMP initiatives today however claim that their solutions are even more secure than card payments, but only time will tell how much truth really lies in those claims. CMP should preferably also be quicker to process at PoS, resulting in a win-win situation for both merchant and customer as mentioned. The briefly discussed “wave and go” CMP built on NFC is perhaps the fastest way to utilize a payment, and saves many seconds per transaction compared to traditional card payments according to some studies (Hayashi, 2012). For lower transaction values (often up to approximately 20 Euro), there is seldom need to confirm the payment with a personal code (e.g. PIN), which even further speeds up the payment but also makes it less secure (Guidobaldi, 2011).

Mobile devices can also eliminate the inconvenience of carrying multiple plastic cards like physical wallets do, by enabling consumers to link mobile payments to those card accounts. These card accounts could include general purpose credit, debit, and prepaid cards, as well as merchant-specific cards that entitle the user to rewards or discounts. The term mobile wallet is often used to describe a mobile application with the functionality to replace a conventional wallet and more. Shin (2009) defined a mobile wallet as “…a much advanced versatile application that includes elements of mobile transactions, as well as other items one may find in a wallet, such as membership cards, loyalty cards and travel cards. It also stores personal and sensitive information like passports, credit card information, PIN codes, online shopping accounts, booking details and insurance policies that can be encrypted or password-protected”. That definition describes many of the advantages the mobile device can have beyond merely payments. However and overall; the benefits of a simple, fast and secure data transferring makes CMP at PoS very attractive and promising for future mass adoption, if these requirements can be fulfilled. Even so, researchers have showed that the uncertainty about the net benefits to consumers of moving to mobile payments not only discourages consumer adoption but also reinforces the supply side barriers (Hayashi, 2012).

3.3 Mobile payments – a world overview

Mobile payments have been defined, categorized, and discussed in terms of its technology and functionality preferences. This section aims to give a brief presentation on the vast differentiated and fragmented world market concerning the mobile payment infrastructure and adoption. This is important in order to understand the stage and continental context of the European mobile payment landscape as focused on in this thesis. What is more, big players forming in continents outside of Europe is seen to slowly enter this market as well, and is in that way essential to be aware of when analyzing stakeholder issues on the European market. To give a perhaps too generalized illustration of the world market one can say that in developing countries companies are tapping into opportunities provided by the large unbanked populations that have no access to alternative methods of financial
services. In other words, remote payments form a huge market in developing countries due to needs such as remittances, the poor merchant payment infrastructure and rather low-tech mobile phone distribution. In the developed countries, more attention is given to CMP using NFC technology (Innopay, 2012). Whatever market, a recent study drawn up by market research company Renub Research shows that mobile payment services worldwide are continually gaining in popularity. By 2014, the total value of the market is expected to cross USD 500 billion. CMP based on NFC technology are further predicted to grow tremendously and is likely to grow with a compound annual growth rate (CAGR) of 118% to the year of 2015 according to the study (PR Web, 2012).

3.3.1 North America, Asia and Africa

In North America mobile payments is a hot topic, and NFC leads the way. As many companies try to obtain a piece of the NFC pie, the last couple of years have marked the beginning of many new initiatives. One of the most important initiatives with its headquarters in the U.S. has been Isis; formed in November 2010 as a joint-venture between a number of major mobile operators, namely AT&T Mobility, T-Mobile USA and Verizon Wireless. Isis utilizes NFC for CMP and in February 2012 they announced their first three banking partners to enable their credit, debit and prepaid cards to be placed into the Isis Mobile Wallet. These card issuers cover 100 million card holders in the U.S. and will probably give Isis a solid start when it rolls out in Austin, Texas and Salt Lake City in the summer of 2012 (Isis, 2012; NFC World, 2012a). Isis has further announced agreements with four major U.S. payment networks, including Visa and MasterCard, as well as mobile device manufacturers HTC, LG, Motorola Mobility, RIM, Samsung Mobile and Sony (NFC Times, 2012a).

Meanwhile, Isis biggest rival; Google, has teamed up with card giant MasterCard and banking partner Citigroup: the world's largest financial services company to create Google Wallet, launched in September 2011. Google is also partnering with PoS system companies in order to introduce a rich interaction between Google Wallet and PoS payments. The giant have also teamed up with Samsung and NXP to create the Nexus S 4G phone; the first phone to support Google Wallet. Also, Visa, Discover and American Express have made their NFC specifications available to enable their cards to be added to future versions of Google Wallet. This enables CMP to be performed with Google Wallet anywhere a MasterCard PayPass PoS terminal is accepted, which currently is available at over 140,000 merchants across the U.S (Google, 2012; MasterCard, 2012). The reason for Google to enter into the mobile payments sphere is presumed to mostly depend on their will to accumulate user data, such as detailed information on finances, consumption habits, location and demographics of consumers in order to create new forms of highly targeted advertising and services which is de facto their core business (The Guardian, 2012). Google have integrated the NFC Secure Element (SE) in their Nexus phone. The rival Isis has chosen to place their SE on the SIM –card instead.

Another major player in the online and mobile payments industry is also making steps towards NFC; PayPal, which is the global e-commerce business allowing payments and money transfers to be made through the Internet. PayPal is seeking to expand its online payment service to the physical PoS and is exploring a range of technologies that could one day include NFC. Like Google, PayPal would not like to see the mobile operators in a too dominant position by controlling the SE and the payments credentials for NFC on the SIM card (NFC Times, 2012c). PayPal is however not only exploiting the US market, but have invested and participated in numerous mobile payment trials and pilots on the European and global markets as well.

Visa and MasterCard has naturally been two actors to also launch new payment alternatives. As hinted earlier, these do not entirely evolve around mobile phone usage, but instead by utilizing the contactless NFC technology to use in their payment cards. Both actors have further developed and manufactured new types of payment terminals, which is used at the PoS to do transactions with NFC compatible cards. Visa’s NFC initiative goes under the brand Visa PayWave, while MasterCard named their solution MasterCard PayPass (Visa, 2012; MasterCard, 2012). These terminals have as mentioned also been used in conjunction with other big initiatives that utilize NFC technology, in an effort to lock some of the infrastructure to be compatible with Visa’s and MasterCard’s payment schemes. Another actor worth mentioning is Square, only present in the U.S. at the moment. Square was launched in
2010, and allows users in the U.S. to accept credit/debit cards through their mobile phones by swiping their card on the Square device which is attached to the phone (Square, 2012). In that sense, Square can be seen as a card terminal provider, which is used in the mobile phone instead of externally at the PoS.

Compared to North America, the developing countries are using much different solutions to serve the largely unbanked populations that have no access to banks and other financial services. Many mobile payment success stories have seen the light of day such as M-PESA in Kenya/Africa (Mas & Radcliffe, 2011). If looking at the developments of mobile payments in Asia, it is clearly a fragmented market. The geographic region of Asia-Pacific has very high rates of mobile penetration and growth, as well as being the most populous geographical region in the world. In Japan and South Korea, where NFC developments have been closely related to mass-transit networks, the take-up has been massive, reaching close to 75% consumer penetration. The transit networks have eventually led to NFC becoming the de-facto standard method for mobile payments in for example Japan (Innopay, 2012). According to Amoroso & Ogawa (2011), the basic fundamental theory with respect to the U.S. is focused on a “pull” theory when establishing the mobile payment ecosystem. U.S. firms make investments when they clearly see that there will be demand from consumers, i.e. investments with lower risk. In Japan, there was according to the authors more of a “push” development 10 years ago, with early a clear investment and cooperation with university labs for example, and where mobile carriers such as NTT DoCoMo developed mobile payment solutions that mobile consumers would adopt to a large degree (Amoroso & Ogawa, 2011). Although, it still took about six years from the first pilots of mobile payments to its interoperable mass-market phase in Japan (Mobey Forum, 2009). However, there are still numerous and vast differences between the markets concerning adoption behavior and infrastructure. The success of mobile payments therefore greatly depends on the effective alignment between business model and physical environment in which it is launched. So to merely transfer business models across countries leave no guarantee for success, as many researchers agree upon (e.g. Au & Kauffman, 2008; Ondrus et. al, 2009; Innopay, 2012; Amoroso & Magnier-Watanabe, 2012).

3.3.2 Europe – a fragmented market
As being the market in focus throughout this master thesis; Europe and its payment ecosystem is diverse, fragmented and filled with a wide array of coexisting mobile solutions. With nearly 50 different countries and territories, Europe’s geographical fragmentation is further aggravated by the historical divide between Western/Northern Europe on the one side and the Central/Eastern European bloc on the other. This implies shared mobile payment characteristics both with developed countries such as the U.S. market as well as developing countries in Asia and Africa. The European landscape is further very differently suited when analyzing infrastructural prevalence for mobile payment development and adoption. For example, many of the Nordic countries (e.g. Norway, Sweden and Denmark) have very high rates of payment card usage and low rates of cash usage. In southern countries such as France and Italy, as well as many eastern countries, this proportion is rather the opposite. This may have an impact on the perceived value and willingness to adopt mobile payments over card payments or cash. Differentiated banking infrastructure, governmental and legal factors effect on a large basis as well. Even so, some European mobile financial service markets has seen a few successful mobile payment trials and implementations, mostly NFC-based but not exclusively so. Despite markets in such regions being remarkably active, mass-market adoption of mobile financial services has not yet taken off. In Europe, the Single Euro Payments Area (SEPA) – under the European Payments Council (EPC) – is also working together with all active stakeholders in the mobile payments ecosystem to contribute to the development of the necessary standards and business rules in Europe (EPC, 2012).

Most progressive CMP adoption has so far been seen in France, the UK, the Czech Republic, Slovakia, Turkey and Poland, and the majority of those initiatives have been built on NFC technology. In Nice, France, the so called Cityzi –project have been going on since 2009, and is seen as a pioneer project in terms of building a commercial wide-scale infrastructure on contactless mobile services. The project was developed in conjunction with numerous stakeholders; mobile operators, transit
authorities, banks and merchants, and was further supported by the French government. The project’s aim was to facilitate payments with NFC compatible mobile phones in restaurants, supermarkets and local stores, as well as to use it for city busses and trams throughout Nice. Regarding the business model, the stakeholders came to agree upon SE placement on the SIM card, and the operators and banks agreed upon a common interoperability model based on technical and functional specifications that was first field tested in other French cities. The Cityzi initiative also included Visa and MasterCard to make sure that the infrastructure deployed met internationally recognized standards and specifications. This ensured some degree of security for the NFC enabled transactions, and ensured interoperability between banks and mobile operators. In a way, Nice has become the “city of reference” for a pre-commercial phase of NFC testing including cooperation among banks, mobile operators, card companies, transit authorities and service managers. The Cityzi model is planned to expand in even more French cities in the near future (Guidobaldi, 2011; Innopay, 2012).

In the UK, CMP at PoS initiatives like Quick Tap have started to get solid attachments on the market (Celent, 2012). Quick Tap is a NFC payment solution launched by mobile operator Orange UK and card issuer Barclaycard, which allows consumers to make purchases of £15 by tapping their NFC compatible mobile devices (Samsung smartphones) against a contactless terminal today available at over 50 000 stores in the UK. These terminals are provided by MasterCard (PayPass terminals). The Dutch digital security company Gemalto provides Trusted Service Management (TSM) –services (see section 3.4.1.8 for definition) which enable the secure deployment and management of the payments. They also supply SIM cards to Orange (Paypers, 2012).

What is more, Visa has confirmed a launch of their mobile payment system V.me as of August 2012. The initiative is a mobile wallet service to launch in the UK, Spain and France, giving merchants, customers and banks access to multiple cards through their mobile devices. According to Visa themselves, the V.me initiative is Visa Europe’s answer to PayPal and Google Wallet (Visa Europe, 2012). Even though the initiative starts off mainly as an online payment service, it is said to be able to incorporate any or all of the new payment types, whether it is P2P-, online- or PoS payments, by the use of NFC technology (FastCompany, 2012).

Another big project currently goes under the name Project Oscar, which is a joint venture between UK’s three biggest phone networks; Vodafone, O2 and Everything Everywhere, which owns T-Mobile and Orange. They have applied to the European Commission to form a company that would create a mobile wallet platform and an advertising sales house that could reach every subscriber on their networks. However, during the time of writing, the joint venture is under approval in the European Commission, which has indicated that it may block future entrants to the market by controlling the SE on the SIM cards to monopolize user power and further by risking to refuse selling phones that could run alternative mobile payments systems, such as PayPal or Google Wallet (The Guardian, 2012; NFC Times, 2012c). Even so, there are other potentially powerful joint ventures forming in the European market, including countries like the Netherlands, Germany, Sweden, Denmark and Hungary (NFC Times, 2012c).

In Sweden, the joint venture WyWallet (former 4T Sweden), formed by the four biggest mobile operators on the market (Telia, Tele2, Telenor and 3), is said to reach approximately 97% of the Swedish population with their new product. The company is launching mobile payment solutions initially utilizing premium SMS, but have plans to expand to CMP with foremost NFC technology when the market is ready (WyWallet, 2012). Denmark and Norway have also emphasized upon similar initiatives (Markendahl et. al, 2011).

In the Netherlands, a consortium of major banks, mobile operators, and financial service providers have teamed to set up a joint venture that aims to promote CMP using NFC technology. For technical support, a TSM is set to be established by the partners. This so called Six Pack –alliance is expected to go live with its services in late 2012 (Innopay, 2012; The Paypers, 2012). As with the Quick Tap – initiative in the UK, Gemalto have also made its presence on the Slovakian market, where they distribute contactless NFC stickers to financial service provider UniCredit Slovakia. As explained in section 3.1.2, these stickers are attached to the mobile phones as a way of utilizing contactless
technology even without NFC compatibility within the mobile device. The initiative has a Slovakian contactless payment market of over 3000 acceptance point in place so far. Also, in Poland, Gemalto has made its presence together with mobile network PTK Centertel (an Orange group affiliate) to deploy NFC mobile payments at approximately 35 000 acceptance points across Poland, including fast food restaurants, cinemas, supermarkets and a number of retailers (Innopay, 2012).

More CMP trials are currently being conducted all across Europe, in countries as diverse as Austria, Belgium, Germany, Ireland, Russia, Slovenia, the Czech Republic, Turkey and Spain (Innopay, 2012). Both Visa and MasterCard are exploiting the European market as well, both on their own and in conjunction with other initiatives (e.g. through the use of their terminals). During the summer Olympic Games in London 2012, Visa will also make huge efforts to gain momentum with their new NFC based payment cards through heavy marketing campaigns (Olympic, 2012).

There is also a huge amount of initiatives launched in Europe that does not fall under the CMP category. These include remote payments and services such as money transfers, top-ups, remittances, mobile wallets for storing loyalty and coupon offers. Technologies include SMS, WAP, Internet etc. (The Paypers, 2012). Other initiatives include more of “hybrid” solutions, for example Swedish iZettle, a company that has developed a device or “miniature card terminal” which can be plugged into the dock connector of an iPhone to accept credit card payments (iZettle, 2012). This idea is similar to that of Square for the U.S. market. The difference is that iZettle utilize EMV chip cards (the international, credit card industry standard for chip-based debit and credit cards) whereas Square utilizes cards only through the magnetic stripe. Cards with chip are proved to be more secure than those only possessing a magnetic stripe (RSA, 2012).

There are also a vast amount of more entrepreneurial initiatives on CMP all across Europe. Many are regional efforts, based on numerous different technologies as well as “over-the-top” solutions for PoS payments. Through such “over the top” -initiatives, it is possible to cut out the middle men, for example mobile operators, banks or terminal manufacturers. The lack of available NFC phones has also been mentioned as an impediment by several companies to launched trials with the use of NFC stickers that easily can be fixed on a mobile device. QR-codes have also been used in a similar way as NFC stickers, as a way of identifying which cash register to accept the payment against, or to generate unique codes on to which data on payment amount, payee/payer etc are stored. This can be used in a number of innovative ways when processing payments. As a final note; the remainder of this master thesis will focus and by indirect means refer to topics and events taking place on the European market if nothing else is mentioned.

3.4 The key stakeholders

The evolving mobile payments ecosystem includes a wide range of stakeholders – some of them from traditionally very different industries – also possessing very different incentives and prerequisites. A stakeholder in this research implicitly means an agent (e.g. an individual, a firm, a government regulator, a user, a buyer etc.) that either affects or is affected by actions resulting in ecosystem changes in some way. Since the mobile payment ecosystem is dynamic and fast-developing, with potential for stakeholders to take on additional roles and for new players to enter the market, a precise mapping of all these stakeholders can be a daunting task.

The stakeholders in the mobile payments ecosystem can take a variety of forms that further confuses the less informed reader. Stakeholders mentioned in the literature such as clearing/settlement organizations, software solution providers, third-party payment processors and wireless operators tend to make the full ecosystem picture very hard to grasp. However, some more apparent stakeholder classifications are generally being used throughout the literature to explain and clarify the ecosystem structure. Generally, most literature groups the stakeholders into two main segments; one which includes the providers of the mobile payment solutions and the other which includes the users that accommodate these solutions (e.g. Au & Kauffman, 2008; Lai & Chuah, 2010; Innopay, 2012). The users consist of merchants and consumers, while the providers consist of stakeholders such as mobile operators, banks and financial institutions, mobile device manufacturers and other service or product...
related actors. Many of the stakeholders on the providing side fight to gain their share of revenue and the associated transaction fees in the forming ecosystem. A third segment surrounding the providers and users is often recognized in the literature as that of government, regulatory institutions and other public sector entities. They track sales practices, monitor innovation quality, regulate potential monopoly markets, make laws and stimulate market demand through advantageous taxation and other business policies (Au & Kauffman, 2008). Again, the two key segments; providers and users, are in focus throughout this thesis, however not implying that the third segment is excluded. The rest of this section will list the key stakeholders adhering to each of the two segments and briefly discuss their role in the CMP ecosystem. To get a fair and objective description of each stakeholder, several literature sources (e.g. NFC Forum, 2008; Tobbin, 2011; Innopay 2012; Mobey Forum 2012) have been used to extract and compiled a brief description of each key stakeholder in their relation to mobile payments. As a note, a CMP actor sometimes can take on more than one stakeholder roles as described in the following sections.

3.4.1 Providers

3.4.1.1 Banks and financial institutions

Being the stakeholders that have handled customers’ financial services for decades, the banks are according to many researchers seen as essential in any type of payment activities. They have a long and strong tradition of personal financial management tools, and are generally highly trusted by people to handle their money. They also have the security processes and systems in place to do so safely. Another great advantage the banks possess is that they already hold customers financial accounts and are established issuers of payment cards and other instruments. However, with the fast evolving and highly dynamic new mobile payment ecosystem forming, the banks may find it hard to adapt quick enough to grab a sustainable and essential position. Even if banks have vast experience in financial services, they do not have that experience in mobile businesses. In general, the banks across Europe have been a bit passive in the development of mobile payment solutions, and seem to have participated more as a defensive play. However, as discussed earlier, there have been some cooperation initiatives where banks have played a key role in conjunction with mobile network operators and other stakeholders.

3.4.1.2 Mobile Network Operators (MNOs)

For mobile network operators (from here on referred to as MNOs), mobile payments is an attractive and potentially rewarding business. The return of investment for infrastructure over the last two decades, through payment related revenues and associated increase in air time and data use, is highly welcome. For the MNOs, mobile payments also hold the possibilities to diversify into other areas of the consumer’s needs and lifestyles, and to build greater customer loyalty. One of the most apparent strengths in possession of the MNOs is however their extensive customer base, since basically everyone owning a mobile phone have a connection established with a MNO whom the consumer also is used to pay in exchange for services. However, if compared to other stakeholders, MNOs have limited experience from the traditional payments industry. This can also be a reason for cooperative efforts with foremost banks. MNOs also have strong distribution connections with mobile device manufacturers, which further put them in a promising position.

3.4.1.3 Mobile device manufacturers

Manufacturers of mobile devices such as mobile phones and tablets (most commonly smartphone manufacturers) naturally have an essential role in the ecosystem since they manufacture the very devices on which the payments are processed. Some literature refers to these stakeholders as Original Equipment Manufacturers, shortly OEM, but “mobile device manufacturer” will be used throughout this thesis as an effort to clarify their role. The contribution from device manufacturers to the ecosystem comes principally from their control over the device hardware, ensuring that the necessary functionality can be integrated into the device to enable CMP and deliver an optimal customer experience. When making CMP enabled through NFC technology, the various mobile device manufacturers have so far manufactured a few different modular designs in relation to the SE placement and choice of strategic partners, as discussed earlier. By manufacturing NFC–compatible
smartphones for example, there is also a change for renewal of existing devices in the market to new
that are payment capable, with the potential to increase the mobile device manufacturers’ sales.

3.4.1.4 Payment Service Providers (PSPs)
A payment service provider (PSP) offers merchants services and the technical platform for accepting
payments by a variety of payment methods including card payments as well as mobile payments. This
implies that the PSP most often distributes the card payment terminals (and NFC-compatible terminals
for CMP), as well as its software. The PSP is more essentially the link between the merchant and the
bank. PSPs can in that sense connect to multiple acquiring banks, card and payment networks and
sometimes also fully manage the technical connections and relationships with external networks and
bank accounts. This makes the merchant less dependent on banks by establishing these connections
directly. The merchants often pay the PSP on a monthly basis, and sometimes also a fee per
transaction. The fee is most often a low fixed cost or set as a percentage of each transaction.
Throughout this thesis, the PSP will mainly be referred to as the distributor or manufacturer of
payment terminals (card or NFC –based).

3.4.1.5 Payment scheme owners
Several payment scheme owners or “card networks” such as Visa and MasterCard have shown great
interest in future payment scenarios in order to support their direct customers (banks and financial
institutions), widen their financial service business and strengthen their brand position in mobile
services. The payment scheme owners have existing and proven high security infrastructure on place
already at PoS, and support established payment instrument issuers and acquirers. They are
responsible for handling agreements with scheme participants, setting fees and establishing technical,
functional, branding and certification policies for scheme participants.

3.4.1.6 Third party technology/service providers
As with all new business opportunities emerging, there are smaller, entrepreneurial firms that also
aims to grab a piece of the revenues by developing their own CMP solutions or innovative technical
preferences to be used by other stakeholders in the new ecosystem. These stakeholders are positioning
themselves to provide infrastructure and applications for CMP and in the process sometimes also
offering to act as a TSM (see further down), i.e. a trusted intermediary between the banks and the
MNOs. Many third party technology/service providers have developed so called “over the top” –
solutions that avoids the need to store any payment card credentials in the consumer´s mobile device.
Many such solutions do not need to cooperate with MNOs or banks, and are sometimes also developed
to be integrated with existing infrastructure or with very small modifications to existing infrastructure,
for example by providing CMP through QR –codes.

3.4.1.7 Large technology/service companies
Many large technology and service related companies, such as internet focused giants like Google,
Paypal (and potentially Apple) are seen expanding their business models by building extensive
ecosystems to support online as well as offline CMP services that serve huge numbers of customers.
Due to these companies’ large customer base and strong financial means, they can develop end-to-end
CMP systems more or less on their own. Although these companies might not hold the same level of
trust as for example banks, some consumers might still feel more attractive to adopt these solutions
due to the actors’ deep involvement in people´s day-to-day life, by bridging the gap between online
commerce and CMP at PoS.

3.4.1.8 Trusted Service Manager (TSM)
A new stakeholder entering the NFC focused CMP ecosystem is the Trusted Service Manager (TSM),
also called TSM to facilitate adoption of NFC services. This stakeholder is considered to work
behind the scenes” to make the necessary link between the MNOs and the banks/financial
institutions. The link adhere to the utilization of CMP where se NFC Secure Element (SE) can be
issued by the MNOs (SE on SIM –card) or the mobile device manufacturers (SE integrated on mobile
device or on memory card). In any case, the TSM is a trusted third party stakeholder introduced to
provide the technical connections with MNOs, mobile device manufacturers and other stakeholders that control the SE. This potentially results in better scalability when several actors must undertake commercial and technical interactions with several SE issuers. In that sense, the TSM knows both banking and mobile phone security and systems, bridging multiple banks and MNOs while ensuring that consumer’s NFC applications and payment credentials are completely secure. However, the lack of a large scale TSM solution is said to be one of the key obstacles impeding wide market acceptance of CMP. One reason there’s no clear TSM solution is that many companies think they can provide this service on their own, but in reality most companies that aspire to the TSM role are not yet capable of supporting all of the functions involved.

3.4.1.9 Other important stakeholders
Other stakeholders such as public transport or transit authorities have wanted to adopt contactless technology for other reasons than merely payments, since for example NFC has proven to be a fast and efficient technology when used in access control systems, such as entering trains or busses. Since the technology can be used to receive and send information in a simplistic and secure way, stakeholders dealing with ticketing, parking, loyalty and couponing, building access, patient monitoring, advertising etc. have also shown interest in its usability. These complementary services can also become important co-drivers in the CMP ecosystem. Furthermore, governmental bodies and regulators (e.g. the European Payment Council) have as already mentioned great impact the CMP advancement as a whole, and is sometimes seen as the third key stakeholder group in the new ecosystem.

3.4.2 Users
3.4.2.1 Merchants
Naturally, the merchants (i.e. retailers), play a significant role in the success of CMP since their involvement and commitment is vital. Merchants already enjoy good payment systems in the form of debit and credit cards on the majority of the European market, and are therefore more likely to invest time and resources in accepting CMP if they are popular with customers or more cost effective, faster, easier and safer than other payment methods. But CMP and mobile wallets can also offer the merchants a new way to interact with their customers, for example by providing loyalty incentives, discounts and other targeted marketing offers through the mobile device. If CMP at PoS could create faster checkouts, many types of merchants could benefit greatly. Investments for implementing NFC-compatible payment terminals are however seen as one of the big impeding elements for making CMP possible at PoS. Other CMP technologies like QR-codes could however elude this issue to a certain degree. Even so, there are still factors like learning costs and security uncertainties that could hinder the CMP adoption by merchants.

3.4.2.2 Consumers
Much of the literature emphasize on the consumers as the central hub in the CMP ecosystem. It is the consumers that generate value for the other stakeholders in the ecosystem by selecting mobile devices, making transactions, accepting coupons, and generally creating data. As with the merchants, consumers must still see some sort of added value before starting to pay with their mobile devices instead of using cards and cash. Adoption behaviors also tend to be very individual and could differ greatly in terms of demographics, existing infrastructure and other market characteristics. It is easier to see the obvious advantages for consumers in the developing countries to start pay with their mobile devices, mostly remotely, due to the lack of other forms of payment services. In Europe and the developed regions where card payments have been greatly accepted and reached an extensive utilization, the net benefit to change payment method is not as clear.
3.5 Issues in the ecosystem

The mobile payments landscape has proven to be a difficult topic to research, analyze and especially to implement in the real world due to its complexity. The numerous stakeholders from industries that traditionally have never worked together must now align in order to provide this new and promising payment solution to consumers and merchants. The consumers must in turn change their payment habits and learn to adopt paying with their mobile devices. Although numerous challenges and obstacles need to be overcome before CMP reach a critical user mass, it seems as if the industry has generally arrived at consensus on the “what” and the “why” of mobile payments. Now the industry has intensified its focus on the “how” – i.e. how to approach common constraints in order to fully capture and reap the fruits of the mobile payments tree.

From this chapter’s description of the current mobile payment state in foremost Europe, a few key issues or challenges seem to be slowing down the very optimistic mobile payment movement. The issues are however two-sided; i.e. they adhere on one side to the development of mobile payment instruments and infrastructure. The key stakeholders on this side of the spectra include banks and other financial institutions, MNOs, mobile device manufacturers, as well as other service and technology providers. In that sense, the issues here generally concern technical, organizational and industrial developments. On the other side we have the users of CMP, i.e. merchants and consumers. The issues on this side are more linked to social factors, cost and market characteristics, and concern in that sense the very adoption of mobile payments. What is more, governments and other regional or global initiatives and agencies are embracing both those sides, framing the ecosystem with regulatory factors as well as providing guidelines for a standardized development where interoperability is a strong word. In Figure 3 below, the mobile payment ecosystem from this point of view have been illustrated.

![The Mobile Payment Ecosystem](image)

**Figure 3.** *The mobile payment ecosystem illustrated, in terms of stakeholder segmentation and the respective sides’ related issues.*

These two key segments or “groupings” of the mobile payment stakeholders are naturally much interconnected. On the user side; it is important for the merchants to add CMP capabilities to their PoS terminals when needed, however this tend to be costly for them. To invest, they need assurances that once the technology is installed they will process high enough volumes of CMP transactions to actually make the hardware and software investments profitable, i.e. a critical mass of customers must pay using the contactless technology. Consumers on the other hand need CMP applications or NFC equipped mobile phones, as well as a sufficiently high number of CMP-enabled retail locations at their disposal to consider paying in a dramatically new way. It is truly a “chicken and egg” problem. This
also leads to user adoption of CMP where paying behaviors and habits need to be changed. Some consumer segments might also be more prone to adopt certain payment types compared to other segments bigger devotion to banks, cards and cash. In essence, the users must have incentives to start adopting CMP. Compared to other payment alternatives and especially credit and debit cards; CMP should preferably be easier and quicker to perform and at least as secure to use.

On the provider side: the very solutions to the users’ needs are dependent on how the different groups of actors involve and interact. All stakeholders want to optimize potential revenue streams and grab a sustainable position in the future ecosystem, and the position of each stakeholder in the payment value chain remains highly problematic in the proposed mobile solutions. For example, some key stakeholders, such as banks, do not want to lose control, while others, such as MNOs, would like to fully control the end-user relationship. This leads to issues of who should control the consumers payment credentials placed on the NFC Secure Element. The MNOs therefore advocate for SE placement in the SIM card, while other actors that does not want the MNOs to reap all the fruit suggest SE placement as an integrated solution in the mobile phone or on a separate card such as a micro SD card. The placement of the SE is therefore closely linked to the business model and type of collaboration among the providers, and numerous constellations try different settings. At the same time, some actors want to have control over most part of the value chain themselves, and giants like Google, PayPal and Visa/MasterCard all have their own contactless payment initiatives. First movers in this race for tapping the users can bring both advantages and disadvantages. Payment security issues are also a very debatable subject in this realm.

To sum up; some key issues have been identified throughout the existing literature on CMP, which is set to be investigated and analyzed further in the remainder of this thesis in conjunction with theories related to new industry evolvement, development and its adoption among the users. The investigation will be conducted from a two-sided stakeholder perspective, where key stakeholders and issues from both the segments presented here will be analyzed in relation to each other. The key issues adhering to the two stakeholder segments that have been identified in this chapter can be roughly and briefly summarized as follows:

- **Provider issues:** Collaboration issues among the providers of CMP, where business models are hard to standardize due to its unevenly distributed control of the users in the ecosystem (heavily related to the NFC SE placement). This might further lead to issues related primarily to early and late movers, alternative mobile payment solutions, network effects and interoperability between technologies as well as across borders.

- **User issues:** User adoption issues, concerning cost, security, behavioral change and uncertainties in added value through CMP compared to foremost card payments. There seem to exist a “chicken and egg” problem between merchants and consumers in relation to CMP utilizing NFC technology.

As reaching the end of this chapter, a rough picture of the mobile payment ecosystem with mainly its European market characteristics, stakeholder positions, and user adoption issues have been clarified. These issues concerned with both the developments on the provider-side, as well as the adoption on the user-side, have been reviewed. Also, the functionality of contactless technologies and their field of applications have been discussed. With this in mind, it is easier (and perhaps essential) to put the developments described in the rest of the thesis into perspective. The next chapter will present the theoretical framework; built on five central and interconnected theoretical concepts, used to process the empirical data for later analysis purpose, in order to extract conclusions to the research questions and objective of this thesis.
4. Theoretical Framework

This chapter will present the theoretical concepts that build up the theoretical framework used as the foundation for this research on stakeholder issues and actions. Five theoretical concepts are highlighted: First- and Second-mover Advantages/Disadvantages, Network Externalities, Switching Costs, Diffusion of Innovations and finally Ecosystem Evolvement. Finally, these five concepts will merge in a comprised theoretical framework, which will be used in conjunction with the empirical data for analysis purpose.

The theoretical framework takes its foundation in the approach of identifying stakeholder issues in the CMP ecosystem, probably most famously used by Au & Kauffman (2008) and Dahlberg (2008). This approach implies a multi-perspective framework comprising several kinds of theories to be the aim, since one or two types of theory has been considered not to be enough for covering an ecosystem centering round a multi-sided stakeholder structure. This approached has later been confirmed and acclaimed by one of the most prominent figures on theory surrounding mobile payments, Professor Jan Ondrus at the ESSEC Business School (Ondrus et al., 2009). In this research, Ondrus claim that it is of highest necessity to take a multi-sided perspective in order of correctly describe the evolving mobile payment ecosystem and identify challenges to overcome, since often only a one-side perspective is taken in the analysis of stakeholders. The work of Ondrus might still seem to leave an unfulfilled need in conducting a similar work and to add upon the body of knowledge since several years have passed. Also, this theoretical framework aims to extend the work of these authors by providing a fuller, more reasoning and dynamic picture of concepts used in the past, as well as by further adding some relevant concepts.

The theoretical framework of this master thesis therefore aims to compile different but interrelated theories that have been shown to be of importance in evolvement of previous industries, primarily those subjected to the effect of networks. Apart from the theories of Network Externalities, Switching Costs as well as Diffusion of Innovations (inspired by the mentioned previous authors), two additions has primarily been made and judged to be relevant for the purpose of this master thesis. These additions come in the forms of theory regarding, firstly, First- and Second- mover Advantages and Disadvantages. This type of theory was chosen partly because of its interrelationship with Network Externalities (e.g. Srinivasan et al., 2005), and partly because of its possible ability to illuminate the wait-and-see strategy by stakeholders in many countries, whereas in a few European countries some actors are making big and aggressive moves. Secondly, theories regarding Ecosystem Evolvement have been chosen as useful, to account for the fuller more holistic view on the mobile payment ecosystem, and since some actors are making moves in forms of collaborations, while others try to adapt their strategies to find niche markets and unfulfilled compliances in the ecosystem by themselves. This notion touches upon the necessity of creating viable business models in new industries, where all types of actors have their defined roles and possibly fair share of revenue and at the same time provide the consumers and merchants with solutions that raise the value of CMP above the current plastic cards. This aspect is regarded as missing in the previous attempts on a multi-perspective approach by the authors of this master thesis. The choice of First- and Second- mover Advantages and Disadvantages, as well as Ecosystem -related theories are also supported by previous authors’ findings (e.g. Varian and Shapiro, 1999) on the evolvement of industries surrounding challenger-types of technologies. Theories on Network Externalities was chosen due to the fact that consumers’ willingness to pay for a good or service (e.g. mobile payments) in a market increases with the number of units sold, thus iteratively adding more value to the network. This is according to the theory also highly related to the impact of hardware and software, which indeed is very relevant to look further into due to for example current low supply on NFC –compatible mobile phones, and other CMP types utilizing mere software-based solutions. The theory could hopefully also help to shine new light on the identified “chicken and egg” –problem, see section 3.5. Theories on Switching Costs were chosen to interpret the potential resistance in users, by changing payment method from cash and foremost cards, to CMP. Also, the user welfare would be reduced if these would be tied and locked-in to a specific solution through the creation of high switching costs, which is further highly related to for example First- and Second-
Mover Advantages and Disadvantages, as well as Ecosystem Evolvement. Finally, Diffusion of Innovations—theory was reasoned to help understand how new products and services (e.g. mobile payments) spread through a population, and which factors and issues are important to understand throughout this process.

Overall, these five theoretical concepts are highly interconnected, with each other as well as with both the user and provider side of the stakeholder spectra. Even so, First-and Second-mover Advantages and Disadvantages and Ecosystem Evolvement might apply more to the provider-side, whereas Switching Costs and Diffusion of Innovations might be more connected to the user-side. Network Externalities is judged to equally concern both sides, but since all five theoretical concepts are, again, very interrelated as we will see throughout this chapter, important aspects within each theory are applicable to both the providers and users. The theories will be represented from multiple perspectives provided by many authors, but the aim for the writers of this master thesis is to keep them as condensed as possible (however, of course with as much essential information as possible) in order to facilitate reading and understanding. In the last section of this chapter, the five theoretical concepts are boiled down even further to an easily overviewed comprised framework to be incorporated with the empirical investigation in the analysis chapter.

As a final and important note when proceeding through the five theoretical concepts; words, phrases, terms or sentences that have been highlighted with bold and cursive/italic typography (in any color), implies that the significance of the concerned sentence/sentences is important, and also used in the comprised theoretical framework in the end of this chapter. This has been done in order to make it easier and clearer for the reader what is of great concern and relevancy for the research of this thesis.

4.1 First- and Second-mover Advantages and Disadvantages

On the topic of industry shakeouts, in relation to the establishment of new industries and technological change, Klepper & Simons (2005) research suggests that markets consequently undergo competitive processes which ultimately lead to a reduced number of firms being able to survive and compete in the long run. The research indicates that early entrants have the highest ability to reach dominant market positions and survive the crystallization. However, this process usually takes many years and even if it in the long run seems to be advantageous to have been in the game early other questions remain. Is it sometimes better to be second than first, for instance? Research by Shankar et al. (2008) suggests that innovative late-movers can grow faster than pioneers, thereby slowing the diffusion of the pioneer and creating a sustainable advantage. Hence, to understand new markets and possible strategic choices for stakeholders, the concept of First- and Second-mover Advantages and Disadvantages (further referred to as simply “FMAs”) is to be scrutinized and incorporated into the framework.

One of the most famous writings on FMAs is the paper simply named “First-mover advantages” by Lieberman & Montgomery (1988). In this paper the authors plainly define first-mover advantages in terms of “the ability of a pioneering firm to earn positive economic profits”. In similar words, Klepper & Simons (2005) recite this definition as “the ability of a firm to earn above average profits by a) entering a market first and b) entering the market in a way that thwarts other firms’ attempts to compete in that market”. Another, yet again similar, definition is provided by Suarez & Lanzolla (2005) who claim that FMA can be described as “a firm's ability to be better off than its competitors as a result of being first to market in a new product category”. Furthermore these authors distinguish between durable and short-lived first mover advantages. However, an important issue regarding the definition is highlighted by Srinivasan et al. (2004) who claim that the detection of resulting pioneer advantage is dependent on which performance metric is used, for instance; market share, profitability or survival duration (terms also touched upon by Lieberman & Montgomery (1988)). Incorporating these definitions, the term first-mover advantage is in this paper hence defined as:

“A firm’s ability to, in the long or short term, being superior to late entry competitors in one or more metrics of competition as a result of taking a pioneering role in market entry”.

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Lieberman & Montgomery (1988) found empirical evidence for categorizing first-mover advantages in three types of ways in which it can be attained, as follows:

- **Leadership in product – and process technology;** which can be achieved either by advantages coming from a first-moving firm’s superior learning curve where costs fall with cumulative output or by early winning of R&D and patent-races.

- **Preemption of scarce assets;** here, the first-mover advantage is created by the early entrants control of already existing assets, such as input factors, location and product space, and also investments in plants and equipment.

- **Development of buyer switching cost;** these can be created by the transaction costs or the investments the buyer makes in adapting to the first-mover’s product, as well as adapting, learning and getting used to the offering of the firm. Furthermore, buyer choice under uncertainty plays a role, since customers might stick to the first brand fulfilling their needs satisfactorily.

Lieberman & Montgomery (1988) furthermore identify potential disadvantages for first-mover firms, these are in turn:

- **Free-rider effects;** late movers might be able to take advantage of the initial investments made by a pioneering firm in areas as, for instance, R&D, infrastructure development and buyer education.

- **Resolution of technological – or market uncertainty;** it might not be wise for a firm to make heavy investments under such conditions, and a second-mover wait-and-see approach can be advantageous in avoiding misjudgment and failure. However, firm-size seems to matter and larger firms are possibly better equipped in waiting for a resolution and can also possibly maintain a quite flexible portfolio of investments.

- **Shift in technology or consumer needs;** a replacement technology often appears when growth is still present in the old technological solution; therefore, it might be difficult for incumbents to realize the threat and keep up with preventive steps. Thus, dynamic buyer needs open opportunities for late entrants if not the first-mover stays alert and responsive.

- **Incumbent inertia;** heavily related to the previous disadvantage, and caused by the firm being locked-in to specific assets, a firm’s reluctance of cannibalizing the firm’s own products and also organization inflexibility. Finney et al. (2008) explain the term incumbent inertia shortly as “first-movers’ possible inability to change business practices when the market changes”.

Considering the frequent mentioning of the same aspects in later work by different authors (e.g. Suarez & Lanzolla, 2005; Srinivasan et al., 2004), these advantages and disadvantages still seem to remain important to consider, and subsequent work of scholars often tries to give recommendations for how to handle the circumstances. For example, Lilien & Joon (1990) suggest that pioneers must invest heavily in R&D to get the product right the first time, and suggest time of entry to be early if expected returns are higher and later when the market is evolving more rapidly. However, in many cases it is almost impossible to hit right at the first attempt, which is supported by Srinivasan et al. (2004), who moreover states that the development costs might outpace a pioneer’s revenue (no matter how good the solution), stalling the company and creating insufficient short-term performance. In addition, this issue is looked upon by Lieberman & Montgomery (1998) who claim that technological-and market uncertainties often leads to a first-mover acquiring the wrong resources. The statement is moreover developed by Finney et al. (2008) who state that the heavy investment a pioneer must pursue in bringing a solution to market makes them unable to acquire more apt resources if the market shifts. Furthermore, Suarez & Lanzolla (2005) highlight these surrounding technological -and market conditions as heavily affecting FMAs, claiming that either rapid technological –or market development diminishes possibilities to gain FMAs, control the market and predict events (and the
hardest conditions naturally prevail under a combination of both technological – and market uncertainties). As a categorizing function for possible strategies, Lieberman & Montgomery (1998) suggest that firms with great marketing capabilities should enter later, whereas innovative companies should try to take a first-mover position and lead.

Finally, several authors (e.g. Lieberman & Montgomery, 1998; Srinivasan et al., 2004 ; Suarez & Lanzolla, 2005) raise importance of the opportunity for possible creation of network externalities (and the switching costs these network effects can create) by a first-mover to be of vast importance to consider. Hence, we will proceed to network externalities as the next theoretical concept of this framework, as well as particularly addressing switching costs in the subsequent concept.

4.2 Network Externalities

For many products, the utility for users increases with the number of other users utilizing the product (e.g. Katz & Shapiro, 1985; Katz & Shapiro 1986). A common definition of the phenomena is that consumers’ willingness to pay for a good or service in a market increases with the number of units sold, thus iteratively adding more value to the network (e.g. Katz & Shapiro, 1985; Katz & Shapiro 1986; Economides, 1996a). Adding upon this notion, network externalities could be interpreted as if "the value of a unit of the good increases with the expected number of units to be sold” (Economides, 1996b). One can also say that any technology requiring some kind of user training for adaption is subject to network externalities, because the potential user finds learning the technological functions worthwhile and valuable if the technology in question is more widely adopted (Katz & Shapiro, 1986).

The externalities can be categorized into direct and indirect network externalities. Direct network externalities imply consumption externalities where a purchase and a new user directly, physically, affect the quality of the product and its utility, for example in business of telephones. Indirect network externalities on the other hand, refer to the notion of hardware and software (Katz & Shapiro, 1985, Katz & Shapiro, 1994), as the consumer expects more development and investment by providing firms in software as the number of owners of hardware increases. A more extensive base of hardware-owners will increase software sales, reduce the cost for software and thus ultimately result in a lower price (Katz & Shapiro, 1994). In addition, Katz and Shapiro (1985, 1994) highlight a third source that network externalities depend on, which is the experience and size of the service network. For example, the purchase of a certain type or brand of car might be impeded by the consumers belief that there are not enough places to serve the car, or that spare parts might be hard to get (Katz & Shapiro, 1994). The research by Katz & Shapiro (1986) further reveals that the dynamics of industries subject to network externalities differ largely from the ones in conventional industries. Network externalities heavily influences the evolution of new industries and the dynamics at play in primarily two ways, the first being sales histories mattering. How attractive a rival (challenged) technology appears is dependent on the size of the in-place base – the more users the technology comprises, the more value it has for consumers. However, the second thing affecting the dynamics of industry evolution is the consumers’ care for the future success of the competing technology, since the altogether benefit in part will be dependent how many consumers possibly are adopting compatible products in the future (Katz & Shapiro, 1986; De Bijl & Goyal, 1995). Still, several networks might co-exist since it is not only a matter of perceived network benefits for the consumer, but rather a product of consumers differences in “taste” (De Bijl & Goyal, 1995).

When it comes to firm perceptions and strategies, firms keen to enter a new technology domain in standard wars can benefit of first-mover advantages in terms of preemption. An early lead can create positive feedback (see e.g. Arthur, 1990), and by network externalities on the demand-side the early leader’s product or service might be percieved as more valuable, due to the value of the user base (Shapiro & Varian, 1999). When a large network is the target, the expansion output required for this cannot be made in the absence of competitors, and the outcome of invitations will be a more extensive network but also more competition (Economides, 1996b). Also, in two-sided markets the competition between platforms sometimes result in “multi-homing”, which implies that a number of users connect
to several platforms (using e.g. several types of credit cards). Multi-homing on the consumer-side intensifies price-competition, promoting use of a specific competing platform (Rochet & Tirole, 2003).

Kauffmann et al. (2000) suggest the importance of expected effective network size when measuring network externalities, and furthermore claim that the attractiveness and possible entry into new markets by firms with established networks in older technology domains is dependent on current market share, potential market share and the leverage possibly created by new technology. The cost drivers are suggested to include adoption costs, the costs of not adopting as well as switching costs. These issues and trade-offs are one reason so many established firms failed to take their businesses online, despite the network possibilities, becoming surpassed by new firms seeing the potential in the network externalities awaiting. Moreover, firms with established large networks are often reluctant to adoption because of higher opportunity costs, whereas similar types of firms (but without the larger networks) seem keen to adopt early when new markets show possibilities for network externalities (Kauffmann et al., 2000). Large existing networks dominated by a few, as well as good firm-reputation, will furthermore tend to be against compatibility, even though the value and utility of the network would objectively increase (Katz & Shapiro, 1985). Regarding adoption of technology, the diffusion can be slow if the price/performance is not attractive and also if the technology requires adoption of a number of distinguished players. An interesting note is that winning a standards war often requires different players to unite in an alliance (Shapiro & Varian, 1999). In relation to standards wars and network externalities, because of indirect network effects it is claimed that markets can “tip” (Katz & Shapiro, 1994, Dubé et al., 2010). “Tipping” implies the tendency of one competing technology or system to pull away from its rivals once it has created a critical mass of user by gaining an initial edge (Katz & Shapiro, 1994). Thus, when tipping occurs, the market diffuses relatively fast (Dubé et al., 2010). Standards wars are especially present in markets that provides strong network externalities (Shapiro and Varian, 1999). Indirect network externalities furthermore give rise to what is called a "chicken and egg" -problem. For instance, some type of network intermediary (imagine, for example, eBay) would be supposed to have a large base of sellers to attract buyers, but the sellers would only find the intermediary platform attractive if they expect a large number of buyers (Caillaud & Jullien, 2003) Similarly related, in many cases producers want consumers and consumers want producers before adhering to a new format for instance. A mitigation of network effects can arise on the provider-side of the market, since incumbent producers for one format might not be too excited by the entry of a firm providing similar content, but the entry is welcomed by consumers getting a larger amount of choices as well as experiencing price-reduction (Parker & van Alstyne, 2005).

Finally, in market with homogenous consumers, these consumers might favor a new standard even if network externalities are present in the current installed base (notice: might, but not definitely will), as an old standard might restrict improvements, whereas on the other hand, an upgrade of the old standard gives the possibility to exploit an already existing network (De Bijl & Goyal, 1995). The research by De Bijl & Goyal (1995) further reveals that in homogenous markets, too little technological change (“excess momentum”) is not possible whereas too much technological change (“excess inertia”) is. The same does not hold true for markets with heterogeneous consumers, where both excess inertia and excess momentum are impossible due to heterogeneous needs and perceptions, thus different markets can coexist, catering for example to older or younger generations specifically.

4.3 Switching Costs

Switching costs could be said to be fixed costs that a buyer (consumer or business) encounter when changing suppliers or providers (Porter, 2008). With the effort invested by consumers or businesses in a product or service, one can also simply say that products and services that are ex ante homogenous become ex post heterogeneous after the purchase of an offering (Klemperer, 1987). Switching costs regard both the cost of searching, learning and evaluating products, as well as psychological- and uncertainty- costs when switching supplier (Burnham et al., 2003). In this thesis, we have chosen the following definition, primarily based upon the suggestions of Gómez & Maicas (2011):

“"The concept of switching costs imply all real or perceived costs the consumer has to bear when switching provider of products or services"
One could thus argue that switching costs are good for retaining customers, but they are generally regarded in several different ways by firms and scholars. For instance, the presence of switching costs reduces consumer welfare, since price competition (brought about by competing firms in order to destroy switching costs) often results in no positive profits for the competing firms (Wang and Wen, 1998). This might ultimately harm the consumers. To *increase welfare, policies* that encourage standardization could be a possibility, in order to increase compatibility and make both firms and consumers better off (Klemperer, 1987b).

Klemperer (1987a, 1987b, 1995) pays great attention to the role of pricing in markets with switching costs, especially in evolving industries. In the presence of switching costs and in a periodical market, rational consumers will recognize that a firm with low initial prices is trying to lock in consumers, gain a great market share and ultimately charge higher prices in subsequent periods (Klemperer, 1987a). However, the assumption of customer rationality with regards to switching costs has been questioned by subsequent scholars (e.g. Gómez & Maícas, 2011). In relation, the behavior of giving away free gifts or other *switching-incentives* is often deriving from a firm’s intention to gain market share and *lock in consumers which might possibly be exploited later* (Klemperer, 1987b). So, even if firms create switching costs for their offerings, with regards to current customers, competitors constantly seek out to break the barriers, and this is often done by providing premium features to the customers if they initiate the provider switch, such as cash offerings from banks or gambling sites, for instance (Yang & Peterson, 2004). It is also worth mentioning that *price competition* is most likely to occur if there is a little difference between rivals and the specific market contains low switching costs (Porter, 2008). Furthermore according to Porter (2008) it is harder for an entrant to gain customers when the switching costs within the industry are high. However, a decade earlier Wang & Wen (1998) investigated the dynamics between incumbents and entrants in the presence of switching costs. The common wisdom would probably be that entrants suffer from a disadvantage under such circumstances (as claimed later by Porter, 2008), since it might be costly to change supplier for the consumer. This is however not always the case if we regard price competition. If the incumbent has created high switching costs it has less strategic incentives to lower the price in order to compete with the entrant. The entrant can take advantage of the incumbent’s possible belief of advantageous switching barriers, lower the price of its offer, steal a part of the market from the incumbent and take advantage of the presence of switching costs (Wang & Wen, 1998). Although, the rationale is that consumers that have made investments in a current provider will probably remain locked-in as long as the higher price charged by a pioneer is lower than the perceived cost of switching (Gómez & Maícas, 2011).

However, naturally, it is not always a matter of pricing. Examining when switching costs matter Yang & Peterson (2004) considers why customers stay by comparing the possible strength of switching costs by those incentives made up by perceived value as well as satisfaction rate among consumers. The results reveal that switching costs only matter if the perceived value or satisfaction rate among consumers is above average, due to an extra incentive of staying with the current provider, which decreases the net utility of switching. On the other hand, if the satisfaction or perceived value rate is low (consumers also tend to overestimate their losses of belonging to the current service provider in these cases), switching costs appears to be insignificant (Yang & Peterson, 2004). Bell et al. (2005) claim that the deeper the customer has gotten into the relationship, the more focus must be aimed at *quality*, since otherwise the switching costs might get perceived as something harmful by the consumers, they feel locked-in, trapped and fooled – which ultimately leads to consideration of other brands. However, even if quality of products and services matter largely, recent work by Molina-Castillo et al (2011) claims to empirically prove that the presence of *network externalities* can be more important than quality itself. The research demonstrates that *indirect* network externalities plays a major role in creating switching costs in the short term, whereas *direct* network externalities plays a larger role in the longer term. Customers value not only quality but also the number of *complementary and compatible products*, and these findings are regarded an important aspect to consider for firms in order to benefit from switching costs in increasingly networked markets. But, in environments and markets where some firms are so deliberately trying to lock in customers one might wonder: is there a relationship between being early to market and switching costs? In relation to possible first-mover
advantages due to switching costs, Gómez & Maícas (2011) find a positive correlation between the two with regards to profitability, but obtain mixed results with regards to market share. They furthermore suggest that standardization reduces the role of product innovation as a mean of competition, limiting the actions followers can execute to overcome pioneering advantage. However, most studies do not take into account that all products are not launched into an existing category, but might be novel in other ways. With respect to the sometimes paradoxical market dynamics, recent work by Molina-Castillo et al (2012) state that when a pioneering product falls into an existing category the perception of an unknown negative outcome raise switching costs, which will be lower for followers as the market matures. The findings by Molina-Castillo et al. (2012) are consistent with most of earlier work, in terms of switching costs being advantageous to firms if they are nurtured correctly. Firms moreover benefit from being early to market when switching costs are low, but if there is a market with high switching costs the firm should focus on an innovative offer to break the switching costs.

With regards to switching cost kind and typology, the probably most famous categorization of switching costs is initially made by Klemperer (1987a, 1987b). Klemperer suggest three categories of switching costs; which are (1) transaction costs, (2) learning costs and (3) artificial switching costs (such as loyalty programs). These types are acknowledged by many subsequent scholars, e.g. Nilssen (1992), who also argues that transaction costs are incurred with every supplier-shift the customer makes, whereas learning costs are associated when turning to a supplier for the first time. Klemperer (1995) extends his framework and becomes more specific in presenting six different categories of switching costs. (1) Transaction –and (2) learning costs are already specified, the others are as follows; (3) compatibility with existing equipment, (4) uncertainty about the quality of untested brands, (5) discount coupons and similar devices and (6) psychological costs of switching.

However, the switching cost typology is further extended and specified in at least two well-renowned cases (Jones et al., 2002; Burnham et al., 2003) that have received much attention, and both studies find support for their claim. Jones et al. (2002) identifies the three main categories of switching costs to be continuity costs, learning costs and sunk costs. The third type, sunk costs, implies costs that are not relevant from a financial perspective, but psychologically important similar to the suggestions of Klemperer (1995). Sunk costs regard the time and effort that have been invested in a particular relationship, and also interpersonal relationships. The first two types of switching costs could be further subcategorized as displayed below (Jones et al, 2002):

- **Continuity costs:** Lost performance costs; the possibility of a decline in benefits that have been accrued over time, such as frequent flier miles, volume-based discounts and special treatment because of prior usage. Uncertainty costs; the perceived risks of untested service providers. Risk and uncertainty is most prominent when objective quality is hard to determine, or varies considerably between providers.

- **Learning costs:** Pre-switching search and evaluation costs; the perception of time and effort required for seeking out information regarding alternatives, Post-switching behavioral and cognitive costs; the perception of time and effort in understanding routines and procedures of a new provider, since these might possibly confuse the customer. Setup costs; such as filling out forms when switching bank, signing difficult agreements etc.

However, important for this master thesis, Burnham et al (2003) also creates an extensive empirically valid typology consisting of (1) Economic risk costs, (2) Evaluation costs, (3) Learning costs, (4) Setup costs, (5) Benefit loss costs, (6) Monetary loss costs, (7) Personal relationship loss costs and (8) Brand relationship lost costs. The eight types of switching costs can be also categorized at higher level into three different kinds; **Procedural, Financial and Relational** -switching costs. These three kinds of high-order switching costs are the ones constituting the foundation for the analysis in the remainder this thesis. They have been chosen because they incorporate all switching costs that have been identified in the literature in one way or another, and the typology created by Klemperer (1995) and Jones et al (2002) can be translated into each of the categories. The typology by Burnham et al (2003)
is displayed below, and will provide a foundation for switching cost related issues in the subsequent parts of this master thesis.

- **Procedural switching costs**: Consisting of economic risk-, evaluation-, learning, and setup costs. Primarily involves expenditures and investments of time and effort.
- **Financial switching costs**: Comprises benefits loss – and monetary loss costs.
- **Relational switching costs**: Implies personal-relationship loss – and brand relationship loss costs. Relational switching costs regard psychological barriers and emotional discomfort in switching provider, primarily because of identity loss and breaking of bonds.

4.4 **Diffusion of innovations**

The *diffusion process* can be seen as a cumulative process where foremost technical innovations are spread among individuals or firms. Unlike the *invention* of a new technology, which often appears to occur as a single event, the *diffusion* of that technology usually appears as a continuous and rather slow process, ultimately determining the pace of economic growth and the rate of change of productivity (Hall & Khan, 2003). As of today, the *Diffusion Of Innovation* (DOI) research has to a remarkable degree been conceptualized by the work of Stanford University professor and researcher Everett M. Rogers. His work has provided a core view of DOI which is stable, but at the same time responsive to changes through newer editions of his renowned 1962 book *Diffusion of Innovations*. Rogers (1995) defines the diffusion process as following:

“**Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system**”

The communication is concerned with new ideas, where the participants create and share information with one and another. The newness means that some degree of uncertainty is involved in the diffusion process. New ideas are in that way invented, diffused, and later adopted or rejected. Rogers’ (1995) definition of diffusion involves four main elements; innovation, communication channels, time and the social system. The innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. A communication channel is the means by which messages get from one individual to another (e.g. mass media or interpersonal channels). The third element; time, is involved in individuals decision process to adopt or reject and how early/late this adoption occurs compared to other members in a system, as well as the number of members in the system that adopt the innovation in a given time period. Finally, a social system is defined as a set of interrelated units that engaged in joint problem-solving to accomplish a common goal. In that sense, DOI theory can be applied on different levels of analysis such as individuals, firms, industries or even societies (Rogers, 1995).

Many observers in the past have pointed to the fact that when users adoption of a new product or innovation is plotted over time, it tend to result in a typical S-curve distribution. The S-shape is a natural implication of the observation that adoption is usually an absorbing state, where the innovation exponentially diffuses throughout the social system to finally taper off when the market gets saturated (Hall & Khan, 2003). Rogers took this notion even further when he developed the adoption lifecycle model (see Figure 4). It describes the adoption or acceptance of a new product or innovation according to the demographic and psychological characteristics of defined adopter groups, which as stated can be analyzed on different levels. This process over time is typically illustrated as a normal distribution or “bell curve”. The model indicates that the first group of adopters to use an innovation is called "Innovators," followed by "Early Adopters", “Early Majority”, “Late Majority”, and finally "Laggards". Rogers also went as far as assigning precise national percentages for each group meaning that “Innovators” affiliate about 2,5% of the population, “Early Adopters” 13,5%, “Early Majority” 34%, “Late Majority” 34% and “Laggards” 16% (Rogers, 1995).
Figure 4. The adoption life cycle model by Everett Rogers, also illustrating the gap or “THE CHASM” as proposed by Geoffrey Moore (discussed further down).

The innovation decision among those groups or “segments” of adopter units is made through a cost-benefit analysis where the major obstacle is uncertainty. Adoption will occur – whatever factors considered – if the innovation will enhance one’s utility. Since many adopter units tend to be relative risk-averse, the uncertainty will often result in a postponement of the decision until further evidence can be gathered. But this is not the case for everyone. The first group to adopt; the “Innovators”, are often seen as venturesome, educated and willing to take a risk on a good idea. They enjoy being on the cutting edge and try new things. “Early Adopters” use the data provided by the “Innovators” confirmation of the innovation to make their own adoption decisions. The “Early Adopters” group is seen as social educated leaders that earn respect for their well-informed decision making if adopting and embracing an innovation. This is according to many researchers the key in the diffusion process, when a domino effect of the innovation gets triggered to the more mainstream market reached at the “Early Majority” (Rogers, 1995; Stanford 2003; Robinson, 2009). This is the renowned “tipping point” popularized by Gladwell (2000), where the rate of adoption rapidly increases as a critical mass is reached. When this level has been reached, the innovation can be spread to the rest of the social system. Rogers himself defined this critical mass as the “point at which enough individuals have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining” which is reached at approximately 16% market penetration according to his percentage distribution research (Rogers, 1995). Other researchers such as Valente (1995) noted that the critical mass is achieved when about 10 to 20 percent of the population has adopted the innovation. Markus (1990) further defined critical mass in a telecommunications context as “the term critical mass refers to difficulties in attracting and maintaining membership in networks that arise from the fact that the value of belonging to these networks generally increases with the number of members”. Although Rogers does not explore the role of increasing returns in relation to the increase in users, modern economic literature on network externalities (as described earlier) implies that the benefits from the fact that other users (or firms) utilize the same innovation increases the benefits for the innovation as a whole. This clearly shows that network effects significantly impact the diffusion of innovation and adoption decision for the majority. The fourth group; “Late Majority” is skeptical and traditional and tend to have lower socio-economic status whilst the last group to adopt an innovation; the “Laggards”, is either very traditional or isolated in the social system. They are conservative and suspicious of innovations and often interact with others who share their ideas (Rogers, 1995). The main idea of Rogers work is that the adoption curve follows a continuum; that the “Innovators” is the first to take on any new technical product or innovation, to later spread the idea through the user segments one by one. Peer-to-peer interaction has due to this notion been emphasized as fundamental in DOI research.

It is important however to mention that Rogers generally directed his work to continuous, perhaps more incremental innovations. Another important consideration is also the idea of what Rogers referred to as “reinvention”. This implies that the success of an innovation depends on how well it evolves to meet the needs of more and more demanding risk-averse adopter groups. No process or
product can rest on its laurels; instead continuous improvement is the key to spread an innovation, i.e. the innovation should strive towards easier, simpler, quicker, cheaper, and more advantageous use (Rogers, 1995). The most contradictory theory to Rogers work has been that of Geoffrey Moore, who proposed a variation of the original adoption lifecycle model in his book *Crossing the Chasm*, first published 1991. Moore suggests that for discontinuous or “radical” hi-tech innovations (apart from Rogers view on more continuous innovations), there is a gap between the first two adopter groups (“Innovators” and “Early Adopters”) and the “Early Majority”, see Figure 4. This gap aims to explain why many new products are initially popular but crash and burn before they reach the mass market, or “critical mass” which is often illustrated as being reached when crossing this gap at approximately 15-18 % market penetration. According to Moore, it is important to create a bandwagon effect in which enough momentum is built up to be able to cross the gap. This can be done through targeting a niche market, and use that as a way into other niche markets or bigger market segments eventually. Since startups or new market entrants tend to lack the resources to focus on a large market initially, it is better to be more focused. Moore also emphasize on the idea of creating a “whole product”—solution to cross the gap. This implies providing a solution to the customers problems in its entirety, since “Early Majority” might not want to stitch together different pieces themselves or be as willing to do so as the “Early Adopters”. Marketing strategies are also of essential matter (Moore, 1999).

Numerous researchers in the field adhere to somewhat different types of characteristics in order to explain the speed of adoption among a unit. These characteristics adhere to both the innovation and the group adopting it. Further, the environmental context also affects the adoption circumstances (Wejnert, 2002). Characteristics that influence adopter groups include foremost socioeconomic and demographic factors such as sex, age, competence, openness to change, personality, intelligence, education, skills, beliefs, income or wealth and the like. Environmental context characteristics include ease of access, economic development, geography and culture among others (Wejnert, 2002; Hall & Khan, 2003; Hornik, 2010). DOI theory also focuses on influences at different stages in the diffusion process, where perhaps the best known contrast has been to argue that mass media influences are most important at the earlier, awareness stages of the innovation process, whereas more interpersonal sources such as “word-of-mouth” has seen to be more important at later stages (Robinson, 2009; Hornik, 2010). Characteristics of the innovation itself also help to explain their different rate of adoption since all innovations are not equivalent units of analysis. Rogers originally identified five characteristics of an innovation in relation to this; its relative advantage (the degree to which an innovation is perceived as better than the idea it supersedes), its compatibility (the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters), its complexity (the degree to which an innovation is perceived as difficult to understand and use), its trialability (the degree to which an innovation may be experimented with on a limited basis), and its observability (the degree to which the results of an innovation are visible to others). Innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more rapidly than other innovations (Rogers, 1995). Research has, however, consistently found that compatibility, complexity, and relative advantage are the most influential characteristics for continuous use and the adoption of innovations (Moore & Benbasat, 1996; Bradford & Florin, 2003). Researchers such as Moore & Benbasat (1996) and Karahanna et. al (1999) have further expanded the five factors by Rogers on their work with IT adoption, by adding factors like voluntariness and image.

### 4.5 Ecosystem Evolvement

A business ecosystem could be said to be a dynamic structure consisting of an interconnected population of organizations, where both competition and cooperation are simultaneously present (Peltoniemi & Vuori, 2004; Adner & Kapoor, 2010). Ecosystems are increasingly central to modern business. An innovation does rarely stand alone and depends on accompanying changes in the environment of a firm (Adner & Kapoor, 2010), and no firm has all the capabilities and resources necessary for managing a whole ecosystem (Moore, 2006). However, business ecosystems are often poorly understood and even more frequently badly managed (Iansiti & Leven, 2004). Such notions suggest that there are issues to be found with regards to this area when examining industry evolvement, as will be shown.
However, firstly, there are several types of roles in business ecosystems. The following roles are defined by Iansiti & Levien (2004), and supported by e.g. Adner (2006). Keystone organizations play a fundamental role in a healthy ecosystem. They are focal firms and the role is such that removal of a keystone would collapse the system, and these organizations are crucial for ecosystem robustness. The keystone creates value and shares that value for the greater welfare of the community, since otherwise it might find itself abandoned. Furthermore, physical dominators exist. Such firms try to integrate vertically and horizontally and are harmful to the greater good, and once a physical dominator becomes solely responsible for most of the value creation and capture, it leaves little to sustain the ecosystem. There are also niche-actors (actually most firms) who work in the shadow of, and with the leverage from, the keystone who ties other niche-actors together in the delivery of the value proposition. Niche-actors can also unfortunately be usurped by physical dominators who try to exploit or displace these (Iansiti & Levien, 2004). The existence of a core firm in an ecosystem could bring dangerous implications for firms aiming for niche-player positions, and dynamic capabilities are essential for the niche firms. For niche players, adaption to factors beyond their control is critical and they need to be able to react to what are sometimes highly idiosyncratic moves of keystone and dominating firms (Pierce, 2009). However, vast competition over designs and standards may prevent any particular firm to grow faster than the others in the formation of a business ecosystem, which reduces the chances or risks of an industry champion emerging early on (Aldrich & Fiol, 1994). This might mitigate the possibility of a physical dominator rising in the early years of an ecosystem. The health and performance of the many niche markets that could be present in ecosystems are tied together by strategic and ad hoc cooperation, compatibility and network externalities (Pierce, 2009). The partner dependency is demonstrated by Adner and Kapoor (2010) who claim that a focal firm’s ability to capture value is highly dependent on the bargaining power of the connected actors, and it does not matter if that actor produces complements, is a buyer or is a supplier. Cooperation on stabilizing conditions in an ecosystem is often incentivized by the possible imitation of products, in order to fend of competitors and new entrants by joining forces (Aldrich & Fiol, 1994).

Some issues regarding business ecosystems raised by Moore (2006) are, firstly, that actors tend to have different images and understandings of the ecosystem, which creates shattered visions. In relation, competition can undermine the greater good in the ecosystem and is a constant threat, in the way of actors aiming on just running their innovative business dismissing co-evolution and, again, shared vision. Additionally, Adner (2006) claims that one common mistake managers make is to plan out the full ecosystem, positioning their firms in a hurry and do everything to defend this position. This way of acting overlooks the process and order through which their ecosystems will emerge over time. An explicit strategy that accounts for delays and challenges inherent in collaborative networks is the key of success in ecosystems. Strategies need to be iterative since there are so many interdependent actors and pieces (Adner, 2006). Moreover, a wanted open space in the ecosystem is not always colonized by the same technology and providers, which this relates to so called standard wars (Moore, 2006). A pioneer can of course gain an amplified first-mover advantage in business ecosystems, if the launched product or service is close to the true preferences of consumers (Soberman & Gatignon, 2005), but this is not always very likely. Also, the more intermediaries that must adopt an innovation before the end users can adopt it – the more risk it carries, and getting to market first only matters if your partners are ready when you arrive (Adner, 2006). Another common mistake is for ecosystem actors to overestimate the potential for value creation, because of the fact that so many actors are combining capabilities. At the same time it is easy to underestimate the challenges, these are frequently referred to as someone else’s problem, not the individual firm’s (Adner, 2006). There is also the question of leadership; a firm always faces the choice of taking and active or passive role in the ecosystem. Each strategy carries its own risks and challenges. A leadership role often entails massive resource investments over long time before realization regarding the reality of the opportunity and the firm’s ability to have an orchestrating role is presented. A more passive role, in turn, entails choices of who to follow, how aggressively to commit and how to defend the chosen position (Adner, 2006). The attractiveness of the focal offer of an ecosystem is dependent on both complements (e.g. the offering of hardware and software) as well as components (e.g. processors in computers) and the distribution of issues within these parties are likely to affect the outcome, performance and success of
individual firms (Adner and Kapoor, 2010). Technology leadership does not matter as much when complements suffer from challenges, providing opportunities for rivals.

Moreover, in an ecosystem there is usually a growth rate with regards to the number of participating firms, a number that declines over time. Change may be exogenous and come from a variety of sources, from technology or regulatory units as well as other sources, such as actions of core firms (Pierce, 2009). The key of surviving in an ecosystem is being resistant of random chance events, which have an important effect on the industry’s ultimate market structure (Klepper & Graddy, 1990). The pace of this selective evolutionary process depends on the utilized technology and on buyers’ preferences. Limited opportunities for technological change usually leads to less uncertainty and a mature stage is reached faster, whereas diversity in buyers’ preferences makes it more difficult for a dominant design to emerge which tends to increase the time to reach maturity (Klepper & Graddy, 1990). Accordingly, one of the most important things for firms in the ecosystem to pursue is dialoguing with customers, since what is created the customers must be willing to pay for. Customer feedback is the most important factor affecting the relevance of a rising ecosystem and if customers buy, they signal that they like what is offered – at least compared to alternatives (Moore, 2006). Actions and feedback from customers as well as competitors affect the development of offerings from each individual firm. There are also media-outlets and regulatory agencies that can play a similarly crucial role, impacting on the context and ecosystem as a whole as on the individual businesses (Iansiti & Levien, 2004). If there is no insight in the social potential of ecosystems, there is a risk of the business ecosystem becoming crippled (Moore, 2006).

Lastly, when an ecosystem emerges, there is great likelihood of entrepreneurial ventures trying to grasp the opportunities created. Aldrich & Fiol (1994) argue that challenges facing early ventures in the formative years of an industry are different than ones facing established players. Such firms must interact with extremely skeptical customers, creditors, suppliers and other stakeholders. Trust is the crucial first-level determinant of success. Lack of credibility and familiarity hampers the fundamentals of interaction and is a great disadvantage compared to established firms, and magnifies other constraints facing the newer actors. Early ventures must learn new roles and establish ties with an environment that might not understand or acknowledge their existence Aldrich & Fiol (1994). But it is not always easy for established firms either to tackle new ecosystem formation. Christensen & Bower (1996) observes, with regards to technology shifts, that when competence among established firms is lacking but there is a sufficient demand from customers to develop that competence – the established firms will succeed in doing it. However, conversely, if the technological competence exists but there is a lack of incentives created among customers, established firms tend to fail in commercializing what they could obviously do. The key issue therefore, under such circumstances, is not perfectly associated with technological change, but rather the disabilities in changing strategy (Christensen & Bower, 1996). Furthermore, for established actors in industries subjected to change, some activities (e.g. R&D) might be very sensitive to technological change whereas other strengths remain, such as marketing and distribution through different channels. However, competence-destroying discontinuities will break the existing market structure, providing opportunities for entry of new players. Exclusively competence-destroying discontinuities will favor entrants over incumbents, since the entry-barriers will be lower. Conversely, if many existing market linkages are maintained for the incumbent they experience significant advantage towards new entrants, and incumbents often play a crucial role in commercialization of an offering due to the importance of complementary assets (Rothaermel, 2000). Adding upon the discussion with regards to market shifts, Pierce (2009) conclude that established firms that are seemingly related to a new industry cannot rely on past performance to the extent one might expect when committing to new endeavors. The research concludes that replicating past successes in new markets is not a trivial activity, and previously successful firms must acknowledge limits of expansion in any diversification strategy (Pierce, 2009). From incumbents’ point of view, they can survive and guard themselves with regards to technological change by cooperating with the new entrants, and such collaborations are incentivized by the search for complementary assets and functions in order to create leverage (Rothaermel, 2000). Similarly related, on the other hand, established organizations could as well try to block new ventures and entrants at every turn. This ultimately affects the growth of new industries, since the growth depends on the
severity of attacks and the resistance from players from established industries ultimately creating an unbalanced ecosystem (Aldrich & Fiol, 1994).

4.6 Comprised Theoretical Framework

As should now be evident there is a multitude of scenarios that can arise within new markets and industries as well as in present ones. The reader of this master thesis is by now hopefully familiar with the five theoretical concepts in the theoretical framework; First- and Second- mover Advantages/Disadvantages, Network Externalities, Switching Costs, Diffusion of Innovations and Ecosystem Evolvement. In order to subsequently identify issues with regards to CMP, the concepts are hereby summarized and comprised into influential factors possibly affecting the dynamics, context and conditions of new industry evolvement. This conclusive framework (see Table 1 on the next page) of issue-identification hopefully provides the reader with a comprehensive overview of influencing factors for each chosen concept, and is furthermore to be used as a foundation for the analytical part (chapter 6) in this thesis. Since the concepts in many ways evidentially influence and overlap each other, some possibly affecting factors have deliberately been left out in each column if they are present in another. The strength of a multi-theoretical approach is assumed to lie in the collective performance and explanatory power of the theories used, which means that if one possible issue escapes through the net of the first theory it is to be caught in the next. Hence, redundancy is preferably to be avoided in order to keep the work as neat as possible while maintaining relevance.
<table>
<thead>
<tr>
<th>First- and Second mover (dis)advantages</th>
<th>Network Externalities</th>
<th>Switching Costs</th>
<th>Diffusion of Innovations</th>
<th>Ecosystem Evolvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm leadership in product – and process technology</td>
<td>Presence of direct network externalities</td>
<td>Presence of consumer welfare increasing policies</td>
<td>Initial targeting of “Innovators”, then sequential user segment adoption (continuum) advocated</td>
<td>Presence of physical dominators</td>
</tr>
<tr>
<td>Possibility of preemption of scarce assets</td>
<td>Presence of indirect network externalities</td>
<td>Creation of switching-incentives</td>
<td>Initial targeting of mainstream user segments advocated</td>
<td>Competition over designs and standards</td>
</tr>
<tr>
<td>Development of buyer switching cost</td>
<td>Existence of in-place base and possible future adoption of alternative technology</td>
<td>Possibility of consumer lock-in and exploitation</td>
<td>Reinvention important during adoption</td>
<td>Coherence in perceptions, understandings and vision among ecosystem members</td>
</tr>
<tr>
<td>Possibility of free-rider effects</td>
<td>Differences in consumer taste and co-existence of networks</td>
<td>Potential of price-competition</td>
<td>Targeting of niche market</td>
<td>Presence of dynamic and agile actors</td>
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<tr>
<td>Technological – or market uncertainty</td>
<td>Possibility of multi-homing</td>
<td>Ability of firms to differentiate with regards to quality</td>
<td>Gradually expanding of business model from niche market</td>
<td>Incorporation of feedback from consumers, competitors and institutions</td>
</tr>
<tr>
<td>Possibility of incumbent inertia</td>
<td>Possibility of standardization</td>
<td>Possible complementarities and compatibility</td>
<td>Creation of “whole product” –solution</td>
<td>Necessary intermediary adoption</td>
</tr>
<tr>
<td>Importance of getting the firm offer right at the first time</td>
<td>Possibility of firms with established networks of creating leverage by entering</td>
<td>Presence of procedural switching costs</td>
<td>Presence of environmental context factors affecting adoption speed</td>
<td>Establishment of ecosystem roles and responsibilities</td>
</tr>
<tr>
<td>Possible outpacing of development costs versus revenue</td>
<td>Drivers: Cost of adopting versus not adopting to the new opportunity for established firms</td>
<td>Presence of financial switching costs</td>
<td>Presence of user characteristic factors affecting adoption speed</td>
<td>Emergence of a dominant design</td>
</tr>
<tr>
<td>Effects of rapid market – and/or technological development</td>
<td>Presence of standard wars</td>
<td>Presence of relational switching costs</td>
<td>Presence of innovation characteristic factors affecting adoption speed</td>
<td>Incumbent challenges and prerequisites</td>
</tr>
<tr>
<td>Order of entry dependency: Firms strong in marketing versus innovation</td>
<td>Presence of a “chicken and egg” -problem due to network externalities</td>
<td></td>
<td></td>
<td>Early venture challenges and prerequisites</td>
</tr>
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</table>

Table 1. The comprised theoretical framework, where the concepts have been summarized and comprised into influential factors possibly affecting the dynamics, context and conditions of new industry evolvement. This comprised theoretical framework of issue-identification is to be used as a foundation for the analytical part (chapter 6). If some factor seems hard to understand, their descriptions have as mentioned been marked with **bold and cursive/italic typography** in the respective concept’s section.
5. Empirical Investigation

This chapter will present the empirically gathered qualitative data from the Nordic Payments Forum 2012 as well as from the 10 in-depth semi-structured interviews with key stakeholders. The data have been interpreted and thereby translated here in aspects to its relevancy of this thesis and its objective. The chapter is divided in sections where all empirical key inputs on each highlighted stakeholder are presented.

The theoretical framework has been presented in the previous chapter, as built upon five central theoretical concepts. These concepts are all highly interconnected, both with each other and with the issues and actions taken by numerous stakeholders in the forming CMP ecosystem. This empirical investigation aims to capture the different key stakeholders’ perceptions of these issues and actions, both in terms of their own presence as well as how they relate these to other stakeholder roles. The empirical data was gathered (as described in the second chapter on Methodology) through two different sources of inputs. The first was from a two-day conference held in Stockholm during March 20-21, 2012; The Nordic Payments Forum 2012. This conference was attended by numerous stakeholders from the European mobile payments market, which held presentations and spoke on the subjects of prerequisites and challenges related to the emerging new ecosystem and its stakeholders. The second source of inputs to this empirical investigation comes in the form of 10 in-depth interviews with key stakeholders on the Swedish and European mobile payments market. The majority of these were conducted during the month of April 2012.

It is further deemed mentioning that the key stakeholder role of the consumer has not been in-depth interviewed due to the qualitative research approach which would not align with potentially unbiased interpretations of the European market from only a few consumer interviews. However, the consumers’ opinions have been extracted from the other stakeholders’ deep insights in this matter. Especially, representative opinions and notions from the key stakeholder role of the merchant on the user-side are strongly believed to act as a fundamental and applicable view on the consumers behalf. Furthermore, the payment scheme owners were not possible to reach for an in-depth interview, although inputs on their behalf were presented by a representative at the Nordic Payments Forum 2012. Due to their absence in terms of the interview process, this empirical data was gathered based on the other stakeholders’ interview inputs on the payment scheme owners’ contribution and influence in the existing CMP ecosystem.

The Nordic Payment Forum 2012 was mainly represented by – in relation to previous definitions on key stakeholders (see section 3.4) – two banks and financial institutions (Swedish Bankers’ Association // SEB), two sets of MNOs (Orange // MNO joint venture WyWallet), one payment scheme owner (Visa Europe), one third party technology/service providers (Klarna) and four representatives from merchants (VISITA // Swedish Trade Federation // EAT UK // NorgesGruppen). Other stakeholder representatives from the CMP guiding initiative AEPM (Association Européenne Payez Mobile), lawyer firm Vinge, membership organization for banks and financial institutions in the Nordic and Baltic countries Pan Nordic Card Association, mobile card terminal company iZettle as well as spokes persons from the Swedish police fraud-division also attended the conference. Our supervisor of this master thesis and researcher on mobile payments; Niklas Arvidsson at the Royal Institute of Technology, also presented his insights and led the conference in the position of a moderator.

The 10 (± one-hour) in-depth interviews included; two banks and financial institutions (Swedish Bankers’ Association // SEB), one set of MNOs (MNO joint venture WyWallet), one mobile device manufacturer (Research In Motion –RIM), one PSP (Point), three third party technology/service providers (Seamless // Payair //Accumulate), one large technology/service company (PayPal), and finally one merchant representative (Swedish Trade Federation).

Regarding the in-depth interviews, the questionnaires used at each of the interviews were built on the five theoretical concepts in connection to the identified key issues or actions related to the development and adoption of the provider and user sides of the stakeholders in the CMP ecosystem.
The aspects of different payment technologies were also highlighted in the questions, foremost concerning QR and NFC (but also SMS and online payments), with the fundamental notions on what it takes to move from cash and cards towards mobile payments. Further, since each stakeholder adheres to somewhat different components or factors encapsulated in the theoretical framework – as well as to their use of payment technologies – each interview was slightly customized in terms of which questions were asked. All questions, each of which at least was used during one of the performed qualitative in-depth interviews, can be found in Appendix A at the end of this thesis. The answers to the questions might further be tied to numerous theoretical factors identified in the comprised theoretical framework since these are highly interconnected. The respondents’ key statements will however be categorized in relation to the five theoretical concepts as far as possible to facilitate an easy read.

Overall throughout the sections of this empirical chapter, categorizations will be made in which all key empirical inputs from each key stakeholder is presented, i.e. both from the Nordic Payments Forum 2012 as well as from the in-depth interviews. The same actor can implicitly (as mentioned) also represent more than one of the defined stakeholder roles. The unique role of the TSM can further be applied to several actors to different degrees. Therefore, some actors will be categorized into key stakeholder belonging to the best ability, based on the actors’ core business. Such multi-stakeholder roles will however be noted to facilitate an easier read and eliminate any ambiguity.

5.1 Banks and financial institutions

5.1.1 Key outcomes from Nordic Payments Forum 2012

Leif Trogen, Chief of Financial Infrastructure at the Swedish Bankers’ Association talked on the subject “How is the European payments market evolving”. He raised the issue of the need of a global or at least European standard for mobile payments to be of primary concern in creating a viable solution. Leif Trogen also highlighted the interoperability around function and security solutions to be of high importance in delivering trans-boundary services for the market, and that each of the stakeholders in the ecosystem are important to consider – but primarily users. Further, the need for defined business models with clear roles for each of the stakeholders was considered, as well as development and standardization in open forums where all stakeholders are represented. Regarding the user-side of the ecosystem, the main aims for satisfying consumers should involve a solution that is fast, secure, convenient and accessible, whereas for merchants the solution should be worth its price as well as having the possibility of utilizing the current payment infrastructure (NPF - Trogen, 2012).

Jan Forsell, Business Development Manager at Skandinaviska Enskilda Banken (SEB) – a major Swedish bank – talked on the subject “The future of payments”. He projected a mobile payment industry shake-out among the vast amount of actors trying to get a piece of the cake today, the reason being that some actor-collaboration will be more successful than others and that the actors unite in business models and mobile wallets where some will survive and some not. Jan Forsell also raised possible key success factors for a viable mobile payments solution, which in turn were: open mobile wallet, security, mobile commerce, business models, accessibility, price and network effects. The “open mobile wallet” implies a solution where several actors share the wallet for offering different kinds of services, thus adding value, and also the wallets should possibly cater to niche consumer groups and different generations. “Mobile commerce” is somewhat similar, which means that services that are indirectly related to payments are incorporated, such as ticketing and coupons. Concerning the business model, it must optimize the value for actors without discriminating the benefit for the consumer. With regards to NFC-technology, the issue regarding the lack of NFC-compatible mobile phones was mentioned, as well as the problem of merchants being reluctant of upgrading their PoS-terminals. Moreover, the constant debate regarding the placement of the NFC Secure Element was a topic of concern, and also if NFC mobile payments can provide enough value for consumers to switch from payment cards. Finally, the issue of NFC mobile payments often incorporating complex business models with lots of stakeholders was taken into account. Jan Forsell also emphasized that the banks generally take their stamp in the mobile banking services as offered since many years back, and from
that tend to expand gradually into more payment related services by adding such functionality. From the banking point of view; security was seen as the most important factor for successful mobile payments deployment (NPF – Forsell, 2012).

5.1.2 Key outcomes from in-depth interviews

<table>
<thead>
<tr>
<th>Company name</th>
<th>Swedish Bankers’ Association</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stakeholder role(s)</strong></td>
<td>Banks and Financial Institutions</td>
</tr>
<tr>
<td><strong>Name and title of participants</strong></td>
<td>Anne Sundqvist, Senior Advisor</td>
</tr>
<tr>
<td><strong>Geographical Market</strong></td>
<td>Sweden (Europe)</td>
</tr>
<tr>
<td><strong>Technology / payment type</strong></td>
<td>NA</td>
</tr>
<tr>
<td><strong>Date of interview</strong></td>
<td>April 25, 2012</td>
</tr>
</tbody>
</table>

**Company description**
The Swedish Bankers’ Association (Svenska Bankföreningen) represents banks and financial institutions established in Sweden. Their aim is to contribute to a sound and efficient regulatory framework that facilitates for banks to help create economic wealth for customers and society. The Swedish Bankers’ Association work closely with regulators and policymakers in Sweden and Europe, such as EPC and SEPA, to establish joint rules in matters of common interest in the Swedish banking industry, such as payment infrastructure and security issues.

**FIRST- AND SECOND MOVER ADVANTAGES**
“The market will find the winners, we are still in an embryonic stage and all new types of actors and initiatives are beneficial.”

“Firms have to start really carefully and comparatively small, and you cannot bring all stakeholders about at the same time, that would in a project of epic proportions. Therefore, the MNOs tend to develop their solutions, the banks their solution etc.”

“It is important is that the banks join the movement and keep up, they have been passive.”

“A very present risk is that consumers could get tied and locked in to a specific solution by a bureaucratic registration process. This regards the merchants more than the consumers since merchants are much more bound to their infrastructural investments.”

**NETWORK EXTERNALITIES**
“SEPA is examining if they should regulate/ legislate with regards to standards etc. in other to make the development go faster”

“With regards to NFC, QR, SMS etc I do not believe that technology is a factor that steers the development. The importance is to gain spread, that an acceptance among consumers will be reached.”

“There is a paradox with innovation and creativity on the one hand, which are extremely important, at the same time as it takes standardization to receive spread and momentum.”

**SWITCHING COSTS**
“Incremental progress (SMS, QR, P2P -solutions etc.) towards NFC payments educates the consumers in using their phones for mobile payments. It is an incredibly, big, heavy and infrastructural change to go directly to mobile payments with NFC.”

“I believe that many solutions will co-exist, and that is also a demographical question. With regards to this, I do not feel as if banks would suffer from trust-issues with regards to future generations. I believe that future generations will continue to feel trust for banks, for instance 99% of the younger generation pays their bills with the facilitation of internet banking.”

“The most important thing is that we have a great infrastructure that is held together, that a solution works with transit, at PoS, at the cinema etc. Compatibility is important.”

“The banks have historically been accused of creating high switching barriers”
"Standardization is a way to speed up the development and diffusion, which is too slow at the moment."

"There must be more of a “whole product” solution, that works everywhere at any type of purchase."

"It is necessary for diffusion that all banks and payment institutions can join an initiative brought forward by the banks together, and not only one bank."

"I believe in the successive diffusion of solutions with regards to mobile payments, which means that you cannot focus on the technology primarily, if it is NFC, cards, QR or an application in your mobile, but learn from what innovators and early adopters in order to see how it can become more user-friendly for the average person."

"There are slight differences with regards to the context of Europe, and I believe that the northern countries have come very far in having a lot of electronic banking, but on the other hand other countries might not carry the same infrastructural luggage. This can make leapfrogging possible, and also speed up the diffusion process."

"The vision of SEPA is one market for mobile payments, but there are different cultures, different people with different habits and so on, and that makes it take different time in different countries."

ECOSYSTEM EVOLVEMENT

"No matter where I am or which bank I have or the merchants have, the solution should just work. This demands a great extent of cooperation between different parties."

"There is a need for very clear business models and very clear definitions regarding what role each actor should have, and that is missing today since every party has some kind of cost to be present in this infrastructure. Should every actor be able to get their share as a payoff to the incurred costs, earn something, it will become very, very expensive for the users. Therefore, there need to be more work put on business models including all actors. The technology in itself is not the issue here."

"Suggestions have been put forward by SEPA with regards to NFC, but not for QR, since QR was is not in any way established in the same way as NFC."

"Cost is a big challenge when setting guidelines and things go slowly due to travelling and planning for all SEPA-members"

"We cannot decide upon a standard for NFC Secure Element placement for instance, since we do not even know if SIM-cards will exist in a few years. In general; if a regulatory standard would be set with regards to technology or security, it would take a very long time to change it if something goes wrong. What has been put forward is a suggestion for roles for different actors."

"Of course there is competition among stakeholders, but it is the competition that also drives the innovation, and the banks want to caress their payment flows, naturally. To take the solutions international demands collaborations, and in collaborations; each party must do what they do best."

"In the end, the final solutions are dependent on demand, which in turn affects the collaborations and business models, which ultimately becomes the challenge."

"I think that what is decided in SEPA will have vast influence in all EU-countries, even those not tied to the Euro, such as Sweden."

<table>
<thead>
<tr>
<th>Company name</th>
<th>Skandinaviska Enskilda Banken (SEB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder role(s)</td>
<td>Bank</td>
</tr>
<tr>
<td>Name and title of participants</td>
<td>Jan Forsell, Business Development Manager</td>
</tr>
<tr>
<td>Geographical Market</td>
<td>Sweden (global reach)</td>
</tr>
<tr>
<td>Technology / payment type</td>
<td>Mobile bank ID / P2P, mobile banking</td>
</tr>
<tr>
<td>Date of interview</td>
<td>May 2, 2012</td>
</tr>
<tr>
<td>Company description</td>
<td>SEB is a major Swedish financial group for corporate customers, institutions and private individuals. Its activities comprise mainly banking services. SEB has around 4 million private customers, 400,000 SME customers and 2,600 corporates and institutions as customers. The SEB Group has about 17,000 employees.</td>
</tr>
</tbody>
</table>
The bank has a presence in 20 countries in the Nordic and Baltic regions, Europe and Asia, although Sweden is the main market. In the fall of 2012, six major banks and financial institutions will together launch the mobile payment application “Swish”, enabling P2P money transfers.

FIRST- AND SECOND MOVER ADVANTAGES

“The banks have not led the way in this new ecosystem, primary since the banks are more concerned with possible risks and always have security as priority number one. Instead, non-traditional actors have driven the development towards new, unknown goals.”

“The Swedish banks will cooperate in the future to provide mobile payment services that fit our customers´ needs. It is important for us to show our presence in the new ecosystem.”

“I think bigger players with end-to-end solutions like Google or Apple should not be underestimated. They have good possibilities to make a huge impact in CMP. Google is very innovative in their way to solving consumers´ problems and they do not have the mission to make money on the users, but instead to use the consumer data to make money.”

“Due to the threat of bigger players and their end-to-end solutions, there is a need for banks and MNOs to cooperate. And since the NFC –compatible phones will be distributed by the MNOs and preferably tied to financial accounts or cards owned by the bank, this is inevitable. Even so, such cooperation is unusual in today’s European market.”

“One big risk for the initial development and progress of the ecosystem is the possibility for security holes in mobile payment solutions. If something goes wrong, the money that might disappear is not a problem, but instead mass media will make the consumers very reluctant by spreading these happenings.”

NETWORK EXTERNALITIES

“For a solution to be successful, it needs many merchants and consumers to adopt it. And many smaller third party providers have a hard time gaining users to adopt their solutions.”

“The use of QR –codes might be a way to deploy now in order to attack the NFC “chicken and egg” –problem. These strategies could also adopt to support NFC at a later stage when the market is more ready.”

SWITCHING COSTS

“Regarding switching costs, the cost factor (fees) is the big issue for the merchants. For the consumers, it is more about the ease of use. If there is a payment scheme structure or something else underneath is not so important.”

“QR –code solutions today, compared to “chip and pin” –cards in the pure payment process, have no added value when relating to CMP at PoS. It still takes some time to make the purchase, to scan a QR code with the camera etc. Therefore, other value added services on top of QR payments is essential, and these must be located before and after the payment process, such as loyalty points, offerings etc. NFC is most likely better at the payment process, since it is faster, especially through “wave and go” transactions. An later on, NFC will also have these capabilities. But they are essential for QR now.”

“Many smaller third party actors fall since users have no trust towards them. They might succeed best if they expose themselves through another channel or other brand/actor, like the banks. The banks are considered to have perhaps the greatest trust in the new ecosystem, and Visa and MasterCard as well.”

“Many kinds of different mobile payment solutions make it very ambivalent for the consumers. Not even the high-level users want numerous solutions in their phone. And the merchants get confused as well. But again, I think there can be numerous technologies (SMS, QR, NFC etc.) but the solutions, offerings or channels in themselves at the end, must be uniformed.”

“The banks already have customers connected to their accounts. For the MNOs it is different. They provide options through the existing phone bill, a separate bill or account, or by tying the cards to the solution basically. That gives the banks an advantage.”

DIFFUSION OF INNOVATIONS

“If you are going to target the whole mainstream market initially, you probably need an extraordinary solution. The mainstream consumer does not think that payment solutions through the mobile phones are rather “sexy”. But generally, I do not think that the banks divide the market into segments, they want a mobile payment solution for everyone. But it is harder to attract 40-60 year olds. I am not worried for the 20-30 year olds.”
“I think the banks are threatened by the MNOs due to the younger user generations more frequent use of their mobile phones. This could cause them to feel higher trust towards such actor as the MNO in the long run.”

“The adoption of mobile payments also depends on where in their lives the consumers are. Users with no fixed household that have not started their working life etc. are more mobile and not dependent on a bank to the same degree, they can instead use other alternatives.”

“To reach international market and interoperability with a solution, it must grow from first working on the local or national level, at buses, in stores, P2P etc.”

**ECOSYSTEM EVOLUTION**

“Out in Europe, (London, France, Poland etc.) it might look like the NFC developments have been very successful. But when you take a closer look, there are still many uncertainties and challenges to handle.”

“I think that NFC will be the standard-technology to be used in those kinds of services, within 3-5 years or perhaps even longer. Much is due to the pressure from the European Union, which we in the Nordic region will have to adapt to in the longer run.”

“In general, many actors are present and say that they want to be a part of the new ecosystem, but only a few actors really can be a part of it. The MNOs have stated that they want to take part, and that is good and might attract future partners. But it is not clear if they have a natural role to play in the ecosystem.”

“I think that collaboration and convergence generally is a good thing. But it is more important that there are fewer and more similar offerings, than that there are fewer technologies or standards behind the curtain.”

“QR –codes might be usable in e-commerce etc. in a better way, but the optimal mobile payment solution should work at PoS.”

“The banks and MNOs are really big competitors in this new playing field. But they also act as catalysts. For the banks, it is naturally easier to develop a successful solution through cooperation with other banks compared to solo bank initiatives.”

“I think that consumers generally are less and less prone to have many alternatives in their wallet, so there will be a kind of selection. That means that there will not be room for so many actors in the long run.”

“Regarding NFC Secure Element placement; if it is placed on the SIM –card, the banks will only work as a back-end financial source, so naturally they prefer it integrated. But I think that the SE placement on the SIM – card is still better, from a technical and security perspective, than SE placement in the phone, so if I would bet on one final standardized SE placement, it would be the SIM. Integrated SE creates a more complex business model, just look at Citizi in Nice where the business model is nowhere near successful.”

“SEPA guidelines and this kind of work are very impeding to the development. So many people work there, creating tons of written material, but no useful things have come out of it. It is crazy”

“Visa and MasterCard are dominators when it comes to international interoperability and existing infrastructure. From a pure competitive perspective, this is of course idiocy. And if there are ways around these payment schemes, many firms will take them. Another factor facilitating for other solutions is that 99 times out of a 100, consumers make local national purchases, independent from international interoperability.”

“The biggest challenge in the entire evolving ecosystem is to add value for the consumers, in every step. Actors can push out solutions, but the consumers must want to use them. Many providers of solutions do not seem to have grasped this very essential question.”

“The banks see mobile payments as an extension their customers banking needs such as mobile banking.”

### 5.2 Mobile Network Operators (MNOs)

#### 5.2.1 Key outcomes from Nordic Payments Forum 2012

Johan Ragnevad, Acting CEO of the Swedish MNO - joint venture and mobile payment initiative WyWallet (formed 4T Sweden, see section 3.3.2), talked on the subject “WyWallet and Mobile Payments”. He highlighted the possible benefits achieved in the future of mobile payments, such as improved security compared to cards, user convenience, several types of value-adding services and a whole new type of flexibility. The value added for customers was considered the driving factor in the ecosystem. The users direct the development by choice of mobile phones, purchasing behavior and
choice of payment tools. The mobile wallet is to be seen as a complement to other actors’ solutions in the mobile payments ecosystem, as well as co-existing with other solutions (as contactless cards), regular debit - and credit cards and cash for a foreseeable future. The entering of Apple and its iPhone on the market for NFC-based POS payments was mentioned as fundamental for getting CMP solutions to gain momentum, partly because of the mentioned control of the users by choosing mobile phones equipped with NFC-technology. Finally, if dividing the process of CMP into the three steps of pre-purchase, at purchase and post-purchase; firstly, pre-purchase the accessibility is essential to consumers, secondly, at the actual purchasing situation the speed and simplicity would be of highest importance, and lastly, post-purchase security is most important, ensuring the consumers of the safety of the transaction (NPF – Ragnevad, 2012).

Jean Kehlaoui, Mobile Banking Partnerships Manager at the large international MNO Orange, talked on the subject “An MNO’s perspective on NFC and mobile payment implementation”. He was drawing conclusions and lessons from the contactless mobile service project Cityzi in Nice/France (see section 3.3.2). The aims of the MNO have been to create a secure solution, ensure service providers that mobile phone with NFC will work with their infrastructure as well as providing them with a platform to distribute their solutions to consumers. Furthermore, the MNO have had the mission statement to promote these services towards consumers and providing support for customers using the services and educating them. On the merchant side, the lessons learned comprised that the costs should be no more than for cards, payment should be guaranteed (thus, the solution must work every time), that the simplicity should be at least the same as for cards, that the payments can be made fast and have cross-border interoperability. On the consumer side, the consumer wanted a trusted brand facilitating the use of mobile payments, that the solution should be secure, have physical applicability and that the service should be easy to subscribe to. It was however unclear if the contactless payment solution should be card- or mobile based. The consumer needs were summarized as being speed, simplicity of use, accessibility and a simple transfer of the application or wallet when purchasing a new mobile phone. Jean Kehlaoui advocated for the mobile payment application to be stored in the mobile phone directly when it is sold to make it as easy as possible for consumers to start using it, as well as to use the CMP argument to boost sales. This possibility was said to be of great advantage for the MNOs. Further, Jean Kehlaoui emphasized on the initially big challenges when educating the users to start adopting CMP. The Citizi project had to undergo huge marketing efforts such as putting up flyers everywhere around the stores to ease this barrier. However, among the users that finally adopted CMP, 90% was said to feel great satisfaction with it. The Cityzi project did not develop any new payment scheme either, but used Visa and MasterCards existing schemes to facilitate interoperability. Jean Kehlaoui however stated that the majority of the contactless services that was used in Nice were based on transport, loyalty programs, easy information access and the like. There seemed to actually be very few CMP in relation to these other services (NPF – Kehlaoui, 2012).

5.2.2 Key outcomes from in-depth interview

<table>
<thead>
<tr>
<th>Company name</th>
<th>WyWallet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder role(s)</td>
<td>MNOs</td>
</tr>
<tr>
<td>Name and title of participants</td>
<td>Johan Ragnevad, Acting CEO</td>
</tr>
<tr>
<td>Geographical Market</td>
<td>Sweden</td>
</tr>
<tr>
<td>Technology / payment type</td>
<td>Premium SMS (initially) / remote payments, P2P, online</td>
</tr>
<tr>
<td>Date of interview</td>
<td>April 27, 2012</td>
</tr>
</tbody>
</table>

**Company description**

WyWallet is an independently managed joint venture owned and created in November 2011 by the four biggest Swedish MNOs; Telia, Tel2, Telenor and 3. This enables them to reach approximately 97% of Sweden’s mobile phone users, and by the use of premium SMS provide payments through their mobile application. Payments can mainly be performed within transit, parking, online at selected merchants and in-between users (P2P). The Swedish technology/service provider Accumulate stands behind the technical platform, which opens up the possibility to incorporate various other technologies and payment types into the solution. WyWallet goes live in summer of 2012.
FIRST- AND SECOND MOVER ADVANTAGES

“It was important for us to get to market fast, and by creating a separate company we were able to do so. For the banks it has been harder, because for them it is about a core business. For the MNOs mobile payments is more about a niche business.”

“There can be some kind of lock-in effect if other companies tie their solution to the merchants, at least in theory. But I think it is very hard for all those much smaller, unknown actors to convince the merchants to use their solution. And the merchants are also aware of the lock-in effect. And then it depends very much on how integrated the solution is with existing infrastructure.”

“The banks have been rather passive in relation to mobile payments. And in alignment with Single Euro Payments Area (SEPA), they have also wanted to see standards and international regulations. But the whole SEPA work has taken 10 years now and they have still not reached their goal.”

“And if there is any stakeholder that knows about standardizations more than the others, then that stakeholder is the MNO. They have vast experience in this field since telecommunications have a long tradition with high levels of standardization. And MNOs have realized that if focus is put on that now it will take too long time to deploy viable solutions. Meanwhile, competitors and giant companies like Google, Facebook or Apple might become the rulers of the game. This scenario creates more of a niche market, with huge amounts of actors trying to provide good mobile payments solutions.”

NETWORK EXTERNALITIES

“New mobile devices are generally being purchased at high rates, so it looks more optimistic than expected with regards to future NFC phones.”

“NFC –compatible terminals are gradually being deployed to merchants at the moment. And the “chip and pin” -terminals have been worn out faster than expected, much faster than magnetic stripe –terminals. And this will possibly make the NFC adoption go faster.”

“We will use our P2P payment service as a way to make users sign up for mobile payment accounts and then expand the business model. And if you want to send money to someone P2P, the receiver must also register and that can build momentum and network effects.”

“When it comes to CMP, we strongly believe in NFC. It is the technology with biggest investments in relation to CMP. We will most likely incorporate it in our solution next year. Today, we have enough work to do with getting the current solution to market.”

SWITCHING COSTS

“The main advantage with mobile payments is the speed in the transaction. It can not be slower than a card transaction if it is going to be adopted. I do not think the consumers are willing to pay more per transaction than for cards, but perhaps the merchants are if they can get a higher payment frequency.”

“One of the main barriers to start use mobile payments is the identification/registration –process. And that small inconvenience make many people continue to pay with cards instead. There must be incentives or ways to make them sign up. We will use our P2P payment service as such a way, and hopefully make users interested in other types of mobile payments after that. This way, the barriers get lowered”

“People tend to already be comfortable with the use of SMS, so by using such technology makes some barriers lower as well. That’s one reason why we use it. We can also make premium SMS payments much cheaper than before, since the mobile payment business is put aside in this new company, and not being confused with other costs. “

“Our solution offers three different ways to connect with your money. But the aim is to stimulate the consumers to go in a certain money-transfer direction later on, so we can lower the prices towards the merchants and thereby compete more with the payments scheme owners.”

“Some stakeholders worry a lot that there will be numerous solutions available to both merchants and consumers, and that this might scare them away instead. But in reality, people are signing up on huge amounts of services all the time, everywhere. They are not as scared of that as some might think.”

“The MNOs might have over-estimated their relationships with the end-users, but still they have one great advantage, and that is their ability to pre-load the payment application on the mobile device before it gets sold to the user.”
**DIFFUSION OF INNOVATIONS**

“Many stakeholders and start-ups provide solutions which are targeted towards more urban users, where everyone is thought to be equipped with a smartphone. We differ in that sense since we wanted to provide a solution for the whole population to use. Our solution can be used with an 18 year old GSM phone thanks to the use of SMS. But we also target the heaviest smartphone users with our app, so we use a mixed market approach.”

“The conditions are very different in-between the European countries. The differences exist on bank-, card-, operator- levels as well as user habits. And that mix makes the prerequisites very unique in each country.”

“Some CMP solutions, like Seamless, are more targeted to merchants, so the problem there is to make the consumers adopt it as well.”

**ECOSYSTEM EVOLVEMENT**

“The MNOs in Sweden realized that they had to cooperate if they were to set a new payment standard on the market, by gaining as big of a critical mass as possible.”

“Many companies have developed so called “over the top” –solutions since many years which cut the MNOs out of the revenue streams. So naturally, the MNOs want to be a part of this.”

“I think solutions that exclude Visa and MasterCard “monopoly” –position is very attractive for merchants, like for example Seamless solution.”

“Generally, I am uncertain with QR –code solutions and the learning costs for the consumers. In general, I think CMP at PoS have the opportunity to work better in some purchase situations than others. There is a lot of talk on QR –codes and NFC, but we see SMS as a bridge –solution.”

“Regarding NFC SE placement, the real battle is between SE on SIM card and SE in the phone. It is an ongoing struggle at high levels between the MNOs, banks etc. I believe that the MNOs have a natural role to take control over the payment credentials on the SIM –card. The real challenge is then to exchange all SIM –cards, but when that have been done the MNOs can become a Trusted Service Manager (TSM). And even if it is placed in the mobile phone, the MNOs could control the payment credentials at a cost. At the end of the day, it is a question around who is the most trustworthy actor. Initially, many stakeholders will probably have this role.”

“We do not have any determined business plan in terms of collaborations with other stakeholders, but of course we want to make as much profit as possible and that apply to all stakeholders. At the moment, we only cooperate with third party developers and other service related companies that can boost our own business.”

“There are organizations setting up guidelines on how collaborations can look depending on NFC SE placement etc. and we read them, but do not really engage in the directives.”

“I believe that the younger generation of kids will be much less loyal to big banks than what we have been. And the banks must be aware of this, and that is why they start to move within mobile payments now. The MNOs have been more active in customer’s day-to-day life on many levels.”

**5.3 Mobile device manufacturers**

**5.3.1 Key outcomes from in-depth interview**

<table>
<thead>
<tr>
<th>Company name</th>
<th>Research In Motion (RIM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder role(s)</td>
<td>Mobile Device Manufacturer</td>
</tr>
<tr>
<td>Name and title of participants</td>
<td>Ola Larsén, Head of Alliances &amp; Developer Relations for the NEAR Region</td>
</tr>
<tr>
<td>Geographical Market</td>
<td>Global</td>
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<tr>
<td>Technology / payment type</td>
<td>NFC/CMP</td>
</tr>
<tr>
<td>Date of interview</td>
<td>April 26, 2012</td>
</tr>
<tr>
<td>Company description</td>
<td>Research In Motion (RIM) is a Canada –based multinational company that designs, manufactures and markets wireless solutions for the worldwide mobile and telecommunications market. RIM’s portfolio includes BlackBerry smartphones, tablets, software development tools and other software and hardware related products. Some of their recent BlackBerry smartphones have NFC –compatibility and is supported to be used with Visa PayWave as well as MasterCard PayPass terminals.</td>
</tr>
</tbody>
</table>
**FIRST- AND SECOND MOVER ADVANTAGES**

“One of the advantages of being an early mover in this race is that it is initially a very good factor to compete upon, for example to offer NFC capability in the mobile devices. Today, the mobile phones compete on screen size, resolution etc. and the differences is not big between brands. But if a phone supports a new way of doing payments, it is a strong factor to compete upon if you are early with such functionality. That mobile device might be perceived as more sustainable with support for future payments, more innovative and more differentiated.”

“If you are way behind with NFC, you won’t sell as many devices, since you do not have this differentiating offering. One of the disadvantages this brings to the early movers is the cost aspect, in terms of development costs and marketing costs to campaign it. And more stakeholders get involved in the process which also brings extra cost, due to all these relationships and connections that need to be in place”

“Another disadvantage with being a first mover is that a slight mistake (for example a security blunder in the solution) can get a massive and fast spread all over the world through blogs and online magazines. That can hurt tremendously, and blow up to gigantic proportions. It does not even have to be true either. False rumors can hurt just as much.”

**NETWORK EXTERNALITIES**

“NFC facilitates for so much more that just payments. We will see its usability in home alarms, opening and locking doors, within the medical care, travel industry etc. and when the development sprawls in many different directions it gets problematic. Payments take a central part in this NFC ecosystem, but due to the very generic fields of applications, it would be easier if we saw some kind of standardization”.

“With integrated SE placement, it is a more limited amount of devices that you have to work against. My belief is that it would be good with a standardized and united decision here, since it will speed up the development. The NFC technology in itself does not bring so many challenges. That is in a way similar to a USB connection or FireWire, it is just a way of communicating”.

“Regarding QR –solutions versus NFC solutions, I think it has much to do with which actors “scream the highest”. When Sony introduced BlueRay, they could just as well have failed totally. But they managed to build momentum because they were persistent and forced their format forward. And I think the same goes for mobile payments technologies. But most actors talk about NFC, and most of the application development have circled around this technology. And another advantage over QR is that it gives opportunity for short distance communication between devices, allowing for easy sharing of pictures and information etc.”

“The ‘chicken and egg’ -problem, is a classic scenario. Is it the providers that create the needs or are there needs from the beginning from the user side to start use CMP? That is the question.”

**SWITCHING COSTS**

“I would say that the biggest challenge to get people to adopt mobile payments concerns trust towards these kinds of payments. But people tend to be more and more willing to try these things and feel trust towards the systems. Online payments etc. have increased enormously and made people feel more secure about these types of payments. There was probably a much bigger step to go from cash to cards, than what it is to go from cards to mobile. But that is also a question on who handles the payment, if it is the banks, MNOs or someone else, and the trust people have against those stakeholders.”

“The advantage with an SE placement on the SIM –card is that you can change phone or manufacturer and still take the payment credentials with you to the next device.”

“The PSPs also want you to continue to use their underframes of course, whether it is Android, iOS, BlackBerry or something else, so the user profiles could also be located in a ‘cloud’ with a desktop-client connected to it. If you change mobile device or make a desktop switch, you can use that user profile again.”

**DIFFUSION OF INNOVATIONS**

“If more and more people realize that there is some kind of added value with CMP, then there is a chance that there will be an adoption among the population over time.”

“We have put NFC in our high-end mobile devices, and the users that buy those more expensive devices might also be more willing to start use CMP solutions, buy more applications etc. It is in that way aimed more towards the early adopters. But then the merchants must be led into this adoption as well, and that will take time. If it takes one year or three years or even more, that is not possible to say, but it is a big adaptation that must occur.”

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“The markets in Europe are different and it affects the adoption of CMP. In southern Europe, like in Spain, you can hardly pay a taxi driver with card, only cash. CMP in Spain and Italy for example have not reached as far as we have here in northern Europe. So in the bigger European picture, the northern countries are more of early adopters, and CMP can roughly be said to move gradually from northern to southern Europe. Then there are some regions where CMP adoption of course has been more rapid. In the Arab countries for example, the culture is very different and there they tend to be much more prone to use their mobile devices to a lot of different things, even if they have a more conservative attitude towards many other things. In Europe, countries like Italy and Spain are much more prone in using mobile positioning services, map functions etc. if compared to the Nordic countries. But they are further back when it comes to financial transactions. Some countries take bigger leaps in the value chain as well, and perhaps skip the card payments to go directly from cash to mobile payments. But I generally believe the adoption will go faster in northern Europe. But for example micropayments have come a long way in east-European countries as well.”

ECOSYSTEM EVOLVEMENT

“Regarding the NFC Secure Element placement, we will most likely see hybrid solutions on the future market, since many stakeholders wants to own the money flows.”

“But everyone wants to make money on this, so we will probably not see only one solution but instead many. If the SE is placed in the SIM –card, the MNOs will have their own specifications, which API:s (Application Programming Interface) etc. that third party actors can develop against. So if a third party application developer wants to use these payment credentials in their solution, they must get access and establish a dialogue with each and every different MNO that they want to interact with.”

“Regarding collaborations; I get phone calls every week by actors who say they have an exciting NFC solution and want to cooperate with RIM, and there are tons of small application and service distributors that tries to handle this. Then we have the payment scheme owners with another view on the whole thing, and Visa and MasterCard want to have a clear connection to these new systems. Then if they see greater value in working with either the PSPs or the MNOs, that can vary. But the payment scheme owners can not be forgotten in the ecosystem, they have great power.”

“In my opinion, the prerequisites for collaboration among stakeholders are pretty much the same across Europe. The transaction flows and their complications is a global phenomenon. The same goes for the MNOs presence and collaborations there and the role of the PSPs etc. All these factors make the collaboration prerequisites for an evolving NFC ecosystem rather similar.”

### 5.4 Payment Service Providers (PSPs)

#### 5.4.1 Key outcomes from in-depth interview

<table>
<thead>
<tr>
<th>Company name</th>
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<tbody>
<tr>
<td><strong>Stakeholder role(s)</strong></td>
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<tr>
<td><strong>Name and title of participants</strong></td>
<td>Tobias Wallhuss, Manager New Payment Solutions</td>
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<td>Card (magnetic stripe+chip), NFC / card payments, CMP</td>
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<tr>
<td><strong>Date of interview</strong></td>
<td>April 26, 2012</td>
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**Company description**

Point is a leading provider of electronic payment solutions in Europe, focusing on payment services to merchants. The company distributes card terminals to merchants, both stand-alone and cashier connected models. The newer generation terminals are equipped with NFC –technology. VeriFone, one of the leading global providers of technology that enables electronic payment transactions, owns Point since 2002.

**FIRST- AND SECOND MOVER ADVANTAGES**

“With new technology there is always a risk of being an early mover, for us the new terminals come at a higher cost, even if it will get cheaper over time. However, we know that there is a technology shift coming but we do not know when.”
NETWORK EXTERNALITIES

“Most of the terminals that are manufactured now have NFC – capability. And we have come a long way with certification and developments of these new terminals. At the end of 2012, I would say that almost all terminals we distribute will have been built in NFC.”

“We help push towards the shift towards NFC by exchanging the terminal infrastructure, so it will be interesting to see how the other side reacts. The new NFC terminals work with contactless cards as well, since they are built on VISA/Mastercard definition and specifications. However, the banks might be hesitant to deploy new NFC contactless cards since these come at a higher cost.”

“We do not believe that there will be a huge wave of merchants that want to replace their existing terminals to NFC at the same time. It will happen more gradually, especially if the merchant’s terminal is working.”

“Our terminals are built on Visa’s and MasterCard’s standards, and in the same way the NFC terminals follow standard specifications from Visa PayWave and MasterCard PayPass. So, all our terminals have global interoperability.”

SWITCHING COSTS

“One strength that ‘real’ NFC solutions possess over others is that there is no need to have an established telecommunications network reception on the mobile device”

“Regarding security on ‘wave and go’ transactions, of course it is one safety barrier lesser if you do not use a PIN – code. But the data is still encrypted.”

“Merchants are generally not very interested in NFC since they recently have upgraded to chip-and-pin terminals, at least in Sweden. However, the cost for an NFC terminal is not much higher than a traditional one, and the merchants might be interested when there is time for a switch when older terminals are worn out.”

“Regarding switching costs, from cards to CMP with NFC, I think it is important to deliver services on top of the payments to make people pay with their phones. It is not so extremely much added value with the CMP in itself compared to card payments. Multi-functionality apps and directed offerings from merchants etc. is therefore important.”

“The next generation NFC terminals can be built with color display and touch screen. So there are big possibilities to make these terminals better and different in many ways. In terms of switching costs, there is always an element of learning costs for the users. And unfortunately different PSPs have slightly different ideas on how to build these new terminals, with regards to placement of the reader for instance.”

“One of the biggest issues at the moment is that there are so many actors and so many mobile payment solutions. It gets very confusing for the users. You do not want 27 different payment apps in your phone. There will probably be a big consolidation of actors and solutions in the near future because of that”

DIFFUSION OF INNOVATIONS

“Regarding targeting a specific market initially (e.g. “Innovators”), I think that appeals more to the consumer side, not the merchant side. We do not have any relationship with the consumers, only merchants.”

ECOSYSTEM EVOLVEMENT

“Many QR-solutions bypass our hardware completely. But in the long run, I believe that global payment systems that are working today are going to last in one way or another. I have a hard time seeing that the terminals will be taken away, in replacement for a third party QR – solution. Visa and MasterCard have too much power and global reach for this to happen.”

“There is a possibility here for smaller third party firms to succeed. One reason for that might be that Visa and MasterCard have not entered Sweden with their contactless cards yet. Another reason is that the banks have been very passive. But these third party actors have the disadvantage that they are often small which makes it hard to compete over the mainstream market consumers.”

“Actors like WyWallet with their SMS based solution are not really a threat to our business since they does not focus on payments at PoS. And premium SMS is not cost effective for most merchants. But if WyWallet adapt their business model more towards payments at PoS and becomes successful, then we might have to provide support for their solution in our terminals. We are very aware of the dynamics in the industry now, and we are ready to adapt with the market.”

“Regarding the NFC Secure Element placement, our terminals will support them all, so we are not affected of
that issue. “

“We get approached from numerous different actors that want to develop more or less obscure solutions with us. We are open and listens to these suggestions, but we also prioritize what we actually do, our core business.”

“There are bigger actors that might enter the European market as well, like Google or Apple. Google wallet is built on VISA and MasterCard specifications, and they work with VeriFone (also owner of Point) which distributes terminals, so that is a dream scenario for us if they can get big impact. Apple’s strength is that they already have accounts established with their users through iTunes, which they could build upon. But it is good that so many actors drive the CMP ecosystem forward - it increases awareness among the users”

5.5 Payment Scheme Owners

5.5.1 Key outcomes from Nordic Payments Forum 2012

Mark Austin, Head of Market Development at Visa Europe, talked on the subject “The Business Case for Contactless Payments – the factors for a successful solution”. He provided an explanation for why contactless payments seem to be the next step to pay for goods, displaying merchants, banks and consumers as stakeholders in the case. Firstly, merchants want to increase productivity, sales, increase customer loyalty and reducing costs. Secondly, banks want to create customer retention, strengthen their brand reputation and increase revenue. Finally, consumers want more convenience. The density of payment terminals was mentioned to be very different from country to country when looking at Europe, with the UK, Poland and Turkey as the by far most prominent markets when it comes to amount of contactless PoS-terminals. However, as of today’s date the terminals are mostly used for payments with contactless credit cards but provide a type of infrastructure upon which mobile phone compatible NFC solutions can rely – the terminals are ready for mobiles but cards are essential and accepted for a foreseeable future. In terms of Secure Element placement in NFC head-sets, the winning solution was thought to rest on the users preferences i.e. the placement that gives the users most value. One highlight was also recognized as situation-based security features for mobile payments, since not all transaction-amounts should demand the same security (depending on if they are small or large), thus making the solution more convenient for users. Contactless payments were in that sense most efficient for low value payments, where payments could be processed without entering any PIN code, and still not be considered too risky. Mark Austin also stated that NFC is most likely to become a default feature. Only the Visa PayWave solution had deployed more than 31 million contactless cards, with approximately 227 000 contactless terminals available at PoS on the European market. Mark Austin’s vision was that contactless cards and mobile payments should roll out together due to differences in users’ payment preferences. His view was further that it would be easier to convince merchants in the deployment of contactless cards contra mobile payments. A final remark was also that a stakeholder with a strong customer base should also be the leader in the contactless payment developments (NPF – Austin, 2012).

5.6 Third party technology/service providers

5.6.1 Key outcomes from Nordic Payments Forum 2012

Magnus Fredin, President of Sales Europe at Swedish-based e-commerce company Klarna (provider of mostly online payment solutions) talked on the subject “The future of payments in e-commerce”. He visualized the mobile payment future as something he referred to as a “zero friction vision”, where the payment process in theory at least should be totally effortless, i.e. close to “wave and go” – payments without entering a PIN-code, or by choosing to pay later through a bill/invoice (effortless at least for the moment). Magnus Fredin also stressed the reality of online payments gradually merging with mobile usage, and that and that younger generations, such as “generation Y”, i.e. people born 1980-2003, are more uncomfortable with complex transactions compared to older generations (NPF – Fredin, 2012).
5.6.2 Key outcomes from in-depth interviews

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<td>Stakeholder role(s)</td>
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<tr>
<td>Name and title of participants</td>
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<td>Technology / payment type</td>
<td>360 degree solution; QR/bar-codes, NFC etc / PoS, P2P, remittance, mobile banking, man-to-machine + support for various additional services.</td>
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<tr>
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<td>May 2, 2012</td>
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Company description
Accumulate is a Swedish based B2B company today present on the global market. Accumulate enables the next generation of mobile payments through a software based solution that covers a wide range of payment situations. The high security transactions are provided through a back end product consisting of an extensive technology platform, and the company works B2B to adapt their services (applications) to fit their client’s requirements. The company have recently gained a great deal of attention and expanded globally due to this innovative and highly secure platform. Accumulate have in that way been able to develop mobile payment solutions to clients such as PayPal, PayEx and WyWallet. Partners include Vocalink, Nexus and Research In Motion (RIM) among others.

FIRST- AND SECOND MOVER ADVANTAGES
“Regarding first movers; many firms tend to be overoptimistic towards the mobile payment development, with initial high investments. The mobile payments industry is generally a business where many investments and projects tend to fail after some time. But it can be handled in different ways. We have tried to scale up our business sufficiently and proportionally in relation to our customers’ feedback, and did not develop an actual product before we had sold our first project.”

“We have never been in the forefront on the user side. Other firms have led the way and tested the market, and then we have followed. This have saved us capital and allowed us to spread more easily, but it has also made us dependent on other firms’ progress.”

“We do not need to use preemption strategies since we do not lock the merchants, although we do it indirectly. Our strategy has instead been to gather as many customers as possible to use our solution as a standard, by lowering the barriers. But if we are able to lock PSPs, they will indirectly help us advocate our solution.”

“It is not always a fact that bigger companies wait to enter until technology uncertainties have been reduced, in hope to do it right with huge financial and marketing powers at their back, although this might make some sense in theory. Companies like Visa/MasterCard and PayPal are presently testing and piloting huge amounts of initiatives all over the world, and Google has rolled out the only real commercial solution so far.”

“Banks have very high penetration rate among consumers and huge trust, which can facilitate for banks to enter in a later phase and still make a huge impact.”

“So far, we have seen payments more pushed and controlled by the merchants, but in the next generation of mobile payments, this role seems to be more the consumers while the merchant have to adopt it to please the consumers. But this can differ across markets, and is also very depend on what type of actors stand behind the issuing and the acquiring side. If a big merchant chose to accept one kind of solution and force this upon the consumers, they will probably make a big impact.”

NETWORK EXTERNALITIES
“Regarding PSPs, most seem to agree that NFC is the communication protocol to be used in the next generation terminals. And the same goes for mobile devices. There is a consensus here.”

“Today there is still a big issue with the lack of NFC devices. And this will not be adopted in a clean cut, just as there was no sudden transition from payments card utilizing magnetic stripe to payment cards utilizing chip. Even today, chip cards also have magnetic stripes on them. And it will probably be the same with NFC. NFC will eat more and more, but today we are still extremely early in this development.”

“Visa/MasterCard has a strong position in terms of terminals and standards, but their strongest position is their wide user base already, both merchants and consumers. It is easier for them in that sense to make incremental changes in the existing infrastructure and still have their network in position.”
“Many try to get a big spread on one market, but if you get a little percentage on many markets it will end up with many customers still.”

SWITCHING COSTS

“Very, very few companies have huge market penetration rate. Banks sit in a unique position, where they have nearly 100% penetration on many markets when it comes to holding people’s money and processing payments. So they can lower the barriers for consumers to start pay with their mobile phone, since accounts are already in place.”

“It can be risky to add too much to the payment solution from the beginning. Then the barriers to enter for the users risk getting too high, since too much is new and unfamiliar. But only to get rid of the physical wallet means great added value for many people. Then by only adding transaction history, receipts, and having online contact with your account in a totally different way, add huge extra value.”

“Considering security, the NFC “tap and go” (a.k.a. “wave and go”) works well in many places where efficiency and speed is crucial, like vouchers for arenas, transit etc. But there are open and closed “tap and go” systems, and the open systems can be problematic in payments. Visa and MasterCard currently demands every fifth payment to be verified when using their contactless NFC cards for example.”

“The majority of initiatives consist of very small niche solutions. This can also lead to an enormous confusion for the consumers, and that is why some stakeholders want to standardize a solution.”

DIFFUSION OF INNOVATIONS

“Regarding target market, there are always early adopters of new innovations, and then it has a tendency to spread from there. But I think it would be hard to find these among merchants. Most companies in this new business aim for as many customers as they possibly can, and later build their solution from the ones that respond. There is a tendency for “trial and error”.”

“Consumers’ willingness to adopt mobile payments is not the same in all countries. In Sweden, we tend to be slower than in many other European countries. We have seen this in earlier projects as well.”

“Some stakeholders might believe that the development of payments can be generalized over all markets. But these stakeholders have not been out there and experienced it. We are out there to a very large extent; in Latin America, Europe, Asia, the Middle East, Africa etc. and we have seen the dramatic differences in the markets. In the Swedish market for example, some actors have seen some possibility to enter with solutions from the back-end through the somewhat open underlying clearing systems. But in many other European countries, the clearing systems are closed and placed in an almost monopolistic position, making this impossible.”

“Sometimes the differences between countries in Europe are even bigger than those in-between some continents.”

ECOSYSTEM EVOLVEMENT

“Many solutions out there are more technically focused, and aimed towards a niche market. We have instead been more process solution oriented where a wide range of technologies and payment types can be accepted.”

“NFC has already built up a huge momentum on the global arena, but QR-codes still have many advantages, it is easier to generate for example. NFC is much more about how you use it. Also, many more stakeholders get involved in the NFC schemes.”

“I have very hard to believe that NFC will be the only viable solution, and if so, it will take a very long time. The use of NFC will also find its way into many other innovative areas besides payments.”

“Regarding the NFC Secure Element placement, we believe that an integrated SE placement will be the most viable solution. The biggest procurements of NFC chips have most recently been the integrated solution. What speaks against that is that most mobile devices sold today are MNO –bound devices, about 80% I think. But many stakeholders do not want more actors than necessary into the value chain. An actor like the MNO might not bring so much value to the table, but still they have this power. That is problematic. And even if the NFC SE gets integrated in the mobile device, the MNOs might want to demand control over the credentials anyway.”

“The PSPs have started to develop and provoke multi-functions terminals, where not only payments can be incorporated but also vouchers, loyalty cards etc. which make the PSPs less willing to only utilize payment terminals. And that opens up opportunities for other players to access these terminals.”

“It is very important to underline that there are extremely different circumstances in different European countries which makes impact and success for different solutions very unique. That’s why Europe have seen a
lot of different niche solutions. Payments are extremely localized.”

“Market differences depends on different playing rules, how integrated the value chain is allowed to be, and which stakeholders that controls it. We have seen projects in some countries where there is a fully integrated value chain, and if one party accepts a solution, all other members in the value chain will follow due to close relationships with banks, issuers, PSPs etc. Sometimes one part may inhabit more or less all these roles, which makes it much easier to implement a solution. Market differences can be traced back to how the infrastructure was built up. It could have been governmentally owned banks, which later were broken loose which create certain type of dynamics. Or maybe the banks joined forces in an early phase in history and together drew clearing settlements, or developed a collective PoS terminal. In this way, the competitive landscape across countries gets extremely in-homogeneous. In some countries it can also be close to monopolistic tendencies.”

“In Turkey and Poland there are a lot of things going on in relation to CMP. Both are extreme growth markets and they modernize fast without too much impact from the financial crisis since they did not have the same credit bases built up. There is also a “settler spirit” in these markets. This enables leapfrogging in the payments development since there is a greater value in adopting mobile payments directly from cash instead of cards. In for example Italy, they have something like 90% cash. In Sweden, there is something like 60-70% card payments, in Norway even more.”

“Generally, there will first be a lot of different niche solutions, and in the long run the interoperability will follow at a larger scale. Some stakeholders might want to set common European business models for all initiatives and solutions. But bureaucratic innovation is totally crazy. These stakeholders see the industry from a completely different perspective, they don’t understand the dynamics.”

“Purely technically it is no big problem with interoperability between countries, but it depends on differences in infrastructure, agreements etc. So standardization is essential, especially within payments.”

“The future of payments will probably rest on those same technical preferences as today’s card payments, since it is much easier to merge that way.”

“There is always a consolidation where some actors loose and other last. Some actors will probably also adapt their business model to fit the evolving industry and perhaps get another role in a new value chain.”

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<tr>
<td>Date of interview</td>
<td>April 24, 2012</td>
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**Company description**

Seamless is a global software development company based in Stockholm. The company provides B2B technology solutions to MNOs, banks, and merchants around the world. Seamless sphere of work today encompasses solutions for money transactions and other value added services. Their CMP solution built on QR–codes called “SEQR” have been piloted at merchants and is planned to roll out commercially in the near future. This solution bypasses the payment scheme networks, and can due to that compete strongly on lower fees towards merchants.

**FIRST- AND SECOND MOVER ADVANTAGES**

“With regards to first mover advantages and disadvantages, we have a unique position in competing with our low transaction fees and that the cost of investment is close to zero etc. We have no competition on those terms at the moment.”

“One challenge is that we are an unknown brand, and even if we show the merchants what we can do they see an actor they do not recognize. There is always a risk with later entrants with big marketing muscles entering later, exploiting the educational pursuit of earlier entrants, but we believe that what is crucial is creating bonds and relationships at this very moment.”

“We want an open platform in the sense of making a statement that this is not a proprietary -monopoly exploiting -solution that creates a lock-in effect.”

“Banks could make everything roll, but they are not in early. They will be in when uncertainties are resolved,
and they are right now sitting with fingers crossed hoping that a card-based form of contactless payments will win.”

“We do not build anything that must be changed – it must be a real mean of payment at the beginning.”

**NETWORK EXTERNALITIES**

“I believe that if you reach certain覆盖 really fast it is not a question of what to use anymore, the consumer will use what is there and the solution will gain momentum.”

“It is necessary that you can build things around the payment application with an open interface, to add services for public transportation ticketing, vote purchases for competition in TV-shows etc. “

“QR-code solutions must be integrated with the cash register system, although not as extensive as with NFC. With QR it is mostly software that needs to be upgraded. It took card companies about 50 years to receive the coverage they have today, but I believe it can go faster for us since the implementation/roll-out costs are so low with QR. But even if we have fast, cheap and easy distribution it will take huge amounts of time to get it out there and accepted.”

**SWITCHING COSTS**

“Our solution gives strong switching incentives to merchants, since we only take half the fees of the payment scheme networks at the moment.”

“There are several thresholds for a merchant in having high investment costs and one important aspect today is that no one knows which payment solution that will win. That is where QR-stickers have a big advantage today; low investment costs and independency of existing terminals. But I do not think that means that the PSP-business will disappear, but on the other hand – the threshold for doing this yourself is vastly lowered.”

“The established trust that VISA/MasterCard possess is absolutely a challenge. The thing is, with regards to security, the card companies’ good reputation is built upon false claims. On the other hand they have the advantage of having creating a user behavior that is set in stone.”

“Our solution demands change in customer behavior and this is a big challenge, which regards primarily the end consumers. Also, one of the absolutely biggest challenges for us is the customer’s registration process. There is some effort in doing so and it reduces customer experience, since they need to go to a bank or register over the internet – there is no possibility of anonymous accounts and security is crucial. This is where current account providers have an advantage since there are a lot of people in the system already. This is a true growth impediment for us; and delimits how fast our diffusion process can be.”

“With regards to expectations to be overcome, merchants have an ungrounded fear that information would get lost if our company would not last. And they should not be worried about us eventually raising our transaction fees, even if the concerns of course are relevant.”

“Additionally, we think it is the merchant’s task to market our solution to the consumers, with discounts, commercials and promotions. We believe they have a great incentive to do so – and it is too expensive for us.”

“There cannot be a lot of different QR solutions out there, and this fact is important for merchants as well as for consumer experience. Too many options will create reluctance.”

“Speed of purchase is very important, but you have to look at trade-offs. The merchants might think that tap-and-go solutions are a great customer incentive, but contactless cards for instance have been subjected to security scandals and might never gain consumer trust due to this.”

**DIFFUSION OF INNOVATIONS**

“We aim for an early adopter approach but it is extremely important that the solution must be really, really simple and that we do not build anything that must be changed regarding the payments. There are some really important target-areas and key drivers in the mobile payment application environment, such as the big food retailers and public transportation due to their frequency of purchases.”

“Things that bring value by paying by your phone are crucial, such as digital receipts and integrated membership cards. This provides more of a “whole product” –solution, and acts as a primary driver. But this advantage will not be present before the critical mass is reached.”

“There is different payment-structures in different countries for card purchases in Europe, and the lower the fees are, the less incentive we can give to utilize our solution. But the situation is the same for merchants all over Europe; they want to improve upon their business by lowering fees.”
“In the short while, the merchants want to lead customers into mobile payments since it will make them money in the longer run.”

“An annoying factor due to the “mid-manager swamp” is that there is an organizational stiffness on the merchant side that slows down the diffusion. Everybody wants to motivate their existence and power, and stick to established routines with regards to planned orders for cash register systems.”

**ECOSYSTEM EVOLVEMENT**

“It is absolutely necessary that companies pull forward together in establishing mobile payments. When there are enough places that accept mobile payments, that is when it will become a real mean of payment and momentum is reached.”

“We want an open transaction platform, because one player will most likely not take over the market alone. However, since we are setting a new standard through bypassing payment schemes so to say, we have been obliged to solve this on our own.”

“We are an enabler for the banks especially, to increase their consumer contact by using our solution in their name. With our solution, they can interact every day instead of 1-2 times a month. But many issuing banks are not happy with our presence, since we are excluding the payment scheme owners.”

“With our solution we heavily reduce the number of players in a possible ecosystem, and of course many actors are not happy with this. There is a load of people claiming money in the transaction processes of today that are redundant.”

“The MNOs, especially in the form of consortiums, are strong players. But if they do not have any strategy in place for in-store payments it will take a very, very long time for them to be an actual player in that context.”

“With regards to use of technology, NFC and QR are merely means of identifying where you are located presently. QR or NFC (stickers) doesn’t matter, it gives the same opportunities. But this requires internet access for consumers to use. Real NFC (NFC-compatible phones/terminals), can be used without connection, and together with the interoperability that comes with facilitates for great consumer flexibility.”

“They think they have decided upon NFC down in Europe, and banks think that is fantastic since they can take it easy -but good luck, it will take at least six years before NFC exists on a broader level in Europe. Meanwhile, we are targeting merchants with a solution they really can use today.”

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### Payair

**Stakeholder role(s)**

Third party technology/service provider

**Name and title of participants**

Staffan Ljung, CEO

**Geographical Market**

Sweden, North America, SAMEA

**Technology / payment type**

QR/ CMP, E-commerce

**Date of interview**

April 24, 2012

**Company description**

Payair is a company primarily distributing QR-based solutions for CMP at PoS. The company has experience with several types of possible mobile payment technologies (NFC, Bluetooth etc.) but is now focusing on establishing their QR-solution in a variety of stores in Sweden, for example at the large consumer electronics store SIBA. Even though Sweden currently is the primary targeted geographical entity, the company also has units working with North America, as well as other parts of the world.

**FIRST- AND SECOND MOVER ADVANTAGES**

“There is an evident risk in being first, if what you are first with centers around technology. If you have to build everything yourself where every component is not objectively the best, while latter entrants can connect different specialized actors, which might lead to a better and cheaper solution than to build everything yourself”.

“It is really important when you are early to build as many distribution channels as possible, and also as many customer relations as possible. Just possessing the best or coolest technology will not give anybody first mover advantage. We are constantly trying to expand our coverage of connected merchants and users.”

“Later entrants that already have market distribution channels and assets might make them successful in this business.”
“It is not the technology that is the difficult part, but the small and incremental adjustments. I feel that this is hard to achieve if you do not get more interactions with consumers; that you could work with a constant flow of customer information. That is also something you cannot do if you enter the market later, so there is an evident advantage in being early”

**NETWORK EXTERNALITIES**

“I know that the merchants want standardization in the long run, one cannot have 15 or so solutions, so there will be a few taking the majority of the opportunities”

“With regards to companies such as Google who distribute terminals for free, that is a way of showing their marketing muscles. They are buying market shares, so to say. I believe that we have a great advantage for us in not having these hardware costs. During our pilot projects we have learned that the merchants are not very keen on investing in hardware-based solutions, since this implies an extra investment cost as well as maintenance costs. Thus, we believe in software-based solutions with just a little piece of hardware, in the form of a QR or NFC-sticker.”

“Regarding the choice of technology, it is totally dependent on what means the consumers have today. NFC is not very present in phones, but cameras are. Therefore QR is the best and most viable solution today. A mobile payment system based on NFC is very far away, and that is due to one specific reason – there are no NFC equipped cell-phones among consumers.”

“With regards to interoperability provided by standardization, of course that is a desired matter. But, however, it takes too long and it is so problematic and bureaucratic and the level of the solutions agreed upon is so much lower than what can be distributed via an “over-the-top” solution. The customers just will not take it.”

“The biggest issues for us regard building a great distribution and get many consumers and many stores. That is where the great complexity lies in building a good mobile payments business.”

**SWITCHING COSTS**

“It is not only about being safer than cards for CMPs at PoS, but that the speed is there, the everyday simplicity. It is absolutely critical when the consumer is observing different options, how simple it is to register for a solution and what statement the consumer makes by registering. What is complex is the customer experience; safety and user friendliness are the factors you cannot compromise. Simplicity in the certification process is extremely important. The foundation of every mobile wallet – solution is that you identify yourself at one point in time and everything from that point on goes very simply. But you lose a lot of potential consumers on the registration process, that is for sure. Moreover, a very important part in the whole process of registration is to build upon reliable ecosystems and established brands which already have the confidence and trust of consumers, for example VISA/Mastercard that are added in our application.”

“You have to bring extra benefits and incentives to a consumer before, during and after purchase. We are focusing less on cost and price, but on a better experience.”

“I believe a lot in the relation with banks, both on the issuing side and the acquiring side. Because who is the most trusted face? Companies such as Payair and Seamless are not recognized brands yet, and the trust will be much higher if we could use the cover of a bank.”

“Regarding possible consumer confusion In the myopia of mobile payments, that is why we are trying to build relationships with actors that are already handling big streams of payments, big banks for instance”

“The merchants are driven by increases in turn-over and processing speed. One incentive for them to invest in contactless mobile payments is also that with cards the holder is anonymous and you cannot contact the person, but as an incentive you can send targeted offers to the consumers if the consumer wishes so. Also, you can store all the receipts in the phone instead of them having to be thrown away which is environmental waste.”

“Merchants do not need to be worried over a lot of information living and dying with us; there are agreements with regards to those matters. But of course there are incentives for merchants to choose a player that they believe will survive in the long run.”

**DIFFUSION OF INNOVATIONS**

“I believe that the first target group is the people who like to shop online, and even if everything is not perfect they want to try it. We believe a lot in taking over the market cluster by cluster, firstly Webbhallen (the innovators) secondly SIBA (early adopters) and so on. It is impossible for us to build everything and force it upon the market, which is why we need to go cluster by cluster.”

“We work a lot with feedback from customers in order to gradually improve the product in terms of usability and friendliness.”
**ECOSYSTEM EVOLVEMENT**

“We are betting on that the card system will not disappear just because you can pay with your cell-phone, but rather that the infrastructure will be built upon this system and the distribution channels already in place. Building relations in this matter is crucial, otherwise we are never going to get a first-mover advantage”

“With new providers, not utilizing current infrastructure and actors, there are so many uncertainties which are currently regulated in a card transaction. Who will pay if something happens, that the technology does not deliver, that there is no risk management and further. Who drives an investigation of fraud in an untested ecosystem?”

“When it comes to trust, I do not believe that the operators have higher trust than the banks among the younger generations. The operators have earlier fallen into the trap of over-estimating the tightness of their bonds with the customers, for example when several of them tried to establish music services.”

“I do not think that partnerships and collaborations have to be changed in a change from QR to NFC. I believe it is a wrong way of thinking to see NFC and QR as two different things; it is the same type of distribution.”

“With regards to the placement of NFC payment credentials I believe it is very troublesome and complex to invite the operators and place it in the SIM-card. I believe there is enough security in an “over-the-top” solution, where nothing is connected to hardware and the authorization happens in the mobile application. I do not buy that technical jargon – yes, the operators could theoretically be in and get power, but it would vastly complicate things and take a long time. The operators have too high expectations of how much they can charge, but if they can reduce their piece of the cake they might work well in the ecosystem. Forget about the secure element in the SIM-card if it cannot be distributed in a good way, if there are not established price models. SEPA and such institutions are quite far away from the business decisions and the consumers. I do not believe that companies on the provider side work very actively towards a secure element and its placement. With regards to interoperability provided by standardization, however, of course that is a desired matter.”

5.7 Large technology/service companies

5.7.1 Key outcomes from in-depth interview

<table>
<thead>
<tr>
<th>Company name</th>
<th>PayPal</th>
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<tr>
<td><strong>Stakeholder role(s)</strong></td>
<td>Large technology/service provider</td>
</tr>
<tr>
<td><strong>Name and title of participants</strong></td>
<td>Jussi Koskinen, Financial Innovation and Channel Development Nordics</td>
</tr>
<tr>
<td><strong>Geographical Market</strong></td>
<td>Global</td>
</tr>
<tr>
<td><strong>Technology / payment type</strong></td>
<td>Internet, SMS / Online, PoS</td>
</tr>
<tr>
<td><strong>Date of interview</strong></td>
<td>May 18, 2012</td>
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</table>

**Company description**

PayPal is a large global online payment company, meaning that they allow payments and money transfers to be made through primarily the internet. With 110 million active accounts in 190 countries and 25 currencies around the world, PayPal enables ecommerce nationally as well as internationally. The company makes revenue by being an acquirer, i.e. performing payment processing for firms and commercial users, for which they charges a fee. PayPal have also taken their payment solutions offline; to physical stores at PoS where they have developed an SMS –based mobile payment solution for the U.S. market. In Europe, they have piloted numerous mobile payment solutions with various actors. PayPal have also developed their own credit card reader, which is attached to the mobile device (similar to Square and iZettle). PayPal have their headquarters in the U.S. and was 2002 bought by online auction and shopping giant Ebay

**FIRST- AND SECOND MOVER ADVANTAGES**

“Regarding the guarantee for secure transactions, it is important to test and pilot the solutions extensively, and we have not completed that even today. There must be succeeding research to make sure it works securely in every scenario.”

“The Google Wallet solution has been put on ice a little bit now since there was some security pitfalls discovered some time ago. That is a big backlash.”
NETWORK EXTERNALITIES

“Our biggest advantage is our great width internationally, and that is where we originally comes from; online payments between borders. Now we aim for payments within borders instead, to use our existing strength to enter into payments at physical stores at PoS.”

“We do not develop too much niche solutions for only one market. Most of what we do has the aim to work on many markets. We see no real obstacles with scaling things up.”

SWITCHING COSTS

“Our mobile payment PoS solutions can be used with existing PayPal accounts. There are no barriers to start use the mobile in that way. Many other firms have made it their main goal; to attract consumers. And this can be a big problem since the certification process is a big barrier for their users. Registration is under law (banking license) inevitable in order to protect the consumers from frauds.”

“Consumers are generally very prone to use their mobile devices with payments. At this stage, it might be more of curiosity, but there are ways to make them try it out and lower these barriers. For example, the payment process could be completed before reaching the counter, or you could trigger consumers with offerings, or say that some products are not available in the store but could be bought at a discount through the mobile device and delivered via a central warehouse.”

“The new type of payments must be easier and more efficient that today’s payment alternatives. There are so few NFC–compatible devices on the market right now and sometimes NFC might not be the most efficient way either. Generally; security, simplicity and user friendliness are the three most important factors to consider with mobile payments”

“Security can not be less than that of cards. PayPal offers full guarantee for the payments, which have made us very trustworthy compared to many other actors.”

“The key to CMP at PoS is to generate consumer data to use with targeted offerings. That will create great added value, which in combination with efficient, fast, secure usage will be necessary to get the users to switch payment method.”

“Sure, it can be confusing for the consumers with too many payment alternatives from numerous stakeholders to choose from. But some will prove to be more powerful, and perhaps different stakeholders can have different roles on different markets.”

“I have not seen any figures yet that confirm QR–code solutions as bringing more value to the users than today’s card payments.”

DIFFUSION OF INNOVATIONS

“I do not think it is deemed to only target a specific user segment initially, like “Innovators”. I think companies could target both innovators as well as the more mainstream user segments; the more the better.”

“Paypal will not roll out any solution big scale before it has been tested enough to make sure it works in every aspect. First when that is made sure of, we put huge marketing campaigns to it.”

“Essentially, customer feedback is very important, whatever you are trying to provide. Measure as much as possible and never stop thinking about what you can do better.”

“Bigger companies like Google, perhaps Apple, and PayPal tend to provide more full scale solutions. PayPal try to be available for our customers everywhere at any time.”

“The smaller firms might want to niche their solutions more than bigger players like us, not in terms of technology but in terms of offers. And the smaller firms have the advantage that they can provide much more niche offerings and target just the precise customer segment. If they could capture these customers, and provide it to the global niche market segment then they could have a huge impact.”

“The markets look different. In some regions, for example in Denmark, they have almost decided completely upon NFC. In the UK especially, we have seen a tremendous competition between many actors and payment types.”

“The adoption of mobile payments will take time. People are very hesitative in the beginning.”

“We have a strategy where we try numerous different solutions on different markets, and if we see that something works out well, we can take that solution and spread it to other markets.”
ECOSYSTEM EVOLVEMENT

“I think it is important for all firms to look at their resources and then create solutions that fit best with their existing customers’ needs. Pilot test the solutions, give the merchants the tools. We are just in the beginner – phase at the moment. If you are a big or small actor and test on 2 or 200 stores, never mind. Conduct customer surveys and find out what really gives your customer the added value.”

“PayPal originally come from online-based payments, where we have 18% of all global transactions. Our goal now is to take all that accumulated knowledge and take it out to the physical stores.”

“I do not see that NFC solutions are the only viable ones. It is too early to say. We try and pilot numerous technologies and types of payments, and then we let the customers decide what they like the best.”

“Standardization can be a good thing, but first there must be room for innovative creation of different solutions. And that is still going on right now.”

“I can not relate to other bigger companies’ strategies, why some are aggressive while others wait. But the ones that are out there today, that is essentially a good thing since the competition drives us to create new and better solutions.”

“PayPal, as well as the whole Ebay group have a very open opinion in terms of cooperation with numerous stakeholders. But the most important stakeholder is the consumer.”

“With collaborations, we have been able to scale up our distribution channels and grow. Our mobile payment solution offers payments through Visa and MasterCard. We also have collaborations with big social networks such as Facebook and Twitter.”

“Regarding the NFC Secure Element, it is too early to say where it will be placed. It is not for us to decide now. But I believe that the most secure SE solution (placement) that also serves the consumers in the best way will be the “winner” in the long run. There is always a power struggle between stakeholders when these things happen.”

“I am not worried that contactless payment cards will be a big threat to what we are doing.”

5.8 Merchants (and Consumers)

5.8.1 Key outcomes from Nordic Payments Forum 2012

Odd Birkenes, Manager of Value-adding Services at the Norwegian food retailer NorgesGruppen, talked on the subject “Business Opportunities and challenges with NFC –technology”. NorgesGruppen had implemented an in-store NFC-technology pilot project in Oslo during late 2011 named Tap2Pay, and the presentation centered round this venture. Apart from the merchant the project comprised a mobile network operator, a bank and a payment scheme owner. The customers had a satisfaction rate of 84% and experienced benefits from NFC-payments they did not receive from cards, however the customers also had further requests. The consumers primarily wished for (naturally) the ability of choosing the mobile phone they would prefer for the payment application and also wished for the service to be in many stores. Furthermore the consumers wanted the freedom to choose between debit and credit transactions, not having an upper transaction limit and, also, more services which would make the mobile payments to be “something more” than a substitute for regular cards. Finally, the consumers concluded the evaluation by stressing that the solution always must work and that it must be simple to use. From the perspective of being a merchant, Odd Birkenes raised the issue of debit cards versus credit cards and NFC mobile payments. For debit cards (which accounts for a large majority of purchases), the transaction cost is very low compared to credit cards, and as a NFC-solution (at least in Norway) would carry costs similar to credit cards the transaction-cost would be up to 25 times higher. The question and issue is which part would carry this amount, may it be the bank, the merchant or the consumer. Odd Birkenes further looked upon contactless payment cards as a viable solution until the majority of mobile devices are NFC-compatible (NPF – Birkenes, 2012).

Ramesh Bukka, Senior ICT Development Manager for the UK restaurant chain and food shop EAT., talked on the subject “Why invest in NFC and how you can leverage on new opportunities with mobile wallets”. He stated that the EAT. was a large embracer of NFC-technology solutions, and identified
several key drivers for successful implementation of NFC mobile payments. These are the availability of NFC in mobile phones, national campaigns to create customer awareness and investments from the payment industry in retailers. Moreover, there has to be more readers (terminals) in more locations and in multiple fields of service. Apart from retailers, the technology is preferably to be applicable in venues, transportation and vending, for instance. Further incentives and drivers could be loyalty programs and rewards, as well as similar incentives connected to the consumer’s purchase activity, for example points, couponing and location based messaging. On the user-side, the NFC-technology firstly provides opportunities to up-sale and cross-sell products for merchants to consumers (making consumers purchase complementary products to the initial intended purchase), with the help of strategic partnerships. Secondly, valuable data and insight to the customer base can be gained and, thirdly, geo-location can help to engage with the merchant’s customer base when and where it is relevant (NPF – Bukka, 2012).

Bengt Nilervall, Manager of payments at the Swedish merchant association the Swedish Trade Federation, did a joint-presentation together with Clemens Wantschura, Development Manager at the Swedish hotel and restaurant association VISITA on the subject “Mobile Payments – purchasing with cell-phone in a physical environment”. These two associations are working together in providing their view, demands and requests regarding mobile payments in physical environments. They recognize the importance of an ecosystem where all actors are recognized and strive together for possible gains for all parties; these include merchants, banks, scheme payment owners, technology providers, mobile device manufacturers, mobile network operators and consumers, but also public transportation, parking services and tourism. They recognize the potential for fast and efficient payments, for instance Clemens Wantschura claimed that today it is not viable to “pay for hotdogs and beers for 25 000 SEK with chip and pin”. It is important with faster payments, since many lunch restaurants make the majority of their money during only the one hour lunch break. The both parties moreover recognized the benefits of possible loyalty programs, marketing, pre-ordering, ticketing, couponing and logistics. The common needs and requests for both the retailers’ association and the hotels and restaurants’ association were displayed as user friendliness, security, transaction time, cost efficiency, standardization and a viable infrastructure. Regarding user friendliness, Bengt Nilervall stressed that many stakeholders list this factor as important, but what does it really mean? Some CMP solutions that has been presented still incorporates too many steps in the payment process, and this is not user friendliness. Moreover, the importance of all ecosystem stakeholders collaborating was mentioned, also working business models and sound competition among similar parties. Additionally, they are convinced that mobile payments will become a complement to other forms of payment and that several forms of mobile payments will co-exist. Furthermore, the common belief by the two parties was that situation-based security should be applied, since users would probably not want the same security process for purchasing gum as a new TV for instance. Conclusively, the absolute key success factors for a mobile payment solution according to the two parties were summarized as user-friendliness (the most crucial factor for adoption), trust and security, openness and competition and, likewise mentioned before, infrastructure. Cash was also expected to live on for still a very long time, since many user groups simply can not use their mobile device for payments (NPF – Nilervall, 2012; NPF – Wantschura, 2012).

5.8.2 Key outcomes from in-depth interviews

<table>
<thead>
<tr>
<th>Company name</th>
<th>Swedish Trade Federation (Svensk Handel)</th>
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<tr>
<td><strong>Stakeholder role(s)</strong></td>
<td>Merchant (representative association)</td>
</tr>
<tr>
<td><strong>Name and title of participants</strong></td>
<td>Bengt Nilervall, Manager of Payments</td>
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<td><strong>Technology / payment type</strong></td>
<td>NA</td>
</tr>
<tr>
<td><strong>Date of interview</strong></td>
<td>April 24, 2012</td>
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Company description

The Swedish Trade Federation (Svensk Handel) is a private interest and employers’ organization and the largest member of the Confederation of Swedish Enterprise (Svenskt Näringsliv), which is an umbrella organization for Swedish trade and industry. The Swedish Trade Federation is the primary organization for
merchants (retailers, wholesalers and importers) and has 13,000 member companies, which represent 23,000 workplaces with slightly more than 300,000 employees. The organization represents trade interests by informing and influencing decision makers in the Parliament and Government as well as authorities and the media regarding trade challenges and conditions.

FIRST- AND SECOND MOVER ADVANTAGES

“Micropayments (below 200 SEK) are initially very attractive with regards to mobile payments, since it allows better to “test” the market in terms of security etc. Some solutions (like MNOs WyWallet) will probably work very well with transit authorities, but not for payments at PoS since SMS is way too costly. The WyWallet solution is also more of a “technology push” in a way, where the consumers will be “forced” to buy SMS tickets for specific needs. QR –code solutions might be see many opportunities at PoS before NFC enters because of that.”

“Preemption strategies could be used to lock-in the merchants, but the natural expansion from card usage is NFC. The regulatory framework on how to handle account information and cards are led mainly by Visa and MasterCard, which advocates NFC. And banks, PSPs etc must align to this and in the end also the merchants and consumers.”

“The banks have for a long time been a “cash cow” with no incentives to change their business models, but now they realize that the rules of the game are changing, so they start to move. But bigger actors like Google, Apple, and e-commerce companies like PayPal also have a large customer base, and these actors might be considered much more trustworthy for the younger generation.”

NETWORK EXTERNALITIES

“The NFC ecosystem is not fully established yet; there need to be more NFC phones, terminal change and business model uncertainties to solve. And QR –code solutions can be rolled out with existing infrastructure more or less, so that is an advantage for these solutions.”

“In relation to the “chicken and egg” problem; the bigger merchants with more transactions will replace the NFC terminals at a faster pace compared to smaller merchants, since the “chip and pin” terminals wear out at a faster pace than expected. And the cost for NFC terminals is not comparably bigger than the traditional terminals. This allows the adoption to go faster. And if many bigger merchants should deploy the same NFC solution, and combine this with transit, it could get a big impact much faster. But some merchants might need other type of CMP, for example where you could pay in advance.”

“Regarding contactless cards, the terminals in Sweden have just been replaced, and the banks must investments again to send out new contactless cards. Their investment in “chip and pin” cards must first be paid off. So in that sense, CMP might be better instead of contactless cards (in Sweden).”

SWITCHING COSTS

“Type of solutions that bypasses the card system (like Seamless), is very interesting for the merchants to to lower cost. The investment cost in terms of software and QR-code stickers are not so big either for merchants. But QR –code solutions might not be enough to make consumers to switch to mobile. Added value services such as digital recipes, account balance view etc. needs to be added on top of the QR –solution to give it enough added value to change from cards.”

“Some merchant groups have a greater use of faster payments; transit authorities, bar environment, lunch restaurants etc. Some merchants do not depend on the speed in the payment at all. At other merchants you might be able to pay before entering the cashier as well. That would improve the logistics. But the consumers need to be a little bit prepared with their mobile devices to make the payment go faster. There are learning costs here. The further down in Europe you go, the more cash is used, and the prerequisites for mobile payments are different.”

“Loyalty points, coupons etc. must belong to the merchants in some way. So that must be secured through contracts and arrangements. There could be a risk if a third party developer distributing such service would go bankruptcy, and no such contracts were established.”

“It can not be more costly for the merchants, if CMP is not extremely consumer-driven. But faster, cheaper, marketing aspects, logistics or some other type of extra value is optional. But security is prio one, and prio two is the ease of use. The drift is another one important issue. Only when going from cash to cards, the infrastructure etc became much more complex, and if one part of the chain crashes, you can not pay. And this can have devastating consequences for many merchants”

“There is always a risk that some firms will compete on initially low prices, but then might increase them. That
is often stated in the agreements.”

“It is many times up to the merchants to educate the consumers on how to use CMP. But it must also be easy to educate the merchants. This is extra important since many merchant groups have high employee turnover and many part time workers. But with many different CMP solutions it gets even harder to educate both merchants and consumers.”

“I think that mobile payments will take most of the card usage, not cash (in Sweden). But that is also different with generations. And e-commerce tend to blend with CMP PoS, and perhaps also with bills/invoices.”

### DIFFUSION OF INNOVATIONS

“Regarding targeting an initial user segment (e.g. “Innovators”), it has been done in Sweden to some extent, where CMP has been trialed at Webhallen, Alpingaraget and SIBA, all merchants with a specific type of costumers, often interested in hi-tech. And for many solutions, it will be the merchant’s role to in turn target the consumers in the right way.”

“CMP adoption will take time. It took 40-50 years to get everyone to use cards for example.”

“It all comes down to issues related to security and trust. And if something goes wrong, media will spread the word fast all over the world which will make a huge impact, both for the provider of that solution and for the technology in itself.”

### ECOSYSTEM EVOLVEMENT

“It is very important not to exclude the merchants’ point of view in this new ecosystem.”

“Seamless solution is very interesting just due to the fact that there is really a need of competition with Visa and MasterCard, which can be seen as dominators. But smaller third party firms must see to aspects of security that is also very important here, and where the payment schemes and banks are strong. Giants like Google or Apple could impact to a large extent as well. But I know that many merchants in for example the U.S. also advocate for parallel solutions to Visa and MasterCard due to their dominance. But Visa and MasterCard have huge advantages due to their trustworthiness. Payments are easy as long as everything works, but what happens when something fails? Third party actors must take this into account as well. And the younger generation mobile users might also be more trustworthy towards other actors than banks, Visa or MasterCard. But the banks will most likely be involved in the new ecosystem somehow, since consumers money already sits on their bank accounts, they handle interest, credit risks etc.”

“At the Swedish Trade Federation today, we do not look so much upon the compatibility with the rest of Europe. You can say that NFC is more of a national matter. The NFC discussions on a European basis have taken too long time, and that facilitates other solutions like QR –code solutions. Visa and MasterCard work more on the international arena, since they have high interoperability in their systems already.”

“But overall, I think that there must be collaboration among the stakeholders more or less, it is inevitable in the new NFC ecosystem. If the user –side demands mobile payments services, the banks will most likely start to provide them inevitably. I think that NFC will become a final solution in this CMP ecosystem. And the majority agrees with me.”

“In general, I think we will see many types of solutions initially; contactless cards, CMPs with both QR -codes and NFC etc. It has some disadvantages of course, but it is also a good thing, since such third party solutions makes the competition favorable for merchants and consumers.”
6. Analysis

This chapter aims to analyze the key factors illuminated in the comprised theoretical framework, in conjunction with the empirical investigation. These factors – strongly related to industry evolution – explain both issues and actions of stakeholders, and how such developments might affect adoption among users.

From the comprised theoretical framework (see section 4.6 – Table 1), a number of key factors was identified in relation to each of the five theoretical concepts. These factors from each of the five concepts, was extracted from several scientific articles in order to find the most relevant interpretations of action and issues taken by stakeholders in new ecosystem.

Throughout the empirical investigation, vast amount of data has been gathered in relation to the many stakeholders in the forming European CMP ecosystem, adhering to both the provider and user –side of this ecosystem. The empirical data from the interviews was further categorized in accordance with each key stakeholder, as well as its relevancy to the five theoretical concepts.

In this chapter, these two sources of information will merge for analysis purpose. Metaphorically speaking; the “net” of the comprised theoretical framework with its factors will hence be filtered through the empirically gathered data, in order to find out how these factors might relate (or not relate) to the relevancy of the CMP ecosystem in Europe, with hope of shining new light and explanations on this complex evolvement. By doing this, it is also possible to find out which of the factors from each concept that holds most interpretive power to explain the key issues in the forming ecosystem, as well as which issues these might be, in relation to the development and adoption of the key stakeholders in the European CMP ecosystem, and what implications might arise from such conclusion.

The structure throughout this chapter will be built on a discussion, where factors are interpreted in accordance with the respective theoretical concepts chosen in this master thesis, which will be listed as sub-headlines. Prior to the analysis part with each such sub-headline, the factors from the comprised theoretical framework adhering to that specific theoretical concept will be listed again for recall purpose. At the end of each such theoretical concept –section, the few factors from the comprised theoretical framework that was found to be the most relevant in accordance with issues of the CMP ecosystem will be highlighted under the headline “Conclusive Summary of section”, which will later be more extensively discussed in chapter 7 – Discussion, in order to answer the second research question (RQ2), see section 1.4. When referencing to the data from the in-depth interviews, the actor will appear in brackets without mark on year to make it short and concise; for example (Accumulate) refer to the interview displayed as (Accumulate, 2012) in the reference –list at the end of this thesis. The Nordic Payments Forum 2012 –references will be displayed as they were in the empirical investigation.

6.1 First- and Second- mover Advantages and Disadvantages

Table 2. Recall of key factors on “First- and Second- mover Advantages and Disadvantages”, as identified in the comprised theoretical framework (section 4.6).

For a reminder of the key factors identified with respect to this theoretical concept on First- and Second- mover Advantages and Disadvantages, please see Table 2 above. To start, it is generally
visible that newer actors in the payments landscape are keener on establishing first mover advantages than larger entities such as banks, even if strategies among the early movers differ to some extent due to firm characteristics. Thus, it seems as if innovative companies enter early, but payment scheme owners such as Visa/MasterCard for instance – as being established players – are very protective of their revenue flows that have marked their presence in an embryonic stage of the industry, since they have visualized the proportions of this industry change. Visa has further stated that it is important for stakeholders with strong customer bases to take a leading role (NPF – Austin, 2012). As a matter of fact – out of what could be said to be established actors within PoS card payments with large marketing power, customer bases and distribution channels – there are only the banks lagging a little behind in the evolving industry, along with another possibly influential but new force; the company Apple (WyWallet; SEB; Swedish Trade Federation), which is a company that has not showed its ability in this playing field yet. In this sense, free-rider effects (Lieberman & Montgomery, 1988) are possibly limited and not many firms are trying to take advantage of these effects, the majority has realized the necessity of making statements, investments and displaying initiatives in the evolving industry early on. However, getting the offer right at the first time is considered a necessity for many actors. Seamless and other small challengers cannot afford to bring out inadequate solutions (Seamless). The first large launch is a one-time opportunity to get fulfilling consumer experience and security, in order to challenge the industry dragons for real. Banks also take this notion seriously, but for them the security and trustworthiness in the long run are more important factors regarding this matter (SEB).

What becomes evident in examining smaller actors (such as Accumulate, Payair and Seamless), as well as large firms in established mobile industries (such as the MNO consortium WyWallet and device manufacturer RIM), is that they all seem to have considered the first-mover aspect in one way or another. Being early implies, or could imply, heavy investments (Accumulate; Payair; Point; RIM), but the characteristics of the mobile payments landscape as well as the actors’ creativity seems to have mitigated this aspect to various extents to avoid the factor regarding outpacing of development costs versus revenue (Srinivasan et al., 2004; Finney et al., 2008). Third party technology/service providers, such as Payair and Seamless, are very determined in providing QR-based solutions with low distribution cost, whereas Accumulate, in the same stakeholder category, work on demand. This notion further relates to the possible first-mover advantage regarding firm leadership in product- and process technology (Lieberman & Montgomery, 1988) which is not viable according to many of the actors, because of the circumstances surrounding the evolvement of CMP at PoS. It is partly due to the fact that if NFC was to be a standard, the changes in existent technology (e.g. mobile phones and terminals) would be comparably simple and small, so that any firm could manage a transition (RIM; Point). Both Payair and Seamless state that CMP at PoS solutions are independent of which technology is used to identify at what cash register the consumer is standing, but is more dependent on what experience can be delivered, and this regards the scenario of no standards being concluded upon terminal-based NFC. What you can receive by being early, on the other hand, is extremely important feedback on user experience (Payair; PayPal), a factor not identified in section 4.1. It is not about providing the most impressive technological solution in this case, but the one solution that the consumers will take to their hearts (Payair). Another interesting notion is the dilemma regarding getting a solution out to the market place fast by doing most things yourself as a distributor. The solution would objectively be better when later entrants have the possibility to connect specialized actors and intermediaries (Payair; Accumulate) in a functional ecosystem (see section 4.5). This might not only harm the distributor’s reputation but also CMP at PoS in general, creating aversion among merchants and consumers if a successful preemption and lock-in strategy was to be used by the provider. However, other actors such as the banks and MNOs are incentivized to cooperate to tackle Google and PayPal (SEB), which further shows the importance of creating the right bonds in the evolving industry, which is what many actors are trying to do early on. This is an interesting fact regarding today’s more and more networked economy, and implies the importance of trying to create network effects as an early mover (Lieberman & Montgomery, 1998; Srinivasan et al., 2004; Suarez & Lanzolla, 2005) – and create them fast (see section 4.2).
With regards to **incumbent inertia** (Lieberman & Montgomery, 1988), it is a phenomenon that many actors relate to banks (e.g. Seamless; SEB; Accumulate) but it seems evident that the banks are very aware of this possibility and start acting (SEB; Swedish Bankers’ Association). The banks’ fear of incumbent inertia and the importance of acting are also recognized by other actors who still see that the banks will probably have huge impact on CMP at PoS when they do enter. That is the reason why the third party technology/service providers are trying to target banks with their respective solutions, getting the banks on board, trying to make them front the solutions and realize the importance of not standing alone as the industry evolves (Accumulate; Payair; Seamless). Strategic partnering undoubtedly has become a delicate question with the numerous actors approach the banks for cooperation, and possibly bypass them if the banks do not make a decision. Smaller actors suffer from not being known brands, and need some help on rebranding their solutions with names such as the ones of banks utilizing their trustworthiness, penetration rate and marketing power, whereas the same actors claim that the banks need them for providing the right customer experience and offering to merchants (Payair; Seamless).

There are opposite incentives for banks further contributing to incumbent inertia, which have to do with the possible transition towards terminal-based NFC. The banks probably want a card based solution to be established as a standard, and the MNOs are still hoping to be able to control NFC to some extent by being able to place the NFC Secure Element in the SIM-card (SEB; Payair; Seamless). At the same time, Visa and MasterCard are trying to create a bridge from debit and credit chip-and-pin and magnetic stripe cards towards NFC-based mobile technology by applying the infrastructure and providing the ability to pay with contactless cards in many European countries (NPF – Austin, 2012). It is more costly for banks to issue these types of cards, and since economic incentives are always relevant this might stall the investments and make the banks not move on the frontier in European countries where Visa/MasterCard are not pushing hard enough for contactless cards and establishment of infrastructure for terminal-based NFC (Swedish Trade Federation). The uncertainty regarding terminal-based NFC is however not stalling the mobile payment initiatives from banks and MNOs, since these initiatives do not primarily concern CMP at PoS at the moment either (SEB; Swedish Bankers’ Association; WyWallet). Banks generally feel that they can afford to wait a little, but still need to mark their presence in the playing field. In Sweden for example, the banks are distributing a P2P-solution together (SEB; Swedish Bankers’ Association), whereas the MNOs are also taking incremental steps starting with an SMS-based solution. Both these stakeholders have much to lose with regards to trustworthiness and lost business, which relates to resolution of **technological – and market uncertainties** (Lieberman & Montgomery, 1988). The banks have much to lose in making mistakes in the industry shift. Drawbacks have already occurred for Google, because of security pitfalls which created a huge backlash for the solution (PayPal). A disadvantage with moving early and too fast in today’s connected society is that the slightest mistake can spread really fast as a bad reputation and reach gigantic proportions (RIM). Events like this might furthermore create skepticism and reluctance among consumers, affecting the health of the whole ecosystem (SEB). In this way, technological uncertainty might pressure challengers to push out there solutions to the market trying to become a standard, even if the offering is clearly not mature enough for the market. The PSPs can also relate to the technological uncertainty and they do not want to see a QR -based solution bypassing their terminals, which is why they prepare themselves and provide incentives for distributors in an early stage by preparing all new terminals with NFC-capability (Point). The payment scheme owners are at the same time welcoming other actors to use their own NFC terminals (PayWave/PayPass), which they simultaneously use with contactless cards (NPF – Austin, 2012), in order to make future solutions dependent on their specifications and schemes, which is also advocated by other actors as a essential (NPF – Kehlaoui, 2012).

Some of the third party technology/service providers (Payair and Seamless), exercise explicit **preemption strategies** (Lieberman & Montgomery, 1988) with their QR-based solutions, whereas Accumulate, which is more of a pure technology provider, exercise it implicitly by tying numerous bonds to firms who in turn front the solutions and distribute it to merchants. These firms enact examples of how the numerous firms and competition in Europe are aiming to establish their own standards. This, in turn, affects and provide implications for other areas – such as network externalities.
with regards to possibly smaller clusters of consumers and merchants with low interoperability (see section 6.2), and switching costs occurring with regards to multiple established solutions (see section 6.3) – due to the multitude of choices and providers that are offered to merchants and consumers. Many parties have realized the problem of the several solutions existing and have been trying to create what they call “open” platforms and interfaces to facilitate for some type of standard regarding the current solutions of payment with QR and NFC – stickers to make it gain speed. This is a kind of competition regarding standardization, but at a lower level than the interoperable NFC-solutions advocated in Europe. So there are local standard battles as well as European (see section 4.2). However, the MNOs claim that preemption with resulting lock-in is theoretically possible, but to not create lock-in is something that QR- and NFC-sticker based service providers see as their strengths, since there are low investment costs and no particular integration with terminals. This provides an opportunity for larger firms to outplace these smaller counterparts when NFC becomes built into every terminal (WyWallet). The merchants agree that preemption is a possibility, but in conjunction with the statements from WyWallet still raises a finger in the favor of terminal based NFC solutions in the end taking over the cash registers, due to the influential power of keystones/dominators (see section 4.5), such as Visa/MasterCard. Since these dominators advocate such technological solution, the banks and PSPs must follow (Swedish Trade Federation). On the other hand, other actors are claiming that the risk is very present that an early mover provider with aggressive distribution can lock in merchants by registration processes advantageous to the provider, thus occupy the merchant not by physical presence, but contractually (Swedish Bankers’ Association) and with other switching costs (see section 4.3). This is also a factor highlighted by Lieberman & Montgomery (1988). It is also important in this matter to take user demand and behavior into account. If a merchant decides upon a solution (for example QR or NFC-sticker) and forces that upon the consumers, it will probably have a great impact (Accumulate). This in turn means that user behavior, loyalty and familiarity with a payment application becomes established, which might in turn create switching barriers when terminal-based NFC or other, possibly better, alternatives utilizing similar technology as the occupying firm arrives, hence decreasing customer and ecosystem welfare.

Finally, it is worth noting that there is an uneven tension among banks and MNOs, in terms of banks regarding the payment transaction flows to be part of core business, whereas MNOs regards the opportunity to be a valuable side-business (WyWallet). Banks and MNOs are probably the actors with the highest current penetration rate among consumers, having the power of creating major impact in their favor if the strategy game is played clever. However, these parties must preferably move together in providing a viable solution for terminal-based NFC, and these collaborations arguments over business models slows down the speed to market. SEPA and GSMA (the MNOs association) are trying to resolve such cooperative issues, but has worked for an extensive amount of time and the progress is doubtful, at least it has taken unreasonably long (WyWallet) taking into account the pace of other actors’ moves, which opens up for quicker, more dynamic firms to exploit the opportunity (Seamless; Payair). The banks and MNOs cannot afford to wait for some kind of standardization, it will take too long. And in the meanwhile, not only the small innovative challengers, but rather other powerhouses such as Google, Facebook and Apple might make moves that create barriers for banks and MNOs to capture valuable shares of the important emerging market of CMP at PoS (WyWallet).

**Conclusive Summary of section**

Firstly, it becomes evident that free-rider effects might not have an extensive impact on the evolving industry; almost all providing stakeholders have presented viable solutions early on, among other discussed aspects. This notion further relates to that the order of entry is not evidentially influent on impediments for ecosystem evolvement. Similarly, the factors of possible outpacing of development costs versus revenue as well as the possible FMA of leadership in product-and process technology seem not to influence the evolvement particularly, partly because of industrial awareness and creativity provided by agile actors, and partly because of the non-complexity of utilized technology and ability of technological replication with regards to QR and NFC. The same factor seems to mitigate rapid technological and market development, which means that first-mover advantages might possibly be obtained to a greater extent than if the circumstances were opposite (Suarez & Lanzolla, 2005). However, since almost all possible providing stakeholders are currently participating in the
competition, monopolistic tendencies might be reduced and also benefit the welfare of the ecosystem in the longer term due to increased innovation. Furthermore, the necessity of \textit{getting the offer right at the first time} is highlighted by several actors. This factor might not influence the evolution of the ecosystem as a whole since other actors are ready to fill the spot of failing firms and also industrial convergence is desired by many parties, but relates to the factor of \textit{technological and market uncertainty} which is a factor judge to dynamically influence the development with regards to CMP at PoS (see below).

Thus, the three most prominent identified factors influencing the evolution of CMP at PoS with regards to “First – and Second Mover Advantages and Disadvantages” are judged to be (1) \textit{incumbent inertia}, and (2) \textit{utilization of preemption strategies} and (3) \textit{technological and market uncertainty}, see Table 3. All three factors are interrelated and will be validated and discussed subsequently in “Chapter 7 – Discussion”.

<table>
<thead>
<tr>
<th>First- and Second- mover Advantages and Disadvantages</th>
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<td>Firm leadership in product – and process technology</td>
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<td>Possibility of incumbent inertia</td>
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Table 3. \textit{The most prominent factors influencing the evolution and issues in the CMP ecosystem with regards to “First- and Second- mover Advantages and Disadvantages”}.

6.2 Network Externalities

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<th>Network Externalities</th>
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<tr>
<td>Presence of direct network externalities</td>
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<td>Possibility of standardization</td>
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Table 4. \textit{Recall of key factors on “Network Externalities”, as identified in the comprised theoretical framework (section 4.6).}

For a reminder of the key factors identified with respect to this theoretical concept on \textit{Network Externalities}, please see Table 4 above. To start; CMP at PoS is an evolving area where network externalities (see section 4.2) are very present (SEB). \textit{Direct} network externalities imply consumption externalities where a purchase and a new user directly, physically, affect the quality of the product and its utility. \textit{Indirect} network externalities on the other hand, refer to the notion of hardware and software (Katz and Shapiro, 1985, 1994), and the presence of both types is currently influencing the present and future deployment of CMP at PoS.

The primary types of technology used for CMP at PoS each carry different abilities to exploit the existence of network externalities. For example, many more stakeholders are involved in the NFC-schemes compared to QR and other alternatives, which imply that NFC can probably reach more touch-points. Today, however, there is a big lack of NFC-devices despite the ongoing development of applications, which constitutes the biggest issue for this technology at the moment (Accumulate). There is a need for more NFC-equipped mobile phones, change of PoS terminals and a resolution regarding business models (see section 6.5) (Swedish Trade Federation). NFC has a vast load of
application areas, and a huge amount of application development is currently happening which implies a possibly vast exploitation of network externalities, but also means that the development sprawls in many different directions. Payments take a central part in the deployment of NFC-technology, but due to the very generic fields of application; standardization could facilitate a larger network held together (RIM). QR on the other hand, is currently being deployed in the market. With regards to QR and the possibility utilization of network externalities, some factors speaking for the technology are the advantages of comparable ease of creation of QR-codes (Accumulate) and low roll-out costs (Seamless), for instance. Some large companies (e.g. Google) are deploying NFC-terminals for free to gain momentum, but many actors believe in software-based solutions with just a small piece of hardware (such as QR or NFC stickers) that in a sense can exploit network externalities in a more frictionless manner. All these matters are touched upon consequently in the remainder of this section. Historically, firms possessing large networks in established industries tend to be reluctant to adoption when a technological shift is brought about; which is however dependent on adoption and opportunity costs (Kauffman et al, 2010). Entry is said to be dependent on existent market share, potential market share, and the leverage possibly created by new technology. Many incumbents in the payment industry have spotted large risks by not adopting CMP at PoS and being surpassed by eager firms wanting in on the opportunities created (SEB), whereas others see possible leverage effects (PayPal). Even if entering the CMP at PoS-battlefield might not create economical leverage, many established payment stakeholders naturally draw upon their strengths, customer relationships and current market channels to maintain and defend positions in the payments arena. The payment scheme owners have strong positions in terms of terminals and standards and have a wide user base of both merchants and consumers. In this way, they possess the ability to progress incrementally and still maintain their network positions (Accumulate). Banks on the other hand see the industry shift as an extension of their customers’ needs, and also rely upon the large network of user accounts the banks possess (SEB). Also, firms processing payments over borders in the current payment industry overcome the issue of interoperability by riding upon their previous pursuits, which is a great advantage in creating valuable networks with regards to CMP at PoS and constantly develop scale (PayPal). Since the attractiveness of an offer lies in the expected number of the particular offer to be used (Economides, 1996b), the examples above display great advantages compared to small third party service providers, and they might have a hard time forming attractive networks (SEB).

Moreover, how attractive a rival (challenged) technology appears is partly dependent on the size of the in-place base, i.e. the more users the technology comprises the more value it has for consumers (Katz & Shapiro, 1986). On the other hand, consumers care for the future success of the competing technology, since the altogether benefit in part will be dependent how many consumers possibly are adopting compatible products in the future (Katz & Shapiro, 1986; De Bijl & Goyal, 1995). However, there is no real battle in that sense between CMP at PoS and credit and debit cards (which constitute the in-place base in this matter). There is rather a matter of co-existence and a successive merger of the two, since in majority of CMP at PoS solutions the card will move into the mobile phone application to facilitate payments (Point). What constitutes the challenge for CMP at PoS-solutions, and the mobile payment industry as a whole, is to make the most of this merger by adding value (SEB) and overcoming switching cost (see section 6.3) and in this way maximize the collective consumer welfare. Conclusively, all the actors in the sample of this thesis agree that multi-homing will exist to a great extent and on many levels. Multi-homing implies that in the competition between different platforms the users connect to several platforms instead of making one choice. In their mobile phone, consumers might pursue both NFC and QR applications for instance, and on the merchant-side multi-homing will most definitely exist for a long time to see, and the consumers will be able to pay with cash and cards as well as their mobile phone for the foreseeable future (Swedish Trade Federation; Point; NPF – Wantschura, 2012). This also relates to differences in consumer taste and co-existence of networks. Since, several networks might co-exist depending on the matter of perceived network benefits for the consumer and also their individual taste (De Bijl & Goyal, 1995). Some consumers will prefer cash, some cards and also the tastes and needs might be different in the pure context of mobile payments; as some consumers will find value in P2P services, some in remittances and bill-payments et cetera. When a consumer registers for one solution (e.g. P2P), direct and indirect network externalities facilitated by the comprising of different mobile payment solutions in mobile wallets will
create spill-over effects on each other, driving forward a momentum and further registration of consumers and merchants tempted by the value brought about by the network effects (WyWallet).

Evidently, the selected sample of the forming industry in general seems to encourage standardization with regards to CMP at PoS, since there cannot be too many solutions out there offered (e.g. Payair; SEB). Too many different solutions would hamper important network externalities and create welfare-harming switching costs (see section 6.3). Necessarily, what is important for creation of network externalities and perceived benefits by users is not the mere industrial winnowing and shake-out of firms, but rather the convergence towards a few market channels through which the offers are distributed (SEB). Standardization furthermore provides the creation of networks spanning over borders, which of course is a desired matter (Payair). SEPA is examining if they should regulate or legislate with regards to standards in order to speed up market development, and by cooperating with the MNO organization GSMA the institution have produced several guidelines for terminal-based NFC and are beginning to do the same for QR (Swedish Bankers’ Association). However, these attempts have resulted in aversion among most stakeholders on the providing side of the market. There is a trade-off regarding the matter, since industrial innovation and creativity are hampered by standardization, and at the same time standardization serves a great part in facilitating for interoperability (Payair), create a spread and achieve momentum for a technology (Swedish Bankers’ Association). Standardization is accused of taking too long and being too bureaucratic (Payair). One reason that a decision upon standardization would go slowly is pure cost aspects for SEPA and connects to the extensive travelling for SEPA – members, as well as the matching of member schedules, which have already created a big challenge when setting the guidelines (Swedish Bankers’ Association). However, further accusations regarding standardization naturally comes from firms not believing in a physical NFC – secure element (one of SEPAs main agendas is to suggest business models based upon placement of this element) and the level of the solutions agreed upon is said to be much lower than what can be created in “over-the-top”-solutions (Payair). All the above tensions create difficulties for various types of standardization, and the matter is touched upon subsequently in this thesis (see section 6.5).

Furthermore, standards wars are especially present in markets providing strong network externalities (Shapiro & Varian, 1999). And there is some kind of a battle going on to some extent with regards to CMP at PoS. The battle regards primarily terminal-based NFC versus competing solutions, in Sweden and many other countries QR-solutions mainly. Some actors argue that it is wrong to look upon QR and NFC as two different things since they are merely means of information transfer (Payair), however, it is not imaginary that many stakeholders have an opinion on the matter, and perceive some kind of clash between the two. Both with regards to the terminals utilized by PSPs as well as the mobile devices, there seem to be a consensus regarding establishment of NFC as the communication protocol (Accumulate; Point; NPF – Austin, 2012). This facilitates for utilization of network externalities and cross-border interoperability eventually, but since there are still issues regarding NFC-standardization it opens up a window of opportunity for QR-solutions. Some actors claim that the consumers will use what is offered now, and that if a QR-solution reaches certain coverage at a rapid pace it will gain momentum (Seamless). The possible benefits for the actors trying to establish first-mover advantages in this way (see section 6.1), is that they might utilize the presence of network externalities with regards to NFC later. It also depends on the possibility to manage the switch toward NFC-technology when agreements have been made with merchants, and the establishment of channels to the market is in place (SEB). Some actors think the outcome of QR versus NFC has much to do with which providers, in simple words, are creating most noise (RIM), and also which technology possesses most current mobile application developments and applicable areas, which is suggested to be NFC (Accumulate; RIM).

Finally, as briefly touched upon in the beginning of this section, terminal-based NFC is subjected to a so called “chicken and egg”-problem, a notion described by Caillaud & Jullien (2003), which implies stagnation in two-sided markets due to no igniting factor appearing on either the supply or demand side. In the case for NFC, it is said that the merchants do not want to invest in NFC-compatible terminals if the consumers possess no NFC-compatible mobile phones, whereas the consumers do not have an incentive to purchase such phones if they cannot use it at the PoS. It is always a question if the
providers should have to stimulate the users’ wants and needs, or if the users will push the providers into making something they desire, and is very applicable to CMP at PoS, in terms of the current situation for terminal-based NFC (RIM). In relation, it is claimed that alternative solutions, such as QR-codes, might be deployed at the present in order to attack this “chicken and egg” -problem, and for firms distributing these to exploit the open window of opportunities (SEB). However, there are several tendencies implying that the risen “chicken and egg” -problem is about to be overcome by industrial initiatives. For instance, all the new terminals from many big manufacturers come with built in NFC (Point). The merchants of course need to replace the existing terminals and this might take a long while since merchants do not want to invest in new terminals just because these facilitate NFC-payments, but the diffusion will go gradually, and by itself (Point). However, the chip and pin - terminals are being replaced at a higher rate than expected, because of the pace with which they are worn out (WyWallet; Swedish Trade Federation). What is more, terminals used by merchants that process higher frequencies of payments, such as big food retailers, will in that sense also wear out faster than low payment frequency related merchants (Swedish Trade Federation). These circumstances are, of course, only present in countries where PoS terminals are deployed at a wide basis. In southern Europe cash is still by far the primary mean of payment which means that merchants do not invest in new terminals on regular basis in the same way as in countries with high card penetration -rate (Accumulate). So, incentives to do so might have to come from NFC being present in the consumers’ mobile phones. Naturally, however, another difference in countries depends on the bridging between chip-and-pin/magnetic stripe payment card and NFC in the mobile phone. In many countries where the banks have made big investments in issuing these cards recently (e.g. in Sweden), they do not want to facilitate and stimulate CMP at PoS payments with the help of contactless NFC-cards, which also comes at a higher cost (Point; Swedish Trade Federation). In yet other countries and areas (e.g. UK) the contactless NFC-cards are seen as an incredible driver and user-stimulating incentive as the world awaits NFC compatible mobile phones (NPF – Kehlaoui, 2012) and especially the advent of an NFC-compatible Apple iPhone (NPF – Ragnevad, 2012). However, things are on the move with regards to NFC-compatible phones, and the initiatives are ignited by the pursuit of strategic differentiation of high-end smartphones from the device manufacturers by the deployment of NFC-compatibility (RIM). Usually, what differentiates high-end phones in the short run will eventually become a standard feature in the longer run. The multitude of application areas for NFC-technology will also act as driver, not only payments, which speak for a vast increase in NFC-compatible phones in a quite near future (Accumulate). Finally, new mobile phones are being purchased at a very high frequency - so it looks more optimistic than many have expected with regards to future NFC phones (WyWallet).

Conclusive Summary of section

This section in the analysis makes clear that there are both indirect and direct network externalities present with regards to CMP at PoS. These both factors are however incorporated into the subsequent parts of the section, which means that they will not be discussed individually even if their existence is noted. The factors regarding the possibility of firms with large established networks entering the market and the cost of adopting versus not adopting to the opportunity for such firms are discussed, and the analysis concludes that the entry of such firms is evident. Some large firms enter to defend their position in the payment infrastructure, whereas some enter because of possible leverage. However, even if this factor imposes disadvantages on smaller firms in several senses, the factor is not judged to be heavily influential on possible key impediments for the ecosystem. The three factors regarding the existence of in-place base, possibility of multi-homing and co-existence of networks were judged to be interrelated and pose no explicit obstacles to the evolvement of CMP at PoS. Moreover, a “chicken and egg” – problem was identified with regards to terminal-based NFC. However, indications are given that even if the diffusion will have different pace in different markets the factor might not be extremely impeding for CMP at PoS, even though it clearly slow down the diffusion process (contextual implications are however noted and emphasized in Chapter 7 - Discussion).

The two factors remaining that will be discussed subsequently are (1) the possibility of standardization and also (2) presence of standard wars (see Table 5), which are interrelated and pose some key issues to the ecosystem (see Chapter 7 - Discussion).
Table 5. The most prominent factors influencing the evolution and issues in the CMP ecosystem with regards to “Network Externalities”.

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<th>Network Externalities</th>
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<tbody>
<tr>
<td>Presence of direct network externalities</td>
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<td>Possibility of standardization</td>
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Table 6. Recall of key factors on “Switching Costs”, as identified in the comprised theoretical framework (section 4.6).

<table>
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<tr>
<th>Switching Costs</th>
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<tbody>
<tr>
<td>Presence of consumer welfare increasing policies</td>
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<tr>
<td>Possible complementarities and compatibility</td>
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For a reminder of the key factors identified with respect to this theoretical concept on Switching Costs, please see Table 6 above. To begin, what seems evident is that almost none of the smaller actors want to be connected to the possibility of lock-in effects, with proprietary solutions luring the merchants into a commitment which makes them feel trapped and exploited (Accumulate; Payair; Seamless). Also, the scheme payment owners are trying to be part of as many solutions they possibly can (RIM; NPF – Austin, 2012) and no specific switching incentives (Yang & Peterson, 2004) are created in the way of offering cash premiums and similar offerings to users. There seems to be a competition on presence, openness and user experience instead (Seamless; SEB). The MNOs have however been accused of forcing customers into a relationship by demanding utilization of their solution in order to purchase tickets for public transportation (Swedish Trade Federation; Seamless; Payair). Direct switching incentives aimed towards users regarding CMP at PoS will instead be the merchants’ mission, by discounts and promotions, and this incentive will only be created if the merchants see that they can gain something from leading the consumers into the use of CMP at PoS (Seamless; Swedish Trade Federation).

The potential of price competition (Wang & Wen, 1998) mostly relates to the presence of few firms (third party technology/service providers such as Seamless, and also MNOs if they manage to stimulate users to put money on an MNO-specific account) possibly excluding actors such as issuing banks and payment scheme owners. However, even if price competition theoretically could harm consumer welfare (Wang & Wen, 1998) the possible competition in the case of CMP at PoS regards establishing economical bonds with intermediaries such as merchants and other businesses, and not consumers explicitly. All types of providers seem exceptionally keen on not harming the consumers in any way, and user benefits, user friendliness and user experience are key words very impregnated in the evolving ecosystem around CMP at PoS. Some actors furthermore claim that charging vastly reduced fees (with card transactions as a reference) is not viable in the long run since the digitalization of the payment infrastructure continuously reduces costs and charges for cards (Payair) and there is also political pressure on lowering the card transaction fees currently taking place. In relation, the possibility of lock-in and exploitation of the customer (Klemperer, 1987a, 1987b, 1995) – in this case regarding the merchants and the potential of offering low prices initially and then raise them – is
something that merchants are worried about but can be regulate through contracts (Swedish Trade Federation). In terms of the consumers, there have previously been large accusations of the MNOs exploiting consumers in other types of mobile payments, such as SMS-ticketing for transit (Payair; Seamless), where the users have however not been locked in by initially low prices or switching incentives, but have rather been forced to pay a price based upon an oligopoly position among MNOs. This will however change as mobile wallets come along (WyWallet), which could be considered a statement regarding the importance of not making the users disappointed by belonging to a certain provider. Many actors claim that the evolving industry of mobile payments stand and fall with the overall ability of fulfilling user needs and expectations as well as keeping them content (e.g. Payair; SEB; Swedish Bankers’ Association; NPF – Trogen, 2012), further demonstrating that the industry is becoming increasingly consumer –driven. There are furthermore incentives and a will to create consumer welfare increasing policies (Klemperer, 1987b), which the cooperation between SEPA and GSMA indicates even if there are no legislations but merely guidelines on the table. These guidelines adhere to both NFC-based solutions as well as to QR-solutions, but presently to a much lesser extent with QR due to the technological novelty of QR in relation to CMP at PoS (Swedish Bankers’ Association), a matter touched upon subsequently (see section 6.5).

Moreover, in a mobile wallet there exist several possible ways of transacting money, and the several types of areas where the mobile phone could be taking over shares from current solutions relate to switching costs both created and overcome by complementarities and compatibility (Molina-Castillo et al., 2011) which is furthermore heavily influential in network externalities (see section 6.2). There is an educational, embedded force incrementally transitioning the consumer behavior and knowledge towards mobile payments, since all application areas (P2P, online, remittances etc.) are preferably present in a mobile wallet. The consumer might choose a starting point in one of the areas and gradually build up the confidence and familiarity towards the others (Swedish Bankers’ Association). Similar statements are that there is a tendency for online commerce, CMP at PoS and bills to blend together with spill-over effects (Swedish Trade Federation; NPF – Fredin, 2012). The infrastructure is key for physical payments, and a solution should preferably work at transit, at PoS and in venue ticketing for creating really large incentives for leaving cards behind (Swedish Bankers’ Association; NPF – Nilervall, 2012; NPF – Wantschura, 2012). These benefits can help overcome the switching costs compared to payment cards, but might create new switching costs due to familiarity, learning and a certain behavior once the user has decided upon which mobile wallet is preferred or fall into the user’s hand initially.

Additionally, one of the most important factors to overcome with regards to switching costs, according to numerous actors, is the setup cost (a subcategory of procedural switching costs, together with economic risk, evaluation and learning costs (Burnham et al, 2003)) of customer registration (Seamless; Payair; Swedish Bankers’ Association; WyWallet). This small inconvenience might make people continue to use their cards instead (WyWallet) but if the consumers are signing up for other services in the mobile wallet at first (e.g. paying bills or P2P services, or, for some MNOs; SMS-ticketing), the transferring of consumers towards CMP at PoS will become more frictionless. It is a constant challenge and aim to lower these barriers (WyWallet). Banks have almost one hundred percent penetration in most markets with regards to processing payments and holding peoples’ money which means that the accounts are already in place and they can lower the setup-barriers for consumers when switching to payments with their mobile phones (Accumulate; Seamless). This advantage is also evident for large independent actors such as PayPal with a huge registered customer base. The MNOs have a similar customer coverage as banks, but in order to separate the phone bill from the mobile payment bill (which is a primary incentive of joining the payment business for MNOs) the users need to register new accounts, which gives the banks a slight advantage compared to the MNOs in lowering setup-costs despite the many touch-points possessed by MNOs (SEB). However, the MNOs have another advantage. This stakeholder has the ability to pre-load their own payment applications into the mobile devices, which slightly reduces the ambiguity in logging onto a mobile application store and search for alternatives to download (WyWallet; NPF – Kehlaoui, 2012). This is an evidential benefit in reducing evaluation costs that does not depend on the possibility of
overestimating the tightness of the bonds with the consumer, which MNOs have been accused of and also agree with (Payair; WyWallet).

Since the majority of solutions are small, as well as often targeting niches, the confusion for consumers could be vast (Accumulate; PayPal). Too many options will create reluctance (Seamless). This notion relates to evaluation costs (Burnham et al, 2003) and is why standardization is needed according to many parties. Not even high-end consumers want numerous solutions in their phones for application on different occasions (SEB). On the other hand it seems as if actors aim for some sort of industrial convergence, even if they are independent providers. Payair for example are trying to tackle the consumer confusion by building relationships with actors that are already handling big streams of payments. Additionally, it is worth mentioning that almost all actors think that a multitude of technologies will co-exist – but it is the offerings or channels themselves that probably must become uniform in overcoming the procedural search and learning costs incurred by consumers when facing solution ambiguity (SEB; Swedish Bankers’ Association). On the other hand an interesting note on today’s world and societies is, contradictory, that people sign up for huge amounts of services all the time, and that they might not be as repulsive to payment application overflow as most stakeholders believe (WyWallet). Furthermore, there is a possibility that different providing stakeholders could have different roles in different markets (PayPal). However, there could be some serious implications with regards to learning costs after all. There are impediments with regards to learning costs arising by the differences among merchants, and not only by the differences and individual characteristics with regards to solutions. Some merchants rely on speed of purchase (e.g. lunch restaurants and bar environments) whereas others are not dependent on all at this factor (e.g. a jeweler selling two gold watches a day). Others want improved logistics and the possibility of for example ordering and paying before the user reaches the cashier (NPF – Nildervall, 2012; NPF – Wantschura, 2012). There are a multitude of differences which in turn affect the provided applications and raise the learning costs for consumers (Swedish Trade Federation). Moreover, there are learning costs for the merchants themselves; characteristics for this type of stakeholder namely include high employee turnover and numerous part time workers. So, the merchants might have to educate the consumers, but the solutions must be so non-complex than any cashier can understand it quickly (Swedish Trade Federation). Also, in some parts of Europe, for example during the Citizi-initiative, the MNOs took the key role themselves of learning both merchants and consumers how to use CMP at PoS (NPF – Kehlaoui, 2012).

Some actors are not extremely concerned about cost and price, but rather on customer experience (e.g. Payair). Worth mentioning, is that such statements indicate that certain actors are going to try on breaking switching barriers by differentiating on quality (Yang & Peterson, 2004). However, the merchants could generally be said to be more concerned about cost (Swedish Trade Federation), whereas the consumers care more about the ease of use (SEB), and the intermediary adoption of merchants are necessary for bringing the solution to the consumers (see section 6.5). Financial switching costs (Burnham et al., 2003) are very critical to merchants since they do not want a more expensive solution no matter what benefits it bring the end users (Swedish Trade Federation; SEB). This also highlights the importance of actors creating viable business models where no actor gets too greedy in order to make the switch from cards to CMP at PoS beneficial for merchants. However, there are actors such as Seamless, going into the battlefield with the promise of lowering the merchants’ transaction fees with 50% compared to card transactions, stirring the pot. The MNOs might in the end also challenge the payment scheme owners on similar terms (WyWallet). Such contenders could possibly create financial switching incentives so strong for merchants that the many other firm-constellations out in the CMP at PoS landscape might become obliged or at least inspired to lower the transaction fees and overcome financial switching costs (Swedish Trade Federation). With regards to the subcategory named benefit loss costs (Burnham et al, 2003), many actors promote alternatives to terminal-based NFC, such as QR-solutions, (in this thesis represented by primarily Payair and Seamless), but not all actors agree upon this. Both PayPal and SEB claims that QR-solutions (as a mean of payment) today provides no added value for consumers with regards to CMP at PoS, this concerns primarily the speed of purchase, a factor many agree that terminal-based NFC will improve upon (e.g. WyWallet). However, this slight disadvantage might be overcome by the
added functions that are included in almost every solution that provides a net benefit of switching, by providing transaction history, stored receipts, distribution of targeted offers and online contact with the user account (Payair). However, too many features could increase evaluation and learning costs (Burnham et al., 2003), so there is a fine balance and a possible trade-off regarding this matter since the complexity of solutions can avert consumers if too much features are added to a mobile wallet in the beginning (Accumulate).

Independent of which solution is utilized for CMP at PoS, whether it is QR-based or, possibly in the near future, NFC-based, the user always have the possibility of taking their registered user profile with them when switching mobile device. This, of course, regards NFC that keeps the payment credentials (SE placement) in either the SIM-card or in a “cloud”-based solution (RIM), which is the same function as QR-solutions are utilizing. NFC could suffer a switching cost disadvantage compared to QR and payment cards regarding this matter if the payment credentials were to be located in the device. Some actors therefore strongly advocate that the final SE placement decision will be the one that gives the consumers most value (NPF – Austin, 2012). Also, the distribution of QR-codes today have an advantage compared to terminal-based NFC and other solutions in terms of financial switching costs and economic risk costs for merchants, which relates to the independency of big initial investments, even if other switching costs appear. High initial investments is a barrier impeding the diffusion of CMP at PoS, since merchants as well as analysts of the mobile payment business do not know which actors will be winners in the game, and QR-codes and NFC-stickers are almost cost free (Seamless). However when terminals are replaced later on these will have built in NFC and this technology can compete on the same prerequisites as QR in terms of merchant investments (Point). Another advantage for terminal-based NFC is that data is only transmitted between the terminal and the mobile device, and no network coverage is needed, which is a must for many QR-solutions (Point).

Many actors furthermore raises the fact that future NFC-infrastructure will provide for so called “wave and go” solutions for micropayments (approximately 200 SEK/$25), that does not demand the user to enter a PIN-code for verification, hence maximizing the value of CMP at PoS (e.g. Accumulate; Swedish Trade Federation; NPF – Austin, 2012). Such a solution could break switching costs cards comprise in terms of speed, and speed is crucial in several touch-points where CMP at PoS could be implemented, such as in transit and voucher-purchasing for venues among other areas (Accumulate). However, no one knows if the consumer skepticism has increased too much towards these kinds of unsheltered solutions after hacking demonstrations has been performed on contactless NFC cards, utilizing similar functions (Seamless). Moreover, with regards to possible benefit loss switching costs for CMP as compared to cards, it becomes evident that merchants are worried about losing stored information, such as customer loyalty points etc. which creates uncertainty and incentives to bet on an actor the merchants think will survive in the long run (Swedish Trade Federation; Payair). However, this matter is nothing merchants need to worry about, since there are agreements regarding such matters (Payair; Seamless), but there is a need to communicate this. Trust towards the provider of the CMP-service is one of the utmost important factors, but the step is probably smaller from cards to mobile payments than from cash to cards (RIM). However, several stakeholders that are offering solutions explicitly aim on approaching banks and make them the cover of the solution, because of the banks trustworthiness and relations with customers in handling their money securely (e.g. Payair). This notion could of course indirectly relate to the presence of relational switching costs, but is more likely to be explicitly linked to economic risk costs (Burnham et al., 2003), since it relates to the presence and risks of unfamiliarity with a firm handling the users’ money or part of the merchants’ money flows. Actually, some say that the only way for smaller and unknown firms to successfully bring an impact on the industry is by exposing themselves through another channel or another brand (SEB). The trustworthiness regards payment scheme owners as well (Seamless; SEB), which also have created some type of user behavior set in stone, which might be hard for challengers to deal with (Seamless). Such factors might act as a non-negligible barrier for the vast amount of entrepreneurial European firms trying to cut a piece of the cake and bring about changes in the, until now, solid payments landscape.
Conclusive Summary of section

Firstly, no specific switching incentives were identified of being created by the providing firms with regards to CMP at PoS. The competition over consumers rather seems to be based on user experience, openness and presence among ecosystem inhabitants. Likewise, there seems to be possibilities for providers to differentiate on quality, which is beneficial for the overall welfare of the ecosystem since this possibility lowers the impact of switching cost (Yang & Peterson, 2004) and it brings no identified implications for the ecosystem. Furthermore, since the mobile phone applications offered by providers are downloadable for free, price competition to some extent becomes obsolete in competing over consumers. Instead, providers earn their money from transaction fees, a matter which of course might be subjected to some competition regarding the common objective of gaining the attention of merchants. However, the harmfulness of price competition relates to decreased welfare for consumers (Wang & Wen, 1998), and even if indirect linkages can be drawn indirectly in this matter, they are not evident. In relation, the possibility of lock-in and exploitation of consumers seems rather seems absent in under the circumstances, since the actors seem extraordinary careful in creating aversion among consumers. The merchants have expressed some concern on the topic, but the factor can however be regulated by contractual agreements and is not perceived to constitute a big impediment on the evolution of CMP at PoS. Regarding the presence of consumer welfare increasing policies they exist to a large extent and are continuously developed, which theoretically and objectively would be beneficial for the development. This factor is however subjected to issues, but since the factor is noted in section 6.2 and furthermore scrutinized in section 6.5 it is excluded in the section of switching costs, based on the comparably large implications it has for other areas. Moreover, the development and presence of complementarities as well as the extent of compatibility seem to favor mobile payments and CMP at PoS in overcoming switching costs in relation to debit and credit cards. However, switching cost might also be created between mobile wallet solutions because of this factor. In any case, the possible implications are discussed in relation to procedural switching costs (see below) and also preemption strategies (see section 6.1 and Chapter 7 - Discussion). Finally, no issues were identified regarding relational switching costs.

Seemingly, two factors are left for further scrutiny with regards to “Switching Costs”. These are (1) the presence of procedural switching costs and (2) the presence of financial switching costs, factors seemingly bringing implications for the evolvement and adoption of CMP at PoS (see Table 7). These factors and will thus be subjected to more discussion (see Chapter 7) before conclusions are drawn.

<table>
<thead>
<tr>
<th>Switching Costs</th>
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<tr>
<td><strong>Presence of consumer welfare increasing policies</strong></td>
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<tr>
<td>Creation of switching-incentives</td>
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<tr>
<td>Possibility of consumer lock-in and exploitation</td>
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<tr>
<td>Potential of price-competition</td>
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<td>Ability of firms to differentiate with regards to quality</td>
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<tr>
<td><strong>Possible complementarities and compatibility</strong></td>
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<td>Presence of procedural switching costs</td>
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<td>Presence of financial switching costs</td>
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<td>Presence of relational switching costs</td>
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Table 7. The most prominent factors influencing the evolution and issues in the CMP ecosystem with regards to “Switching Costs”.

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Table 8. Recall of key factors on “Diffusion of Innovations”, as identified in the comprised theoretical framework (section 4.6).

For a reminder of the key factors identified with respect to this theoretical concept on Diffusion of Innovations, please see Table 8 above. To start, it is important to distinguish between the different actors’ position in the value chain when relating to targeting of specific markets or user segments which in turn affect the diffusion process according to Rogers (1995). In relation to the CMP ecosystem; some actors are more of intermediaries, utilizing B2B strategies to target other actors which in turn utilize B2C strategies with the suppliers’ products/services (e.g. Accumulate). Others provide more end-to-end solutions where both merchants and consumers on the user-side are targeted (e.g. PayPal; Seamless; Payair), while others only target merchants (e.g. PSPs such as Point) or only the consumers (e.g. RIM). These different units of analysis or social systems (Roger, 1995) give rise to one essential question; whether the need for CMP is primarily merchant – driven or consumer – driven. It has been found that the actors’ opinions in this matter differ, but where the majority seems to strongly believe in CMP developments as primarily driven by consumers (PayPal; Accumulate; Payair). As the decision process to adopt or reject an innovation is stated to be made through a cost-benefit analysis (Roger, 1995), the merchants seem more driven by cost factors, while consumers adhere more to the characteristics of the innovation itself, such as the ease of use. Again; which factors that are most important for the providers to take into consideration differs with their view on whether the ecosystem is perceived as mainly driven by merchants or consumers. This can be linked to differentiation in actors’ strategies, where some obviously believe in a merchant – driven ecosystem by primarily competing on cost – factors (Seamless), while others compete more on behalf of consumer preferences (e.g. Payair; PayPal).

However, with regards to user segmentation in the diffusion process, it could be assumed that a clear link exists between merchants and consumers on the user-side of the CMP ecosystem, since the targeting of “Innovator”- like merchants could be seen as indirectly targeting “Innovator” - like consumers, as being the customers of “Innovators”. But, by instead targeting merchants of the more mainstream market (such as a big food retailer), the costumers would belong to both “Innovator” or “Early Adopter” -groups as well as more risk-prone and reluctant user segments. This in turn would imply that it is more essential to see to the end-consumers when targeting the market, instead of the merchants, which also seem to be coherent with the majority of the actors’ perception of a consumer – driven ecosystem (Accumulate; Payair; PayPal).

According to Rogers (1995), his work adhere more to incremental innovations, while the work of Moore (1999) and his Chasm-theory adhere more to radical innovations. Mobile payment solutions using SMS, QR or NFC stickers could in that sense provide more relations to the work of Rogers since the changes in infrastructure and usage are not as extensive as with NFC solutions, i.e. more radical innovation. Upon this claim, it would be riskier for NFC –solutions to fall into “the chasm”, which also could provide an explanation to SMS, QR and NFC stickers as gap-bridging solutions that co-exist with the evolvement in order to help the NFC ecosystem to cross the chasm. These gap-bridging solutions are further emphasized as having the possibility to be targeted towards more mainstream markets, since they have the possibility to be used by more or less all of these segments, with less risk
of falling victim to the chasm. This correlates with for example the device manufacturers targeting of more “Innovator” –segments, by initially offering NFC –capability in their more expensive high-end phones, more frequently bought by consumers that enjoy new features and functionality and who can afford it (RIM). Solution not built on NFC, are in that way not as deemed to only target these early user segments.

Overall, it seems as if smaller actors, with limited financial means and brand awareness, target not only more niche, specific user segments such as “Innovators”, but also provide more niche solutions, where a specific type of mobile payment is used in conjunction with a specific technology. A strong reason for this could be their limitations in capabilities, while larger more known actors with strong financial means tend to target the mainstream market to a large degree, i.e. several user segments at once, as well as providing richer and wider product solutions (PayPal), referred by Moore (1999) as more of “whole product”–solutions, which also facilitates for crossing the chasm.

What is interesting is that very few large scale rollouts of CMP at PoS have so far been made on the European market, while smaller, more targeted, nice solutions and rollouts/pilots have emerged in the thousands. One contributing factor for this could be that the majority of actors, small or big, are trying to target as many merchants they possibly can. The merchants that in turn respond and agree on such working relationships, might be more of “Innovator”–user segments due to their genuine interest in new products/services and more venturesome attitude to take a risk on a good idea. These types of merchants could also be more prone to try mobile payment solutions due to the fact that they see a higher added value in the solutions – e.g. lunch restaurants, bars etc. (Swedish Trade Federation; NPF – Nilervall, 2012; NPF – Wantschura, 2012) – compared to other merchants, perhaps not in need of speedy purchases. One strong reason for this setting is also the current low supply of NFC – compatible phones, which makes merchants more or less willing to make large scale investments in excess technology if they were to adopt it today. This makes merchants’ NFC adoption rate generally lower than those utilizing SMS, QR or NFC -stickers. What is more, actors with big established customer bases, like the banks, might be more prone to develop these “whole product” –solutions towards the more mainstream market in order to please the majority of their large customer base. Since these actors have the means to develop more wide scale solutions to please their consumers, they tend to align well with the motto “the more targeted users, the better” (SEB; PayPal; WyWallet). This also seem to correlate with some smaller actors’ targeting of more “Innovator” and “Early Adopter”–related user segments among merchants, such as retailers selling hi-tech electronic products (e.g. Webhallen, SIBA etc.) (Seamless; Payair; Accumulate), while some bigger actors have made efforts to target mainly merchants with more mainstream user segments, high payment frequency rate and wide distribution networks, such as big food retailers (PayPal; Point).

In accordance with Rogers´ (1995) idea of reinvention, (i.e. the importance for an innovation to evolve to meet the needs of more and more demanding risk-averse adopter groups), many actors seem to emphasize the importance of customer feedback whilst developing the respective payment solutions, in order to meet their needs at all times and adapt their solution to these (Payair; PayPal; Swedish Bankers Association). This could also implicate that CMP technology, whether it may be QR, NFC or something else, is something that is tested against the early user segments, which respond to the user experience and in turn affect further developments on the provider side of the ecosystem. Such cycles could also be exploited through free-rider effects by new actors entering the ecosystem, when users’ switching barriers have been diminished and technical- and/or market uncertainties have been reduced (see section 6.3 and 6.1). In relation to the notion that smaller actors tend to target more “Innovator” -user segments to a larger extent than their stronger and bigger rivals; reinvention could also be seen as a more important and proper strategy in order to grow proportionally with the actor’s present capabilities (Accumulate). Bigger actors might be more apt to survive a “bad investments”, hence not utilize reinvention strategies to the same extent. Even though this is a generalized opinion, the importance of getting the offer right at the first time (see section 6.1) to avoid further changes was advocated by for example Seamless, while the bigger actor PayPal emphasized on launching big scale solutions with huge marketing efforts only when they were certain that the solution were guaranteed some degree of sustainability through extensive consumer feedback (Seamless; PayPal).
It has also been evident that smaller companies generally tend to niche their solutions more than bigger players, not in terms of technology, but in terms of offering. It is further noticed that if a small company can successfully capture a small nice market on a regional or national level, and later take the same niche solution to a the global nice market, they could make a big impact (Accumulate; PayPal). This also aligns with strategies suggested by Moore (1999), in order to cross the chasm, by **gradually expanding business model from niche market**. One big challenge with this strategy, perhaps extra important to consider in relation to payments, is the vast contextual differences between countries which influence the prerequisites of successful implementation to a very large extent (Accumulate; RIM; WyWallet). Rogers (1995) emphasized on these environmental factors as affecting the speed of adoption, which makes this issue extra important to consider with regards to such strategies suggested by Moore (1999). Some actors emphasize on the need to first establish a local or national solution that gradually incorporates support for various payment types and services, such as transit, P2P, PoS etc, to only after that be able to grow on the international level with gradual increase in interoperability (SEB). This seems as the obvious way to go for a majority of actors, but there are exceptions. An interesting finding in relation to this is that the origin of the specific actor or stakeholder seems to have a big effect on this subject. For example, PayPal, with origin as being a huge global actor in the online business, is seen to go from the global market towards more niche regional PoS solutions in order to extend their business into mobile payments (PayPal). This approach is more a narrowing down to specific markets from once processing payments on a global scale, which make them less dependent on interoperability concerns related to market expanding strategies as suggested by Moore (1999).

Further, these seem to be a general shared vision among most stakeholders that it is important to provide more than just payments with the mobile phone in order for users to adopt it at large scale. As suggested by Moore (1999), it is deemed necessary to provide a **“whole product”** –solution in order to cross the chasm, since “Early Adopters” might not want to stitch together pieces themselves. In other words, this implies providing a solution to the customers’ problems in its entirety. With regards to mobile payments, this could imply more of a **mobile wallet** –solution, that works more or less everywhere at any type of purchase, e.g. P2P, PoS, transit, vending, and with the support for coupons, loyalty points, information access and the like. Such solution has been proclaimed by numerous actors as essential in order to reach a critical user mass (Swedish Bankers Association; NPF – Kehlaoui, 2012; NPF – Birkenes, 2012; NPF – Bukka, 2012). Also, this need was in hindsight stressed by management of the Citizi –initiative in Nice, as well as the Norwegian food-retailer –initiative Tap2Pay, as being of great importance, when building a **larger scale** CMP at PoS -system based on NFC (NPF – Kehlaoui, 2012; NPF – Birkenes, 2012). This correlates with previous findings that **bigger actors**, targeting more mainstream user segments, also provide more of these **“whole product”** –solutions. Other actors emphasized on issues in relation to reaching such a **“whole product”** –solution, such as the need for collaboration when creating an “open” mobile wallet with numerous stakeholders (NPF – Forsell, 2012) or that it is paradoxically not possible to develop such solution **prior** to the reach of a critical user mass (Seamless).

The diffusion of innovation –research also circles around factors affecting the speed of adoption, where mainly (1) environmental context (as briefly discussed), (2) user characteristics and (3) innovation characteristics are emphasized (e.g. Rogers, 1995; Wejnert, 2002; Hall & Khan, 2003; Hornik, 2010). With regards to environmental context, most actors seem to understand that the prerequisites for a successful implementation are very context-bound and unique depending on which European country you relate to. According to many actors, this depends on the unique countries’ specific infrastructure, power and constellations of major banking networks, value-chain integration rates, consumers’ willingness to adopt, card versus cash penetration rates, culture and much more, and are in that way vastly differentiated on multiple levels (Accumulate; WyWallet; RIM). This is also according to some actors the very reason for the many niche markets that have emerged, since payments are considered extremely local. However, this insight seems much more pronounced by actors that have implemented and been active with their mobile payment solutions on numerous European or global markets (Accumulate; RIM). The further away from this practical experience you get, the less the actors seem to understand how diverse these different European markets really are. Some actors mean that there are only slight contextual differences between European countries that...
affect payment applications, and therefore work hard on standardization aspects and united business models in order to speed up the adoption (Swedish Bankers Association). Most of these guidelines, primarily provoked by SEPA and EPC as well as larger banking initiatives, are however not particularly popular among the more aggressive actors, which notice their existence, but are many times strong resisters to this type of aligned development since the speed of adoption is seen to be greatly reduced. A great contradictive perception of market contextual factors is therefore present among different stakeholders, which also align with the CMP issues of innovation versus standardization (see section 6.2). It is not only on the European market that these environmental context factors seem to be present. Some actors also emphasize that the majority of national or regional solution are more apt and concentrated on urban, heavy smartphone user segments, while the majority of consumers living in suburbs and more isolated areas are not considered (e.g. WyWallet).

As a contrast to this, other actors state that from a holistic European perspective, the northern countries are more of “Early Adopter” types compared to the rest of Europe when it comes to CMP, and that the adoption seems to gradually spread from north to south (RIM). An interesting relation to this is that the card penetration rate are generally higher the further north in Europe you go, while cash is more used in southern European countries such as Spain and Italy (RIM; Swedish Trade Federation). This could also enable leapfrogging, since the value added by moving from cash to CMP are generally considered higher than when moving from cards to CMP, which instead would imply more of an adoption movement from south to north. As have been seen, some east European countries have been very fast in the adoption of CMP at PoS as well due to leapfrogging patterns.

User characteristic factors are also incorporated in environmental context in the bigger picture, but an interesting finding in relation to the adoption rate among consumers is that adhering to the younger generations’ willingness to adopt mobile payments. This willingness is by many actors seen as bigger with younger generations, due to their deep connection and heavy day-to-day use of mobile phones, compared to older generations (SEB; WyWallet). The younger generations are further seen more reluctant towards complex payments (NPF – Fredin, 2012). What is more, this seems to be highly interconnected with perceived trust towards certain stakeholders (NPF – Kehlaoui, 2012; WyWallet). For example, the banks might lose some of their very highly seen trustworthiness to the MNOs with the younger generations, since the relationship between bank and consumer is rather diffuse today, whilst MNOs tend to be more active in consumers day-to-day life, in some aspects at least (SEB; WyWallet). This potential transfer of trust is however not regarded as threatening for the banks according to some insights, but it could still be seen as a motivating factor for the banks as generally passive actors, to start engage more in CMP initiatives.

Finally, innovation characteristic factors are seen as greatly influencing the adoption speed according to diffusion –theory. According to the actors; some factors are seen as more important than others, and have been repeated by numerous stakeholders. With regards to the consumers, the CMP solution must be fast, secure (at least or more secure than card payment), convenient, simple, flexible, easy accessible, easy to sign up to and incorporate other value-added services (e.g. Payair; Point; NPF – Austin, 2012; NPF – Trogen, 2012; NPF – Ragevad, 2012; NPF – Kehlaoui; 2012). Overall, the actors emphasize on a solution that must have added value compared to card payments. It is also thought of necessary that a trusted brand stands behind the solution according to some actors (SEB; NPF – Kehlaoui, 2012). With regards to the merchants, the CMP solution must be fast, worth its price, i.e. cost efficient compared to cards, simple, have the possibility to utilize current payment infrastructure, be trustworthy and imply guaranteed payments and interoperability (e.g. SEB; WyWallet; RIM; Accumulate; Seamless; Payair; NPF - Trogen, 2012; NPF – Kehlaoui, 2012; NPF – Nilervall, 2012; NPF – Wantschura, 2012). Overall, the merchants seem to want increased productivity and increased consumer loyalty (e.g. NPF – Austin, 2012). In relation to Rogers´ (1995) identified factors of the innovation characteristics, the CMP solutions relative advantage over foremost payment cards is greatly stressed (e.g. faster, simpler, more convenient usage). Compatibility is according to some actors further important (e.g. utilize current infrastructure and have at least as high trustworthiness and security as card payments). Also, the innovations complexity is stated to affect the speed of adoption negatively, and as have been stated by numerous stakeholders, since ease of use and convenience is a seen as a key factors. The last two factors stated by Rogers (1995); trialability and observability, was not explicitly recognized by the stakeholders as key factors, which
also strengthens previous research on the three first mentioned factors as being most important for adoption speed in the diffusion process. An important consideration marked by Bengt Nilervall (Swedish Trade Association) was also that although simplicity is regarded by most stakeholders as a key factor, it is hard to define what simplicity really is – it is truly in the eye of the beholder. This aligns with some CMP at PoS initiatives, which have been seen being incorporating many more steps in the payment process compared to card payments.

As a final note, in relation to theories on diffusion; it is clear that no critical mass or tipping point (approximately 15-20 % market penetration) has yet been reached with regards to CMP at PoS on the European market. Also, the majority of stakeholders share the vision that it will take considerable time to reach such critical mass and visions of one, three, five years or even more have been suggested (e.g. RIM; PayPal; SEB; Swedish Trade Federation).

### Conclusive Summary of section

Firstly, with regards to targeting of specific user segments with solutions from the provider-side of the CMP ecosystem; both initial targeting of “Innovators”, then sequential user segment adoption (as a continuum), as well as initial targeting of mainstream user segments were found to be present as strategic decisions. Since the adoption of CMP on the European level seem to be primarily consumer – driven (instead of merchant –driven), these strategic decisions were targeted towards consumers at a larger extent. No explicit implications affecting the evolvement of the industry was however found in relation to these strategies, only the notion that larger actors might be more apt to target more mainstream segments due to their richer capabilities to do so, as well as to please their already large customer bases. The idea of reinvention was further coherent with the majority of the stakeholders which practices extensive consumer feedback, in turn bringing value to the ecosystem as a whole, and especially the end-users. Smaller actors were also found to target more nice markets, not in terms of technology, but in terms of offerings. Some were also using such strategies with the vision of gradually expanding their business model from the niche market, in order to progressively capture larger market shares. A challenge impeding such strategy was although found as the vast contextual differences in-between countries on the European market. This might act as a big obstacle when expanding internationally (however more tied to the key factor environmental context factors touched upon later). More incremental innovations (coherences with SMS, QR and NFC stickers –based solutions) were found to act as gap-bridging solutions that co-exist with the evolvement in order to help the NFC ecosystem (more radical innovation coherences) cross the infamous “chasm” (Moore, 1999). As such, these findings are all for the greater good, if the vision of a future NFC ecosystem is to be reality, which most actors seem to agree and wish upon. The creation of “whole product” – solutions, also emphasized by Moore (1999) as a well provoked strategy in order to cross the chasm, was something that in a larger sense were more developed by larger actors, but which was seen as an important consideration even for the smaller counterparts, by realizing the necessity to provide value added services on top of the mere mobile payment experience. However, too many “on-top solutions”, even though they might raise the overall value by creating more of a “whole product” – solution, was found to have the implications of also scaring the consumers to perhaps not adopt CMP in the first place. This issue is also incorporated, and will be treated in, the key factor procedural switching costs (see section 6.3 and Chapter 7 - Discussion), hence not lifted out here as an additional matter.

Since innovation characteristic factors affecting adoption speed was found consistent with previous findings, and not directly relating to further issues for the ecosystem, two factors are left to investigate which have shown most crucial or issue –related tendencies towards the evolvement of CMP at PoS in Europe. These two key factors are (1) presence of environmental context factors and (2) presence of user characteristic factors, both affecting the speed (and possibility) of adoption (see Table 9). These two factors will thus be subjected to more discussion (see Chapter 7) before conclusions are drawn.
Table 9. The most prominent factors influencing the evolution and issues in the CMP ecosystem with regards to “Diffusion of Innovations”.

### 6.5 Ecosystem Evolvement

<table>
<thead>
<tr>
<th>Ecosystem Evolvement</th>
<th>Presence of physical dominators</th>
<th>Competition over designs and standards</th>
<th>Coherence in perceptions, understandings and vision among ecosystem members</th>
<th>Presence of dynamic and agile actors</th>
<th>Incorporation of feedback from consumers, competitors and institutions</th>
<th>Necessary intermediary adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Establishment of ecosystem roles and responsibilities</td>
<td>Emergence of a dominant design</td>
<td>Incumbent challenges and prerequisites</td>
<td>Early venture challenges and prerequisites</td>
<td>Relative ease for firms of providing similar/imitated offers</td>
<td></td>
</tr>
</tbody>
</table>

Table 10. Recall of key factors on “Ecosystem Evolvement”, as identified in the comprised theoretical framework (section 4.6).

For a reminder of the key factors identified with respect to this theoretical concept on Ecosystem Evolvement, please see Table 10 above. For a healthy ecosystem to emerge, prosper and meet the consumers’ needs, the firms present in the industry need the ability to adjust in accordance with market shifts, and niche firms need the ability to cope with idiosyncratic moves of larger actors on which they depend (Pierce, 2009). This notion regards the presence of dynamic and agile actors. There are many technically focused solutions on the CMP market focusing on niches (Accumulate). However, technology providers such as Accumulate work with solution oriented payment processes, and are somewhat technologically independent. However, even if they could possibly be labeled niche-players, other third party actors such as Seamless and Payair are also well aware of possible shifts in consumer wants and the dynamic market, which has lead these firms to develop the ability of coping with many different technological solutions for initiation of their payment applications. The PSPs are also prepared for the market dynamics, with solutions independent on NFC Secure Element placement, and also have the resources necessary to cope with a large actor rising with regards to CMP at PoS, for instance MNOs. The PSPs could thus provide support for such actors if the game of CMP at PoS would play out in such ways (Point). Others, generally larger, actors have specific targets of entering all types of payments, for instance CMP at PoS, at a somewhat later stage (WyWallet; SEB; Swedish Bankers’ Association). This provides room for agility and flexibility in relation to market demand.

With regards to feedback from consumers, competitors and institutions as the primary prerequisite for a valuable ecosystems (Moore, 2006), it becomes evident that all examined providers regard consumer feedback as a key of succeeding and surviving in the ecosystem. It does not matter much whether the firm is a large independent provider such as Google or PayPal, that can process loads of feedback, or if you are a small firm present in a few stores – the customer feedback might be just as relevant (PayPal). This to a large extent holds for observing competitors as well. However, there are some observations
worth mentioning with regards to institutional feedback. For terminal-based NFC for example, SEPA are setting guidelines for how possible business models could look like in terms of this technological solution, and some members go even further and says that a standard must be set as soon as possible (Swedish Bankers’ Association; NPF – Trogen, 2012). The responses regarding the guidelines and possible business models are quite explicit. Some call it out-of-mind attempts to bureaucratic innovation from institutions that do not understand dynamics (Accumulate) and also non-applicable and redundant (SEB). Some process the feedback and guidelines, such as the MNOs, but do not really engage in the directives (WyWallet). The above statements indicate that there are different views, visions and attitudes among the stakeholders, something that could possibly damage the health of the evolving ecosystem (Moore, 2006; Adner, 2006), and a matter touched upon subsequently in this chapter.

All actors present in this thesis emphasize the greater good in huge amounts of companies pulling together and competing in establishment of mobile payments and CMP at PoS. It is said to to create customer awareness, drive forward better solutions and create paradigmatic change in society, and also forge the way different types of payments blend together with a multitude of other areas provided by the technologies in play. Moore (2006) argues that the welfare an ecosystem can bring to the world is dependent on shared vision among ecosystem inhabitants. So, however, even if the previous statement from the collective force of actors is inspiring, there are still matters where perception and visions clearly differ among stakeholders. Great extent of cooperation between different providers and other stakeholders is a necessity for a solution benefiting the consumer the most (Swedish Bankers’ Association), and most actors believe in large scale interoperability for CMP at PoS in the long run. Stakeholder views seem to explicitly differ where it comes to contextual implications, and indications are given that the context plays a big part in establishment of roles with regards to CMP at PoS. There are no impediments of interoperability from a technological point of view (Swedish Bankers’ Association), but applicability of a solution depends heavily on established payment infrastructure and agreements between parties in different countries (Accumulate). Some stakeholders, such as institutions and consortiums, might want to set common European business models, but that impedes solution development (SEB; Payair). Differences between countries regard primarily extent of integration and alliances in existent value chains for PoS-payments, and also the distribution of stakeholder power within these chains and networks. In some countries there are almost monopolistic tendencies (Accumulate). On the other hand, many stakeholders aim on crossing borders with their solutions or say that that the European context can be generalized. However, indications supporting the view of context dependency are that CMP at PoS solution today are extremely localized (SEB), and Europe shows a lot of niche solutions compared to broader expansions and initiatives. Furthermore, numerous actors see benefits with building CMP at PoS payment infrastructure upon the current PoS infrastructure for various reasons (e.g. Accumulate; Payair), whereas some disagree and also make it their core mission to challenge the established infrastructure and value chains, where Seamless is the example in this study.

Some actors look at technologies such as QR and NFC as mere means of identification (Seamless; Payair), which they of course are, but such statement do not take into account that there is just an enclave in the ecosystem looking at the matter in this way. Most actors are focused on and cheer for the development of terminal-integrated NFC at the PoS. However, the necessity of offering solutions that merchants and consumers can utilize today is what has provided firms distributing QR-solutions with lots of valuable reputation, showing that there is room for co-existence of technologies, even if many actors think that terminal-based NFC will be the dominating technology in the long run due to for instance magnitude of investments (WyWallet), multitude of application areas (Accumulate), interoperability (Swedish Bankers’ Association) and pressure from the European Union (SEB). QR on the other hand, except from gaining advantages for being here at the present (see section 6.1), can gain some advantage from spillover effects due to the technology’s applicability in online commerce and bill payments (SEB). QR-solutions furthermore have the advantage of simpler generation and distribution (Accumulate). However, competition over designs and standards, in this case both between QR/NFC-stickers and terminal-based NFC, might prevent harmful dominating firms arising at an early stage in the ecosystem evolvement (Aldrich & Fiol, 1994). In the case of terminal-based
NFC, what prevents standards from being put through at a political (SEPA) level is uncertainty regarding the future, since SIM-cards for instance might not even exist in the future (concerning NFC Secure Element placement) and standardization with regards to security would take too long to change if a breach was discovered (Swedish Bankers’ Association). If no legislative enforcements regarding standardization are put through, it might take a very long time for this industry to crystallize. However, if such legislations where put through it would have a vast influence for all European countries (Swedish Bankers’ Association).

Several providers distributing solutions to the market states that technological uncertainty is not a problem (Payair: Seamless; Accumulate; Swedish Bankers’ Association; SEB). The products rather concerns the distributors’ payment applications embedded in the mobile phone, which in many cases are technologically independent or easy to modify with regards to technology used to initiate the application. Hence, the offering is not something concretely physical, but not either entirely a service. In this sense, even if CMP at PoS is also a physical matter, it is hard to conclude upon the concept of dominant design in relation to mobile phone (smartphone) payment applications, a concept more apt with regards to the carrier of the application i.e. the smartphone itself. Both QR-codes and, especially, NFC-technology has extensive amounts of application areas which could become embedded in a provider’s solution (Accumulate), which in turn means that the offering from the provider could be differentiated numerous times. When firms can differentiate vastly on experience and benefits of an offering (and also buyers’ preferences are diverse and uncertain), it usually takes longer time for an up-and-coming industry to converge and consolidate (Klepper & Graddy, 1990). This might very well be the case for CMP at PoS, due to the fact that the PoS payment itself will usually be part of so-called mobile wallets, providing several application areas for the different contents within it. However, on the contrary, the many solutions may look the same for the consumers on the surface, i.e. they are merely icons in a mobile application store. This is one matter making firms emphasize the importance of distribution (e.g. Payair; Seamless) and to get as many touch-points as possible and create network externalities (see section 6.2), incentivizing ad hoc and strategic cooperation (Pierce, 2009). Seemingly related, cooperation often arises in evolving ecosystems due to the objective similarity in offerings (Aldrich & Fiol, 1994). The visible stakeholder endeavor for increased presence benefit firms utilizing cooperation, which implies (in this case when the payment applications are easily accessed but hard to judge by cover) an aim on trying to overcome the search and evaluation costs incurred upon consumers (see section 6.3). Most actors want to distribute solutions other providing firms can join or utilize (Seamless; Swedish Bankers’ Association; Accumulate) in order for the number of market channels to converge. In addition, some actors say that cooperation between certain parties might not be affected by transitioning between different technological solutions (e.g. Payair; Seamless). However, such statements might depend upon the assumption that either no terminal-based CMP solutions will occur in the foreseeable future, or that over-the-top solutions will co-exist with terminal-based solutions to a large extent, where the latter is the most likely scenario according to most actors (e.g SEB; Accumulate; RIM; Point). Finally, when it comes to the development and evolvement of terminal-based NFC, cooperation and establishment of stakeholder roles is a very delicate issue bringing many implications. According to Swedish Bankers’ Association, this is the single most important impediment for CMP at PoS as of today’s date, and is discussed below.

In this evolving ecosystem, both factors of competition over designs and standards, and furthermore shared perceptions, understandings and vision among ecosystem members relate greatly to the factor regarding establishment of ecosystem roles and responsibilities. Whereas QR seems to raise curiosity among merchants, the evolving industry at a European level still at large have eyes focused at terminal-based NFC as the ultimate target (e.g. NPF – Austin, 2012), and most roles and responsibility matters concern NFC, which could be related to the novelty of QR as technology facilitating payments (Swedish Bankers’ Association). For such reasons, the debate regarding roles, responsibilities and value chain power mostly center on terminal-based NFC at the present. Many more stakeholders get involved in NFC-schemes (Accumulate), and this is problematic on many levels. Many actors want to be part of the terminal-based NFC scheme, but only a few actors really can be part of it (SEB). For instance, many stakeholders do not want more actors than is necessary in the value chain, and claim that MNOs do not bring much value to the scheme, but this actor still wants in at any cost.
Inviting MNOs would vastly complicate the infrastructure according to some actors (e.g. Payair) and it is not clear whether this type of firm has a natural role to play with regards to CMP at PoS (SEB). Therefore, the establishment of viable business models is the most crucial matter impeding terminal-based NFC to take off. Other actors claim that even in the current PoS payment infrastructure the number of actors is far too large, and that certain established actors are redundant and only contribute with costly transactions (Seamless). Complicating the crystallization of stakeholder roles further, the PSPs are developing multi-functional terminals where not only payments can be used, but also vouchers and loyalty cards among other things, opening up for even more actors top enter and utilize this node (Accumulate).

A matter heavily touched upon in this thesis; the placement of the NFC Secure Element (SE) at either the SIM-card, integrated in the mobile phone or placed on a memory card, is subjected to further questions (and relate to the sometimes seemingly absent factor of shared vision and perception, previously mentioned). Some actors think that integrated NFC SE is a more viable placement (e.g. Accumulate), others believe the SIM-card to be best placement (SEB), while certain actors claim that many providers would rather see a cloud-based solution or other solutions where payment credentials are not connected to hardware at all (Payair). All the actors holding these perspectives claim that the other options would increase complexity of business models. There is a great likelihood that there will be hybrid solutions in the future markets, because of the many stakeholders wanting to own the payment flows (RIM). The placement of the NFC SE is hence a question of payment distribution, and there is a grounded fear among other stakeholders that the MNOs would extract too much profit and become some type of ecosystem dominator which is a type of firm-positioning harmful to the environment it operates in (Iansiti & Levin, 2004). If the SE would be placed on the SIM-card, the MNOs feel that they would have a natural role in the ecosystem (WyWallet). There is a good chance that the MNOs could succeed in placing it there, despite several stakeholder complaints, since what speaks against a phone-integrated NFC SE is that the MNOs control about 80% of the cell-phones sold today, since the phones are tied to subscriptions, which however also brings the possibility that even if the NFC SE becomes integrated in the mobile device, the MNOs might demand the control of it regardless (Accumulate; WyWallet). One implication such an operator-centric scenario could bring, not concerning revenue streams but rather impediment of network externalities (see section 6.2), is the certain specifications regarding API:s (Application Programming Interface) MNOs could bring about. This would force any third party developer wanting to utilize the payment credentials for development of an application to develop a dialogue with each and every MNO they want to interact with (RIM). This implication naturally gets enforced if the MNOs are not operating in consortia, as they however do in several European countries. Furthermore, banks and MNOs are really big competitors in this field (SEB) and there is an ongoing struggle on high level (WyWallet), and both types of stakeholders are forming consortia with regards to solutions in order to be able to achieve bargaining power towards each other. Banks naturally prefer the NFC SE integrated, since there is a present risk that they otherwise would end up as a back-end financial source only (SEB). Other actors suggest that the de facto definite SE placement will be the one that gives the consumers most value, hence putting the consumers in the balance of power in this situation (NPF – Austin, 2012).
could be regarded as an incumbent challenge but there is not a lot that speaks against further domination and impact by firms such as Visa and MasterCard since their market linkages seem almost intact. This is due to the many new providers wanting to rely upon established infrastructure and partnerships with well-known brands in order to access established market channels, and intact market linkages and complementary assets most often favor incumbent firms over entrants and challengers (Rothaermel et al, 2000). The payment scheme owners furthermore try to tie important nodes such as mobile device manufacturers (RIM) and large service providers such as Paypal and Google (PayPal), in marking their presence and receive strategic advantage in the formation of the ecosystem around CMP at PoS. However, actors such as Seamless have been applauded by merchants and providers for challenging these established brands and even excluding them, which hopefully can stimulate similar initiatives and provide some real competition for the payment scheme owners (WyWallet; Swedish Trade Federation).

In a sense opposite to dominator roles, Aldrich & Fiol (1994) argue that early ventures in emerging ecosystems suffer from trust-disadvantages compared to established firms coming from industries seemingly related to the new opportunity. As a matter of fact there are also such tendencies noticed in the evolvement of the ecosystem around CMP at PoS. Trust is extremely important, and even if a providing firm’s offer is tempting for merchants and challenges established patterns, the lack of trust might become a large obstacle to overcome for entrepreneurial firms and newcomers. Contributing to the lack of trust for entrepreneurial firms is not only the disadvantage of being a new player, but furthermore if the pursuit of an actor regards challenging the current infrastructure in the payment ecosystem. This raises questions of risk management, technology performance and capability of fraud investigation (Payair; SEB; Swedish Trade Federation), and such questions might create big barriers for firms intending to raise some noise. Seamless, a third party service provider representing challengers of the established infrastructure, are to some extent experiencing these matters, even if the firm’s offering have obtained much attention. Furthermore, size and resources could in themselves pose expansion-related challenges, and reduce potential to compete over mainstream consumers (Point).

Lastly, there are institutional aims that a solution should work everywhere in society to maximize welfare for consumers (Swedish Bankers’ Association), and the several applications areas of today’s CMP at PoS technologies certainly allows for such a scenario to rise theoretically (Accumulate). However, each payment at PoS situation requires the adoption of different intermediaries. The more intermediaries that must adopt an innovation before the end users can adopt it – the more risk it carries (Adner, 2006). This notion concerns as well cooperating distributors as merchants. The offering of a sole or a few solutions applicable at a huge percentage of venues, transit, restaurants, stores, bars and several other locations, might take an industrial consolidation so extensive that it would seemingly take multiple years, especially also regarding the necessary adoption and diffusion process for the intermediaries (see section 6.4).

Conclusive Summary of section

The presence of dynamic and agile niche-firms in the evolvement around CMP at PoS seems evident, and the larger firms seem very adaptable to the environment as well, which is one factor contributing the overall value and health of an ecosystem (Pierce, 2009). Feedback from consumers and also from competitors is being incorporated to a vast extent by the providers within the ecosystem and is regarded as a key factor of success in many cases, and the presence of this factor is valuable for the ecosystem in creating welfare for consumers (Moore, 2006). However, there are implications with regards to feedback from institutions but this notion is evaluated in relation to the factors perceptions, understanding and vision among ecosystem members as well as the factor regarding establishment of ecosystem roles and responsibilities (see below). Additionally, the event of competition over designs and standards in the evolving ecosystem is present, and this factor might contribute to the ecosystem’s wellbeing in terms of preventing harmful dominating firms to arise and exploit the other inhabitants (Aldrich & Fiol, 1994). There is however some implications tied to this factor, but these are discussed more heavily in relation to the factor possibility of standardization (see section 6.2) and also incorporated implicitly in the factors of perceptions, understanding and vision among ecosystem members and establishment of ecosystem roles and responsibilities (see below). Moreover, the
establishment of a dominant design is a matter having been touched upon in this section. However, the factor is both difficult to relate to CMP at PoS because of the characteristics, complexity and nature of distribution channels, physicality of product and infrastructural aspects. However, the analysis suggests that differentiation can be pursued by firms for quite a while, which in turn suggest that industrial convergence will take a fair amount of time (Klepper and Graddy, 1990). There might be implications tied to this observation, but they are however not explicitly evident and not regarded as key factors stalling areas of the ecosystem. However, on the surface the offered solutions might look similar to consumers and this is assumed to be a factor contributing to firm cooperation (among others) in the establishment of CMP at PoS, as a facilitator for gaining more market presence. However, the factor itself is judged to have more direct impact on procedural switching costs (see section 4.3 and section 6.3) with regards to possible industrial implications and is discussed under that label. With regards to incumbent challenges, no heavily influential factors with regards to CMP at PoS impediments were identified, except that the survival of the incumbents seems to be quite evident due to the observation that many incumbent market channels and user bases might be somewhat intact. Similarly, with respect to early venture challenges the issue of lack of trust was raised. However, despite being seemingly influential on ecosystem evolvement, the both previous factors are not regarded as causes for key issues in the ecosystem. The factor concerning necessary intermediary adoption is considered important, since the more intermediaries that have to adopt an innovation before it reaches the end user, the more risk the solution carries (Adner, 2006). This factor is however instead discussed in relation to the factor of possibility of standardization (see section 6.2). Finally, the presence of physical dominators is to be discussed with regards to the factor regarding establishment of ecosystem roles and responsibilities.

The two most critical factors influencing ecosystem evolvement has been judged to be (1) lack of coherence in perceptions, understanding and vision among ecosystem members and (2) uncertainty in establishment of ecosystem roles and responsibilities (see Table 11), and are discussed in the next chapter.

<table>
<thead>
<tr>
<th>Ecosystem Evolvement</th>
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<tbody>
<tr>
<td>Presence of physical dominators</td>
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<tr>
<td>Establishment of ecosystem roles and responsibilities</td>
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</tbody>
</table>

Table 11. The most prominent factors influencing the evolution and issues in the CMP ecosystem with regards to “Ecosystem Evolvement”.
7. Discussion

This chapter aims to discuss the most critical factors that pose challenges and issues for the evolvement of the CMP ecosystem. These factors were highlighted in the previous chapter under each and every theoretical concept as being of most relevancies to the objective of this thesis. Thus, this chapter will provide an answer to the second research question (RQ2), posed in section 1.4.

One of the most evident influences on the evolution and diffusion of CMP at PoS in Europe relates to disagreements and competition regarding the placement of the NFC Secure Element (SE). This issue is also noticed and widely discussed in current writings on the topic of mobile payments and CMP at PoS (see e.g. section 3.2.1 and section 3.5) with regards to the distribution of power in the evolving ecosystem. However, put in the light of theories on industrial dynamics, it seems likely that the issue does not only carry such direct influences - but also bears implicit characteristics affecting the industry evolvement in the longer term. What seems to be a primary reason for several unbalances and different views in the ecosystem is the advent of a large possible type of stakeholder, who wants to take advantages of its relation to the focal distribution channel of mobile phones and enter the industry of payments. The type of stakeholder implied is of course the MNO. Almost all stakeholders in the industrial sample of this thesis questioned the involvement of MNOs in terms of the ability for this type of actor to add value to CMP at PoS in relation to desired extent of control this actor wants to possess. However, the rise of so called smartphones are affecting the telecom industry by facilitating for so called “over the top” -solutions in forms of mobile phone applications, which by utilizing internet connection can provide free calls and text messages for consumers. This in turn makes MNOs anxious to find new revenue streams, and they are very persistent in marking their presence in the formative years of mobile payments and CMP at PoS. Even if there is a resistance and questioning of the added value the MNOs might bring – among both incumbent stakeholders in the payment industry as well as newer actors – there is particular reason the MNOs might influence the establishment of roles in the NFC -payment value chain vastly. The rationale being that a large majority of mobile phones sold today are bound to subscriptions provided by MNOs, so, their presence and possible influence on the playing field seems evident. Thus, the advent of MNOs as a stakeholder makes the power struggle and issues regarding business models evident with regards to increased complexity of infrastructure. Additionally, MNOs know that they want in on the opportunity, but not in all countries are viable strategies present for how this stakeholder will enter CMP at PoS, which create further ambiguity. The presence of MNOs contributes greatly to the different views and industrial ambiguity with regards to the placement of the NFC Secure Element, as indicated above and argued around in Analysis – Chapter 6.

However, the arguing around the NFC -payment value chain and its business models as well as the stakeholder ignorance and aversion towards institutional (SEPA and GSMA) efforts on industrial guidelines, as well as discussions of possible standardization for terminal-based NFC, have opened up a window of opportunity for firms utilizing other technologies than standardized NFC to enter the playing field. Since terminal-based NFC is somehow stalled by the previous matters discussed, solutions such as QR-based ones are becoming increasingly present in the meanwhile, creating a kind of standards war (see section 4.2). The providers of other solutions than standardized NFC to a large extent seem to try to create first-mover advantages by the utilization of preemption strategies, which might bring a non-negligible load of implications for the forming ecosystem. Indications are given that actors utilizing this strategy are noticing that others try to do the same, and that procedural switching costs (in this case mainly concerning evaluation- and learning costs) incurred upon consumers (due to the increasing number of solutions offered) is something that must be overcome in order for CMP at PoS to gain momentum. Therefore, as well as for utilizing network externalities present, these providers are trying to facilitate solutions which other firms can join. In this way, many providers are trying to become some sort of standardized intermediary solution (their own words). Numerous countries in Europe display similarities on the matter, which poses the possible implication of CMP at PoS becoming extremely localized if domestic solutions are gaining fast spread in the diffusion process. Moreover, it is claimed by firms utilizing preemption strategies (and providing alternative solutions to standardized NFC) that they can make a smooth transition towards NFC-technology if agreements upon standardization could be made. However, the placement of the NFC Secure Element
might play a big role also on such statements, and if it was to be placed in the SIM-card (as MNOs want), great industrial tensions could become present. Since, if the providers of example QR-solutions would be keen on making a transition towards standardized NFC (in order to utilize interoperability, for instance) they might be forced to develop applications based upon the API (Application Programming Interface) -specifications of each MNO present on the concerned market, which they might refuse. This issue, as mentioned with regards to ecosystem evolvement (see section 6.5), is more present in countries were the MNOs have not formed consortia (e.g. joint-ventures) and thus also to some extent displays context-dependency. However, there is one even larger issue possibly arising in relation to the above remarks. If preemption strategy is successfully used by local actors they might not want to adhere to a solution utilizing a physical Secure Element at all, since it might cut the profits if the provider would have to share their revenue with other actors in the offered value chain. If considerable bargaining power was to be created by indigenous providers of solutions in various European countries it might hamper the diffusion and spread of a large, interoperable solution. This matter further ad to the possibility that CMP at PoS would become largely localized for quite a time to come. Also, if enough momentum could be built up around for instance QR –code solutions before terminal-based NFC catches up, there is a possibility that these alternative CMP solutions could be sustaining for quite some time, as seen in diffusion –theories, if a critical user mass gets reached and the adoption rate start to increase exponentially. However, these more alternative CMP solutions which have seen great progression due to its many advantages such as low investment costs (lowering the financial switching costs) for merchants (through QR –based solutions and NFC stickers), might not only act as subjects of standard wars and preemption strategies to exclude terminal-based NFC solution. As a matter of fact, these alternative mobile payment solutions (more of incremental innovations) might very well be the perhaps most valuable thing for terminal-based NFC (more of radical innovation) to become a future standard. This is due to the fact that these alternative CMP solutions most probably will act as gap-bridging (also “chasm-bridging”) -solutions in their co-existence with terminal-based NFC, in the sense that they will lower the switching barriers among consumers, by learning them how to use and handle mobile payments, and to make them realize what kind of value added lies behind it.

A further matter with regards to the utilization of preemption strategies regards the very nature of first-mover advantages – they can only be created if you are early. This matter has to some extent been shown to imply a trade-off in relation to security. All actors of course emphasize security as the probably most important aspect of mobile payments, but if a firm decides to hit market too fast in order to gain first-mover advantages the solutions might just have been considered “secure enough”. This has been evident in the case of Google and its Google Wallet, which was discovered to have big security breaches. Such events are considered to contribute not only to damaged reputation of the providing stakeholder, but also to the reputation of the whole mobile payments industry. This theme also applies to the establishment of roles in the ecosystem, where providers and institutions accentuate the dangers of large established firms pushing out solutions that almost spans end-to-end in the CMP at PoS value chains. There is an overall emphasis that each actor needs to find a role where they fit, doing what they do best. At the same time, being incentivized by possible gain of market shares and possible increase in revenue created by grasping an opportunity is embedded in the very nature of many firms.

In relation, the risk of doing things wrong, and distributing an inadequate solution that possesses flaws with regards to security, seemingly contributes to the tendencies of incumbent inertia for banks in general. The technological uncertainties regarding this matter make banks hesitant since they have much to lose with regards to trustworthiness and reputation of being able to handle money, which is the paramount foundation upon which this stakeholder rests and relies. In order to maintain trust, banks in general do not even seem reluctant to the possibility of placing the NFC Secure Element on the SIM-card if this solution should be proven to be the most secure. This is an interesting note, since banks and MNOs are big competitors with regards to standardized NFC, and banks are very aware of that they would be benefited more both with regards to value chain power and revenue streams if the NFC Secure Element was to be integrated in the mobile phone. So, to some extent, the general decision of banks to proceed incrementally towards CMP at PoS seem reasonable, especially when
taking into account their ability to overcome the procedural switching cost of set-up costs (see section 6.3), which allows for some delay before going full speed. However, user characteristic factors affect the adoption speed, and in relation to this it has been found that the younger generations’ willingness to adopt mobile payments might be much bigger than the older generations. Also, the younger generations’ deeper connection and heavier day-to-day use of mobile phones might be highly interconnected with perceived trust towards certain stakeholders. Banks might for instance lose some of their very highly seen trustworthiness towards stakeholders like the MNOs or bigger companies like PayPal, also due to the fact that the banks tend to take a smaller and smaller part in consumers day-to-day life compared to these other stakeholders. Since trust is seen as one of the cornerstones according to many stakeholders – when it comes to taking the role as a TSM, or the role of holding the payment credentials on the SE – this might affect the banks negatively in this relationship.

With regards to CMP at PoS and user adoption, and the attempt on overcoming the benefit loss costs incurred by payment cards, a possible trade-off could be spotted. Many stakeholders argue that payment cards are relatively fast and secure and also provide interoperability across borders. In order to create consumer incentives of utilizing CMP at PoS instead, the CMP at PoS -feature is most often a part of a mobile wallet, which facilitates several different types of mobile payments. The mobile wallet is by many stakeholders said to increase the possible utilization of network externalities and also to create spill-over effects between the different types of mobile payments and increase user adoption and usage. Further support for such arguments can be found in diffusion –theory, where developments of “whole product” –solutions are provoked as “chasm-bridging” strategies for firms in order to reach a critical user mass with their products and services. Such “whole product” – solutions also imply value added services to be placed on top of the mere CMP process at PoS. However, it becomes evident that the procedural switching costs of learning and evaluation would make consumers reluctant if the mobile wallets possessed too many features, which was a great concern according to many stakeholders. Only adopting one kind of mobile payment might be a big step for many consumers, and being faced by a variety of payment types which each also carries a load of features might just be too much for many consumers. This is again, a trade-off, in terms of finding just the right amount of the most relevant and value added services and payment types, to facilitate for a shift in payment behavior among consumers, without making them too uncomfortable with the switch by adding excessive components.

Another interesting observation is that almost all discussion among providers regarding the successful evolvement of CMP at PoS centers on consumers, which have frequently been appointed the ones to identify the winners and losers within the forming industry. Such statements might very well be true to a large extent, only the future can tell. However, the providers to some extent seem to have lost focus on the marketplace as a whole. The users are not only consumers, but also merchants – there is a two-sided market and switching incentives must be created for both groups in order for CMP at PoS to prosper. Merchants are often characterized by high employee-turnover and also a large percentage of the employees work part-time. This implies that there must be a focus on low learning costs not only for consumers but also for merchants, taking such aspects into account. Whereas most providers seem focused on consumer experience, some solutions however provide strong financial switching incentives for merchants. In any case, the question remains if the providers in general have also considered the many differences between them – merchants are not a homogenous group. Some merchants are clearly stressing for the need of faster payments (e.g. lunch restaurants, bar environments etc), where micropayments and “wave and go” transactions without PIN –code verification might provide the best solution. Other merchants might be more cost-orientated and does not care about speed at all, while yet others may provoke more logistic-improving solutions such as payments before reaching the cashier. Another notion in relation to so called micropayments and “wave and go” –transactions is that these according to many stakeholders are the ones generally maximizing the added value of CMP at PoS. However, they might also be the least secure types of CMP since no PIN –verification is needed. Thus, fields of applications that might be best suited for “wave and go” –transactions, must also take into account if the lowest security level for such applications can be fulfilled.
The lack of *shared vision and perception* seems to be the cause of some other implications in the forming ecosystem, besides the issues regarding the placement of the NFC Secure Element and the implications for the *establishment of roles* in the NFC-value chain. The factor on shared vision seemingly also has the possibility to influence the cross-border interoperability of various CMP at PoS-solutions. Suggestions on international standardizations and united business models over many European borders in order to supposedly *increase* the adoption speed of CMP at PoS, as provoked by SEPA and similar organizations, also inhabit big issues that would rather *decrease* the adoption speed, and there are notably extremely diverse opinions among the stakeholders on this matter. Most providers of CMP solution seem to understand that the prerequisites for successful implementations are very context-bound and unique depending on which European country you relate to, since financial and mobile infrastructure, value chain integration, card-penetration rate, and stakeholder power within the value chains are vastly different. The actors that have made its presence in many different countries on the European market already, emphasize these extreme differences to the greatest extent, whereas organizations or actors that have not been physically active on these markets (institutional organizations etc.) do not explicitly emphasize these differences at all. There are truly different opinions on these *environmental context factors that affect the speed of adoption* and possibility for implementation. Many indigenous providers have expressed the desire of scaling-up their respective solutions beyond national borders, but the contextual differences between European countries might act as strong barriers for such attempts. Here, firms handling payments over borders already (e.g. PayPal) possess a large advantage. Also, interoperability and international as well as national standardization attempt will also act as innovation-and “free competition” -impeding evolvement among CMP solutions, which is harmful for the greater good of the ecosystem, and more explicitly, for the end-consumers. The natural way to go are according to many smaller entrepreneurial firms to first allow for innovation and solutions to grow and be established on a local or national level, gradually incorporating support for various payment types and services (e.g. transit, P2P, PoS etc), to only after that grow on the international level with gradual increase in cross-border interoperability. The very time-consuming standardization efforts might otherwise take too long time to reach a consensus on business models, roles and technologies, meaning that larger powerhouses outside the European market such as Google or Apple risk entering the European arena and set the rules. Of course, innovation supportive development resulting in a vast niche markets on the local level also bear the risk for confusion among users.
8. Conclusions

This chapter will fulfill the objective of this thesis on issues and developments of the European CMP ecosystem, by drawing conclusions on the two research questions stated in section 1.4.

The objective of this master thesis was to: “From a multi-stakeholder perspective, find and analyze key issues that impede the development and adoption of contactless mobile payments in the European market”. In order to seek an answer to the objective, two research questions (RQs) were formulated, namely;

- **RQ1**: Which key issues on development and adoption can be identified as the most prominent in recent literature on mobile payments, with regards to the stakeholders on both the provider- and user-side in the European contactless mobile payments ecosystem?

- **RQ2**: In what ways can theories of new industry evolution, strategy and adoption help explain – and possibly identify additional – key issues regarding the evolution of the European contactless mobile payments ecosystem?

Regarding **RQ1**, the literature review on the current European CMP ecosystem (*Chapter 3*) revealed some key issues adhering to both the provider- and user-side of the stakeholder spectra. They were identified as;

**Provider-related issues**: These issues mainly revolve around collaboration among the providers of CMP, where business models are hard to standardize due to the unevenly distributed control and power over the users in the ecosystem. This notion seems heavily related to the NFC Secure Element (SE) -placement in the mobile phone, holding consumers’ payment credentials (passwords, codes, license keys etc.) in CMP processed by NFC technology, which the majority of the European market seem to see as a kind of final solution for CMP at PoS. The actor that owns these payment credentials will be able to control most of the revenue flows, which is why all actors naturally want to get access to them in order to potentially maximize their future revenue streams. The stakeholder struggle in this matter makes the CMP development highly problematic. The MNOs prefer SE placement in the SIM – card, while other actors that does not want the MNOs to reap all the fruit provoke SE placement as an integrated solution in the mobile phone or on a separate card such as a micro SD card. Meanwhile, bigger actors such as Google, PayPal and Visa/MasterCard all have created their own (more end-to-end) contactless payment initiatives, complicating the evolvement even further. In addition, this might further lead to issues related primarily to; early and late movers among providers, alternative mobile payment solutions and merging of those with CMP, as well as issues related to interoperability between solutions/technologies as well as across borders. Security concerns have also been highlighted in the literature as a prioritized matter.

**User-related issues**: Key issues here relate to the adoption of CMP at PoS, such as investment costs for merchants to implement new hardware and/or software (terminals, mainly NFC-compatible), security concerns, behavioral change among consumers in payment methods, and uncertainties in the perceived added value through CMP compared to foremost card payments at PoS. There also seem to exist a “chicken and egg” -problem between merchants and consumers in relation to CMP utilizing NFC technology, where the merchants are unwilling to invest in costly NFC-compatible payment terminals if consumers are not equipped with NFC-compatible mobile phones (which currently is very rare on the market), and consumers are unwilling to buy or feel the need of such phones if there are no NFC-compatible terminals at merchants for them to process CMP at PoS in the first place.
Regarding **RQ2**, the analysis—part of this thesis further revealed some interesting new insights on key issues for the ecosystem evolvement, as listed below.

Preemption strategies utilized by indigenous firms in European countries (i.e., firms distributing alternative solutions to NFC) might hamper the diffusion of standardized NFC. This could happen if enough bargaining power could be obtained by the providing firms and if the providers’ relationships with merchants would be adequately strong. Such an event might lead to decreased cross-border interoperability with regards to CMP at PoS which would clearly constitute an issue. This statement is further supported by the explicitly expressed aims of firms providing alternative solutions to establish domestic standards as a first step. However, indications are also given that these alternative solutions could possibly educate consumers with regards to CMP at PoS, which, contradictory, could facilitate for the diffusion of standardized NFC. Moreover, the temptation for firms of getting a solution fast to market and utilize preemption strategies could increase the risk for security breaches, which might harm the reputation and prosperity of CMP at PoS.

A trade-off issue was discovered in terms of that CMP at PoS has to offer the consumers additional benefits and features compared to payment cards. However, too many features will increase switching costs. Additionally, many stakeholders do not seem to take into account the heterogeneity of merchants, as well as sometimes seemingly forget that they operate in a two-sided market which implies that they must overcome learning costs not only for consumers, but merchants as well.

The disagreements and competition regarding the placement of the NFC Secure Element is seen as a major impediment for the evolving CMP ecosystem. However, it seems as if the rather unclear role of the MNOs’ participation in this developments seem to be the real issue in this subject, by increasing the complexity enormously with their involvement. Almost all stakeholders seem to question the involvement of MNOs in terms of the ability for this type of actor to add value to CMP at PoS in relation to desired extent of control this actor wants to possess. However, anxiousness from MNOs in finding new revenue streams, as well as possessing the distribution control over new sold NFC—compatible mobile phones, makes these tensions highly problematic.

The banks passive role in the CMP at PoS evolvements might be traced back to their fear of technology uncertainties, since they have much to lose with regards to trustworthiness and reputation of being able to handle money. The banks’ incremental steps towards CMP at PoS might however be excused, since they already have the perhaps largest penetration rate among consumers in many European countries, with already established accounts—a task numerous smaller stakeholder on the provider-side strive for. Even so, the banks high devotion on trust might not be as sustainable as expected, since younger generation of users is seen weakening their relations towards banks, instead increasing them towards other stakeholder of CMP at PoS which are being more active in these users day-to-day life. This might also hamper the banks’ efforts in making impact on NFC Secure Element placement, if this matter does not reaches a consensus in the near future.

A trade-off between standardization of business roles and technologies on a national and international level on the one hand, and innovation and free-competition climate on the other hand, clearly impedes the developments of the CMP at PoS ecosystem, since there are clearly shared opinions in this matter among the stakeholders. Actors that have made its presence in many different countries on the European market already, emphasize on extreme differences in relation to the prerequisites for successful CMP implementations in each and every different European country, whereas organizations or actors that have not been physically active on these markets (institutional organizations etc.) do not explicitly emphasize these differences at all, hence provoking such standardizations. All stakeholders although share the opinion on a faster adoption rate of CMP on a European level, and believes their own opinion in this matter helps the ecosystem as a whole to develop this in the most frictionless way. If the evolvements take too long, there is an immediate risk that larger powerhouses outside the European market, such as Google or Apple, enter the European arena and set the rules. Hence, trade-off and shared opinions are harmful for the greater good of the whole CMP at PoS ecosystem, and more explicitly, for the end-consumers.
Finally, in relation to the “chicken and egg” – problem, this might not be such a big problem after all, since NFC –terminals are being exchanged in a much faster pace than first expected since the EMV (chip and pin) –terminals deployed at large scale over Europe (but mostly in the northern countries) are seen to wear out faster than the predecessors utilizing magnetic stripe. Bigger merchants (e.g. food retailers) will probably exchange these first, due to their high payment frequency rate, which also facilitates for large scale deployments. Also, these NFC –terminals will not be noticeably more expensive for merchants compared to traditional terminals, as well as many PSPs provide them on a subscription –basis, making the exchange even more frictionless. On top of that; NFC –compatible smartphones are seen to explode on the market the forthcoming year(s), diminishing this “chicken and egg” –problem even further.
8. Further Research

This chapter will briefly suggest some further research topics which throughout this research have been found relevant to look into further, but which were out of the scope and time limit for this particular thesis.

Due to the so many times emphasized complexity of this emerging new CMP ecosystem, there are clearly numerous interesting topics to investigate further. Also, since the topic on CMP is happening and evolving at the very moment, many questions remain to be answered, of which most might imply merely guesses to what the future might hold. Even so, some topics have been found to perhaps be more relevant to look deeper into than others.

Firstly, the power of collaborative initiatives versus more independent end-to-end solutions is found to be an essential and hot topic in the emerging ecosystem. Many contradictions between stakeholders have been found on whether it is deemed necessary to collaborate in more extensive forms or not. For example, which types of coalitions might be best fit for banks in order to leverage their huge existing customer base and trust with more dynamic, innovative and “mobile” actors such as third party providers? How could MNOs leverage their power and control over users and relations with mobile devices manufacturers? Or perhaps more essentially; how should the MNOs be able to gain trust and gradually be able to take the role of a TSM? Younger generations have been found to be more open towards services provided by MNOs than the older generations, but again, how could this fact be leveraged? More follow-up research is needed upon MNOs and banks potential collaboration successes, for example by looking at developments at the Citizi-project in Nice. What has proven to work/not work with the collaborative business model here?

Secondly, contextual factors on cross-border level still hold many unanswered questions on the European market, but also globally. Since so many levels of environmental characteristics affect the possibility of successful CMP implementations, it would perhaps be wisest to focus on a specific type of mobile payment in relation to a few selected countries, for example on the European market. Alternatively, the characteristics of a few countries in themselves could be investigated, and later compared to the potentially most apt type of mobile payment and technology for the specific markets. The market-characteristic factors are many but some key questions might include; how is the banking infrastructure built up? Are the financial and mobile value chains heavily integrated? What about stakeholder power distribution? What are the card and mobile phone penetration rates? Is cash heavily used? Are there tendencies for leapfrogging? What are the regulatory forces affecting the specific clearing settlements and prerequisites for CMP transactions?

Finally, it has been found that different types of CMP at PoS do not hold the same potential for all types of merchants and situations. For example, the need for fast payments might be more relevant to implement for lunch restaurants, bar environments, arenas etc. CMP at PoS utilizing NFC and “micropayments” might therefore be better apt to these merchant –types, where “wave and go” transactions could be processed. Other merchants might be more prone to increase their logistical settings, such as payments before reaching the cashier. This influences what technology might be more apt as well to process the mobile payments. QR –code solutions could for instance be better apt towards some of those merchants or also used in conjunction with online or bill payments in a more efficient way. Overall, there might be a much too generalized picture of what CMP can provide to both merchants and consumers in terms of added value. This also adheres to the jungle of value added services on top of mobile payments. Which are more important to consider? It has been found that the vast amount of services and possibilities could actually scare away consumers instead of making them adopt it, also affecting the payment process. Therefore, such subjects could be very relevant to investigate further.
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**Empirics**

In-depth interviews

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**Nordic Payments Forum 2012**


Appendix A – Interview Questions

The following template was used to guide the empirical investigation in relation to the theoretical concepts. The template was built to follow four chronologically structured sections:

1. The stakeholder was asked to describe their role/product/service in the mobile payments ecosystem.
2. We explained to the stakeholder what our purpose was with the investigation and what we tried to extract from the interviews in relation to our work and delimitations.
3. The lion part of the interview starts. Several questions on mobile payments were asked in relation to each of the theoretical concepts used and other issues identified, see list of questions below.
4. The stakeholder was asked to freely speak about issues in the mobile payments ecosystem.

Since each stakeholder adhere to somewhat different components encapsulated in the theoretical concepts used, each interview was slightly customized. All questions listed below were however used during at least one of the performed qualitative in-depth interviews. Some questions might further be tied to numerous theories since these are highly interconnected, but are listed in theoretical categories as far as possible to facilitate an easy read. Also, a brief summary on the theoretical concepts were sent to the stakeholder participants in advance of the interviews to prepare them if desired. The questions were however asked in such a way that the participants did not need an appreciable understanding of the theoretical concepts prior to the interviews. A few questions might still have needed a very brief introduction to a specific theory, however not transcribed here. Since the interviews followed a semi-structured approach, the questions listed below were merely aimed to provide guidance in the empirical investigation. Many follow-up questions (not listed here) were therefore further asked based on the stakeholders’ response to the specific questions.

1. Questions related to First/Second Mover Advantages/Disadvantages

   • There is a strategy called “preemption”, often used by many early distributors, meaning that for instance payment terminals are being occupied in an early stage. If merchants invest in a specific mobile payment solution, how easy do you think is it to change solution if it turns out that their chosen solution is not sustainable/“survives”?

   • Would you say there is a danger to invest too much in an early phase for small provider firms, before the users even know what they want? What if there is a big shift in the market?

   • Is it of big importance which technical solution that will dominate in the future (e.g. QR, NFC or other)? Some stakeholders provide more or less a “360 degree –solution” covering numerous technologies and mobile payment scenarios, while other stakeholders invest and bet on one technology/payment scenario. How to you relate to this?

   • Some theory suggests that firms with big marketing muscles can wait longer than newer firms to enter the market. How do you relate to this?
• Do you see any risk with so called “free-rider effects”, i.e. that firms investing early take big risks meanwhile they educate the users for later solutions?

• A combination of rapid technical development and a fast increasing market is sometimes linked with a reduced advantage to be first. How do you relate to this? And how fast are the marketing development and the technical development really in CMP?

• Sometimes there are many advantages with being an early mover. Why do you think the banks in general have been very passive in the development of mobile payments? Is it not risky to wait, perhaps loosing incomes and market shares to the ones rolling out today with fully developed QR-code solutions for example, and those who wants to cut out the payment scheme owners?

• Do you see any problems with single bank-solutions? Is it not important for the banks to roll out a collaborative solution? What are the advantages/disadvantages according to you?

• Do you think many stakeholders that are more passive in the mobile payment development want to wait for many uncertainties to be solved before entering the market?

2. Questions related to Network Externalities

• How do you look upon the classic “chicken & egg” problem, i.e. that the merchants might be unwilling to invest in a mobile payment solution (terminals etc.) until the consumers are willing to use their mobile for payments (and have the right devices to do so) and vice versa?

• What possibilities do you think exist if a merchant would want to change or implement several mobile payment solutions, for example QR-code or NFC based? This relates to hardware and software, i.e. if different “apps” can use the implemented hardware at PoS?

• You want your solution to become the dominating one in the future. But do you see other companies with similar solutions as merely competition or is it a good thing that many companies pull in the same direction?

• Do you think it is important for companies to complement each other and drive the development together?

• Is the standardization-issue very important? Why? In context of NFC technology?

3. Questions related to Switching Costs

• Which are the biggest problems with getting the users (merchants and consumers) to accept mobile payments?

• What are your general thoughts on switching costs in relation to mobile payments i.e. what mobile payments must overcome to replace card payments (both in relation to
consumers and merchants)?

• There is also a possibility to create “artificial” switching costs, with value added services such as loyalty programs and coupons etc. Do you think they are these important to for the adoption of mobile payments?

• In relation to switching costs, one can say that sometimes firms want to create them to make it harder for users to change solution, but at the same time it seems to reduce the development and advancement of the whole mobile payments ecosystem and especially the value for the users. How can you relate to this?

• Do you think the consumers might get confused when faced with several mobile payment solutions at different merchants? And if a merchant change payment solution, what would happen to for example loyalty points and other rewards the consumers have gained from the mobile payment solution?

• How does the mobile payments price settings look like from a merchant perspective?

• How do you look upon strategies where initial affordable/low prize -offerings are later increased when consumers are “lured in” after some degree of market penetration?

• The certification-process for mobile payment solutions (tying a bank account or card to a mobile payment solution for example) seem to be very different among the different stakeholder solutions. How important is it to make the certification process easy?

• Do you try to develop your solution with as many similarities as possible compared to today’s payment products utilizing card payments, in order to lower the switching costs by making the users familiar with the new products?

4. Questions related to Diffusion of Innovations

• Do you think it is essential to target one specific customer/user –segment, for example “Innovators” (more “geeky”/venturesome users, first to take a risk on a new idea) to get them to start use mobile payment solutions, before eventually target the more mature and perhaps conservative user segments?

• How important is it to successfully adopt, change and especially simplify the mobile payment solutions to the user needs as more mature segments are being reached?

• “The Chasm” -theory talks about a gap in the diffusion process just before a critical mass is reached, into which many new innovations/ideas crash and burn if enough momentum is not built up at an early phase. Could you relate this to mobile payments? How could companies avoid this gap?

• Would you say it is important to develop niched solutions for smaller actors and do you think it is important to provide “whole” product solution for the mobile payment actors
or do you think many actors should focus on smaller core areas?

• Do you think the younger generations (gen y, z) are more prone to try mobile payment solutions compared to the older generations which might tend to have a closer relationship with for example banks and cash, payment cards?

• Do you think bigger companies (more end-to-end solutions) have bigger incentives to roll out solutions for the main market, instead of being niched in their solution like many smaller actors?

• Which characteristics would you say is more important that others when relating to the rate of adoption among mobile payments (relative advantage, compatibility, low complexity, trialability, observability)?

• What about time? Do you think it will take longer than first expected to reach a critical user mass in CMP?

5. Questions related to Collaboration

• Mobile operators and banks seem to prefer different business models in contrast to the NFC SE placement. Do you think it is essential for banks and operators to cooperate to provide a satisfying solution?

• Do you think there is important collaboration–related issues between banks and operators in the European market that does not relate to the operators strong will to increase and control the revenue streams?

• How would you say collaboration among stakeholders generally differ when developing QR-solutions compared to NFC–solutions?

• Would you say trust/power distribution is a big issue among the collaborating stakeholders?

• Some stakeholders say that the different emerging business models are no important issue, while others such as researchers and consultancy firms tend to say that cooperation, distribution of revenue streams between stakeholders is very important to align before mobile payments take off. How do you relate to this?

• Do you think it is possible to develop complete and satisfying mobile payment solutions without stakeholder collaboration? Is perhaps collaboration needed to be able to compete with giants such as Google or PayPal (more end-to-end solutions) in the long run?

• Considering the NFC Secure Element placement. Do you think there will only exist one “placement → type of business model” in the future or do you think there is room for more than one? What about interoperability then?
• How do you as a mobile device manufacturer relate to the NFC SE placement and the resulting business models/collaborations?

• Do you as a mobile device manufacturer get approached a lot from different stakeholders that want to collaborate with you on new NFC models? Do you also search actively for collaborations?

• What is the issues concerning manufacturing of CMP devices? Security, costs etc?

• Is it a big difference (cost etc) in terms of manufacturing, when relating to the different NFC SE placements?

• Does the comparative power between the stakeholders in the ecosystem change with the NFC SE placement, or is it not so essential?

• Do you think contextual factors play a big part when it comes to collaborations among stakeholders in Europe? For example, do you think Swedish stakeholders have bigger facilitators for collaboration than in other European countries?

• Is it obvious/natural that Visa and MasterCard get an important role in the new ecosystem? How is their position in the ecosystem (power to set fees etc.)?

• How does your company depend on Visa/MasterCard in terms of business model, fees etc?

• How important would you say that the banks role is in the forming ecosystem? Can the banks be totally cut out in the development of CMP at PoS?

• How do you look upon end-to-end solutions compared to collaborative solutions among many stakeholders?

• Do you think that it is obvious that the merchants should bear all the cost for new payment terminal infrastructure to boost CMP?

OTHER QUESTIONS

• Do you think NFC has built enough momentum already to become a sustainable and large-scale mobile payment solution on the European market in the future?

• Would you say that the Swedish market is very different from other markets in Europe? Do you think the issues discussed can be generalized to apply on the European market, even if they sometimes described the Swedish market?

• What are your general thoughts on NFC solutions versus QR-code solutions? Is QR – solutions more of a “phenomena” in for example Sweden compared to the European
Do you have any general thoughts around switching costs and to what degree they exist? Do they differ if compared to cash or cards versus mobile payments? Do they exist between e.g. SMS, QR-codes and NFC?

Do you think big end-to-end solution companies from the US for example, might enter the European market and have a big impact here as well (e.g. Apple, Google etc)?