



**SCHOOL OF ECONOMICS
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Micropayments

A Key to a Constrained Market

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Foreword

"Micropayment- A key to a constrained market" is a master thesis at the Department of Business Administration at the University of Lund. Micropayments is a fairly new concept to the e-market and in general, therefore we found it interesting to do further research on the subject. We could not have been able to do so without the support and knowledge that we have received from our supervisor Ingmar Tufvesson. We would like to thank the suppliers and the merchants for taking their time to help us complete the empirical study.

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Summary

- Title:* “Micropayments- A key to a constrained market”
- Subject:* Marketing
- Keywords:* Micropayments, e-commerce, adoption-diffusion theory, strategy
- Authors:* Miryam Bäckström, Martin Hansson and Ebba Wikström
- Supervisor:* Ingmar Tufvesson
- Seminar:* 20-01-2003
- Purpose:*
- describe the suppliers’ and the merchant’s adoption-diffusion process for micropayments by determining what issues that face them in order to gain market acceptance.
 - develop strategic guidelines appropriate for a rapid development of a sustained position on the international- and domestic market?
- Method:* To best answer our stated problem and purpose we have used a qualitative research in form of an e-mail based questionnaire as well as content analysis.
- Conclusions:*
- The relationship between supplier, merchant and end-consumer for micropayments differs from the traditional relationships that are described by Robertson and Gatignon. The communication channel between the merchant and the end-consumer is disrupted by the merchants’ lack of need for the micropayment solution. This means that the supplier should actively pursue strategic relationships and coordinated efforts, particularly in the introductory phase.
- The merchant’s ability and interest to actively market the micropayment solution depends on what kind of product it carries. The research shows that a merchant that offers streaming and information viewing products is far more likely to influence the end-consumer in a positive way. Regarding merchants with other products, the supplier must communicate the relative advantages of micropayments. For all merchant industries it is recommended to find opinion leaders. The trust associated with the opinion leader is communicated to end-consumers and other merchants.

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1 Introduction

1.1 Background

The invention of the telegraph, radio and computer has set the stage for the revolutionised Internet, with possibilities for communications over the world like never before. The Internet is also one of the most successful examples of the benefits of sustained investment and development of information dissemination.

The Internet is often called the net and is a world wide system of computer networks. This is a network that can be used to collect information and to communicate with people at other computer locations. Electronic mail is one of the most common services, for many users this service has replaced the traditional letters through the post. The Web is another service that is being characterised by hypertext, a technique where documents have a link to other useful documents with millions of pages of information.¹

The precursor to the Internet was the military computer network ARPANET that was created in 1969 by the American Defence Advanced Research Project Agency (ARPA). The purpose of this network was to try out new techniques of the network. The first important steps were taken at Stanford's Research Institute and UCLA (University of California Los Angeles). The positive aspect of this network was that it could continue to work although parts of it were being destroyed.²

The Internet has gone through some inevitable changes during the last decade. During the first phase everything was open and for free. Information was then widely spread and it was fairly new to common people and the market. The next phase then started and the firms had to start charging for their services, since their revenue was zero.³

An estimation over how many online users that existed in the world in September 2002 was 605.60 million according to nua, the World's leading resource for Internet trends and statistics. In Europe it is Iceland that has become the leading country with Internet access up to 69,8 % of the population (September 2002). Canada and the United States had 182,67 million Internet users, which stands for approximately 30% of the worlds Internet access during the same period.⁴

¹ <http://www.student.uu.se/upunets/guide/guide.7.1.html>Allmänt om Internet, 02-12-30.

² *ibid.*

³ Forsman, J, 2001, p. 2.

⁴ http://www.nua.com/surveys/how_many_online/index.html, 03-01-01.

The consumer in the United States seems to feel secure with the online shopping since it has increased 155% if you compare the first quarter of 2001 and 2002. The total online purchase value in the first quarter of 2002 was US\$ 300 million.⁵

The Media on the net all agree that the content on the web must have a price. Advertising does not bring enough revenue to the firms. One early example of a company which started to charge for their Internet service was the newspaper "Sundsvalls tidning" in 1996. At the introduction the customers were charged 25 SEK and they also received free Internet access.

This leads us to the definition of micropayments. There are many different existing definitions of micropayments, for example: "*as low-value electronic financial transactions*"⁶, or "*Micropayments are small online payments that range from a few American cents to about 10 dollars*"⁷

The firms that have the opportunity and possibility to be the first to supply a payment procedure that is easy to use for the consumer, easy to implement for the merchant, safe and with low transaction costs will be rewarded with volume. Transaction solutions that are under 10 SEK apiece have a great and investment willing market in front of them. This kind of transaction cost is called micropayments and is a fairly new concept. This applies for both the end-consumer and the merchant.

A number of firms can now lower their requirements for serving an order. The need to write an invoice decreases. The delivery period may be shorter when the consumer can order and pay immediately and the credit risk also disappears. The companies that dare to charge for information on the Internet will be the winners when the Internet market starts to take on a new lease of life.⁸

In the early nineties when the web was fairly new, micropayments seemed to be a key in the fast developing e-commerce market. Merchants were able to sign up with micropayment companies, which could service one billing from a couple of cents to about 10 US dollars.⁹

Micropayments are more needed in the current global economy, with the rising importance of intangible goods and services. It enables new possibilities in product development on the Internet. We are for example able to download our films instead of renting them at a video store. It is also possible to download only one song, article or an expert opinion from for example a doctor.

Today there are approximately 25 firms working towards the goal to develop the best system able to handle micropayments. We got in contact with a Swedish company, Paynova, which produces a computer system that enables micropayments over the Internet. The company is beginning to introduce itself on the market, which means

⁵ http://www.nua.com/surveys/index.cgi?f=VS&art_id=905358239&rel=true 03-01-01.

⁶ <http://www.tml.hut.fi/Opinnot/Tik-110.501/1999/papers/micropayments/micropayments.html#sect3.1>, 03-01-01.

⁷ Burstein, J, 1998, p. 10.

⁸ Forsman, J, 2001, p. 2.

⁹ Solomon, M, 2000, p. 1.

that there exist many unresolved questions and unknown areas to discover, which is the case for many of the micropayment suppliers.

1.2 Problem Discussion

There are a number of factors that are considered to restrain the evolution of the e-commerce market. Among those are the payment difficulties, which are divided into two areas. The primary problem is the practical work of establishing a payment system that is easy to handle, safe and which can be used at low transaction costs. The secondary issue is related to the customers and their fear of new things, bad information and lack of security. Micropayments is in its idea a solution of the practical problem and indirectly a solution to the consumers' attitude.

History has shown many examples of products that had good odds of being successful, yet failed. The dynamic character of the market causes changed conditions, which constantly require new solutions. This leads us to the discussion concerning innovation. Further, if we make the assumption that micropayments will be a standardised system for Internet payments, there are other aspects besides the practical that must be solved. The adoption process of merchants and end-consumers, the diffusion process of the product, barriers that inhibits the adoption- and diffusion process, are some aspects to be considered. These can be divided into external and internal factors. In this paper we shall concentrate on what we define as the internal. From these obstacles we are inclined to look at the problem from a practical perspective, i.e. describing the most efficient set of strategic guidelines.

From the above discussion we arrive at the following questions:

- What is the definition of micropayment and what does the market look like?
- What factors affect the relationship between the micropayment supplier and the merchant?
- How do these factors apply to a possible strategy development for a maximised diffusion of micropayment in society?

1.3 Purpose

The purpose of this thesis is to:

- describe the suppliers' and the merchant's adoption-diffusion process for micropayments by determining what issues that face them in order to gain market acceptance.
- develop strategic guidelines appropriate for a rapid development of a sustained position on the international- and domestic market?

1.4 Delimitations

We decided to exclude the end-consumer from our thesis since we believe the diffusion and adoption is more dependent on the overall acceptance of micropayment as a means of payment by the larger merchant companies. We will of course not ignore the consumer side completely but simply regard it as a factor of consideration for the merchants and suppliers.

The study will be conducted on an international sphere, including the market of The United States and Europe, with a slight concentration on Scandinavia. These three markets are chosen because we have found that they interact and almost merge into one market at least in certain segments.

1.5 Disposition

1 Introduction

In this chapter you have been given a background understanding to our problem and the subject of micropayments. You have read our purpose, problem and delimitations.

2 Method

We will start out with a general approach discussing our choice of subject, perspective, frame of reference, and our general investigation method. We will then continue with a more detailed and critical discussion of our choice of literature, articles, the Internet sources etc as well as of our empirical approach.

3 Micropayments

This chapter will give you a detailed and theoretical description of what micropayments is, as well as an understanding of the market.

We will also describe six micropayment suppliers with information built on our empirical study.

- 4 **Theory**
The theory provides you with knowledge about the innovation-adoption-diffusion theory and the different barriers that exist for suppliers and merchant. It ends with theories of marketing strategy.
- 5 **Qualitative Research and Content Analysis of Merchants**
Here we present the research made on the merchants.
- 6 **Analysis**
With the theory as a base we analyse the empirical information according to our problem and purpose.
- 7 **Guidelines for Marketing Strategy**
We provide a discussion around marketing strategy connected to the micropayment supplier, based on the results in the empirical study.
- 8 **Conclusions**
We will in this chapter present our conclusions and our theoretical contribution.

2 Method

2.1 General Approach

This part will deal with how we came to choose our subject and how we decided the focus and borders of our study. With this information as a base we will then describe the choice of investigation method. We believe this will help the reader to understand our choice and methods of collecting data.

2.1.1 Choice of Subject

Along with the beginning of e-commerce came payment solutions on the Internet. A lot of attention and research has been spent on finding a solution that reaches customers needs of security, ease of use, reasonable transaction cost, etc as well as unlocks the limitations of the restrained e-commerce market. Since the Internet and e-commerce is a dynamic and relatively new phenomenon, we acknowledged the steady need for new studies on the subject. Through a contact, we got in touch with a Swedish company, Paynova, which has developed a micropayment system. We found this new payment solution with all its possibilities fascinating and decided to look deeper into the problems surrounding it. We realised that the need to be able to handle micropayments efficiently has existed for many years, but due to technical problems it has been difficult to find a good solution. This is currently changing. We have found some 25-companies with different micropayment solutions that today compete to conquer the market in order to become the standardised system. eBay, which is the biggest online auction company, recently bought one of them, Paypal, for a large amount of money.¹⁰ MIT, Massachusetts Institute of Technology, has two upcoming seminars on the subject.¹¹ These are two examples of the actuality of micropayments.

At the beginning we did not know how to deal with the subject of micropayments, but as Paynova, among many others, is presently introducing its system on the market we thought of developing guidelines for a market strategy. This lead us further on to questions about adoption of innovations and the diffusion process. We started out studying all parties involved, the supplier, the merchant and the end-consumer, but decided to concentrate on only the relationship between the supplier and the merchant. This can be argued to limit the relevance of our thesis, but we believe that this relationship is more significant in the market entry phase. As the thesis developed, many questions arose and disappeared along the way. The problems

¹⁰ Svenska Dagbladet, Näringsliv, eBay köper Paypal i miljardaffär, 09-07-02.

¹¹ <http://ebusiness.mit.edu/news/Fall2002Seminars/schedule.html>

around micropayments are many, which forced us to focus and limit our problem and purpose.

2.1.2 Perspective

The angle of approach of a study directs its outcome. It cannot be said that only one approach is correct instead there can be many different. This means that the “truth” can be different depending on from what perspective the viewer regards the subject. We will approach the subject of micropayments from a theoretical perspective with the business in focus. We will also analyse the problem from the micropayment suppliers’ position, as in contrast to the end-consumer. The angle of approach is necessary, but can be criticised for excluding relevant factors included in the “reality”.

2.1.3 Frame of Reference

Our frame of reference has naturally affected our study. Miryam has studied marketing on bachelor level as well as on master level at Lund University. The last six months she has also worked as a marketing assistant at Lohmann & Rauscher AB. This has given her some practical experience in marketing. We believe this has helped us when formulating our marketing strategy. Martin has an academic history of strategy, marketing and psychology from Lund University, but also from Germany. His studies in psychology have broadened the otherwise concentration on marketing and business. The experiences from Germany are relevant in our study since we evaluate the global aspect of micropayments and the possibilities of rapid expansion internationally. Ebba also has a lot of experience from abroad, living in Switzerland, Belgium and France for many years. She has specialised in marketing on both bachelor and master level at Lund University.

Other effects that are relevant to this thesis are our buying experience on the Internet. We have all bought something on the Internet, plane tickets, books, music, etc, but have different attitudes towards it. Miryam and Ebba both feel comfortable with buying on the net even though they restrict themselves to known companies; Martin on the other hand is sceptical.

2.1.4 Investigation Method

One purpose of this thesis is to give a theoretical contribution. To do so we need to be critical of existing theories, present a retrialable method based on valid sources, be able to reject the theory as invalid, openly show the results and how we found them and finally to present the individuals asking the question.¹² The method chosen to achieve this depends on the problem. There are many and different methods that can be used to deal with the same problem. As our subject is relatively unexplored and our

¹² Eriksson, L, & Wiedersheim-Paul, F, 1997, p. 172.

prior knowledge limited, we will follow three basic steps. These are based on our level of knowledge about the subject. Each step will then be specified further to complete our method.

From the research material gathered we will, according to the deduction method, draw conclusions. Simultaneously we will conclude the results we attain from our empirical research, according to the induction method.¹³ We will then again scrutinise our own hypothesis with the deduction method. The combination of both methods creates a thorough research to built our study on.

1. Explorative phase

The researcher is in this phase ignorant about the subject and needs to search for a wider and deeper understanding. It is very important to be open towards the subject and consider many alternative ideas and directions. This phase is characterised by method techniques like observation and qualitative interviews.¹⁴ We have decided to use qualitative questionnaires and content analysis as an alternative to observation. An account of these follows below.

- Qualitative research, is according to John Lofland when there is a physical closeness to the subject, the conversation is objectively portrayed, objects, situations, people related to the conversation are also thoroughly described, and there are direct quotations.¹⁵ An alternative method to use is quantitative technique. This is usually not used in the explorative phase, but we will discuss it here to contrast the qualitative technique. Quantitative means to describe a phenomenon with number data.¹⁶ For a long time quantitative data was considered the only reliable source for proving a theory. Today we know that a qualitative technique often can be better suited to achieve reliable results. We consider that a qualitative technique is best situated for our research due to the relative lack of existing knowledge and research on the subject. This technique also best corresponds to our stated problem. The business of micropayments is on the other hand dependent on quantitative data, because of its possibilities for reaching a mass market. In the future that will without doubt be a necessary technique to use, but since micropayments still is in its introduction phase the qualitative data becomes more interesting.
- Content analysis means that we observe certain factors of the actors in the group we are going to examine. By using this method we can gather information about the objects without their knowledge, which has the advantage of providing a more objective base.

¹³ Rosengren, K, & Arvidson, P, 1992, p. 23.

¹⁴ Ibid, pp. 93.

¹⁵ Lofland, J, according to Holme, I, & Solvang, B, 1997, p 93.

¹⁶ Holme, I, & Solvang, B, 1997, p 151.

2. Descriptive phase

Through the knowledge gathered in the Explorative phase, we can now start to generalise. This provokes a number of new questions to be answered.¹⁷ In this phase we search for the reasons and the extent of the phenomenon.¹⁸

3. Explanatory phase

This is described by Rosengren and Arvidson as finding the cause- and effect relation between two or more variables. The presentation is traditionally made in numbers,¹⁹ limiting the use for our study. For us this phase will be more analytical by searching for answers and connections between events, actions, strategies etc.

2.2 Practical Approach

This part will explain our choice of theory and information, in forms of literature, articles etc. There is also a thorough description of how we gathered our empirical information. We will also criticise these and consider alternative choices and methods.

2.2.1 Collecting Data

Since our subject is relatively unexplored and new, it was natural for us to start searching for information on the Internet. Here we found articles and theses of both negative and positive characteristics, which gave us an understanding of what micropayments is and the kind of problems associated with it. We continued to search for information on the Internet, especially during our empirical research, where we found a lot of information about the competing micropayment companies as well as about the merchants. We have also received some written information about some of the micropayment companies.

The published work was found through the Libris database at Lund University. We had use of the economic and business library, but also the library of social science.

2.2.2 Choice of Theory

One central purpose of this thesis is to give a theoretical contribution. To be able to do this we need to study and evaluate the theories that already exist. The choice of theory springs from the choice of subject, formulated into a problem and a purpose. From the

¹⁷ Rosengren, K, & Arvidson, P, 1992, p. 90.

¹⁸ *ibid*, pp. 99.

¹⁹ *ibid*, pp. 105.

beginning we had many ideas and variations on our problem, but there were always a few things we came back to and felt were central. It was the micropayment suppliers' strategies to reach the market and expand, the merchant's role in this process as well as the consumer's interest. As you know we chose to concentrate on the two former actors on the micropayment market. The consumer of course plays a vital role in the whole process but as said before, the established relation between the supplier and the merchant create the market. The consumer does not tend to demand new technology when functioning alternatives already exist. Another argument is that it is the merchants who demand the micropayment procedure to be able to bill their customers. We believe a study on the consumer could be an interesting topic for another thesis. There have been other interesting perspectives surrounding the subject of micropayments, like for example how micropayments might give rise to new product development as well as changing the "rules" of e-commerce. We realised that the market needs to be more mature to be able to see these possible changes.

To select the theories that would support our study and take it one step forward came natural to us because of the specified problem and purpose of the thesis. The innovation-adoption-diffusion theories and marketing strategy theories for technological products became our base. The choice of literature within each area will be discussed in the next part. As mentioned before we aim to use hypotheses, according to the deduction method, to try and analyse our results. A theory is never complete, which always makes it possible to ask the question "Why". The same goes for our conclusions; they can always be questioned and developed further.

2.2.3 Choice and Criticism of Literature

With our choice of subject and theory as a starting point we could select the theoretical material that we needed to understand and analyse our problem. We will discuss the literature that has had most impact on our study. Rogers with his book "Diffusion of Innovation" can be regarded as one of the pioneers in connecting marketing with social science.²⁰ His theories are relevant for many aspects of our study, highlighting the innovation of micropayments and the merchant's adoption process as well as the diffusion process. Robertson and Gatignon developed Rogers's theories by studying the adoption- and diffusion process for companies. Since we are mainly studying the relationship between the micropayment supplier and the merchants as well as the competitive environment, the theories apply well to our study. Porter's theories of market entry and five forces could be argued to be relevant for our study. We will only mention him to show this relevance, but will not use him actively in our analysis. This is because we do not want to highlight certain influencing factors more than others. We have used Kotler to give a theoretical base of our environmental description. Our final part in the theoretical chapter deals with a general creation of marketing strategy guidelines. There is no obvious theory that should be applied like it is for the theory of innovation-adoption-diffusion. Our primary source has been Mohr's book, as she has developed marketing strategies especially adapted for highly technological environment with rapid expansion.

²⁰ Tufvesson, I, 2002, p.55.

Criticism of sources means broadly that the researcher contrasts his empirical result with theoretical concepts. But more often we narrow it down to a critical review of the sources we used in our study. The purpose of this method is to verify if the source is relevant, valid and reliable. There are three factors that should be considered when evaluating written information, contemporary time requirement, tendency criticism and dependence criticism.²¹

The actuality and dynamic characteristics of micropayments makes the contemporary time requirement extra important. The literature we have used are mostly from the eighties and nineties and sometimes even older, thus they can be criticised for being too old for our type of study. But as the innovation-adoption-diffusion theory, our theoretical core, has not changed very much or been developed further since Rogers himself came out with the last edition, we believe it is still relevant to support our study. We also find it applicable to fulfil our theoretical contribution. The same applies to Robertson and Gatignon's article. Mohr on the other hand can be considered contemporary regarding micropayments. The second factor to take into account is tendency criticism, which all authors can be criticised for. We believe it is most apparent in Robertson and Gatignon's article "Competitive Effects on Technology Diffusion". Even though the article is built on Rogers's theories it is also a clear message to what it lacks. They can also be criticised for dependence on Rogers, which means their study should be seen as related to Rogers.

2.2.4 Choice and Criticism of Articles, Theses and Internet Sources

In a thesis like ours, where the subject is relatively unexplored, most information tends to be articles by authors that either believe in the micropayment phenomenon or do not believe in it at all. Our aim when searching for articles on the subject was mainly to learn about what micropayments are and what the chances are for future expansion of the technology. We have searched in ELIN (Electronic Library Information Navigator)²², but mostly on the Internet to find articles as up-dated as possible.

The most important aspect when searching and evaluating information on the Internet is to use your common sense. If the information does not have an author or a reliable origin it is not highly rated. We have used these kinds of sources only as inspiration. The sources we refer to can be regarded as reliable, which means that they have a known and often trusted origin as well as a known author.

The IT crash and the instable world economy affect journalists and researchers when they evaluate the future possibilities of micropayments. The tendency criticism is more common in articles, since the purpose and audience of the article usually are different from when writing a more lengthy research paper. It is usually not possible to identify the sources the author has used to write his/her article, which means that we cannot know who has influenced who. We have been aware of this, and have tried

²¹ Eriksson, L, & Wiedersheim-Paul, F, 1997, p. 153-154.

²² <http://elin.lub.lu.se/elin/loadf?f=infopage>

to present many ideas as well as our own, to give the reader a chance to form his/her own opinion.

2.2.5 Empirical Approach with Criticism

2.2.5.1 *The Micropayment Suppliers*

The number of active micropayment suppliers on the global market is relatively limited. Because of the intangible characteristics of a micropayment system and its activities with the merchants and the end-consumer the market is not well defined. We have chosen to regard this market from an international perspective, which means we have picked suppliers that originate from the United States and Europe with a slight concentration on Scandinavia, but are mostly cross border active. The different suppliers are in different stages of expansion, which means some are bigger than others. We have chosen four active suppliers on the international market, Paypal (USA), paybox (Germany), Paynova (Sweden), Payex (Norway). There are also two less developed suppliers included, Spacecoin (Sweden), and Pay-Read (Sweden). They will illustrate the situation facing the micropayment supplier in the early phases, the competitive market situation and the newcomer's chances to succeed.

The research was conducted by using a qualitative questionnaire and content analysis. After a prior phone call to the above micropayment suppliers we sent them our questionnaire (see appendix 1), which is based on our theoretical hypothesis and problem. From the beginning we had several ideas of how to receive the necessary information safely and objectively in order to be able to draw proper conclusions from the material. Since the number of suppliers we wanted to contact is limited it would have been possible to carry out a telephone interview, which might have given us more spontaneous and covering answers. To do face-to-face interviews was not possible due to the placement of the companies around the world. Our choice corresponded best to our idea of handling the suppliers consistently, avoiding the possibility to lead them by interviewers effect or misunderstandings because of language problems. We received answers from all even though some were more reluctant to share information than others.

The content analysis included searching for news releases about each supplier, studying their websites and corporate material, as annual reports and investors' memorandum etc. The qualitative questionnaires as well as the content analysis provided us with information from an external point of view, as we assume the suppliers did not reveal any insider information when answering the questionnaire.

We chose to present our study on the suppliers in the chapter that define and describe micropayments and its market. By doing that we prepare the reader for applying the subject of micropayments in the theoretical chapter. The presentation of material is made in a descriptive way. It is divided into four of the major influential factors, the system, design, security, and marketing. These are discussed more in detail than other possible factors, because they have occurred to us as more important for our study of

diffusion of micropayments. We also created a summarising schedule to facilitate the comparison of the suppliers for the reader. The schedule is basically built up on the basis of the former description of the suppliers. The information we gathered about the suppliers has created a base for the study of the merchants.

2.2.5.2 *The Merchants*

The merchants constitute the base for the adoption theory. This means that we need to find the information that describes their adoption process as well as possible barriers to adoption. It can be difficult to receive information that covers this process completely. The person, or like in our case, the merchant is not aware of his adoption behaviour or his pre-adoption behaviour. Also, you cannot ask a potential merchant to imagine a possible adoption of the product, since the reality always comes out differently. These things are good to keep in mind when doing our kind of research.

From the six suppliers we had chosen, we picked one merchant from each of thirteen different industries in order to get a wide range and to be able to see possible adoption differences between different industries. Two of the suppliers, Spacecoin and Pay-Read, did not have contracted merchants in each industry so we were obliged to select the ones that were available. All the merchants are connected to the Internet, and are in some way selling something that is possible to pay with a micropayment system. This means we see no difference between complete e-commerce companies and ordinary companies selling on the net.

We divided the research into two different categories, qualitative questionnaire and content analysis. For the first category we had prepared a questionnaire (see appendix 2) built on our theoretical base, as well as on our purpose and problem. We had also added some extra questions that were connected to the end-consumer, with the purpose to understand the end-consumers' possible influence on the merchant's adoption process. We started out by calling the randomly selected merchants in each industry in order to reach the "right" person to send our questionnaire to. We then sent the questionnaire by e-mail, finding it the most efficient way to handle the material and get fast answers. Questionnaires were chosen before interactive telephone interviews because of the extensive number of merchants we contacted. Naturally we did not get answers from all the merchants we contacted, due to busy schedules. Some answers were also incomplete, which does not mean they did not provide us with information about their adoption behaviour, but they were not used as a good example in our presentation. Of the merchants that replied we selected five examples from different industries to be described in detail. We presented these merchants in a descriptive way and each one by it self. Another possible presentation could have been to compile and describe each question and answer apart. We believe our choice gives the reader a better understanding of the merchant's business in relation to its answers.

The other research category of content analysis has provided information about both the merchants and the suppliers. From the merchants we randomly picked in each industry from each supplier, we conducted a thorough observation of their website. We created a comparative schedule showing the different suppliers and merchants against several influencing factors. The factors describe all the visible presentation of the micropayment supplier on the merchant's website. Spacecoin and Pay-Read are

excluded from the comparative schedule because their amount of connected merchants are very limited and will therefore not be sufficient as analytical material. We observed the website as outsiders, which has the advantage of providing us with relatively objective information. Both the qualitative research and the information schedule will be used interactively with our theory to analyse and draw conclusions.

3 Micropayments

3.1 Electronic Payments

Before we delve into the problem of defining just what micropayments are we first need to look into the term electronic payment of which micropayment is a part. Another term is digital payment but we don't perceive a difference between the two concepts and will henceforth use them interchangeably.

Electronic payment can be defined as any payment that takes place by exchanging digitally represented payment instruments through a network connection.²³ Through the advent and rise of the Internet, capitalists world-wide have tried their best to capitalise on this new possibility for making money. However, one cannot make money on the Internet unless one has a suitably developed payment system. Customers are of course more used to shopping in a physical location with face-to-face interaction with another person. The Internet has consequently a couple of inherent weaknesses, some of which affect the payment part of the shopping. Depending on what is being bought and the corresponding cost different solutions may be appropriate. If an item were expensive perhaps one wouldn't mind paying a bit more to have it done in the utmost security.

When it comes to classifying the different payment methods available there are a couple of different alternatives. Westholm, a consultant in Internet commerce, differs between several alternative payment methods. Payment through a debit card with encryption is one. Another is a third-party system where a trusted third party handles the sensitive information such as credit card number and personal data. Certificate based system such as SET (secure electronic transaction) designed to encrypt the credit card information sent. A natural extension of ordinary banking is Internet banking where you connect directly to your bank account from the merchant's web page. A virtual credit card is when you don't get an actual card but only a credit with the provider. You then only have to pay once a month for the products you receive. A virtual wallet is simply defined as a session based micropayment solution. The last is mobile payment where you pay through your mobile phone.²⁴ Although having some merit this listing leaves a bit to be desired. For example the versatility of micropayments is lost in the narrow definition of micropayments as only handling payments through a virtual wallet. As we shall see later micropayments come in many forms and shapes and cannot easily be defined as being only a virtual wallet.

Deitel, Deitel and Steinbuhler divide electronic payment into a somewhat different set of methods. The traditional credit card transactions, the e-wallet which is the same as

²³Kytojoki, J, & Karpijoki, V, 2000.

²⁴Westholm, M, 2001, <http://webhandel.nu/betal/index.html>.

a virtual wallet, digital currency a sort of token currency, peer-to-peer transactions, smart cards with computer chips, micropayments, B2B transactions and e-billing a sort of virtual bill connected to a persons bank or checking account. Inherent in this classification is a couple of weaknesses worth mentioning. The separation of some of these concepts isn't appropriate. For example peer-to-peer payment is something that is possible in micropayment as well as in digital currency schemes. Digital currencies is something upon which some micropayment schemes are built, again e-wallets are used in among other things micropayment schemes and thus does not warrant a section for itself.²⁵

Perhaps one should look at the phenomenon from a different perspective, a more generic and functional point of view. Tennant divides every payment method found on the Internet into two basic categories: payment per transaction and payment through accounts.²⁶ The first class deals with payment that occurs without the two parties (buyer and seller) ever having been in contact before. The second one deals with situations where a prior contact between buyer and seller is necessary. Everything else falls under these two concepts.

Payment per transaction involves among other things traditional credit card transactions over the net. This involves a relatively high transaction cost, a fixed cost and a percentage of the amount being paid. This effectively bars amounts of lower value of becoming economically feasible. Recently the security of credit card transactions has improved, which means that the transaction costs has risen even more.

The other payment method connected to payment per transaction is the concept of net money. This is a set of different technologies dealing with transactions as if they were in fact cash. Some technologies have been designed to mimic the concept of cash with its anonymity as the main feature. Digital currency schemes such as beenz and flooz belong here. If you look more to the low transaction cost of net money you come across micropayments, the focus of our thesis.

The other part in the Tennant dichotomy is payment through accounts. Here he incorporates such payment systems as subscription, purchase orders and net accounts.

Subscription is an old solution to the hassle of verifying the credit card. This needs only to be done once and the payments are subsequently easier and simpler. Subscription is something that is currently hotly debated when it comes to web publishers wanting to make money on their sites. A drawback to this system is that after a while you tend to accumulate quite a few user IDs and passwords that you have to remember, something that might deter some potential customers.

Purchase orders are more a solution for the business-2-business environment dealing with larger specified amounts.

²⁵Deitel, H, Deitel, P, & Steinbuhler, K, 2001, pp. 92-111.

²⁶Tennant, H, 1997, <http://www.htennant.com/hta/askus/5models.htm>.

With net accounts the method is to accumulate charges over time and every now and then pay them off, like a telephone bill if you like. This system is also fitting for small transactions, as the price isn't paid until the account reaches a pre specified amount.

3.2 The Definition of Micropayments

If we continue to narrow our field of investigation we arrive at the main focus of this thesis. A Micropayment system is a set of software, algorithms, and network protocols designed to enable users to make small monetary transactions on the Internet. One aspect of micropayments is that the definition varies with the audience. The problem is not to handle the small amounts of money, but to keep the individual transaction cost at a low level. Micropayments are suitable for the sale of non-tangible goods over the Internet and the delivery is made almost instantly. "Conventional" payment methods tend to be more expensive than the actual product. Micropayments are small online payments that range from a few American cents to about 10 dollars. The overhead- and support transaction costs range from a fraction of a penny to at most a dollar or two.²⁷

If you search for micropayment at www.google.com you end up with some 122.000 results. If you continue to research the subject you will find a veritable host of different micropayment schemes, some dead and buried and some still active trying to make an impact on the market. PayPal, Qpass, CyberCoin, Millicent, PayBox, eCharge, Mondex, iPin, Digicash, Pay2See, Micromint, Paystone, MiniPay, Payex, Spacecoin, Pay-Read and Paynova are all micropayment systems, all with different characteristics suitable for different purposes. It is also not unheard of in the micropayment universe to develop a system solely for one purpose or merchant e.g. a newspaper on the web trying to charge its readers for the material.

On researching the phenomenon you realise that the coming of micropayment has been around for a couple of years now. The earliest records we have found mentioning micropayments date as far back as 1997²⁸. What has happened since? The truth of the matter is that it hasn't gained widespread acceptance even if researchers and businessmen see quite a few advantages over traditional electronic payment methods. The rise of micropayment has been heralded by quite a few over the years but still nothing much has really happened. Has the time for micropayment finally arrived?

A common denominator for the micropayment systems of the past is that they were often based on some kind of digital currency. Research was focused on the efforts to make it as safe as possible but normally didn't worry too much about the usability. These systems tended to become a bit too complex for the average consumer. At best they were popular with technology enthusiast but didn't often reach more than this segment. A typical system based on digital currency had the consumer store encrypted strings of numbers (money) on their hard drive. If your computer crashed you lost

²⁷Burstein, J, 1998, p. 10.

²⁸Schmidt, C, & Müller, R, 1997.

your money. A bank had to be involved in order to control that you hadn't already paid for something with that particular string of money. The result was that a payment system could only connect to one bank that held all information.

The systems of today are also alike, but different from the old ones. Today you are mainly dealing with real money, dollars and cents etc. Developers tend to use available encryption and incorporate that into a system that they try to make as user friendly as possible. Most systems on the market are quite easy to use. Perhaps that is why they are still around.

So, what speaks for micropayment? As the Internet continues to evolve and grow, the opportunities increase. New products have emerged in the last years and with increased bandwidth additional products have become available to more people. As the micropayment technology has evolved further it has spread into other areas of use such as mobile Internet, digital television (DTV) and peer-to-peer payment. All these applications contribute to a possible rise in usage of different micropayment schemes. What is crucial though is to find the ultimate application in the future which will demand the use of micropayment, a "killer app" if you want, just as the PC got its breakthrough much thanks to the word processing and spread sheet programs. But what will it be? The Internet has already reached a mass-market diffusion level but it hasn't paid off so far. Mobile Internet shows promise although the diffusion rate seems to be a fair bit slower than the industry expected or hoped for. Nevertheless, if 3G does not catch on quickly after its introduction, the normal GSM system (2G) is also suitable for rendering funds through SMS services such as number queries. Digital television seems on the brink of a breakthrough whether we want it or not since it has been heavily subsidised here in Sweden. Micropayments are quite suitable for this medium if you'd like to for example order (download) a movie in the middle of the night. The trick is perhaps to embed micropayment systems in these technologies before they reach their take off stage.

What speaks against micropayment? The adversaries for micropayment have been quite vocal recently and have given us a number of reasons that this will never take on. The most fundamental argument common to most of them is not that micropayment hasn't worked because of poor implementation but because it's a bad idea. Shirky points to the reason as being simply, that users hate it. In his at the time widespread and often cited article "*The Case Against Micropayment*", Clay Shirky points to a dilemma facing the consumer in a world of micropayment. The merchant seems to be saying: This is worth so much you have to decide whether to buy it or not. And: This is worth so little that it has virtually no cost to you. The consumer then invariably asks himself: Then why isn't it free?²⁹

Another aspect speaking against micropayments is that it takes up too much time for the consumer, and time is something the consumer doesn't have that much to spare. S/he simply cannot be bothered to deal with so many decisions for such a small value. The transaction may be small in absolute monetary terms, but it taxes the consumers' amount of a very limited resource namely time. Time is something that s/he doesn't have in abundance, as is almost the case with money for microscopic transactions.³⁰

²⁹Shirky, C, 2000.

³⁰ibid.

3.3 What Products Can Be Bought with a Micropayment System?

According to the definition of innovation, micropayment systems have the potential to “create or revolutionise markets and demand”³¹ Micropayment systems enable us to pay for the smallest unit we can think of, for example 1 second or 1 byte. This development does not only solve some of the pricing problems, like articles versus subscription, but it also creates new business opportunities on the net. The traditional products like newspapers, greeting cards, or encyclopaedia are entering a new area as well as opening up to a much larger consumer target group. Some examples of future consumer behaviour are how we now will be able to download music, a film, a game or a computer program only for the limited time we need it. Instead of going to a video store or a computer store we will rent what we need or want. Micropayments can also be used for business outside the net. For example when people call in donations on a television gala, there is transaction cost that, relative a micropayment system, eat up a part of the donation. With micropayment systems we can make the transaction over the net and avoid some of the transaction costs. Many of the examples that we have discussed here assume that people will have an Internet connection in their home. Since this is not yet the case, the expansion of these kinds of products might have to wait.

3.4 Security

For a consumer or a merchant to commit themselves and their money to a payment system they first need to trust it. Trust comes from a decrease in uncertainty. If you perceive the system to be safe and secure, you are one step closer to adoption and trust. With a history of Internet fraud and hackers stealing money straight out of the bank vault, security is understandably an important issue. Hence we will give a short account of the different security problems and solutions available and in use today.

A concept often mentioned when talking about security and safety is SET which stands for Secure Electronic Transaction. The standard, developed by VISA and Mastercard, works on the basis of digital certificates based on the technology of public key cryptography. The certificates associate the cardholder and merchant with their respective financial institutions. Confidential information, such as credit card number and expiration date is never sent over the Internet.³² The system is thought to be the most secure way to handle payments on the Internet. It is a bit expensive though so it is normally not used for the smaller transactions in a payment system.

A new concept in the above paragraph is public key. This refers to two main encryption systems: public key and secret key cryptography. Secret key cryptography or symmetric encryption is when data is encrypted and decrypted using the same key. The problem is how to get the sender and receiver to agree on the same secret key

³¹Robertson, T & Gatignon, H, 1986, according to Shanklin & Ryans, p. 2.

³²http://www.setco.org/faq_usr.html

without anyone else finding out. In public key cryptography each party receives a pair of keys, one is public and is made public, the other is private and is kept secret. All communication involves only public key and no private key is ever transmitted. The private key is linked mathematically to the public key but to derive the private key requires too much computing power since it is encrypted in 128 bits (the highest level commercially available). An advantage with public key cryptography over secret key is that the private key never needs to be transmitted to anyone. In contrast the secret key must be transmitted.³³

In order to communicate credit card information and other sensitive data securely over the Internet, Netscape developed a protocol called SSL for Secure Socket Layer. It relies on the use of a digital certificate to identify a computer, the e-commerce server. The consumer's browser validates the server's certificate, and then uses the public key in the certificate to share a symmetric key with the server. For the remainder of the session, the shared symmetric key is used to encrypt communications between the browser and the server, preventing credit card or other sensitive information from being sent over the Internet in the clear.³⁴ The SSL solution has gained wide spread use since it doesn't demand too much of the home consumers computer. Any modern web browser supports the standard and when in use you can see a small padlock at the bottom of the screen.

3.5 Micropayment Suppliers

In this section we will try to describe the characteristics of some different micropayment systems currently on the market. This in order to understand the present systems and competition better. We collected the information through surveys sent to actual running systems via email after a prior phone call to increase the reply rate. The companies were selected to get an acceptable geographic dispersion in the world. Incidentally the companies are also all present on the Swedish market.

The market for micropayment solutions has over the years taken many companies to the grave. If you go back a mere two years you would find a collection of different suppliers who don't exist anymore. Companies such as Millicent, Cybercoin and eCash are no more. Has the time for micropayment systems come at last? Many companies still believe so and continue to invest in the industry. The market today is characterised by many small suppliers, all struggling to grow and to expand their customer base in order to avoid red numbers at the bottom line. A couple of solutions have made it big and are continuing to define the market. Paypal and paybox are examples of companies that have made it and continue to gain acceptance.

Below, in alphabetical order, follows an account of the main competitors we saw as most vital for this thesis in terms of lucidity and ease of understanding. The facts given in this section are taken from the answers from the survey or possibly from additional promotional material supplied by the system providers.

³³Deitel, H, Deitel, P, & Steinbuhler, K, 2001, pp. 184-187.

³⁴<http://developer.netscape.com/docs/manuals/security/sslin/contents.htm>

We chose to divide the presentation of the different systems into four main categories: **The System** is in order to give the reader a general understanding of the system, what it can do, who the main target customers are, applicability (dispersion) etc. **The Design** is fairly self-evident, a description of how the system is built, and how it works. **The Security** category deals with encryption and safety issues. And finally the **Marketing** part deals with how the company actively tries to spread their system and thus affecting the diffusion process. The reason we chose these categories were to demonstrate the different criteria for evaluating a micropayment system according to Schmidt and Müller³⁵, such as security, reliability, customer base etc.

3.5.1 paybox

The System

paybox is a German based company mainly dealing in m-payments. M-payment is a payment solution that uses the mobile phone as a payment device. The system can be used both for online digital products as well as for physical products in the real world such as taxi fares or to pay the pizza delivery guy. The main target is not the usual micropayment but more along the lines of smaller macropayments or minipayments. It is compatible with mobile Internet such as WAP and GPRS as well as digital television. The company earns revenue through fees from merchants, which vary depending on the extent of service and integration supplied from paybox.

The Design

The system on which paybox is based is designed to handle payments via an interaction with the consumer. It is designed to work in the real world, on the Internet and mobile commerce. The system is connected to the user's bank account and the amount is reserved there immediately after the purchase. Consequently you don't need a separate account or a wallet that needs refilling. As a customer of paybox you can use it to different ends such as transferring money from one user to another and of course as a means of payment.

The procedure for a payment can be used to illustrate the architecture and also a safety aspect of the paybox system. When the consumer decides to buy a product on the Internet, whatever it may be, s/he enters his phone number and clicks on a link that says, "call me". This triggers paybox to make a call to the consumer's mobile phone with information on product and amount. The consumer then authorises the purchase with a PIN-number.³⁶

³⁵ Schmidt, C, & Müller, R, 1997, pp. 2-4.

³⁶<http://www.paybox.se>

The Security

The design of the system is in itself fairly safe since it demands a certain amount of interaction in a second step from the consumer. A typical transaction passes through three different networks:

Public Internet (unsecured)

This is the network through which consumer and merchant interact. Information communicated here is only the “consumer paybox number” and amount. In itself not enough to manipulate the system

Secure Internet Connection (SSL)

Here the merchant interacts with the paybox system

Telephony Networks

Authentication and PIN-number verification is handled over a GSM-network.

In order to penetrate the security the hacker must gain physical possession of both the phone and the PIN-code. This design of course makes it harder to manipulate.

The Marketing

Having been around for quite a long time compared to other competitors (paybox was launched in Germany in May 2000) paybox has accumulated a rather large customer base in comparison to other solutions. In order to gain a larger foothold on the market they try to reach new customers through e.g. targeted newsletters and various website activities. They actively try to start relationships with leading merchants in the online industry such as news and ring tones. paybox then attempts to join marketing activities with the merchants such as joint discounts and marketing through SMS.

3.5.2 Payex

The System

Payex is a micropayment system developed by eSolutions in Norway. In Sweden Wallit provides the system. Payex is already a minor success in Norway and is just now breaking into the Swedish market. In a recent press release BitoS announced that they opted for Payex as the favourable payment system in Sweden.³⁷ BitoS is an organisation of interest for Swedish players such as portals, online newspapers, service providers and others that see the need for new services on the online market. Payex is based on a flexible system compatible with digital television (DTV) and mobile Internet as well as peer-to-peer real time transactions.

³⁷http://www.bitos.org/info/info_up_02_6.htm

The Design

The Merchant can choose any number of payment alternatives such as prepaid wallet options or direct payment through credit cards or premium charged SMS. For the merchant there is an option of designing his own payment solution for a specific purpose without the need for the consumer to register with Payex. A well-known example is all the competitions in television where you must SMS a reply for ten or fifteen kronor in order to participate. It was originally developed for micropayment with digital information products in mind. The Payex payment platform allows the merchant a broader choice of payment method apart from only micropayment. Revenues are created through a fee per transaction and also a fixed monthly or yearly fee. In addition to this the money deposited by the customer earns interest.

The Security

As far as we have been able to comprehend the security is not an issue of concern for Payex. The information collected at registration and at the time of some purchases such as mobile phone number or email address is not allowed to fall into the hands of the merchant. Data streams that occur within the system when someone makes a purchase are encrypted using the SSL-protocol.

The Marketing

Thanks to the design of the system, allowing non-registered users to buy using their mobile phone they can be accessed and perhaps persuaded to register with Payex. Mostly though, Payex as all others tend to focus on the merchants, the larger the better. The larger the merchant the greater the increase in customer base for Payex.

3.5.3 Paynova

The System

Paynova is a Swedish company. It was founded in early 2000 and the system has been up and running since October 2001. The solution is geared towards the digital market, which doesn't prevent it from working for ordinary physical products as well. It is compatible with fixed and mobile Internet as well as with digital television (DTV) and P2P-payments.

The Design

The Paynova system works as a virtual wallet that you must first fill with a sufficient amount of money in order to make a purchase. The system supports a multi-deposit method through which a user can deposit money via different channels such as credit card, bank account or giro. Paynova is authorised to store the consumers' money but are under no circumstances allowed to touch it. The Paynova payment solution is totally server based and thus requires no installation on the part of either the consumer or the merchant. It works with fixed and mobile Internet as well as with digital television (DTV) and for P2P-transactions.

Paynova earns its money through a transaction fee from the merchants. A purchase starts out with the consumer wanting to buy an item with his/her Paynova wallet. The merchant checks with Paynova to see if the consumer's balance is sufficiently large, if it is the purchase is approved.

The Security

The security issues facing Paynova are the risks of hacking and fraud (as with all the other Micropayment suppliers). These issues are handled with encryption and monitoring of transactions. The systems and servers themselves have been outsourced to a company specialised in secure hosting. Information flows between both consumer and merchant and Paynova is encrypted with SSL encryption, which is pretty much the fastest available on the market today. Payment and loading the wallet is available with SET security thus avoiding ever having to send sensitive information such as account number and credit card number over the Internet.

The Marketing

As we have seen with most other MPS-providers Paynova hopes to expand quickly by having primarily larger merchants offering Paynova as a payment method and thus hopefully reaching critical mass of consumers or transactions. This way to increase one's customer base looks good on paper but few new customers actually start to use the new wallet or even activate it. They also try to undertake joint marketing drives with strategically large merchants/partners.

3.5.4 Paypal

The System

Paypal is perhaps the most successful example of a micropayment system to date. It started in December of 1998 in Palo Alto, California. The latest figure we have found is a customer base of more than 20 million users and over three million business accounts³⁸, far outpacing much of the competition, who average between 100 000 and 150 000 users if they're lucky. The payment method has gained wide spread use as a means of payment at e-Bay Internet auctions. This has helped Paypal to become the dominant P2P-payment solution. On the other hand the possibility for online session based purchase is a bit limited.

The Design

Paypal is quite simple in its design. It is an email based system where you can send money to anybody with an email address, and if the recipient doesn't have a Paypal account they will get an email notification telling them to register in order to collect the money. This is the viral component of the Paypal system, which has helped them gain such a large customer base. Paypal works well as a means of payment for online

³⁸ www.paypal.com

merchants, but it's between private consumers it has gained most of its customer base. Many micropayment systems can be used in this fashion but it is only for Paypal it has had some kind of impact.

When you sign up for an account you are asked to register a credit card through which you can later make payments. You are also able to connect your bank account to your Paypal account. Since many transactions occur between private consumers this is a necessary feature. How else would you get your hands on the money you make? It is possible to use the account as a pre paid wallet.

The Security

As Security goes in this field, Paypal holds out well. Paypal automatically encrypts confidential information in transit from your computer to theirs by using the Secure Sockets Layer protocol (SSL) with an encryption key length of 128-bits (the highest level commercially available). Before you even register or log in to their site, their server checks that you're using an approved browser, one that uses SSL 3.0 or higher. Once your information reaches Paypal, it resides on a server that is heavily guarded both physically and electronically. The servers sit behind an electronic firewall and are not directly connected to the Internet, so your private information is available only to authorised computers.³⁹

The Marketing

With such a demanding presence Paypal can afford to relax a bit when it comes to marketing. The fact is that consumers and merchants are signing up at a rate of more than 20000 per day. A rate that wouldn't benefit too much from any marketing campaign. From a modest beginning the adoption rate has gained momentum and taken off. The secret to Paypal's success is that it was considered a killer app for online auctions and foremost for eBay. Paypal started to spread via word-of-mouth and reached critical mass in number of users. The strategy of Paypal now is to spread goodwill about their name and to keep complaints at a minimum.

3.5.5 Pay-Read

The System

Pay-Read is a Swedish system originally developed for the information sector and thus well equipped to handle payments for online articles and other related products in the online sector. It is mostly used for products of digital content and less for actual physical products. It is well suited to handle so called session based payments where you pay as you go.

³⁹ www.paypal.com

The Design

The actual payment system for Pay-Read is build on the principle of accumulating small payments into a bill payable at the end of the month. Pay-Read being largely an unknown company could be a problem when it comes to the payment of bills. The company has gone into partnership with Radiotjänst in Kiruna, a known Swedish company dealing with television licence fees. This in order to increase the sense of trust for the consumer. This monthly billing procedure is a relatively unique solution for a micropayment system, as most companies prefer to get paid at the moment of purchase, as is the case when using a virtual wallet. Such a wallet is also available to Pay-Read customers although they mean that the end-consumer is more likely to prefer a system where you don't have to load your wallet with cash in order to buy something for 1 SEK. Such a commitment may repel some potential customers.

To describe the way the payment procedure works in a few words we begin from the consumer's point of view. The users identity is checked by the Pay-Read payment system. If it checks out OK he can pay and read. For every read article or other payment object such as time, file, link or query, a payment transaction is sent to Pay-Read. All transactions are sent regularly to Radiotjänst where they are accumulated. Once a month Radiotjänst bills the user if they haven't already chosen to pay in another fashion e.g. prepaid, credit card or Internet bank. The user pays radiotjänst who in turns refers the sum to Pay-Read less a certain percentage.

Revenue for Pay-Read is created through a commission on every transaction where the percentage varies with the amount paid. We assume that the percentage is higher for products of lower value than for products of a higher value where they face competition from established credit card companies.

The Security

A key consideration for any electronic payment system is security. The trust a consumer puts in a system is often directly proportional to the perceived security of said system. Pay-Read has firstly developed a partnership with Radiotjänst, and thus increasing trust for the system. The security issue is handled through such safety protocols as Secure Socket Layer (SSL). SSL is a security protocol developed by Netscape Communications and is used to secure communications on the Internet.⁴⁰ The user identifies himself with a password using a software called WEB/3. WEB/3 is based upon SSL encryption. He can also identify himself with the help of a certificate previously downloaded to the computer.

The Marketing

Pay-Read is of course trying to expand and build a larger customer base in order to reach a critical mass of customers. The strategy used to accomplish this is a combination of direct marketing and personal selling. They exclusively target merchants on the Internet and content providers and thus do not attempt to contact the end-consumer directly. In order to reach a critical mass of customers fast and to gain a take-off effect in users they try to reach larger publishers and newspapers in order to

⁴⁰Deitel, Deitel & Steinbuhler, 2001, p. 193.

become a de facto standard in certain industries. In order to maintain satisfied customers they use interactive meetings with partner merchants where they try to convey a sense of co-operation in product development. These meetings serve as a medium in trying to better understand the needs of the market they are serving.

3.5.6 Spacecoin

The System

Spacecoin is a Swedish company based in Uppsala and founded in 1999. It is in many aspects your typical micropayment company of today. Its solution is both flexible and varied. They focus their efforts on online digital content such as articles and web pages or games, but can and do serve merchants for physical products.

The Design

The Spacecoin system is built to be simple in use and without any need to download certificates or other software. The consumer is billed monthly and there is no option of loading a wallet with cash in advance. The principle of being billed monthly is of course beneficial for people without credit cards or who just don't want to disclose their number on the Internet no matter how safe it's supposed to be.

The system is entirely server based and hosted by Spacecoin. There is no need for either the consumer or the merchant to download and install any additional software. This makes the solution flexible for the consumer and easy to implement for the merchant.

Spacecoin earns its revenues partly from a monthly fee for the merchant and partly from a percentage of each transaction. They choose to target content providers on the Internet and to largely ignore potential merchant customers dealing with physical products. They have thus chosen to target a narrower niche than say Paynova who cater not only to digital content providers but also to mail order firms on the Internet. Spacecoin can thus be said to be a purer breed of micropayment system.

The Security

When it comes to security in the Spacecoin solution it is not more secure than any other system currently on the market. The information communicated over the web is of course encrypted and information about user ID, password and other user related information is sent via email and regular mail independently and one needs information from both to gain access to Spacecoin.

The Marketing

As already mentioned above Spacecoin has targeted the online digital content providers exclusively in order to gain a foothold in a market they think will grow the most in the near future. Apart from a logo on the merchant's webpage with a request to sign up in order to gain access to the product we haven't been able to find out more

about their marketing strategy. One could assume that Spacecoin tries to tie the larger merchants to their system and in doing so procuring a larger customer base.

To get a better overview we include a matrix of the discussed systems and the features they hold.

Below follows an explanation of what the different variables mean in the below presentation.

- Global: Does the company have a global focus with their strategy?
- Session: Can the system charge by the minute or by another small unit?
- Focus: What kind of merchants does the company target? Do they sell electronic or physical products, or both?
- Platform: On what platform(s) does the system work? Mobile internet is presently WAP and in the future 3G UMTS, DTV = digital television, P2P = peer to peer.

			Focus		Platform				
	Global	Session	Electronic content	Physical content	Fixed internet	Mobile internet	DTV	P2P	SMS
paybox	X		X	X	X			X	X
Payex	X	X	X					X	X
Paynova	X	X	X	X	X	X	X	X	
Paypal	X			X	X			X	
Pay&Read		X	X	X	X				
Spacecoin		X	X	X					

4 Theory

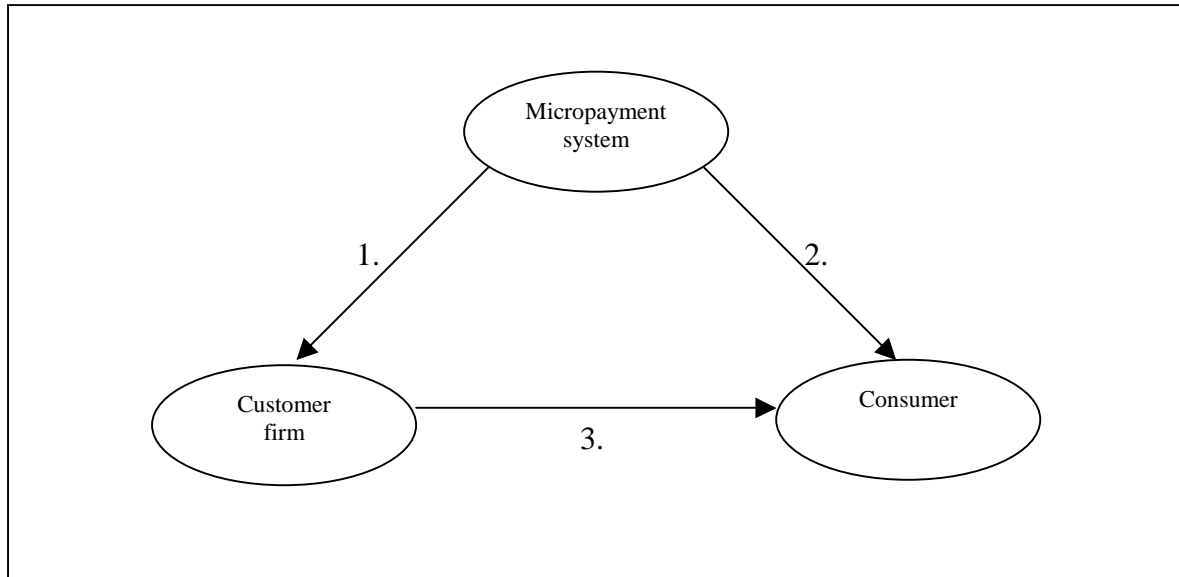


Figure 1. Showing the relation between micropayments and the two market connections. 1-B2B, 2-3-B2C.

In this chapter we will start to discuss the adoption of innovations and the diffusion process. This will lead us further on to the barrier to diffusion that exist for the suppliers and the barriers to adoption for the merchants. In the figure above we illustrate the relationship between the three actors on the micropayment market. As explained in delimitations we will just briefly discuss the role of the end-consumer, but still acknowledge him as an influencing factor.

4.1 Innovation-Adoption-Diffusion

4.1.1 Diffusion Theory

The Theory of diffusion goes back a long way. It was originally developed in Europe by sociologists and anthropologists. For the greater part of its history, diffusion theory has not dealt with marketing or business at all. Instead studies have been made on the adoption of boiling the water for health reasons in a Peruvian village or the adoption

of hybrid corn by farmers in Iowa. Not until the 1960s did it reach the attention of marketing researchers and the tradition didn't really take hold until the 1970s with the advent of social marketing.⁴¹ So as with all new ideas and inventions, the adoption of diffusion theory follows an S-shaped curve, just as it predicts. This S-shaped curve is something like a natural law since it is derived from the point of adoption for individuals which is normally distributed, or in the words of Rogers: "*Adopter distribution follows a bell shaped curve over time and approach normality*"

Since one of the basic problems facing micropayment suppliers involves the adoption of a new technology by customer companies and end-consumers we believe that we can study the problems better by applying the theory of diffusion to the situation as Rogers describes it. The theory of diffusion is basically about the adoption of innovative technology by the users, or in the words of Rogers himself: "... *the process by which an innovation is communicated through certain channels over time among the members of a social system*".⁴² Diffusion can also be described as a kind of social change, defined as the process by which alteration occurs in the structure and function of a social system.⁴³

The quote above indicates a break up into four major elements in the diffusion of innovation, namely 1) the innovation, 2) communication channels, 3) time and 4) the social system. They will be further explained below.

4.1.1.1 *The Innovation*

So what constitutes an innovation? According to Rogers the most important feature of an innovation is that it should be new, whether an idea, a practice or a technology. Whether it is new or not is really beside the point, what matters most is that the potential consumer sees it as new. Robertson, on the other hand, discusses the relative novelty of an innovation in four distinct dimensions; in relation to existing products, in time, in terms of market penetration and in terms of how new the consumer sees it.⁴⁴ He further distinguishes between three different sets of innovations on a continuum:⁴⁵

The continuous innovation is more like a modification of an existing product and has the least disruptive influence on existing consumption patterns. An example is the yearly models from car manufacturers.

The dynamically continuous innovation alters to some point the behaviour of the consumer although it still employs the same basic product. An example here is the Walkman.

⁴¹Rogers, E, 1995, p. 79.

⁴²ibid, p. 5.

⁴³ibid, p. 6.

⁴⁴Paltschik, M, 1985, p. 12.

⁴⁵Brown, L, 1981, p. 2.

The discontinuous innovation signifies the radical alteration of the behaviour of the consumer and the creation of totally new products. Examples of innovations here are the PC, the television or even the car.

There are several attributes of an innovation important for the adoption of it. They are according to Rogers's' summary: relative advantage, compatibility, complexity, trialability and observability.⁴⁶ A deeper explanation of them follows below.

Relative advantage concerns itself with the perceived advantage for the consumer compared to his or her present alternatives. The higher the relative advantage the faster the rate of adoption. The most obvious and also the most stated reason for adoption is economic factors. If a new invention can produce an economic advantage for the consumer then this effects adoption positively. Another aspect not to be overseen is status. This aspect traditionally is more important for the early adopters and innovators rather than for the late majority or laggards. The innovation is not always adopted to give the adopter a higher status, but just as often anything is adopted so as to maintain the image of being an early adopter and the status that comes with this position. Considering the status given to early adopters in society it is only fair to assume that adoption can get out of control and the innovation become over adopted. It is then referred to as a fad. Everyone wants to be an early adopter, which has the effect that virtually everyone has the new gadget. It then becomes hopelessly outdated fairly quickly.

Compatibility on the other hand, deals more with uncertainty. The more compatible a new technology is with one's existing beliefs, values, ideas and needs, and those of the society, the less one would have to change one's habits, and the more prone one is to adopt.

Complexity is the connection between adoption and uncertainty when it comes to understanding a new product. The more complex the product, the less likely is adoption. You will of course always find a couple of enthusiasts but the deeper diffusion into a social system is more unlikely with increasing complexity.

Trialability affects the rate of adoption positively, i.e. the more trialability an innovation allows before a decision on adoption the more likely is it to be adopted.

Observability. If the result of an innovation is easily observed by the individual or the members of the social system, the probability for adoption increases. This is something perhaps best described with the opposite. Consider the idea of safe sex for example. This is a preventive idea. If you adopt it you will be spared of the consequences of something, say AIDS that might not even have happened in the first place. The results are not easily observable thus the rate of adoption is low.

⁴⁶Rogers, E, 1995, p. 206.

4.1.1.2 *Communication Channels*

Communication channels facilitate the creation and transfer of knowledge within a social system in order to gain a mutual understanding. You often find theories on diffusion in the field of communication. This is not that strange with diffusion being in essence a sort of communication dealing mainly with the exchange of a new idea.⁴⁷ At its most basic the diffusion process involves the exchange of information from one individual to another or to several other. A basic prerequisite for this communication to take place is the inequality in knowledge which leads to a conveyance of said knowledge from one party to the other. Knowledge transfers best between two homogeneous parties but as stated above, at least some heterogeneity is required if any conveyance is to take place at all. This constitutes a problem since this difference means that information gets distorted and misunderstandings can and will happen. The distance in knowledge and understanding between a change agent and the potential adopter for example can be quite large. This said about the parties, what channels are there to transfer said knowledge? Mass media is very useful when it comes to communicate to larger groups of potential adopters. This is perhaps more useful than ever in order to create knowledge and awareness (compare this with the knowledge stage of the innovation decision process below). Interpersonal channels on the other hand must be one of the oldest forms of communication channels. This involves a face-to-face interaction between individuals. This sort of communication is more useful in the persuasion stage. Cosmopolite channels are more important during knowledge state and locality during the persuasion stage.⁴⁸

4.1.1.3 *Time*

The time element is a strength of the diffusion theory, but if you don't take care it can also be a weakness. An example of a complication in diffusion research is the fact that you can only interview respondents about their adoption after it has happened. Is this relevant and validating or do you have to seriously doubt the individual just as you should doubt the reliability of a crime scene witness? It is impossible for an individual's present set of values to cause the adoption of an innovation, say, three years ago.⁴⁹

The time element figures in three different aspects in the diffusion theory. They are:

- 1) The innovation-decision process that describes an individual's way from ignorance through awareness and persuasion to adoption.
- 2) The propensity for an individual to adopt a new thing, meaning how early in relation to other people do you adopt that is. What category of adopter are you, an early adopter or perhaps a late majority member.
- 3) An innovations rate of adoption in a system, or how steep the S-curve will be?

⁴⁷Rogers, E, 1995, p. 17.

⁴⁸ibid, p. 18.

⁴⁹ibid, p. 121

4.1.1.4 Social System

Diffusion takes place within a social system that strives towards a goal, common to its members. Different aspects of the system have different influence on the diffusion. The structure of the system deals with opinion leaders, social structure and communication structure within the system. Is the system homophileous or heterophileous. Similarity (homo-) eases communication whereas heterophily often spans the gap between two dissimilar social systems or networks, thus facilitating the wider spread of an innovation. Homophily spreads ideas horizontally not vertically. Something of crucial importance to the individual's adoption in a system is the manner in which the decision is taken. In Rogers you can see a clear distinction between:⁵⁰

- 1) Optional innovation-decisions, where the individual independently takes the decision
- 2) Collective innovation-decision, where the entire system must reach consensus for or against adoption.
- 3) Authority innovation-decision, where the choices are very limited and it instead comes down to a couple of system leaders whether to adopt or not.

These different decision patterns naturally affect the nature of the diffusion in a system.

4.1.2 Adoption Theory

The adoption perspective is the traditional approach to diffusion studies, but one should not be tempted to equal the two. Whereas diffusion can be said to take place on a macro perspective, adoption involves the micro perspective. To clarify: Diffusion concerns itself with how, how fast and where an innovation trickles down in a social system. Adoption, on the other hand, is more about the single individual or other decision-making unit, be it a company or another group of individuals. Why do they choose to adopt or reject a new innovation? We assume that different rules govern this process for the single individual and the organization.

Rogers defines adoption as the decision to make full use of an innovation as the best course of action available.⁵¹ Robertson narrows the definition somewhat as he states that: "*Adoption refers to the use and continued use of an item; it involves commitment rather than purchase trial.*"⁵² Inherent in this definition is the meaning that a purchase is not enough to warrant the term adoption since the individual perhaps does not use the innovation after buying it and the anticipated change in behaviour remains unclear. The individual has to in effect be a consumer of the innovation for a longer time period. Some problems arise with this since the length of time recommended varies with the product category.⁵³

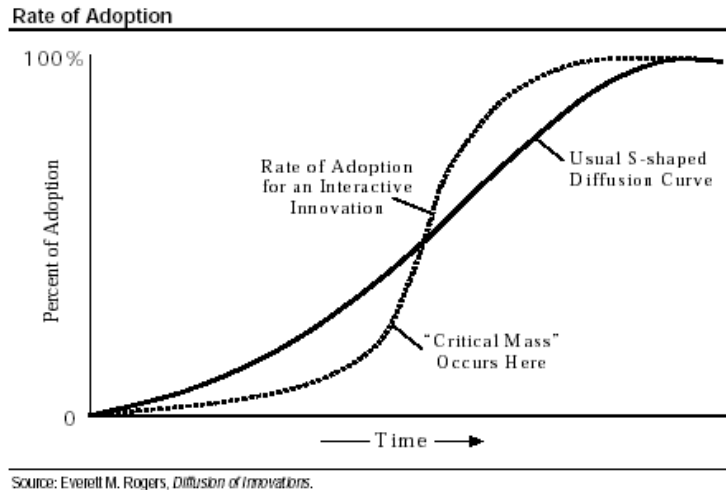
⁵⁰Rogers, E, 1995.

⁵¹Rogers, E, 1995, p. 21.

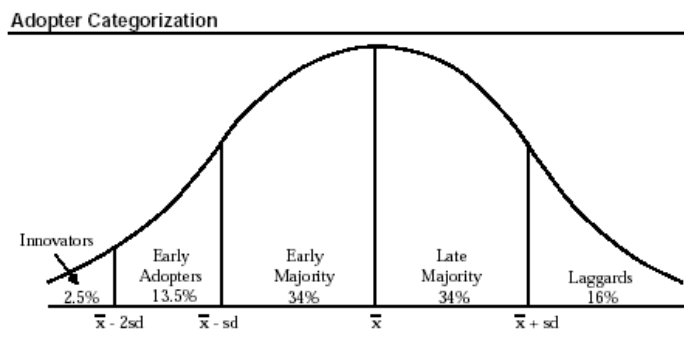
⁵²Paltschik, M, 1985, p. 14.

⁵³ibid, p. 15.

Each individual goes through a series of stages on its way to full adoption. But since the propensity for change is different for different individuals they reach the last stage of adoption at different times. Over time this adoption pattern describes a normality curve. From this curve we can derive the S-shaped curve used to describe the accumulated adoption of an innovation.



Source: Everett M. Rogers, *Diffusion of innovations*.



Source: Everett M. Rogers, *Diffusion of innovations*.

Figures 2.1 & 2.2: The S-shaped diffusion curve and the Adopter categories. (Rogers)

4.1.2.1 Take-off

Why does the diffusion curve describe an S, why does adoption take off after a while? Would it not be possible for diffusion to describe a straight line instead? If you look at the figures above and consider the implication they have on each other you will notice that the majority of individuals do not adopt an innovation until a certain level of earlier adopters has been reached. They have an adoption threshold described as the number of individuals in the potential adopters social system that has already adopted

the product. Individual thresholds for adoption are normally distributed, thus creating the S-curve of diffusion.⁵⁴ There is a connection between the two curves above. The derivative of the S-curve is the normal distribution of, in this case, the adoption threshold of the individual.

An additional and related reason for the take-off is the escalation of positive feedback reaching the individual through his/her personal network which gives rise to an increased probability of adoption. This communication appears to be the most accepted view of the basic reason for the diffusion process.⁵⁵ Initially the adoption rate is quite low, while information and knowledge is communicated through mass media channels to innovators and early adopters. If this group adopts the innovation they start to communicate and influence other people in their social network. This communication can be said to then follow an exponential expansion where each additional adopter communicates their experiences to a couple more people in their group. With normally distributed adoption thresholds for individuals, an S-shaped curve then follows.⁵⁶ Some factors may influence the take-off negatively such as the homophily in personal networks, i.e the social likeness between the people involved in the network. This may inhibit information from travelling outside the network at the same time as it is easily diffused within the same network. This can for instance inhibit the adoption from reaching the next group of adopters.⁵⁷ These weak ties between networks can work as diffusion agents spreading the information from one smaller segment to a much larger, thus leading to a take-off effect.⁵⁸

A related interpretation of the diffusion process is the concept of critical mass, which means that a certain number of adopters are necessary in order to reach the take-off point. After this the innovations further rate of adoption becomes self-sustaining, it reaches its social momentum so to speak.⁵⁹ Until this point is reached, however, the diffusion is in an unstable position, where it might still remain a failure if it fails to spread enough. If a large enough number of adopters is reached, the positive feedback in the system will dominate and the diffusion gain momentum. It is often the uncertainty related to adoption that keeps people from embracing a new innovation. These people can be said to wait for said uncertainty to drop below a certain level through increased positive feedback from their social network.

However there is a problem that Moore describes as the chasm.⁶⁰ By this he means that between different adopter categories (see next page) such as early adopters and early majority. The early majority follows the early adopters in accumulated adoptions, but the individuals are quite different and adopt an innovation for different reasons. Once the early majority is convinced to adopt the adoption rate increases and takes off.

There are two more phenomena ascribed to the take-off effect. These are the network externalities and the technological "lock-in". These should not be confused with each

⁵⁴Rogers, E, 1995, p. 322.

⁵⁵Link, F, 1997, p. 85.

⁵⁶ibid, p. 87.

⁵⁷ibid, p. 90.

⁵⁸ibid., p. 92.

⁵⁹Rogers, E, 1995, p. 324.

⁶⁰Moore, G, 1999, pp. 56.

other. For products with network externalities the critical mass is of paramount importance, since they per definition cannot function alone. What is so special about these products is that for each additional adopter the usefulness of the innovation increases for everyone, not only for potential subsequent adopters but to present users as well. The other concept is the technological "lock-in" which depicts that for product categories dependant on a standard the critical mass is of the utmost importance. But more than anything else the opinion leaders are here crucial to the success of a product. If one specific product is understood to become the future standard on the market, everyone will want to have one since this radically lowers the uncertainty related to the adoption.

4.1.3 Innovation Decision Process

Individual's decision of innovation is not an instant act instead it is a process over time, characterised by a series of actions. It is during these stages that the supplier can influence the customer firm or the end-consumer and it is also when they face barriers that inhibit the consumer's adoption process.

The decision unit in the process whether to adopt or not goes through a series of steps. They have had many different names over the years, but basically they have all referred to the same stages. This terminology we have taken from Rogers. Below is Rogers's figure that illustrates the concept.

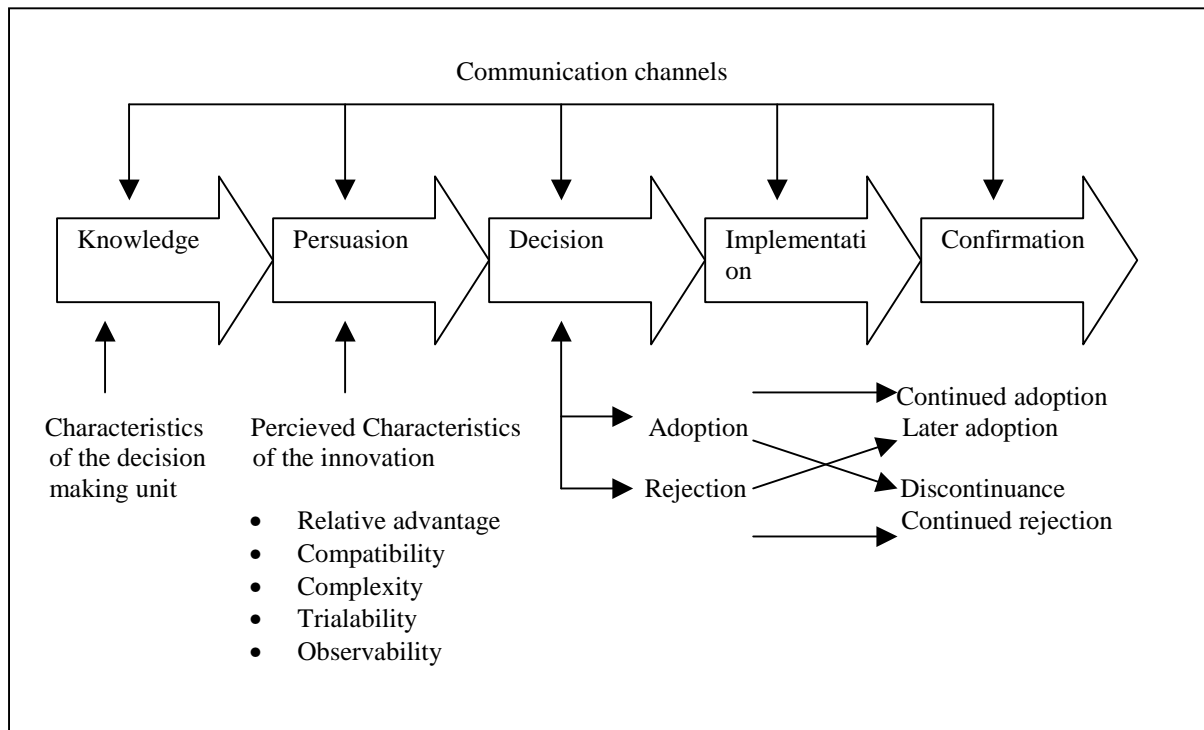


Figure 3. The innovation-decision process through which an individual or a decision-making unit passes.⁶¹

⁶¹Rogers, E, 1995, p. 163.

Knowledge or awareness

When does knowledge come in to the discussion? It all depends on the adopter category the decision-making unit belongs to. Adopter categories are innovators, early adopters, early majority, late majority, late adopters, laggards⁶² see fig 2.2. Naturally, the argument goes, if you are a late adopter you either become aware of the novelty later or, since the adopter categories mainly deal with the time of adoption, you simply adopt later because you are more conservative. A lot of thinking has been done on the problem of what actually comes first, the need or the awareness? Does innovation you did not know existed create new needs for you when you become aware of it? Perhaps you expose yourself to ideas in accordance to your needs and wishes? The research is very unclear concerning the causality connections between need and awareness. What actually came first, the egg or the chicken?

Persuasion or interest

Whereas knowledge is more about cognitions the persuasion stage concerns itself more with affections. The object of this particular stage is to develop a favourable or unfavourable attitude toward the innovation. This is done with the help of the perceived characteristics of the innovation as mentioned above: relative advantage, compatibility, complexity, observability and trialability.⁶³

The decision or evaluation stage

Now it comes down to whether or not to adopt. If we decide not to adopt, that is reject, do we actively do so or do we simply let the adoption decision fade away without really considering it as an option? In other words, passive rejection or non-adoption.⁶⁴ We can however sometimes get away with a trial before we adopt it full out. This is of course dependant on the nature of the product. Sometimes, though, it is impossible to try the product beforehand, instead you have to adopt it fully out from the start. For some the trial by a close contact can partly replace his or her own trial as a means of evaluation. From the point of view of the supplier you could of course focus on the opinion leaders and let them act as evaluators for contacts in their network and thus help diffuse an innovation in the system.⁶⁵

The implementation stage

This stage is also sometimes confusingly called the trial stage. This definition is accurate only if a trial is indeed possible and adoption is not a final and irrevocable step. For the implementation stage we deal for the first time with practical issues as opposed to the process so far which has dealt purely with mental activities. Now you put the innovation into use.⁶⁶ During this stage we can see a heightened uncertainty, especially when it comes to implementation of an innovation by organizations. It concerns more practical question about function or maintenance. A new idea can in its diffusion into implementation change, re-invent itself, and adjust itself to new

⁶²Rogers, E, 1995, p. 262.

⁶³ibid, p. 262.

⁶⁴ibid, p. 172.

⁶⁵ibid, p. 171.

⁶⁶ibid, p. 172.

settings, this in order to lessen the uncertainty and make it more useful to the adopter.⁶⁷

The confirmation stage

This stage can also be called the adoption stage. During the confirmation stage the adopter again evaluates the innovation and hopes to reduce any dissonance he or she may experience. Dissonance occurs if the decision unit finds messages conflicting with the prior decision to adopt or reject. He or she can then according to Rogers reduce this feeling by either discontinuing the adoption or adopt at a later stage.⁶⁸ However, as research in psychology has found, after a decision to buy or adopt, the human being is apt to see only the positive aspects of his or her decision and filter out messages that might be construed as negative. This selective perception is a defence weapon to enhance once own self-image and thus lessen the impact of a misdirected resolution.⁶⁹

Other researchers such as Karlsson argue that it does not end there and propose at least two additional stages in the decision process, the adaptation- and implementation⁷⁰, which since have been assimilated into Rogers's terminology.

Yet other researchers try to look at this process from the point of view of the organization. Zaltman et. al. for example try to simplify things with two major categories, the initiation and the implementation stages. They then divide the process further into more substages. Under the initiation stage we find the knowledge-awareness substage. The authors tackle this stage with a performance gap theory. A company can either be aware of a gap that needs to be filled by an innovation, but on the other hand an organization may not even be aware of a gap until it learns about the innovation. Formation of attitudes toward the innovation substage. Decision substage. Implementation stage: Initial implementation substage. Continued- sustained implementation substage.⁷¹

Many different characteristics of organizations affect the outcome of the adoption and the innovation process. The research has not been able to find any clear relationships between characteristic and adoption. This is thought to be because different attributes effect the organization at different stages in the process. For example the complexity of an organization is positively related to innovation at the initiation stage. The more complex an organization, the better the chance of generating or acquiring new ideas. During the implementation stage however, the complexity may become a liability preventing the company from implementing the new idea.⁷²

The reverse can be said about formalization as an attribute for organizational innovativeness. During the initiation stage the company can do well without proper formalization of routines and rules. This, again, helps new ideas from trickling in into the organization. It promotes an environment of experiments and innovations. Once

⁶⁷Rogers, E, 1995, p. 174.

⁶⁸ibid, p. 181.

⁶⁹Kellog, R, 1995, pp. 378-382.

⁷⁰Karlsson, C, 1988, p. 33.

⁷¹ Zaltman, G, et. al. p. 58.

⁷² ibid. p. 137.

you reach the implementation stage, you need some direction and formal rules and regulations, a guideline of sorts to guide the organization through the implementation process with all its risks and uncertainties.⁷³

The same can be said about centralization where you need less of it during the initiation stage so that each separate employee is allowed to make his or her own decision, which promotes an environment of creativity. When the same organization reaches the implementation stage it is in dire need of some formal authority and a leadership, which can see the big picture and adjust the strategy accordingly.⁷⁴

4.2 Barriers to Micropayments

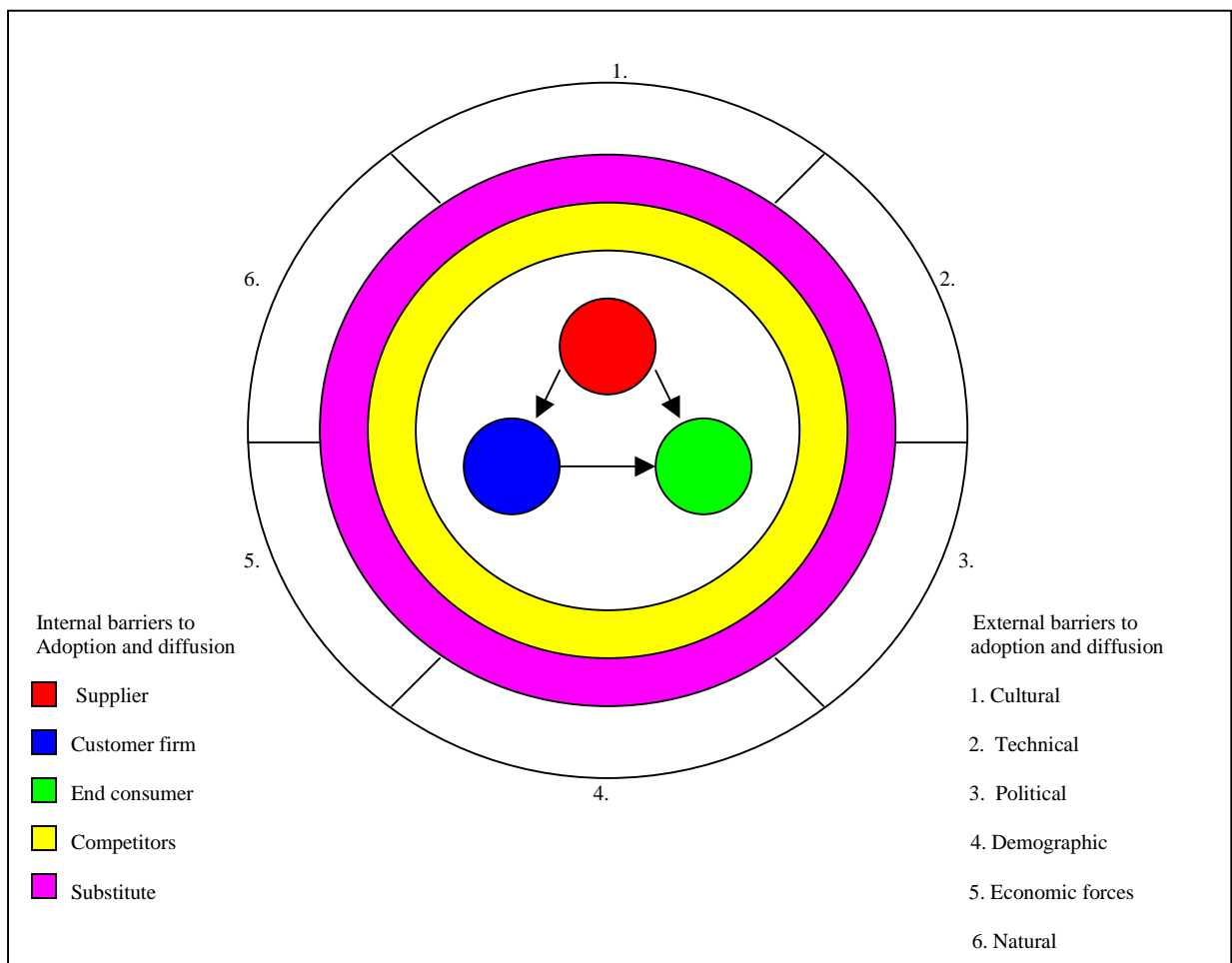


Figure 4. Illustrating barriers to diffusion between the micropayment system (supplier), the customer firm (industrial adopter), and the end-consumer combined with the external barriers of Culture, Technique, Politics, Demographics, Economic and Natural forces as laid down by Kotler.

⁷³ Zaltman, G, et. al. p. 139-140.

⁷⁴ *ibid.* p. 143-144.

When we discuss barriers we mean all factors that might influence the diffusion process negatively. At the same time many of these can be turned around and be seen positively. A barrier of diffusion can also be indirect, for example is lack of resources a direct barrier to research and then lack of research is a direct barrier to rapid diffusion. In any way they stand as obstacles or factors to be considered to actively affect the diffusion process. In a practical aspect these barriers decide how we should form our strategy of distribution and communication. As seen in the figure we also illustrate what we call the external barriers to adoption and diffusion. We will introduce this chapter with a wide description of the external factors affecting micropayment expansion.

4.2.1 The Macroenvironment

Hereby we will present the six most influential forces in the macroenvironment. The first one, *Demographic Environment*, is of interest to marketers because it involves people, who in turn make up the market. Demography is a study of human populations. The study contains among other statistics size, density, location, age, gender, race and occupation. The ageing population leads us to two reflections. First, a long-term slowdown in birth rate which leads the population's average age down. Economies in Eastern Europe and Asia are developing and the population become more educated and this will increase the demand for quality products and services.⁷⁵

Factors that have an impact on consumer buying power and spending patterns are *Economic Environment*. In the 1990's a global upswing in technology and communication made some regions of the world richer and a shift in economic power took place. Despite the fact that there has been a narrowing in wealth and living standards between the developed western and rising Asian countries, there is an uncertainty in Asian economics, which give certain implications for international marketers. Marketers are interested in how spending patterns of consumers vary by different income levels. Changes in for example income, cost of living, interest rates and savings- and borrowing patterns influence the market a great deal. The firms actively watch these patterns by using economic forecasting.⁷⁶

Environmental issues have become more important and discussed the last twenty years. In large cities the levels of pollution are of dangerously high levels for the nature. *Natural Environment* is resources that are needed as inputs by marketers. In Natural Environment marketers need to be aware of four trends: The first one is the shortage of raw material. The second one is the increased cost of energy and the third one is the increased pollution. The last one involves government intervention in natural resource management. It is necessary for marketers to help develop materials and energy to help face this world problem.⁷⁷

Technological Environment creates new technologies and thereby new product and market development and opportunities. Technology has brought positive aspects like

⁷⁵Kotler, P, et al, 1999, p. 153-155.

⁷⁶ibid, p. 158-162.

⁷⁷ibid, p. 162-165.

the penicillin and organ transplants, but also negative aspects like nuclear weapon and machine guns. The following aspects are needed in mind in order for the marketer to succeed. The fast pace of the technological change, the technology life cycles are getting shorter by time. Firms that are not able for some reason to keep up with the technological change can easily find their product outdated. Innovations and technology require high investments in research and development and the firms try to focus on minor product improvements instead of replacing a whole new technology system. When products become more complex regulations must also be involved so that the consumer receive a safe product.⁷⁸

Decisions in a firm are strongly affected by the *Political Environment*, which consists of laws, government agencies and pressure groups that influence and limit various organizations and individuals in a given society. Regulation can encourage competition and ensure the market that they receive fair goods and services. The regulations also exist to protect companies, consumers and the society's interest. The marketer must know the group that have in interest to protect the environment, for example women or children. Despite the regulations that guideline the firm, managers are being recommended to "do the right thing" and use the right codes of ethics.⁷⁹

Cultural Environment is made up by institutions and other forces that affect the society's values, perceptions, preferences and behaviours. People grow up with different believes and values because of living in different societies. Marketers must observe the cultural varieties and predict cultural shifts so that the firm can see new opportunities or threats. People use different products or services to express themselves, for example to drive a specific car gives the person a special feeling.⁸⁰

4.2.2 Business-to-Business

4.2.2.1 *What Affects Diffusion?*

Supply side factors

The suppliers are the companies providing the micropayment system, like Paynova. They affect direct the diffusion process and indirect the adoption process of customer firms and end-consumer. The suppliers of a new technology must determine the characteristics of the innovation, allocating resources in the innovation and also the pricing so that they can speed up the diffusion potential and process. There is assumed to be a direct relationship between client characteristics and the adoption decision.⁸¹

Many of the aspects that are discussed by Roger, Robertson and Gatignon are connected to the competitive environment. In our figure we see that the competitors and the substitute products to the innovation influence the diffusion process. In the

⁷⁸Kotler, P, et al, 1999, p. 165-167.

⁷⁹ibid, p. 167-168.

⁸⁰ibid, p. 169.

⁸¹Robertson, T & Gatignon, H, 1986, p. 3.

discussion about competition Porter's theories of the five forces also becomes relevant. We will only mention this to show his relevance to these theories. In our study he will on the other hand have a minor roll.

Depending on how the industry, in which the innovation takes place, is structured it will affect the diffusion process. There are a couple of factors that all have an impact on the diffusion process:

1. Competitiveness of the supplier,
2. The competitive standardization of the technology,
3. Reputation of the supplier companies
4. The level of vertical coordination.
5. The culture of the industry
6. The actors in the industry

Burns and Stalker illuminate the importance of the organizations structure for diffusion. An unstable environment characterised with rapid changes adapts best to an organic type of organization. The information is said to flow more openly and the resistance to change tend to be smaller.⁸²

A couple of propositions have been made for the diffusion process.⁸³

Proposition 1: the more intense the competitions among the suppliers are the more rapid the diffusion process gets. Under a high competitive competition within the suppliers' thesis mean that this leads to a faster diffusion process. Under the competitiveness more aggressive pricing systems occur and the resource allocation becomes more effective these factors lead to a faster diffusion process. Periods of high competition correspond to industry "shake-outs"; this is shown by Eliashberg and Jeuland who with a model illustrates that prices go down after a new entry and because of the price sensitivity that demand increases. At the product life cycles later stage the competitive intensity remains high and the producers focus much more on the secondary demand. More customers will come into the market and thereby at a faster pace because of the experience curve pricing has driven the prices down. At the same time, the increased competition will limit the market penetration level, shutting out new individual suppliers.⁸⁴

Proposition 2: the more positive reputation the supplier group has, the faster the initial diffusion. The reputation of the supplier is extremely important especially when there are a group of suppliers. The concept reputation means established relationships and confidence to the potential adopters. When substitute products are in the picture, for example the client chooses the material paper instead of plastic, the reputation of the supplier is especially important. Shapiro even suggests that a firm should upon entry sell high quality products to a low price, even below cost, to later enjoy the benefits of the gained reputation. If the firm has a high reputation, a thesis for this has been made and this supplier group will achieve a more rapid diffusion curve.⁸⁵

⁸²Burns, T, & Stalker, G, in Zaltman, G, Duncan, R, & Holbek, J, 1973, p. 170.

⁸³Robertson, T, & Gatignon, H, 1986, p. 5-6.

⁸⁴ibid, p. 3.

⁸⁵ibid, p. 5.

Proposition 3: Technology that is more standardised leads to more rapid diffusion. If the technology is standardised the diffusion rate can become more rapid. This concept is called dominant design. This concept is mostly important when dealing with high technology products such as computers or automated tellers. As the perceived risk of buying a product declines for the client, the easier it is for the client to go into the diffusion process. The client is terrified that he or she will buy a product that is not going to be standard in the future; therefore it is important for the supplier and the industry to attain standardization. There is no value in only one adoption, the technology is only useful if there are other existing adopters and most important of all that the technologies are standardised. The standardization also leads to reducing price levels in the market. The standardization leads to less product differentiation among suppliers, this leads to a higher price competition. The negative aspect with standardization is the fact that it can inhibit better and new products and the “old” and standardised products just continue to exist on the market.⁸⁶

Proposition 4: “the greater the vertical coordination between suppliers and customers, the more rapid the diffusion”. A high degree of vertical coordination is associated with faster diffusion, because the information flow is increasing. The vertical coordination leads to external informational environments and these are valuable information. These boundaries have been positively associated with organizational innovativeness. The clients who realise “tomorrow’s need today” can easily identify new product opportunities by testing new products and provide new opinion leadership for later adopters.⁸⁷

Proposition 5: “The greater the allocation of development and research resources within an industry, the more rapid the diffusion process for new technologies and the higher the diffusion level”. There is a positive relationship between development and research and the innovation process. The more development and research that exists the faster new products reach the market. When competition exists on the market it stimulates development and research even more. Robertson & Gatignon mean that the greater the expenditure in development and research the supplier firm has will lead to new technologies and a new range within them. This in turn will lead to a faster diffusion process. Domestic markets also lead to a faster diffusion process through an enriched technological stream of products, which again leads to a faster diffusion process.⁸⁸

Proposition 6: The diffusion process and level accelerates the more marketing resources that exist. The higher extent, in which the supplier advertises, promotes personal selling and distribution process the more rapid the diffusion process gets. Actions of marketing are important to get faster diffusion and thereby establish a customer loyalty and to get return of investment in acceleration.⁸⁹

Robertson and Gatignon’s theories of supply side influence on the diffusion process can, as mentioned before, be closely connected with Porter’s theories on competitive strategy. Porter presents five forces; Competitors, Substitute products, Distributors, Potential competitors and Buyers. His theory concern mostly competition in an

⁸⁶Robertson, T, & Gatignon, H, 1986, p. 5.

⁸⁷ibid, p. 5.

⁸⁸ibid, p. 6.

⁸⁹ibid, p. 7.

already existing industry, not innovation. But, the five forces of Porter are still applicable as an explanation to micropayments competitive environment. The strongest forces for micropayments are the existing industry competitors and substitute products. As discussed earlier there will always be a race to become the most standardised technology. A good example of this is video recorders, where there were two developed formats, but only place for one “winner”, which today is known as VHS. These companies then realised the importance of partnership and exchange of information. By studying the companies who have developed micropayment systems we can see that they form partnership with other companies in the industry but not with the direct competitors.

4.2.2.2 What Affects Adoption?

Adopter industry factors

The industry adopters or the customer firm can be compared with the end-consumer. Many things affect them likely, but there are some main differences that we now will highlight. The biggest difference for the supplier is that he has little possibility to control many of the factors affecting customer firm adoption. The following factors are associated with the merchants adoption process:

1. Industry heterogeneity
2. Competitive intensity
3. Demand uncertainty
4. Signal frequency and clarity
5. Professionalisation
6. Cosmopolitanism

Proposition 7: “Rapidly in technological diffusion will be maximised at an intermediate level of industry heterogeneity”. When the industry is more heterogenised it leads to greater diffusion. An industry with homogenised is lower in innovation content than information from heterogeneous industry. The value of heterogenised industry was documented as early as in 1973.⁹⁰

Proposition 8: At an intermediate level of competitive intensity the rapidity of technological diffusion will be maximised. It exist a positive relationship between competitive intensity and innovation receptivity. That is, a reasonable level of competitiveness encourages the acceptance of innovation by the customer firm. The acceptance of technological innovation by industry actors has been found to be particularly important in building or maintaining barriers to entry.⁹¹

Proposition 9: “demand uncertainty is generally positively related to the acceptance of innovations”. The competition on the market will be higher the more the industry is unable to predict the demand. The competition then leads to faster diffusion. When

⁹⁰Robertson, T, & Gatignon, H, 1986, p. 7.

⁹¹ibid.

the environment changes drastically, the market demand becomes even more uncertain and that causes changes in the consumers needs. March and Simon points out that a certain level of dissatisfaction result in a search for new alternatives. The higher the environmental changes, the higher need for high technology, which in turn leads to higher rate of adoption of innovations.⁹²

*Proposition: 10 “frequency of signalling and signal clarity is positively related to the speed and level of diffusion.”*⁹³ Signals can for example be new investments, production processes and product introductions. These signals are interesting to have in mind with the clarity of them to see how adoption of the new technologies is related to them. Industries may be very careful with revealing information and they may also send the wrong signals to make the existing competitors confused. Communication openness can be measured in terms of how many trade journals, industry meetings and press briefings that exist. To signal frequently and have existing clarity leads to a positive relationship to the rate of diffusion of new technologies.⁹⁴

Proposition 11: “the diffusion process gets more rapid the greater the professionalisation in the industry is”. Social influence by the firm is extremely important in diffusion process and widely used in diffusion models. If the industry is professionalised in a way so that the employed can relate to their profession as much as they can relate to the firm this will increase the extra organizational information about innovations.⁹⁵

Proposition 12: “The greater the cosmopolitanism of the industry, the more rapid diffusion”. This refers to an external rather than local orientation. Mansfield has noted that the most common source of innovation comes from the outside, thus the greater external integration and network the greater is the innovativeness and diffusion process.⁹⁶

Harvey and Mills highlight the influence of different departments within an organization on diffusion. They mean that the department’s attitude towards innovation depends on if the innovation will affect their single unit positively or negatively. Here we can detect the individual adoption patterns that thus also influence the organization.⁹⁷ Zaltman, Duncan and Holbek describe mostly what relevance the individual in an organization have on the adoption process. The employee’s sensitiveness to local pride, status, hierarchical roles etc are some examples.⁹⁸

⁹²March, J, & Simon, H, in Zaltman, G, Duncan, R, & Holbek, J, 1973, p.169.

⁹³Robertson, T, & Gatignon, H, 1986, p. 10.

⁹⁴ibid, p. 8-9.

⁹⁵ ibid, p. 10.

⁹⁶Mansfield, in Robertson, T, & Gatignon, H, 1986, p. 220.

⁹⁷Harvey, E, & Mills, R, in Zaltman, G, Duncan, R, & Holbek, J, 1973, p.172.

⁹⁸Zaltman, G, Duncan, R, & Holbek, J, 1973, p. 85-93.

4.2.3 Business-to-Consumer

4.2.3.1 *What Affects the Adoption Process?*

This is a short list of the direct factors affecting the adoption process for the end-consumer. We believe it is important to provide the reader with the basic knowledge of the consumer side since it has an indirect impact on the other two actors. Many of these are also relevant for the customer firm's adoption process. We believe this list gives wide description, which helps the understanding of the concept.

- Relative advantage – is the innovation better than existing products?
- Perceived cost - is the innovation consistent with its price?
- Switching costs – is it costly to change from current product to the innovation?
- Uncertainty – will the innovation stay on the market, will it be standardised?
- Compatibility – is the innovation compatible with your values, norms and behaviours?
- Trialability – can the innovation be tried before it is adopted?
- Complexity – is the innovation complex to use?
- Observability – can the innovation be seen on the market?
- Social value – does the innovation bring a social value, status?
- Legitimacy – does the innovation follow established social guidelines?
- Adaptability – does the innovation fit with existing, complementary products and style?
- Modernity – is the market positive to change?
- Homophily – is it a homogeneous or heterogeneous market?
- Physical difference – is the members of the social system spread apart physically?
- Opinion leaders – are there easily identified opinion leaders within the social system?⁹⁹

⁹⁹Hoyer, W, & Mac Innis, D, 2001, pp. 494.

4.3 Strategy

4.3.1 An Introduction to Strategy

The concept strategy derives from the Greek word *strategia* and means generalship, which in turn derives from *stratos*, meaning army or to lead. The first work within strategy is “*The Art of War*” by Sun Tzu about 500 BC. In definitions of strategy it is easy to see a relation between business strategy and military strategy.¹⁰⁰

There are several existing definitions of strategy and some imply military aspects. The Oxford Pocket Dictionary defines strategy as: “*Strategy. The art of war, especially planning of movements of troops and ships etc., into favourable positions; plan of action or policy in business or politics etc.*”¹⁰¹

Another definition on strategy follows” *Strategy is the pattern of objectives, purposes, or goals and the major policies and plans for achieving these goals, stated in such a way as to define what business the company is in or is to be in and the kind of company it is or is to be.*” From the book *The Concept of Corporate Strategy* by Andrews.¹⁰²

4.3.2 Winning Market Leadership

According to Mohr the traditional marketing planning process does not work in a high technology environment. Managers in high technology environment confront the situations they have ahead by strategic market planning process, that are more complex and to difficult to control than the situations themselves. Strategic market planning must become more functionally integrated, simple, fast, iterative, team- and opportunity based. The steps that will be presented below are focusing on developing strategies to win market leadership.¹⁰³

The Strategic Market Planning Process is developed by Barclay & Ryans and constitutes ten steps.¹⁰⁴

¹⁰⁰Grant, R, 2002, according to Andrews, p. 16.

¹⁰¹ibid, p 17.

¹⁰²ibid.

¹⁰³Mohr, J, 2001, p. 39.

¹⁰⁴ibid.

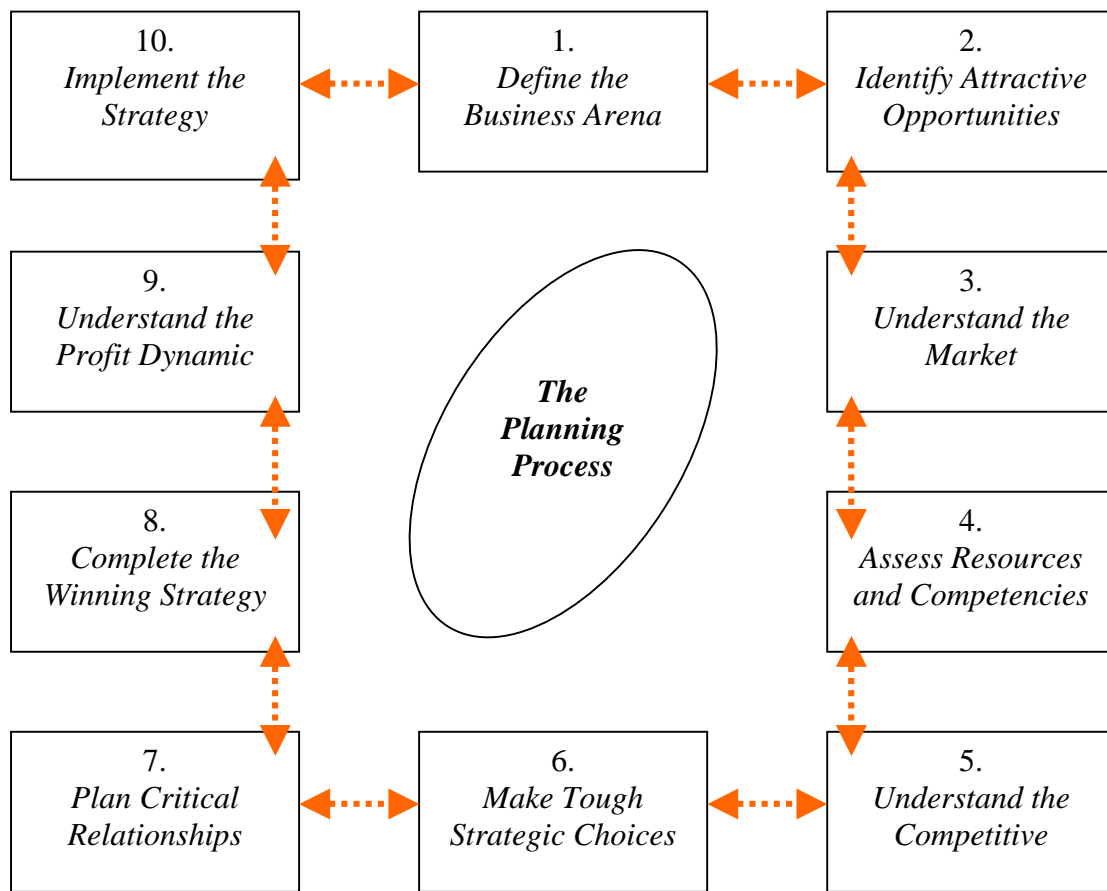


Figure 5. Strategic Market Planning Process¹⁰⁵

1. *Define the Business Arena*; the primary thing in the planning process is to identify the business arena that the firm will target. The arenas that have potential need to be defined along four main dimensions.¹⁰⁶

-Potential customer segments that could be served.

-Potential applications or functionality that could be provided to these customers.

-Possible technologies and capabilities that could be used to create the applications or functionality.

-Possible role for the organization in providing the value to the customer versus the roles of others in the market chain.¹⁰⁷

2. *Identify attractive opportunities*; a client might present a new idea or draw the firm's attention or someone within the firm all of a sudden comes up with a brilliant technological breakthrough. In this step it is of great importance to carefully segment the market, because it leads to a development of the understanding of functionality and application that the customers require.

¹⁰⁵Mohr, J, 2001, p.40

¹⁰⁶ibid.

¹⁰⁷ibid, p. 41.

Then the firm must decide the profitability of serving the different market segments. In certain market segment, the market and others are negative and no firm is likely to be profitable. Then the firm can either be eliminated or not. The management might see a way that they can change the segments dynamics or be in the segment for strategic reasons.¹⁰⁸

3. *Understand the Market Environment*; is particularly important and one must look at the chain of the potential markets with the actual product or service. The management must also look at the buyer behaviour in the potential market segment. If the customer's needs are being satisfied by other suppliers, a fortitude of what will make the customers buy the product from your firm instead. The firm also need to understand the buying criteria, buying process and barriers to adopt the future product or service.¹⁰⁹
4. *Assess Resources and Competencies*; means that it is time to see what internal resources like for example financial resources, technology platforms, intellectual capital and capabilities that exist. It may lead to the firm leaving the opportunity.¹¹⁰
5. *Understand the Competitive Challenge*; is best done after assessing of resources and competencies. The competitive analysis has two basic purposes:
 - *To determine if winning a profitable position in a particular market opportunity is likely.*
 - *To develop the strategy and tactics that will allow the firm to achieve that winning position.*¹¹¹

When developing the competitive analysis the firm must identify all possible competitors that the firm may face. The indirect competitors are the firms that use another technology but meet the same need of the customer. The next question the firm must ask is how does each competitor compete? How do its current and future performance look like and what future strategies underlie? A shift in manager can imply a shift in strategy or a fusion between two companies. What are the weakness or vulnerability of the competitors that the firm can exploit?¹¹²

6. *Make Tough Strategic Choices*

Two strategic issues appear from each opportunity. The first constitutes of finding the best strategy for taking advantage of the opportunity and addresses winning. Has the planning team developed a strategy that will lead the firm to a leadership position in the opportunity? The second addresses, is it worth to win? Should this opportunity be pursued? Is the strategy perfect and powerful enough to target the profit that is goal related? Is the opportunity market attractive enough to generate customers? The firm need to have in mind how well the opportunities fit with each other. Are the strategies for the different opportunities consistent? The hardest challenge is to decide things within the different opportunities. A strategy that is

¹⁰⁸ Mohr, J, 2001, p. 41.

¹⁰⁹ *ibid.*

¹¹⁰ *ibid.*

¹¹¹ *ibid.*, p. 42.

¹¹² *ibid.*

well thought out in the planning process has a few truly attractive opportunities with a developed leadership positioning.¹¹³

7. *Plan Critical Relationships* means that the relationship between the organisation and the market chain in high technology industries are of great importance for success. Other relationships might need to be developed, for example a firm with a complementary product or service that can progress the firm's situation.¹¹⁴
8. *Complete the Winning Strategy*, leads us to marketing and pricing communications. These activities must lead other firms in the market chain to want to work for this specific company, then to work with competitors. The strategy has to fulfil the goal, so that all key players achieve their personal objectives by working with your firm.¹¹⁵
9. *Understand the Profit Dynamic*, leads us to a financial model. Now the ability and the time for developing a financial model is in. This is of value to reach understanding to the marketing strategy and the associated costs.¹¹⁶
10. *Implement the Strategy*, the firm is now ready to implement the strategic plan. To success with the implementation process, it is important to have all key players involved in and committed to the strategy. This is of importance to make the players understand particular choices and to contribute to the development of the strategy. The key players will then make those adjustments that are necessary because of the shifting reality of the marketplace. The Strategic Market Planning Process need energy, ideas and help from all the major functional units. The plan can now come together and a final strategy in different areas become complete.¹¹⁷

¹¹³ Mohr, J, 2001, p. 42.

¹¹⁴ *ibid.*, p. 43.

¹¹⁵ *ibid.*

¹¹⁶ *ibid.*

¹¹⁷ *ibid.*

5 Qualitative Research and Content Analysis of Merchants

As explained in the method, we have from the six chosen suppliers (paybox, Payex, Paynova, Paypal, Pay & Read and Spacecoin) picked one merchant from each of thirteen different industries. We will in this chapter report our content analysis of the micropayment suppliers presentation on these merchants website. The supplier's presentation is evaluated according to ten factors. The factors demonstrate all the observed ways the suppliers show themselves to the end-consumer. We have decided not to present the comparative schedule for Spacecoin and Pay-Read, since the number of merchants that are connected to them is very limited.

In the second part of this chapter we will account for the combined qualitative research and content analysis of some representative merchants. The questionnaire we sent out can be found in appendix 2. It is built on our theory to help fulfil our purpose. The response is presented in a descriptive way to be able to explain the merchant's business in relation to the answers to the questionnaire.

5.1 Comparison of MPS (Micropayment Systems) Presentation on the Merchants' Website

Below follows a comparison of how the six different micropayment systems are presented at their selling merchants.

Definition of Concepts

Below follows a definition of what we mean with the different variables we use to describe the merchants presentation of the micropayment system.

- Logo – Logo visible
- Logo on 1:st side – logo is visible in the opening page
- Logo with link – the logo is created as a link to the MPS homepage
- Mentioned – the MPS is mentioned in name. Note that some merchants only have this to connect them to the MPS.
- Explanation + Link – means it exist an explanation how the MPS works and also a link to the MPS homepage
- Link to explanation - it exist a link to an explanation of the MPS

- Link to signing up – it exist a link to a MPS page where you can sign up as a new member of the MPS
- Link to homepage – it is a direct link to the homepage (not an explanation or signing up)
- Uses more than 1 MPS – means the merchant use more than one MPS system (i.e. Paynova & paybox)
- MPS not found – means there was no connection to the MPS, even though the merchant is listed as a MPS customer.

Paypal	Adresses	Logo	Logo on 1:st side	Logo with link	Mentioned	Explanation +link	Link to explanation	Link to signing up	Link to homepage	Uses more than 1 MPS	MPS not found
Media:	<i>magazinevalues.com</i>				X						
Books:	<i>vjbooks.com</i>	X	X	X			X	X	X		
Beauty:	<i>no-acne.com</i>	X		X				X			
Sport & Leisure:	<i>whateversports.com</i>	X	X	X			X	X	X		
Clothes & Accessories:	<i>shopgco.com</i>	X	X	X			X	X	X		
Food & Drink:	<i>lowcarbchocolates.com</i>	X	X	X			X	X	X		
Travels:	<i>dreamdays.com</i>	X	X	X			X	X	X		
Music & Films:	<i>hollywooddir.com</i>										X
Games & Gaming:	<i>5stardeal.com</i>	X	X		X						
Finance:	<i>sendmoneyorder.com</i>				X						
Home electronics:	<i>ikesound.com</i>				X						
Computer products:	<i>tigerdirect.com</i>										X
Telephones:	<i>eforcity.com</i>										X
paybox											
Media:	<i>spray.se</i>										X
Books:	<i>adlibris.se</i>										X
Beauty:	<i>livingbody.com</i>					X	X	X	X		
Sport & Leisure:	<i>sportus.com</i>	X	X		X					X	
Clothes & Accessories:	<i>mangoshop.com</i>					X			X		
Food & Drink:	<i>vinshoppen.com</i>	X	X	X			X	X	X		
Travels:	<i>mrjet.com</i>	X	X	X							
Music & Films:	<i>filmzone.se</i>	X	X		X					X	
Games & Gaming:	<i>gamezone.se</i>	X	X		X					X	
Finance:											
Home electronics:	<i>nordicchannel.com</i>	X	X		X					X	
Computer products:	<i>ad-data.se</i>									X	X
Telephones:	<i>halebop.se</i>										X

Paynova	Adresses:	Logo	Logo on 1:st side	Logo with link	Mentioned	Explanation +link	Link to explanation	Link to signing up	Link to homepage	Uses more than 1 MPS	MPS not found
Media:	<i>strix.se</i>										X
Books:	<i>bokbutiken.com</i>	X	X		X					X	
Beauty:	<i>friskochkry.se</i>										X
Sport & Leisure:	<i>cykelkraft.se</i>				X						
Clothes & Accessories:	<i>losandes.se</i>	X		X	X	X	X	X	X		
Food & Drink:	<i>bryggeriet.nu</i>										X
Travels:											
Music & Films:	<i>dominanten.nu</i>	X		X	X	X	X	X			
Games & Gaming:	<i>Cdbutiken.se</i>				X	X	X	X			
	<i>mgon.se</i>										X
Finance:	<i>aktietips.com</i>										X
Home electronics:	<i>nordicchannel.com</i>	X	X		X					X	
Computer products:	<i>elji.se</i>				X	X	X	X			
Telephones:	<i>datorprylar.com</i>				X					X	
Payex											
Media:	<i>aftenposten.no</i>				X	X	X	X			
Books:											
Beauty:	<i>mozon.no</i>										
Sport & Leisure:											X
Clothes & Accessories:											
Food & Drink:											
Travels:											
Music & Films:	<i>dylanism.com</i>				X	X	X	X			
Games & Gaming:	<i>radiobingo.no</i>	X	X		X						
Finance:	<i>forinvestor.com</i>				X						
Home electronics:											
Computer products:	<i>thesto.com</i>	X		X	X	X	X	X			
Telephones:	<i>eurobate.nu</i>										X

5.2 Interviews with Merchants

Below follows accounts of questionnaires sent to merchants. The firms are all from different industries and use one or several of the six micropayment solutions.

5.2.1 Bryggeriet Magnum

The firm Bryggeriet Magnum has been advised by its consultant to add several micropayment solutions to the firm. The manager and owner, Benny Magnusson founded the firm in 1993 and has since then been the only employee. Magnusson was familiar with micropayments before several salespersons came to visit and presented the solution. The firm has since the year 2002 been using paybox, Paypal and Paynova. Magnusson defines the micropayments as: “Card payment through the net”. He also finds this kind of payment to have advantages, for example that they can handle most credit cards and cash. The reason for Magnusson to choosing this payment solution was to make it easier for the client to handle the particular purchase. After the visit of the salesperson it took him approximately one month to decide whether he was going to adapt it or not and he had seen that competitors used similar solutions. He then compared the solution with others before the decision making process. The firm was able to try the solutions before they made the final decision. Magnusson had never yet received a request by a client to offer a micropayment solution. However he found it important to be a pioneer in adopting this payment solution to show the environment and the clients that the firm is ahead in the constantly changing technology. Magnusson says: *“I only think that the society is ready for micropayments up to fifty percent, the security is the great issue in every individual”*.¹¹⁸

The firm markets the micropayments through a logo and information on their web site. The established relationship between the supplier is an ordinary one that goes by email or phone. The micropayment company gave guidelines on how to present the payment solution. Magnusson thinks that the clients consider this payment solution to be extremely smooth and that the clients have security and trust in mind.¹¹⁹

5.2.2 Drängahuset

Drängahuset sell furniture and antiques in Swedish old style and give advice when redecorating. The firm also have courses in design and redecorating.¹²⁰ Drängahuset has yet no micropayment solution, but it has been ordered. Drängahuset got an offer through the program that they run on the net, Easy-shop. If they adopted Paynova they would get an upgrade on their Easy-shop. The reason for Drängahuset to choose this kind of micropayment system is because they want to be able to offer the clients this alternative. The firm is hoping that the clients will continue to pay in advance because

¹¹⁸ Magnusson, B, e-mail interview, 02-12-05.

¹¹⁹ *ibid.*

¹²⁰ <http://www.drängahuset.se>, 02-12-12.

they find it easy. The firm also thinks that Paynova has some problems because they want the freight charge to be included. It is not possible for Drängahuset because sending a sofa or a napkin has different freight charges.¹²¹

5.2.3 Los Andes

Los Andes is a rather small firm that was founded in year 2000. The firm sells hammocks and handicrafts that are being imported from Latin America. The distribution is mainly being made through the Internet.¹²² The firm is supplying the favour of micropayments and the clients are able to pay through the Paynova wallet. Paynova contacted Los Andes and the manager Pauline Besselsen found it to be interesting and she also wanted to have a payment solution that was suitable for her firm. Most of Los Andes clients pay through (COD) cash on delivery or in advance and that is working well for them. Besselsen is surprised that no one has used the service to pay through the wallet and she says: *“I am actually thinking of terminating this service from my payment solutions”*. Besselsen has the security in mind and means that the client might not feel secure with a micropayment solution. She also means that her experience of this is rather limited since she has only been in contact with it for a few months.¹²³

On Los Andes website there is link with an explanation where it also says that if you pay with the wallet you do not have to pay 40 SEK in COD fee. If the client does not have a Paynova wallet there is a link to where you can sign up for one.¹²⁴

5.2.4 MGNON International AB

MGNON International AB was founded in 1999 and has 17 people employed. The firm is supplying a number of games online. The firm defines micropayments as payment solutions over the Internet where you use e-mail or cellular phone as main source. The firm offers paybox, PayPal and Paynova. They have been using Paypal since the winter 2001 and paybox since the spring of 2002. At MGNON International AB Gunilla Jansson is responsible for the payment solutions. Jansson searched for information on the Internet regarding micropayments and her decision process lasted three weeks. She did not try the system before adopting it, nor did she compare it with other similar payment solutions. The firm has 80 percent of their clients in the United States therefore it becomes even more important to offer micropayments. Jansson thinks that it is important to be a pioneer in adopting current phenomena and that this firm in particular is in a highly competitive environment. If this firm would not offer micropayment solutions their customer base would be substantially smaller. The firm and the micropayment supplier communicate by email and phone and they do not have a special agreement or guidelines. Jansson means that all kinds of customers use

¹²¹ Drängahuset, e-mail interview, 02-12-12.

¹²² <http://www.losandes.se>, 02-12-05.

¹²³ Besselsen, P, e-mail interview, 02-12-03.

¹²⁴ *ibid.*

the micropayment systems and they have three factors in mind, security, simplicity and rapidity.¹²⁵

5.2.5 Norvoice A.S/Datahorse

The firm Norvoice A.S/Datahorse was founded in 1982 so that customers could bet on horses through the Internet. The turnover is not less than € 100.000 year. The firm's manager John Fr. Bårdsgård defines micropayments as "*payment of small amounts performed on the Internet or other similar platform*". Norvoice A.S/Datahorse offer payment solutions through suppliers like paybox, Paypal, Payex and Paynova. The firm has had these solutions since May 2002 but they have had other similar solutions in 1985-1986 on the videotext- platform. Bårdsgård have been searching for micropayments since 1995 and at last in 2001 someone was able to understand what he meant. He thinks that the customers' ability to transfer money to a virtual wallet and start using it at the same moment is the best advantage. He finds the negative side to be all about the delay in getting the money accumulated from sales to the seller/content provider. The other negative side is the cost (of the transaction) when customers uses their GSM-phone and SMS to pay, and the extra delay in getting the cash from these transactions. The customers wanted a system like this on the net since 1996. Bårdsgård have been monitoring possible micropayment systems since 1986 through all available channels.¹²⁶

Bårdsgård have noticed that some competitors offer micropayment solutions and he has received a request by a customer to adopt the system. Bårdsgård says: "*Yes - as I always has published my knowledge of what was the future in this field, I have noticed that my customer - of course - want to act rationally*". The manager does not consider it important to be pioneers in adopting current phenomena because it costs too much to be among the very first to apply new technology. When we ask if Bårdsgård thinks that the society is ready for micropayments he claims: "*The only people that have not been ready for this are the people working in stupid organizations like banks and institutions giving advice in this matter. Luckily after 7 years of mistakes there was no more mistakes left to do and even the ignorant banks and their likes are now forced to act in the right direction*".

The firm does not have any special agreements with the micropayment supplier and they have not been giving any guidelines on how to present their payment solution. Bårdsgård think that the clients want an easy and flexible system that does not interfere with privacy or violate their security of bank accounts.

¹²⁵ Jansson, G, e-mail interview, 02-12-12.

¹²⁶ Bårdsgård, J, e-mail interview, 02-12-07.

6 Analysis

6.1 Analysing the Environment

A micropayment supplier is influenced and dependent on several environmental factors that can affect the firm positively respectively negatively. The company can't influence these factors but should in any case try to adjust their strategy to them. Below we will identify and analyse these factors.

In the micropayment suppliers' case the demographic environment is a factor he is not able to influence. If the population is rather young it is of advantage to the micropayment supplier since young people are thought to be generally more open to technological change. In areas where people become better educated like for example in Asia, they also become more open, flexible and interested in new things and ways, in this case perhaps to make a purchase through a micropayment supplier. Factors like these are important to have in mind when developing a system that is dependent on new technology and the Internet. We find it important for the micropayment supplier to target their customers with accuracy. This can easily be done through the Internet where the firm can get access to databases, trends and other statistical bases.

A micropayments supplier is also influenced by the economic environment. A region or a country with a healthy economy tends to spend more money, which leads to different payment solutions becoming interesting on the market. If a country suffers from a poor economy it is hard for them to make investments in research and for example Internet access. We find it important for the micropayment supplier to go into markets where there is a strong economy and an interest in new technology. This leads us to the technological environment. A society with a technological interest and drive force is more likely to adopt a micropayment system. The micropayment supplier should market their product in areas where the Internet and computers are just as common as a car, since their product is dependant on the Internet. It would for example be impossible to succeed in marketing a micropayment system in Iran where Internet is not at all common. If the micropayment supplier succeeds well in different areas it can wipe out other payment solutions, just like the compact discs (CDs) did with the vinyl records. Technology leads us to new product and research development, which is partly being regulated by government policies.

The political environment strongly influences the micropayment suppliers' situation. The government can for example decide that every household should have Internet access which creates a perfect opportunity for micropayments. The politics can have a negative side as well as it can help other payment solutions to become standardised. A society is dependent on regulations and laws and we believe that people feel secure if something gets standardised by the government; therefore we find it important for the

micropayment supplier to follow or at least have some knowledge about “new” laws, regulations or guidelines. The micropayment supplier needs to know what is happening in the world of technology otherwise they will lose their relative advantage and another idea, firm or a law can put their own firm in bankruptcy in no time at all.

Technology requires raw material which leads us to the natural environment. As micropayment systems only deal with software the only resource they might use is energy and only marginally so.

The cultural environment influences how people see and view things which is something a micropayment supplier should keep in mind when targeting their customers. In some cultures they have beliefs that are against new technology. There are also existing cultures that are open-minded and that encourage new technology and we mean that the micropayment must target these cultures to succeed.

6.2 Analysis of the Comparative Schedule and an Introduction to the Relative Positions of the Supplier, Merchant and End-consumer.

This part will explain the comparative schedules of the suppliers’ presentation on the merchants’ website that can be found in chapter five. The supplier, merchant and end-consumer will be introduced in an interrelated way and lead us further on to a discussion about a possible development of Robertson and Gatignon’s theory of Competitive Effects on Technology Diffusion.

By observing the comparative schedules of the suppliers’ presentation on the merchants’ website we can find some interesting facts about the different suppliers. Since we have not researched the importance of each factor in influencing the end-consumer’s adoption, we will concentrate on what the schedule might say regardless of the end-consumer. We can see that Paypal and Paybox sell their system with a more standardised presentation. They are keen on displaying their logo, preferably on the front page with a link to an explanation and sign-up for new customers. If we compare this to Payex and Paynova’s presentations we see a wide spread between the factors. Sometimes the companies are not even mentioned or they lack the link that could have reached a potential end-consumer, and sometimes they are very well presented with logo and link. What could be the reason for this? Paypal and Paybox are compared to Paynova and Payex more established on the market and thus have more experience. Paypal is by now a great American company and a part of eBay, the biggest online auctions place. This means they have more resources, both financially and in human knowledge, which facilitates the strategy forming process. We believe a standardised concept and presentation is of great importance to reach the consumer market. Three aspects to have in mind are simple, rapid and easy to use.

A problem here is of course the merchants’ unattached relation to the micropayment system. Mostly they are not in actual need of the system, which means that they do

not actively market it to the end-consumer. This is another reason for focusing on merchants with streaming products in the introductory phase, since they have an interest in paying the system forward to the end-consumer. Robertson and Gatignon's theories discuss the adoption and diffusion process between companies. The adopter is here actively involved with the product and interested in forwarding it to the consumer or using it himself or herself as a piece in production. We want to take their theory one step further and show the situation when the supplier needs to reach two parties, the merchant and the end-consumer, but without any active action by the merchant to pay the system forward. This situation is characterised by uncertainty and a need for the supplier to find alternative channels and strategies to the traditional. The main problem is that the supplier, end-consumer and merchant form a triangle rather than a traditional circle when it comes to product interest. We believe a circle is impossible to create, except for merchants with streaming products, and that a triangle might be in need of extensive investments to succeed. Since investments are not always available it is not a reliable strategy.

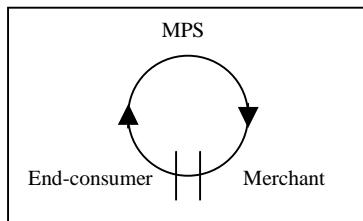


Figure 6 a

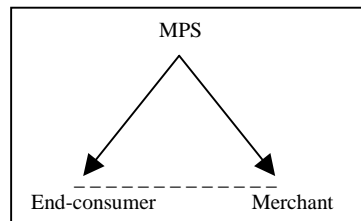


Figure 6 b

Figure 6a, illustrates the improbable but preferable circle relationship between the MPS, merchant and end-consumer. The two lines on the circle show the disruption of interest that disturbs a natural information flow. In figure 6b, the two arrows describe the open information channels and the dotted line the lack of a direct connection.

We think this problem is most apparent in the introductory phase before reaching the critical mass. When the critical mass is reached the system will be forwarded naturally between the consumers by word-of-mouth. It is necessary for the supplier to create strategic relations with the merchants in the beginning. The merchant is the natural and most direct communication channel to reach the end-consumer and should be used as such. The primary advantage for the merchant is to reduce the transaction costs that are connected to traditional payment methods as well as to decrease the administrative work. Make the merchant understand the relative advantage of using a micropayment system.

In the sections below we will in more detail analyse the aspects affecting the diffusion and adoption process.

6.3 How Do the Micropayment Suppliers Try to Affect the Diffusion Process?

After reviewing the data collected from the various companies we have been able to single out some points worthy of notice in this study. With micropayment being as it is a fairly new thing in terms of commercial possibility, the greatest challenge for the companies is to gain traffic and thus to make money. In order to gain more users most of the surveyed companies rely heavily on acquiring merchants in order to offer their payment method as an alternative to traditional means of payment such as credit cards etc. This passive method of tying new consumers to their solution is predominantly used because it is an easy and fairly cheap way to reach new consumers.

One could perhaps view the merchants as opinion leaders whom it is important to reach according to Rogers, but that would only be valid in relation to other merchants who might follow an industry leader. This is a strategy that many companies follow. They target the larger portals and web merchants such as MSN, eBay, or Amazon.

Opinion leaders among the end-consumers are harder to find and it has shown in the efforts spent to actually reach them. The theory of diffusion of innovation states that the opinion leader plays a vital role in the diffusion of an innovation in a social system. What really matters here is the communication channels used to further the idea of adoption. Most of the case companies tend to use direct sale in order to tie the merchants to them. Some as for example Payex also use targeted emails to consumers in their databases in order to reach them. The fact of the matter is that in order for word-of-mouth from opinion leaders to lower level consumers to work efficiently, a critical mass of users should have been reached. The critical mass is hard to reach since there is a chasm between the early adopters and the early majority that is very hard to bridge, as Moore states in his book.¹²⁷

In order for an innovation to gain acceptance in a society it is important that it reaches a number of individuals sufficiently large that further adoption is self sustained through enough word-of-mouth connections. The only company in our survey to successfully have reached critical mass is Paypal. Their Adoption rate took off almost at once. Instead of the forecasted 100 000 users in the first six months they had a stunning 1,4 million users. The reason? They were felt to be ideal as a P2P-payment system by the users of eBay, so within a smaller enclosed society (eBay) the innovation Paypal reached a large adoption in a relatively short time span. It was thought to be a killer app for this kind of business, and most of the communication was through word-of-mouth between private users.

The safety and security issue is of vital importance to all companies in this industry. With tales of online fraud and people losing their savings to unscrupulous individuals abounding, people tend to be careful when shopping on the Internet. The involved companies understand this and they generally spare no expenses explaining exactly how safe their solution is. The uncertainty felt by the consumers must be replaced by a sense of trust in the safety of the systems. How safe are they then? Most systems use

¹²⁷Moore, G, 1999 pp. 56.

SSL-encryption for communications on the Internet. Some use SET certificates to ensure that the credit card transactions are safe. All in all one can say that competing micropayment systems aren't all that different anymore. In the distant past of micropayments many systems relied upon unique and for the occasion created virtual currencies. Nowadays most systems deal with normal currencies and connect to brick and mortar banks and the accepted credit card companies (VISA, Mastercard etc.).

To retrace our steps back to Robertson and Gatignon we can analyse the factors on the market according to the propositions proposed by them, and to see how they hold for this new market (to refresh your memory, please turn to page 45). We will start out by analysing the supply side propositions, and the adopter industry propositions follow in section 6.3. One should keep in mind that we view micropayments in a long-term perspective and that the present situation is only a minor part in our analysis.

Competitive Intensity: An interesting aspect in the development of the micropayment market is the fact that so many companies have come and gone. Imagine handling all the payments flowing through the e-commerce. This is an opportunity that has attracted a fair share of entrepreneurs. Many have failed, or rather, most have failed, but some have prevailed. This intense competition was perhaps more outspoken before the IT bubble burst, when money was easy to come by. Now when investors are more restrictive with their funds the micropayment suppliers have to make do with less and thus slim their solutions and strategies down to a minimum. Competition between suppliers has entered a new phase where they not only compete for customers but also for funds.

In the future the most probable scenario is one with fewer larger suppliers and a more standardised market. We believe that this is the most favourable development in order to get a rapid diffusion, mainly because larger companies convey a sense of trust to the end-consumer. The number of competitors is in the end irrelevant to the competitive intensity as long as they compete in a true fashion. Despite the few competing suppliers we believe that the competitive intensity will remain since they will continue to compete against traditional electronic payment methods.

Reputation: A common denominator for many suppliers is the lack of public awareness. Trust is something that often lies in the reputation of a well-known company or brand. Since the industry lacks this kind of reputation, they most often focus on the security aspect of the solution instead in order to compensate. Studies have shown that consumers are more likely to commit themselves to a company they trust rather than a company that offers a secure payment solution. In other words, users and merchants are more likely to use an insecure payment system from a trusted company than a secure payment system from a mistrusted company¹²⁸. As mentioned above a few large suppliers are able to convey a stronger sense of trust than many smaller unknown. The aspect of trust is particularly important since it involves transactions of consumers' money.

Technology Standardisation: The new generation of micropayment systems is more alike in their design than they used to be. It seems that they have experimented with a couple of different designs and now have agreed on a general design that works better

¹²⁸Kniberg, H, 2002

for the end-consumer. Survival of the fittest as the designs that were too complex were eliminated. A kind of standardisation has emerged that would facilitate a swifter diffusion of micropayments.

Vertical Co-ordination: Some companies develop added features in close co-operation with customers (e.g. Pay & Read), but mostly the merchant just buys a complete pre-packaged solution. In addition, all the dominant systems on the market have been developed without any advice or recommendations from merchants. Some major merchants have tried to develop their own system but have yet to break through to a larger audience. We believe the merchant should be used as a marketing channel to reach out to the end-consumer. This is particularly important in the introductory phase, but once you have reached a critical mass the diffusion rate becomes self-sustaining.

R&D Resource Allocation: This may have been true in the past when micropayment systems needed enhancements in its functions, but nowadays the area of micropayments is well developed in terms of knowledge. The industry can be characterised as dynamic where technological development is more frequent, which means that there will always be a demand and need for new solutions.

Marketing Support: Again not much is spent on marketing nowadays when it comes to micropayments, due to a lack of investors. The optimal way to spread the idea of micropayment today seems to be by word-of-mouth and not so much by regular marketing. Word-of-mouth is better when it comes to convincing the regular consumer how to pay for his or her products. Of course, if resources had been available a more accurate marketing would lead to greater diffusion.

6.4 Analysing the Adoption Process

There are several factors that contribute to the adoption process of a micropayment system, here we will further analyse and identify these factors.

If the merchant finds relative advantages with the micropayment system compared to other payment systems this will lead to a faster rate of adoption. The merchants MGON International AB, Bryggeriet Magnum and NorvoiceA.S/Datahorse have received economic relative advantages because they were now able to reach a larger market and sell smaller units of their product. The advantage is also that it is easier for the end-consumers to pay and the transaction cost is now lower. In the case of the merchant Los Andes it was more about having alternatives when it comes to payment solutions, therefore the manager Besselsen adopted Paynova. It was not done because of other economically relative advantages.

Compatibility, complexity and trialability are factors that effect adoption according to Rogers. The micropayment supplier must make their system compatible with the merchants and clients otherwise they will loose interest which in turn leads to

rejection. Customers are most of the time not interested in changing habits and values, therefore this issue must always be considered.

The merchant Los Andes had the opportunity to try Paynova's solution before adopting it, and since trialability leads to a greater probability of adoption this is not a bad strategy. We believe that the merchants must be offered to try the system in the introductory phase. However some merchants were not interested in trying the solutions because they were certain that the system worked perfectly for their product.

There is always a small group of enthusiasts when it comes to complexity in a product, however we are certain that when it comes to complexity the micropayment suppliers' system needs to be easy to handle and understand, otherwise it will lead to a decrease in the adoption rate. People in general are not interested in a system that is hard to understand and complex, because there is no time for this matter. The merchant MGON International AB says: "*We have three factors in mind when adopting a micropayment system, security, simplicity and rapidity*". The quote says it all. The merchant Norvoice A.S/Datahorse's manager Bårdsgård means that clients have needs and they require an easy and flexible system that does not interfere with privacy or violate their security of bank accounts. All these factors contribute to our understanding that the merchant have demand in order for the end-consumer to feel comfortable.

Status and being a pioneer of an innovation is of importance for some merchants or end-consumers, this also leads to greater adoption as some of the clients want to gain an image of being early adopters. In this case when it comes to micropayments it is not like purchasing a sports car. When the person drives the car he feels young, but with micropayments the individual cannot show off in the same way, although we believe it can help the person to feel that he is always the first one to adopt a new thing. The early adopters are the ones that get to know the product first and can thereby spread information about it.

From the interviews with merchants we have noticed that they have different opinions regarding new technology and whether to adopt it or not. Bårdsgård at NorvoiceA.S/Datahorse is not interested in being a pioneer in adopting new technology he means that it costs too much. Whereas Jansson at MGON International AB is eager, and finds it extremely important, to be a pioneer in adopting new phenomena and technology. The merchant Bryggeriet Magnum is of the same opinion, namely that it is important to be a pioneer in adopting new technology and was advised to adopt the systems by their consultant.

The merchant Bryggeriet Magnum was an early adopter since he wanted to show the clients that he was ahead of the changing environment. Here we can see a perfect example where the rate of adoption is influenced by the changing technology, and the firms aim at being ahead. In the case of the merchant NorvoiceA.S/Datahorse, of course no one affected the manager Bårdsgård in the adoption decision process since he was so eager to find a suitable solution as soon as possible. The only way to sell his product of digital content is through a micropayment system. At MGON International AB the decision for adopting a micropayment system was three weeks and the person responsible did not try the system or compare it with other payment solutions. Once again we think her decision process was rather easy and fast, this due

to the fact that their product, games online, is perfect for a micropayment solution. We now understand that the decision and adoption process depends a great deal on what kind of product that the merchant offers.

If everyone wants to be an early adopter this might influence the product negatively and it might become a fad, partly because it gets outdated too quickly. We do not think this is the case with micropayments since some firms and individuals still have not heard of what a micropayment system is.

Robertson & Gatignon mean that the supplier has little possibility to control the factors that affect customer firm adoption. However it is extremely important for the supplier to have certain aspects in mind about the adoption process. We will hereby analyse the last six propositions further.

Industry Heterogeneity: Since the merchants of most of the suppliers are from a wide range of industries, it can be regarded as a heterogeneous customer market. This kind of market facilitates the information flow between different segments and industries, more so than in a homogeneous market. The homogeneous market also often leads to less innovation development. The supplier Paypal has for example positioned them selves in a large range of industries. On the other hand the supplier can decide to concentrate on one industry, which will lead to greater diffusion within this particular industry. Payex for example establishes itself within only a few industries; we believe that they do so to receive a customer base for the future. This might be a way to become the accepted standard within one particular industry.

Competitive Intensity: There is a positive relationship between competitive intensity and innovation receptivity. We believe this proposition to be true since micropayments otherwise would not have been diffused as much as it has been up until today. All merchants from the interviews claim that they are in highly competitive environments. Some merchants mean that they must offer all kinds of payment solutions in order for the end-consumer to not feel limited. Jansson at MGON International AB claims that: “ *I think that our firm in particular is in a highly competitive environment*”. This firm in particular is competing online with the games available and then we immediately understand her quotation. Without the innovation of micropayments this merchant would loose approximately 80 percent of their clients. Without competition, the customers would not notice the product in the same way as if several firms supplied it. In a competing environment one needs to search for different alternatives and the best suitable solution, but in a market with no competition this is not necessary.

Demand Uncertainty: The constantly changing environment contributes to a need for new technological breakthroughs, like for example micropayments, to be implemented. If the demand is hard to predict this in turn leads to even greater competition since not every firm is updated and certain of what the competitors are up to. This in turn leads to greater diffusion when the merchants adopt to be on the safe side. We find the demand uncertainty to be true and especially suitable in the industry of micropayments. The relatively low cost of implementing a micropayment system makes adoption all the more probable in cases of uncertainty.

MGON International AB is a perfect example of demand uncertainty; Jansson (micropayment responsible) says that it is impossible for her firm to predict the demand in the industry. Because of the demand uncertainty we believe that it is an advantage for the merchants to offer several payment solutions. One may be preferred over another by the end-consumer, which in turn leads to greater diffusion. The diffusion is important for the merchant because the more clients they get the more profitable they will become and end-consumers will understand that they can purchase small units to a very low cost compared to before.

Signal Frequency and Clarity: The amount of signalling is of interest regarding the diffusion of new technologies. This we can understand, but we have not really been able to see if this is the case for our study. To reach any conclusion about this, one would have to follow the development on the market for a longer period of time. Another factor preventing us to draw a definitive conclusion is the fact that we have studied so many different industries.

Professionalisation: If the merchant has personnel employed that are interested in their profession, they will communicate their adopted innovations more efficiently. This proposition is true and of precious information especially in the micropayment industry since it is so dependent on what information the individuals spread. The communication will be spread through all their networks, like for example strategic alliances, partners, clients, and even to family and friends. It is the so-called word-of-mouth that will spread information, good or bad. This will hopefully lead to greater diffusion since the information about the system and the “new” products is spread. It is of advantage for every firm to have professionalised personnel in order for information, marketing and a high level of engagement to show. If the supplier and the merchant lack this professionalisation it will lead to a decrease in information flow, the product or system will then not be marketed.

Cosmopolitanism: The greater the cosmopolitanism of an industry the more rapid rate of diffusion. We find this to be appropriate for the industry of micropayments. Due to micropayments the merchants can also see a larger market in front of them, not limiting them to one market. They can now sell their product throughout the whole world where Internet access is available. By having their firms available to a larger market, the firm automatically comes into contact with external networks and other institutions, which in turn leads to an increased rate of diffusion. Another rather good way in which some suppliers do it is to connect to international corporations; by that means the innovation gets diffused naturally across national borders.

7 Strategic Guidelines

This chapter will provide some thoughts about the expansion of micropayments. The guidelines, as we call them, are meant to highlight the factors that we during our study found to affect the success of the micropayment supplier's expansion on the markets. We will follow Mohr's ten steps of marketing strategy for technological companies. Some of the steps are early stages in the company's lifeline, which have been less studied by us and will therefore be less discussed. We will connect our earlier discussion of the supply side propositions, since the strategy is closely connected with the purpose to diffuse into society. We believe micropayments to be different in some ways from many other technological products and similar in others. There is a need to emphasise these differences, which we in short aim to do here.

1. Define the business arena

Providing a well functioning system, the market for micropayment systems is practically unlimited for the world as well as for different industries. The most obvious limitation to expansion is the use of Internet on the market. As explained in the environmental analysis the supplier preferably needs to act on technologically mature markets. To target the global market can of course not be a first stage of expansion, instead the micropayment supplier must start out somewhere smaller, often due to limited resources. The target group does not necessary mean a geographical area, but can be a concentration on a special industry. An already mentioned example is Payex's concentration on the industry of newspapers and television. Becoming the accepted standard within one industry can open doors for other industries thanks to gained trust. To target a market does not mean that you close yourself for new opportunities. Instead the supplier must always be prepared to expand when opportunities come along.

Target your market according to the advantage of your system, but see the whole possible market as your goal.

2. Identify attractive opportunities

Opportunities can arise from within the company, but very often it comes from the outside. A merchant, an end-consumer, a partner or a competitor can come up with ideas, criticism or problems. The economical environment or a political decision can also change the rules on the market. The supplier must therefore be alert to these information channels and try to have an interactive communication. An example is the answer we received from "Drängahuset", who was concerned about problems facing

the incorporation of different freight costs in the payment when using Paynova. This could be a technological problem in the system or a comprehension problem by the merchant. In any case it should be considered, solved and eliminated as a problem, to open up to new opportunities. In an industry like micropayments or the Internet-business, the “rules” change all the time and at a higher speed relative many other industries. It is therefore necessary for the micropayment suppliers to be flexible practically as well as internally within the organisation.

Keep information channels open to merchants, end-consumers, partners, and competitors, and be sensitive to changes in the external environment, in order to identify attractive opportunities. Stay flexible.

3. Understand the Market Environment

The suppliers must understand the merchant as well as the end-consumer. Information like buying behaviour on the net, attitudes towards payment on the net etc are necessary for the suppliers to understand. We have in the analysis discussed the merchant’s adoption behaviour for a micropayment system. To understand the reasons why the merchants choose one system over another or choose to implement two or more systems rather than one should not be left out. To study your competitor and identify his most obvious advantage with the merchants and end-consumers respectively relative your own system. Only the knowledge of the buying behaviour of the merchant and the end-consumer, and the advantage of the competitor makes the supplier more ready and more flexible for changes.

Understand your environment of merchants, end-consumers and competitors. Constantly learn more and stay alert to changes.

4. Assess Resources and Competencies

The six suppliers we have studied have had different financial starting points. The market leader, Paypal, started out in 1999 when the Internet-business was on its way to a peak. They received large investments and adapted their strategy after it by buying their end-consumers. For Paynova and Payex the situation looks quite different. The economy is in recession and the Internet bubble didn’t burst that long ago. They have concentrated on binding influential merchants to them, with the objective of spreading their product the opposite way from what Paypal did from the beginning. Paypal has today a great advantage by having an enormous amount of merchants and end-consumers connected to them. The financial resources are thus vital for a quick expansion. Technological resources should not be neglected, but to what extent do they matter? It is not sure that Paypal has the best technological solution because it is a market leader. The suppliers must therefore evaluate their technological and human resources against the financial. As discussed in the analysis we agree on a constant allocation of resources to R&D, since the market is always changing with new possibilities or possible threats by competitors. When discussing

the advantage of a standardised systems, this does not be it should not develop with the changes in its environment.

Evaluate your financial, technological and human resources against the estimated needs to expand on the market.

5. Understand the Competitive Challenge

When the supplier has assessed its resources it has knowledge about its own capabilities and possibilities and can evaluate the competitive challenge. We have discussed only six of the suppliers in micropayment industry, Paypal, Paybox, Paynova, Payex, Pay-Read and Spacecoin. There exist others like Micromint, Qpass, CyberCoin, Millicent, eCharge, Mondex, iPin, Digicash, Pay2See, Paystone, and MiniPay. The supplier needs to know its competitors and determine its position against the others. There are many different possibilities in how to position your system. For example does Paynova concentrate on so called information viewing, and Paybox concentrate on expanding by using the mobile as a payment tool. For micropayments it is not completely clear who the competitors are. Is it all payment solutions on the Internet like credit cards, post and bank checks etc, or is it simply those who concentrate on micropayments? The suppliers should not neglect the bigger picture due to possible changes or opportunities that arise, but should concentrate on the closer circle of competitors. The competitive intensity for micropayments will remain, partly because of the presence of alternative payment methods, but also because of the dynamism of the market. The big German company "Computop" deals with security for the world's credit card market. They have seen ahead of themselves and regarded the possible threat of micropayments to credit cards on the Internet. Paynova has close collaboration with them, assuring their own knowledge about the credit cards on the Internet as well as vice versa for Computop. To be ahead and consider the future steps of the competitors is necessary within the dynamic micropayment industry.

Understand your competitive environment and learn to use the weaknesses of your competitors. Evaluate your market position and set up a goal for your winning position.

6. Make Tough Strategic Choices

To achieve the winning position the supplier is forced to make choices. The best strategy for achieving one goal might not be compatible with the strategy for achieving another. The opportunities must be measured against each other and against the resources. Since this kind of information most often is internal and not attainable for the public we have no direct example of how the different suppliers have reached the decision to use one particular strategy and not another, some conclusion can be drawn anyway. Paypal for example must have had many strategic choices to consider before merging with eBay.

Consider carefully each opportunity and weight the possible strategies against each other. Judge the compatibility of each strategy with another strategy and with the company goal.

7. Plan Critical Relationships

Critical relationships have been seen as vital for the success and expansion of a micropayment system. The system needs to be trustworthy and create a long-lasting reputation. This strategy highlights the reputation proposition, where we conclude that micropayments in particular are in need of communicating trust since they handle money. Since the potential market is so big, they need partners to help them reach out. In some ways partners can be regarded as competitors, but can still be useful. Critical relationships like Paypal's merge with eBay was huge and possibly also a limiting. Smaller relationships, like close co-operation with your key merchants (opinion leader) can be vital. This can be connected to the Vertical Co-ordination proposition, where we stress the importance of incorporating the merchant as an active part in the organisation. Paynova co-operates with Computop for example, as discussed above, which inspires trust and safety. Another example is their co-operation with Easy-shop, who provides complete solutions for making business on the Internet. This means that Paynova is incorporated in their solution. Payex is partially owned by other influential companies within the industry, creating a strong chain of reliable connections.

Create and maintain critical relationships to strengthen your position.

8. Complete the Winning Strategy

Develop a winning marketing mix will make you expand. This is of course connected to the supplier's financial resources, which will not be directly considered. Since we have studied the suppliers from the outside we will also highlight the most obvious factors we have come upon in our study. From the schedule where we compare the suppliers' presentation we can understand that there exist some differences and some important points to be mentioned. We can see that Paypal and Paybox have a more standardised presentation than the others. As mentioned before the ease of use is essential for attracting the end-consumer. The same visual logo with a standardised connection to explanation and signing up will definitely help to facilitate the consumer's adoption. We have concentrated on the merchants and their importance in order to take market shares. This goes hand in hand with building critical relationships to reach out. A micropayment system has a so-called fax effect, which means that it functions very badly alone, and better and better the more merchants and end-consumers that are connected. This naturally creates a snowball effect, where word-of-mouth is an important way to expand. Even though we concentrate on the merchant the end-consumer should not be neglected. Paypal offers \$5 if you sign up as a Paypal user. This could become expensive and people could sign up for the wrong reasons. We believe that the consumers that sign up for Paynova, Paybox or Payex, actually will use the payment solution. The consumers should be carefully maintained by

creating a relationship. It could, for example, be interesting to send out a weekly information letter where the supplier informs of the newly acquired merchants. The more merchants connected to the supplier, the more valuable will the micropayment solution be to the consumer.

Create an attractive marketing mix to reach the merchants and the end-consumers. Collaborate with the connected merchants to reach the end-consumer.

9. Understand the Profit Dynamic

Simultaneously to the development of a marketing strategy the supplier must form financial strategies. Here we see the importance of long-term strategies and their connection to available and future resources.

Formulate financial models compatible with your long-term marketing strategies and company goal.

10. Implement the Strategy

The final stage is to use and implement all the information gathered in the prior stages. It is important that the supplier uses the key person within the organisation to follow through with the strategies. The process needs energy, ideas and motivation. It is important that all parties involved understand the choices that have been made and the strategies created to complete their role and contribute in order to reach a “winning” position.

Make all parties involved understand their role to complete and reach a “winning” position.

8 Conclusions

Through our analysis we have reached certain conclusions about the issues facing the supplier's and the merchant's adoption-and diffusion process as well as about the marketing strategy. The conclusion incorporates our theoretical contribution and our own reflections on the subject.

We have through our study realised that the relationship between the supplier, merchant and end-consumer for micropayments differs from the traditional relationships that are described by Robertson and Gatignon. The communication channel between the merchant and the end-consumer is disrupted by the merchants' lack of need for the micropayment solution. We believe that the supplier should actively pursue strategic relationships and co-ordinated efforts, particularly in the introductory phase.

We have come to the conclusion that there are some basic factors for a successful diffusion of micropayments. The system should be secure, simple, rapid, easy to handle and use, and compatible with the merchants present system. With a solid technological base the supplier must create a marketing strategy to reach merchants and end-consumers and diffuse into society. We would like to describe the diffusion process as a two-stage process by highlighting the most important and influencing factors in each phase to enable the supplier to expand on the market.

We have noticed that most suppliers tend to focus exclusively on the merchants as a means of acquiring market shares. The supplier can enlarge their customer base (number of end-consumers) by tying large merchants to them, but since merchants normally offer a selection of payment methods, this does not mean that the merchants' customer base necessarily will be the suppliers' as well. In an introductory phase it is important to acquire merchants, but in order to grow further the supplier should not rely completely on the merchants, but instead they must incorporate the end-consumer into the strategy. In the next phase, after introducing themselves with a selection of merchants, they need to concentrate on the consumers to trigger their adoption; otherwise they will not gain any transaction traffic and hence make no money.

In the introductory phase it is vital for the supplier to target those merchants that they deem to be of most importance to the further development of the market. One key aspect is the kind of product the merchant supplies. We believe it should preferably be so called streaming- and information viewing products. This due to the fact that these products have no real alternative payment solution in order to create revenue. In the beginning it is also important to build a reputation. This can also be done through the merchants as well as through partners. The forming of critical relationships is vital to

create trust and reducing the negative associations connected to payments on the Internet.

A parallel issue is that the suppliers must communicate the advantage of micropayment to the merchants, in the sense that it enables the merchant to charge for very small units. For a situation where the merchant sells among other things lower cost products ranging from a few cents to \$10, they can be made to understand the value of micropayments as the only economically feasible solution. If the supplier succeeds in reaching this understanding with the merchant they might forward the message of usability to the end-consumer, which might lead to a wide spread acceptance for micropayments.

As opposed to other industries, the micropayment business is dependant on reaching opinion leaders among merchants in different industries. Our chosen perspective describes the opinion leaders role in the diffusion process on the market of merchants. Since micropayments work similar to fax machines in the aspects of being useless alone and increasing in value with each connected party, it is necessary for the suppliers to market their solution by word-of-mouth i.e. by using opinion leaders.

This leads us to the discussion of the merchants' adoption process. Since most micropayment suppliers are in a relatively early stage of development in the product life cycle, the connected merchants of today can be considered as early adopters. Despite this we have noticed a difference in the adoption behaviour among the early adopters. For example there is one group of merchants that adopt a micropayment system because their own product is in need of it to function at all, like Norvoice A.S/Datahorse. This group tends to adopt the system quickly due to their knowledge and interest. Another group adopts because they find it important to be ahead of the changing environment and to be pioneers in new technology. They often get an offer by one or more micropayment suppliers and they do not hesitate to adopt several. An important factor for both these groups is the merchants desire to provide alternative payment solutions to the end-consumer, despite the actual lack of demand from the end-consumer.

To finish off our conclusion we would like to highlight some practical strategic concerns. Since the micropayments industry is not yet completely established the suppliers must be flexible to possible changes. This can be reached by creating relationships and communication channels with the merchants, end-consumers, partners and competitors and stay sensitive to the external environment. Another aspect is the importance for the suppliers to communicate a standardised concept on the merchants website. This will facilitate the acceptance of the micropayment solution for the end-consumer. To build a closer relationship with existing consumers we believe it is vital for the suppliers to keep a constant contact by for example sending newsletters.

The establishment of micropayments as a generally accepted payment solution on the market is still in its infancy. We believe we have clarified certain aspects that concern the diffusion of micropayments.

8.1 Suggestions for Future Research

In this thesis we have predominantly investigated the supplier-merchant relationship. The end-consumer has been seen mostly as a variable and the ultimate end to the means of the supplier. What drives the consumer in the adoption process of micropayment systems? What do they perceive to be most important? These are some of the questions we have raised in the progress of our work and we think are important. We feel that there is a need to investigate this further. Because of the actuality of micropayments there will naturally arise aspects that need further research.

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Appendix 1

Questionnaire to suppliers

I ***The micropayment solution***

1. *What characterises your micropayment solution?*
 - a. *What relative advantage does it have? (towards competitors and the market)*
 - b. *How is your system designed? (billing, financial institutions, security)*
 - c. *Is your system compatible with Digital Television and Mobile Internet?*
 - d. *How do you earn money? (does the customer firm pay a fee per transaction or does it subscribe to the whole system?)*

II ***Marketing***

2. *How do you recruit new customer and how do you maintain the existing ones?*
3. *Can you distinguish between different industries that are more attracted to micropayment?*
4. *Do you have a defined marketing strategy? Who is your primary target group and how do you reach them? (merchants)*
5. *Do you adapt your marketing towards different industries? If yes, how?*
6. *What characterises your relationship to the customer firms when it comes to marketing towards the end-consumer?*
7. *As a micropayment supplier you are faced with network externalities (the so called fax effect). Do you consider this and if yes, how?*
8. *Do you think that in the future there will be one dominant standard for micropayments or several competing?*
9. *Approximately how much is your budget for marketing expenses?*
10. *How do you position your company on the market? (relative other payment solutions like credit cards, and relative other micropayment systems)*
11. *Can you name a few merchants who use your system?*

12. *Do you have any strategic partners or “key” players?*

III *The future*

13. *How do you picture the company’s future?*

a. Do you plan to expand and if so, when?

b. In what time perspective do you plan to expand?

c. Do you plan to expand in different regions and internationally at the same time or gradually?

14. *Do you see any new possibility in product and market development, due to the micropayment system?*

Appendix 2

Questionnaire to merchants

I Company background

1. *Contact person:* *e-mail:*
Phone:
2. *Company name:*
3. *Foundation year?*
4. *Number of employees?*
5. *Turnover per year?*
6. *Hierarchy and structure of the firm?*

II Payment solution & Adoption

7. *Are you familiar with micropayments? If yes, describe what it is.*
8. *What micropayment solutions do you offer? (paybox, Paypal, Paynova etc.)*
9. *For how long have you had your micropayment solution?*
10. *Who is/are responsible for adding micropayments solution to you payment alternatives? (position/s in the firm)*
11. *How did you come in contact with the micropayment supplier? (through the supplier, marketing, competitor, a friend or other)*
12. *What advantages/disadvantages does your micropayment system offer to your firm and to your clients?*
13. *How long was your decision process for adapting the micropayment solution?*
14. *Did someone in particular affect your decision?(If yes, please explain who)*
15. *Do you think it exist opinion leaders for micropayments in your industry?*

16. *What factors affected your decision to offer micropayments to your customers?*

- a. *Did you search for information about your micropayment solution?(If yes how?)*
- b. *Did you compare your chosen micropayment solution with other alternatives before adopting it?*
- c. *Did you have the opportunity to try the solution before adopting it?*

17. *What is your reason for using micropayment solutions?*

- a. *Have you received a request to adopt the micropayment solution by a customer?*
- b. *Have you noticed that your competitors offer micropayment solutions?*
- c. *Does your company consider it important to be pioneers in adopting current phenomena? (Why/why not)*

18. *Do you consider your industry to be in a high competitive environment?*

In what way has it affected your decision process on offering a micropayment solution to your customers?

Are you able to predict the demand on the market in your industry? In what way and how?

19. *Do you think the society is ready for micropayments? (why/why not)*

III Marketing

20. *Do you have a separate marketing unit? If not, who handles these issues?*

21. *Do you get help from another firm concerning the marketing?*

22. *What do you do to market your different payment solution?*

23. *Do you want the customer to use a specific payment solution? If yes, what do you do to make them favor it?*

24. *What kind of relationship or contact do you have with the supplier?*

a. *Do you think the supplier works on having a good relationship with you?*

25. *Do you have any special agreements with the supplier?*

a. *Has the supplier given you guidelines on how to present their micropayment solution? (If yes, what kind?)*

b. *Do you present the micropayment's logo as a payment solution in your firm? (If not why)*

26. *What does the consumer think of the micropayment solution?*

27. *What factors do you think that the consumer consider when choosing a payment solution?*

28. *Have you noticed what kind of consumer that uses the micropayment system?*

Appendix 3

Explanations of technological terms

2G: The second generation of mobile phones also known as GSM.

3G: The third generation of mobile phones currently in development. This standard will support much higher data rates, measured in Mbps. 3G will support bandwidth-hungry applications such as full-motion video, video-conferencing and full Internet access.

B2B: B2B stands for “business-to-business” and points to trade between companies. But there's more to it than purchasing. It's evolved to encompass supply chain management as more companies outsource parts of their supply chain to their trading partners.

B2C: B2C stands for "business-to-consumer" and applies to any business or organisation that sells its products or services to consumers for their own use.

DTV: Digital Television as opposed to the current analogue transmissions.

e-commerce: referring to business transactions involving information- and communication technology. Both B2B and B2C can be included in this concept. We have mainly used it in the B2C context.

GPRS: GPRS is an abbreviation for General Packet Radio Service and is a new non-voice, value added service that allows information to be sent and received across a mobile telephone network. It is sometimes defined as 2,5G.

GSM: GSM stands for Groupe Speciale Mobile after the group whose mission it was to develop a common standard for mobile telephony in Europe. It is a standard for digital mobile telephony.

MPS: Micropayment system. An electronic payment system that can handle amounts of a low denomination efficiently and cost effective. In this thesis we have sometimes used the acronym instead of writing the full name.

P2P: Peer to peer. Transactions occurring between private consumers without the interference of any business. Originally defined as: communication between independent computers without the interference of a central server.

SMS: SMS is short for Short Message Services. It is a standard for sending small messages of up to 160 characters to mobile phones.

WAP: WAP is an abbreviation for Wireless Application Protocol. It is a standard developed to handle information via mobile phones and other wireless applications like a PalmPilot.