

## **The Early Success of the Finnish e-Banking**

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### **BACKGROUND AND MOTIVES**

Recently The Banker again presented Nordea with global award for best e-banking strategy. Much of the success of Nordea is based on the work done in the Finnish part of Nordea, Merita bank. In the present paper the success of the Internet banking (Internet banking is a synonym for e-banking) is explained by the history of the electronic banking in the Finland. The aim in electronic banking to increase the share of the machine readable form in transactions.

Choi et al (1997) presented the trends in electronic commerce by a cubic, the three dimensions of which are virtual product, virtual agent and virtual process. I look the banking from the point of banks' payment system, which of course is a small part of the activities in the bank and the Internet bank. Mattila (2001) names six payment ways for consumers: 1) bill payment in an envelope, 2) via automatic teller machine (ATM), 3) over the counter, 4) as a direct debit, 5) by telephone and 6) over the internet. In order to have more background for the Internet banking I included in our analysis all the six used by Mattila (2001) and two others: the bankcard and PC banking (paying bills by the PC either on-line or in a batch process). The study is based on the secondary material and interviews in the field.

The bank technology has improved in the last 40 years significantly. Several social and technological innovations have occurred. According to Hirvonen et al (1993) the initial impetus to payments based on electronic data transmission was laid in the 1960s when employers started paying wages and salaries directly into employees' bank accounts. Postal and bank giro have been developed earlier in 1939 and 1942, respectively. Computer was introduced in the banking sector in Finland in 1960. Since then bank card, reference bank giro, automatic teller machines (ATMs) digital phone, personal computer and mobile phone have been introduced in the banking sector (see Table 2 on page 9). As mentioned the main goal of all these changes have been the increase of the number of transaction in machine readable form. The transaction in machine readable form is itself a digital transaction. Systems using digital transactions such as bank card, ATMs, PC, etc. belong to electronic banking. Machine readable form, digital and electronic terms means in this study the same thing. Thus, Finnish banks have been making their operations digital since the introduction of the first computer in the 1960. In ten years, from 1986 to 1995, the share of digital transactions in bill payment rose from 24 per cent to 73 percent (The Finnish Bankers' Association, 1996:23). This means that the Finnish banks had a

remarkable share of the products, process and agents in Choi et. al.'s (1997) dimensions in digital mode before the introduction of the Internet in the Finnish banking sector.

The motives for this research lies on several reasons. First, I have nine years experience in research on impacts of technological changes on industry structures. These studies include causal analysis with a comprehensive longitudinal research approach: Several stakeholders, sources of information and triangulation have been used. The studied industries are, for instance, the flat glass (Uusitalo, 1995 and 2000) and cement (Uusitalo, 2000) industries. Second, already in 1995 I was asked whether the models used and developed by the author are applicable also in the service sector. Third, the banking sector is interesting in many ways: 1) the number of bank offices first went up and then sunk dramatically, 2) I have participated within the industry since the 1960s, 3) studies on the switch to the Internet, namely Mattila (2001), are interesting. Mattila's (2001) research approach was totally different to that of the present study. Mattila used cross sectional data. Does cross sectional data work in a causal study? According to Mattila (2001) there were two main reasons to switch to the Internet. The use of the Internet bank does neither depend on time nor on place. Was the Internet bank the first mode to offer these features? More over I belong to the main Internet user group defined by Mattila, but the study gave no reason why I do not use the internet bank.

The main objective of the present research is to find out reasons for the early success of the internet banking in Finland.

The rest of the paper is divided into five sections. The first section addresses the theoretical base, Choi et. al.'s (1997) cubic for the trends in the electronic commerce, Foster's (1986) S-curves, the cyclical model of technological change introduced Anderson and Tushman (1990), the typology of the determinants of technological change proposed by Tushman and Rosenkopf (1992), and the landscape of technology adoption life cycle proposed by Moore (1995). The second section is devoted to an illustration of the research methodology in the empirical study. The third section deals with the empirical part. This section includes brief illustrations of new innovation in the banking sector and a case descriptions of the evolution of the Finnish banking technology in 1960-1995, the era before the introduction of the Internet. The evolution is tied to the dimensions Choi et. al.'s (1997) cubic. In the fourth section the success factors are introduced. In the final section, I propose, on the basis of the analysis, that the generalisation of the success factors to other countries should be done with care, since the ground for Internet banking in Finland was much different form those of many other countries. I also discuss the applicability of longitudinal and cross sectional approaches in causal studies. Theoretical and managerial implications plus suggestions for future research are presented, as well.

## CONCEPTS

### Choi, Stahl and Whinston's (1997) trends in the electronic commerce

Choi et. al. (1997) presented their trends in a cubic form (see Figure 1). The cubic has naturally three dimensions. In this case the first axis or dimension is the agent (or the marketing channel), the second one the product and the third one the process. In all dimensions there is a continuum from physical properties to digital ones. In traditional commerce the agent, product and processes are physical such as buying a vinyl record (a physical product) in a music shop (physical agent) from a sales person (physical process). On the other end there is pure electronic commerce with digital or virtual product, agent and process. In pure electronic commerce everything takes place in virtual environment. An example of this is, for instance, the digital music (digital product made in digital processes) which is down loaded from the internet (digital agent and process).

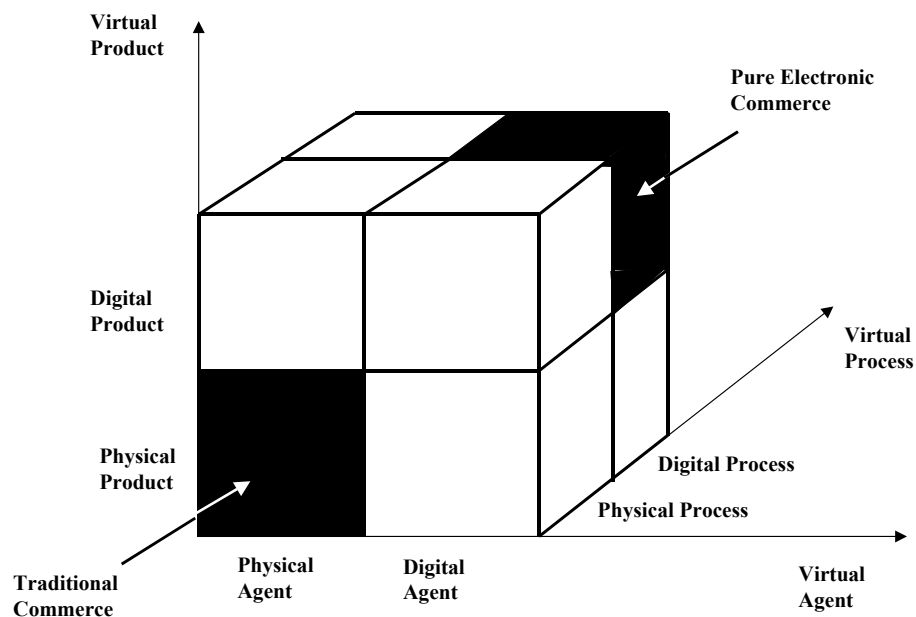


Figure 1. Trends in Electronic Commerce (Choi et al 1997)

### Foster's S-curves

According to Foster (1986), most of the managers of companies that enjoy transitory success assume that tomorrow will be more or less like today. Significant changes are unlikely, unpredictable, and they in any case come slowly. Foster's S-curve is a graph of the relationship between the effort put into improving a product or a process and the results one gets back from that particular investment (see Figure 2). At the beginning, as money is put into a new product or a new process development,

progress is very slow. Then something happens as more learning and the key knowledge necessary to make advances is put in place. Finally, as more money is put into development of the product or the process, it becomes more and more difficult and expensive to make technical progress. The S-curve sets the limit to a particular technology. The quotation from Foster (1986:34) explains the importance of an S-curve. "If you are at the limit, no matter how hard you try you cannot make progress. As you approach limits, the costs of making progress accelerates dramatically. Therefore, knowing the limit is crucial for a company if it is to anticipate change or at least stop pouring money into something that can't be improved. The problem for most companies is that they never know their limits. They do not systematically seek the one beacon in the night storm that will tell them just how far they can improve their products and processes." According to Foster, S-curves almost always come in pairs (see Figure 2). The gap (or the movement) between the pair of S-curves represents a technological discontinuity - a point when one technology replaces another. Rarely does a single technology meet all the customers' requirements and the many technologies compete with each other.

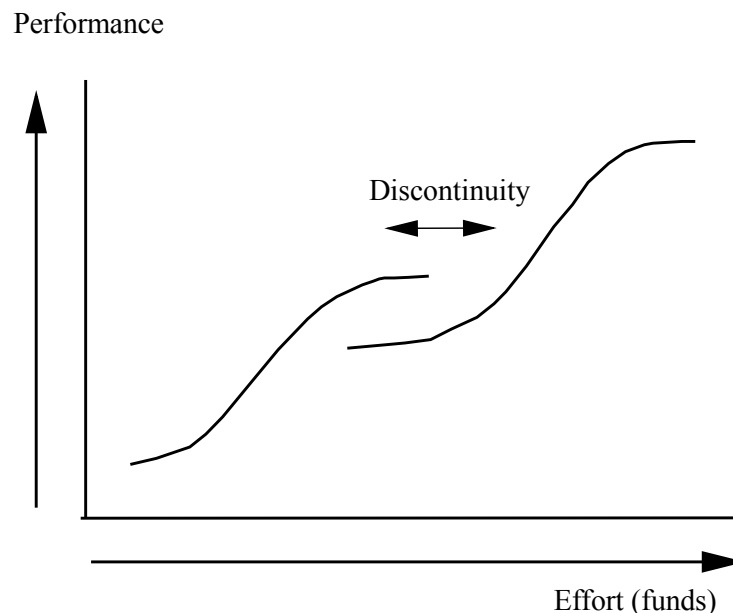


Figure 2. S-curves Almost Always Appear in Pairs (Foster, 1986)

### The cyclical model of technological change

The normal process of technical progress in an industry is assumed to consist of long periods of incremental change. A technological discontinuity inaugurates an era of ferment in which competition among variations of the original breakthrough culminates in the selection of a single dominant configuration (dominant design, Utterback and Abernathy, 1975; technological paradigm, Dosi, 1982; technological guidepost, Sahal, 1981; tornado, Moore, 1995) of the new technology. The era of ferment is characterised by two processes: technological substitution (that is the prior technical regime was replaced by the innovative product or process) and design competition (that is technological rivalry between alternative new regimes).

Successful variations were preserved by the incremental evolution of this standard design until a new discontinuous technological change initiated a new cycle of variation, selection, and retention. The cyclical model of technological change is illustrated in Figure 3. Anderson and Tushman's (1990) model provides a base for understand different types of innovation in different industries during different periods, using a common framework that lets us compare one to another.

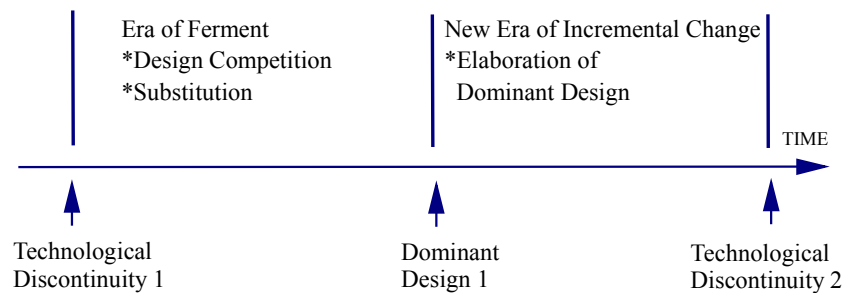


Figure 3. The Technological Cycle (Anderson and Tushman, 1990).

Tushman and Anderson (1986) characterised technological discontinuities as competence-enhancing (that is significantly advancing the state of the art, or permitting the transfer of, existing know-how and knowledge) or competence-destroying (that is significantly advancing the technological frontier, but with a knowledge, skill and competence base that is inconsistent with prior know-how). Social, political and organisational dynamics selected single industry standards or a dominant design from among competing technological alternatives.

### **The organisational determinants of technological change typology**

Tushman and Rosenkopf (1992) defined technology as systems composed of component and linking technologies. More precisely, they distinguish four types of products: non-assembled products, simple assembled products, closed assembled systems and complex, open systems. The more complex the product is, the more subsystems exist, the greater the number of internal and external interfaces becomes and the greater the technical and contextual uncertainty is. Thus, while the technical system itself may suggest logical evolutionary paths, as the system gains complexity, nontechnical forces weigh more heavily on the process of technological evolution (see Figure 4). The greater these uncertainties are, the greater the intrusion of sociopolitical dynamics in the evolution of a particular technology becomes (Tushman and Rosenkopf, 1992). They defined the organisational community as the set of organisations that are the stakeholders for a particular technology. Depending on the technology this set of organisations will include suppliers, manufacturers, user groups, governmental agencies, standards bodies, and professional associations. Tushman and Rosenkopf (1992) stated that technology as systems focuses on differences in technical complexity across products.

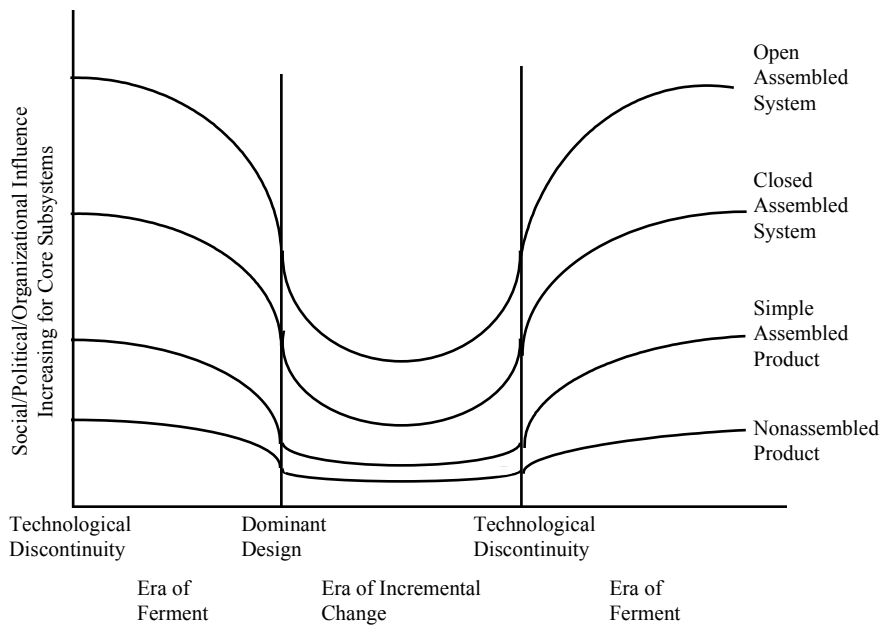


Figure 4. Toward a Sociology of Technology (Tushman & Rosenkopf, 1992)

### Bowling Alley (market research, Lead users) and Tornado

Moore (1995) builds on the technology adoption life cycle (Rogers, 1983)(see Figure 5).

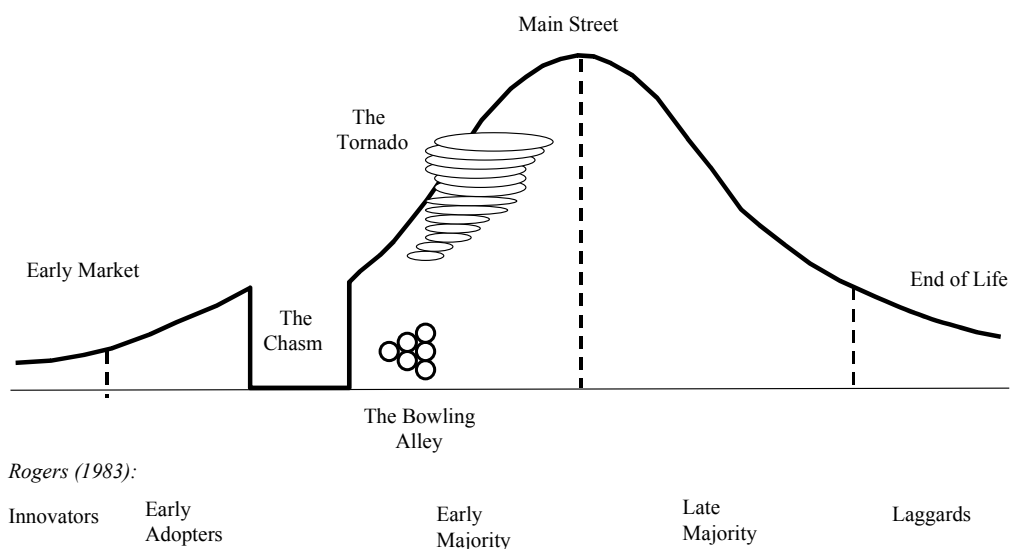


Figure 5. The landscape of the technology adoption life cycle (Modified from Moore, 1995)

Innovators (or technology enthusiasts, in Moore's terms) are people who like to use new technology when ever it is available. These you have in families or in offices. Early adopters (or visionaries) are true revolutionaries who bring real money on the

table. Early majority (or pragmatists): make the bulk and they do not love technology for its own sake. These people believe in evolution not in revolution. Early majority compared to visionaries adopt innovation only after proven track record of useful productivity improvement. This group believes in strong references from people they trust. They protect the infrastructure from novel intrusion. As such they prove to be a tough nut to crack to shift to the new paradigm. When pragmatists shift, they prefer to buy the market leader because first, everyone else in the market makes their products work with the leader's and second, market leader attracts many third-party companies into its after market. Since I look the early success of the Finnish banking sector I do not discuss Late majority (or conservatives) and Laggards (or skeptics).

Table 1. Comparison of visionaries and pragmatists

<b>Visionaries</b>	<b>Pragmatists</b>
Intuitive	Analytic
Support revolution	Support evolution
Contrarian	Conformist (conservative)
Break Away from the pack	Stay with the herd (like cows)
Follow their own dictates	Consult with their colleagues
Take risks	Manage risks
Motivated by future opportunities	Motivated by present problems
Seek what is possible	Pursue what is probable

The fundamental strategy for making a successful “crossing” is based on a single observation. The main difference between the visionaries of the early market and the pragmatists in the mainstream is that of the former are willing to bet “on the come” whereas that latter want to see solutions “in production” before they buy. Specifically, what pragmatists want, more than anything else, is a 100 percent solution to their problem – what Moore calls the whole product. The goal is to win a niche foothold in the mainstream as quickly as possible - that is what is meant by crossing the chasm

1. *The Early Market*, a time of great excitement; customers are technology enthusiasts and visionaries looking to be first to get on board with the new paradigm.
2. *The Chasm*, a time of great despair; the early-market's interest wanes but mainstream market is still not comfortable with the immaturity of the solutions available.
3. *The Bowling Alley*, a period of niche-based adoption in advance of the general marketplace; driven by compelling customer needs and the willingness of vendors to craft niche-specific whole products (see Figure 6). In the bowling alley the same application is offered to different segments (to top left) or a different application is offered to the same segment (to top right).

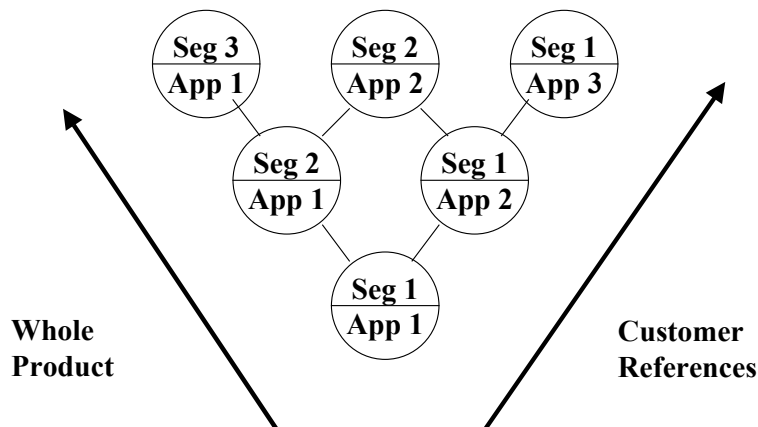


Figure 6. Bowling alley market development (Moore, 1999)

4. *The Tornado*, a period of mass-market adoption; the general marketplace switches over to the infrastructure paradigm.

Business strategy must be changed dramatically as marketplaces move through these four stages. According to Moore (1995) in the Bowling Alley a company needs a niche based strategy which is highly customer centric. Inside the Tornado a firm has to follow mass-market strategy to be able to deploy a common standard infrastructure.

## RESEARCH METHOD

The present study adopted a longitudinal, historical and contextual case study approach since it is crucial for causal studies. The units of analysis are technological changes in the Finnish banking industry. Pettigrew (1985) argues that to understand a change one has to study it as a continuing process in the context in which it appears, and he encourages one to adopt a contextual and historical perspectives on processes of change, whatever the content of the change might be. The purpose of the present empirical research was to determine the factors of the early success in the Finnish e-banking. For this task we have to understand the effects of technological changes on the industry structure and the complexities involved in the diffusion of new technologies.

A single case study design has certain advantages compared with multiple cases. The most important is the depth of the analysis, both in terms of the number of factors studied and sources of information used (Yin, 1984). A single case analysis is the best way to get a holistic picture and understanding of the research problem. Patton (1990: 95) has argued that "qualitative inquiry is highly appropriate in studying processes because depicting a process requires detailed description. As in any research approach, the case study has its limitations. One of the biggest concerns has been the lack of rigor in case study research. The methods of analysis are not well-formulated in the use of qualitative data (Miles, 1979). Case study research is very time-consuming and results

in a massive amounts documentation the handling of which requires special skills (Yin, 1984). Another limitation of case studies is that they provide very little basis for scientific generalisation.

### *Overview of the Finnish banking industry*

Here I followed the ideas given by Porter (1980) who points out that in an industry analysis there are important benefits in gaining an overview of the industry first, and only then focusing on the specifics. Descriptions are central to the generation of insight (Pettigrew, 1990). The importance of a good knowledge of the industry was also emphasised by Porter (1980), who stressed the value of in-depth industry histories in understanding industry environments and identifying firms' strategic interactions on a longitudinal basis.

### *Operationalisation*

Although payment systems present only a small part of the e-banking operations, in the study of early success of the Finnish e-banking is operationalised by measuring only the diffusion of different payment methods. There are two reasons for this choice. First, the Finnish payment systems are such well developed that the evolution of them is worth studying. The results of the present study may be used in analysing the development of payment systems in other countries. Second, the earlier studies (Mattila, 2001) made on the Finnish industry have used payment systems in their operationalisation.

There are several ways to pay bills: First, one can pay bill immediately at the shop, hotel or some other place by either by cash, bank card or credit card. Provided that the retail outlet has an EFTPOS terminal (providing digital transmissions) the last two transactions are in machine readable or digital form. Second, the customer may pay the bill received from the service provider several ways (see Appendix 1). S/he can go to the bank and pay it by cash or debit from own account. The bill can be paid in an envelope. These three transactions require physical work and thus they are not digital. Direct debit, the use of telephone, automatic teller machine (ATM) or terminal services (either PC banking, the Internet or mobile connections) are digital form of transactions. These belong also to electronic banking.

Most of the payment methods are listed in Table 2. (see Appendix 2 for the development of the Finnish banking technology and the customer services). For clarity bank card and credit card have a joint column. The first lines provide the information of the technology, introduction and the process needed. Since almost all retail outlets (some may still use slips) have EFTPOS only over the counter (in the bank offices) services and bill payment in an envelope require physical processes. The rest of the items in Table 2 provides features of the different payment methods. These features are important to understand the meaning of positioning of new services from the user's point of view. For instance PC banking taught the users the freedom of time and place (the users could pay when ever they want and either at home or at work). In comparison the PC banking and the Internet banking we see that Internet banking provided new features, such as e-mail and e-commerce. The freedom of place was also increase a bit since the Internet bank user can use all computers equipped with the Internet connection.

TABLE 2. Comparison of payment methods

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Payment methods / POSITIONING

Feature	Bank office	Envelope	Card	ATM	Direct debit	Phone bank	PC-banking	Internet banking	WAP
Introduced		1982?	1980	1989	1980	1982 <sub>SYP</sub>	1984	1996	2000
Technology						digit. phone	PC/mod	+internet	+mobile phone
Process/digital			+ EFTPOS	+	+	+	+	+	+
No time dependent	+	+			+	+	+	+	+
No place dependent	++				+	+	+	++	++
Speed	distance	distance	++	distance	++	+	++	++	++
Electronic sign								+	+
E-commerce								+	+
E-mail								+	+

*Validity and Reliability of the Empirical Research*

Yin (1984) divides validity into three types: construct, internal and external. Construct validity refers to the establishment of appropriate operational measures for the concepts being studied (Yin, 1984). The analysis of the operationalisation process of this study was divided into two parts: 1) an evaluation of the competence of the present author and 2) the quality of the data sources. Since the present study concerns technological changes in process technology, the engineering (power electronics and automation) background. Experience of studying the natural sciences meant taking a consistent approach to the empirical material. All the previous studies (Uusitalo, 1995 and 2000) in industry evolutions provided an excellent basis for a longitudinal study of another industry, the Finnish banking industry.

*Data Sources.*

To improve the validity of the research I used the triangulation methods described by Pettigrew (1990) to construct case studies from a variety of information sources: interviews, company histories, industry studies, business periodicals, books written by businessmen, trade journals, company correspondence, academic journals, and news clippings from the mass media.

Interviews (either personnel or by telephone) were carried out in Spring and Summer 2001. Interviewed persons are from The Finnish Bankers' Association and from two banks, Merita and POP. Eight interviews were carried on. The first paper was

presented in June 2001 in Jyväskylä. Company histories and banking technology books. Important histories concerning the Finnish banking sector were Vihola (2000), Tilli (1996), Pietilä (1995), Hiilamo (1995) and Aromäki (1995). One book on the information technology in banking was also used (EV-kehitysyhtiöt ja Fistec, 1989). Trade Journals, Business Periodicals and Business Books. The account of the development of the Finnish banking technology in (1960)- 1990- 2000 was based on a review of issues of *Kulta YV/Kultaraha* the period 1990-2000. The annual reports of Päijät-Hämeen Osuspankki on the period of 1980-2000 were also studied. Several articles from business periodicals (*Talouselämä*) provided the view of management on the development of the banking sector. Archival records (i.e. industry statistics) were also used. Qualitative data were supplemented by quantitative data. The Finnish Bankers' Association has provided abundant amount of statistical data for constructing the development of payment methods in Finland. Longitudinal study (important in causal studies).

Moreover I myself have made my own remarks on the development of payment methods. In the late 1960s and the early 1970s the first wages were paid on hand. Later on the banks provided cheques, envelopes for bill payment, bank card, credit card and PC-banking. A contract for PC banking was sign already in 1992 and it is still in use although the Internet banking is available. By following my three children (now ages of 16, 22 and 23) I have been able to track also how young people use bank services.

## **THE EVOLUTION OF THE FINNISH BANKING INDUSTRY**

The evolution of the Finnish banking industry is illustrated with the help of the dimensions, virtual agent, virtual product and virtual process of Choi et. al.'s (1997) cubic (see Figure 1 on page 3). It seems that the first one, virtual agent has been the most challenging for the Finnish bank. Postal and bank giros were taken in use in 1939 and 1942, respectively (see Appendix 2). The great change in banking was the moment when employers started to pay wages and salaries directly to banks. This cause a lot of head ache to banks. How to treat such huge amount of customers? The solution for this was a computer introduced in 1960. Electronic data transmission of wages and salaries is itself a machine readable or digital product. Thus, banks started to develop both virtual product and virtual process already in the 1960s. More over they also started to build the content, payment methods, for the coming Internet. SYP (the predecessor of Merita, now the Finnish part of Nordea) opened the first on line connections in Finland in 1975. At the end of 1970s all bank branches in Fainland had on-line connection to the central computer.

Consumers were offered cheques in the late 1960s. In 1971 limited number of automatic cash withdrawal machines without on-line connections were in use in Helsinki. The technology was not good enough and this trial failed. One important innovation in developing both the machine readable or digital product and process was the reference bank giro in the late 1970s. The agent was developed as well. Luottokunta, a company representing credit card companies brought Visa credit card to

Finland in 1979 (Hirvonen et. al., 1993). The bank card was introduced in 1980. Cheques required physical work. At the beginning cards, both credit and bank, required also labor work. The agent took a big leap forward when EFTPOS system for retail outlets was created. This made the card transactions digital. In the meanwhile the first PC banking connections were opened in 1984. This was a new digital agent with digital product and processes. However, that time the number of PCs was limited. At the end of 1980s automatic teller machine for bill payment was introduced using. This let people pay bills without queuing in banks, but they still had to go to ATMs. All agents mentioned so far were created by the banks themselves.

The Finnish banks have co-operated well in creating the machine readable form of transactions. In 1972, for instance, the POLM (Banks' On-Line Data Communications System) agreement between all banks including the central bank was signed (Vihola, 2000). In 1976 SYP accepted POLM. Next year machine readable communication between SYP and KOP, the largest commercial banks, started. In 1978 POLM was finally accepted by all banks. Sometimes the new agents such as ATMs (both for cash withdrawals and bill payments) have created competitive advantages for banks. Then, of course, co-operation has not been possible. For instance, it took 14 years until the main banks formed a joint system (Otto) and a joint company for cash withdrawals.

For the companies and institutions data transmission or banking connections were well developed in the late 1980s. The liberal human resource policy of the Finnish employers' let employees to use PC banking at work. For instance, the town of Anjalankoski let employees use working time and PCs for handling bank transactions. The bank gave training to 20 employees of the town (Vehviläinen 1993b:29). Credit cards, which also provide a digital product for banks, were adopted in Finland much later than in other western countries. This gave room for PC banking in the early 1990s. In 1995 in the country of 5 million inhabitants there were 230000 households plus thousands of entrepreneurs using PC banking in their bill payments (see Figure 7.).

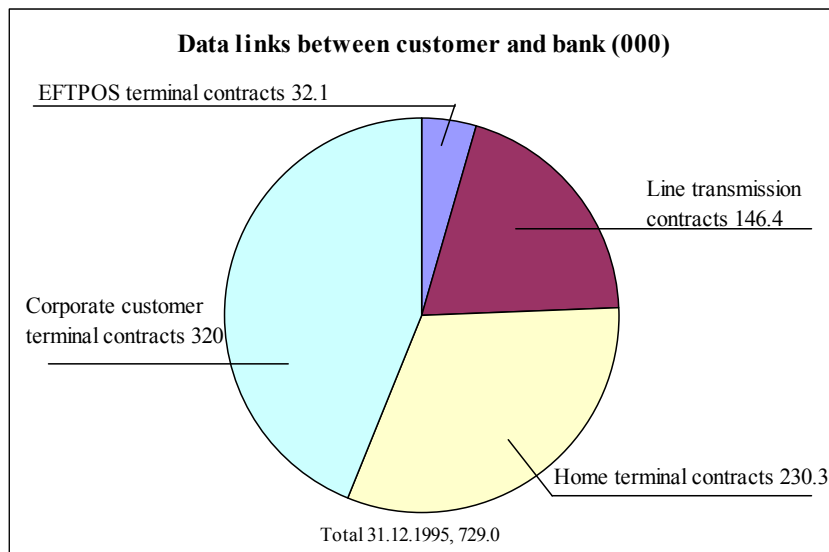


Figure 7. Data links between customer and bank (The Finnish Bankers' Association, 1995:25)

PC banking gave people freedom from place and time as the following citation tells. "The combined quest room and workroom became also Räsänen's own home bank with PC-banking services. The construction company owned by Räsänen and his two partners has used the terminal in bill payments for years. Based on this experience Kultaraha terminal contract was an easy and good solution. Earlier some of the bills were paid by direct debit and for the rest I used bill payments in an envelope whenever I remembered. Always some of the bills were late. My work does not allow visits to the bank and the personal service is nowadays anyway also a question of cost. Payments could be filled for one year ahead." (Vehviläinen 1993b:29). The Appendix 1 provides the ways and costs to pay bills in OKO Group in 1993.

In 1989, a project for the development of a general data network called TELMO (TELEmatic MULtiservice) was launched in Finland. The banks participated jointly in this project. The aim of the project was to develop the standards and procedures necessary for achieving a data network that is uniform in respect of its methods of application and the services provided. In addition to other service functions, it is planned to link to the data network banking, payment and insurance services which users of the network would have been able to handle from their homes. Hirvonen et al.(1993:101).

## **SUCCESS FACTORS**

In the 1950s and 1960s there was a radical social change in banking when employers started paying wages and salaries directly into employees' bank accounts. This change involved several stakeholders such as employers, banks, government, trade unions etc. The social, organisational and political influences were enormous. However, this episode was important in many senses. First, banks had now large amount of consumers as customers which require improvements in processes. The lead the start for machine readable form of transactions. Second, the banks and large employers started co-operation and they became emphatic to each other regarding to the banking transactions of the employees. Banks provided personal services in large factories or offices. When the PC banking was introduced employers let employees to use their equipment and lines in working hours. This was a response to bank, which took the personal service to factories and offices. We can regard the switch to virtual banking and then to e-banking as a social change taking place in the last four decades. The change has followed the logic of change illustrated by Tushman and Rsenkopf (1992) (see Figure 4 on page 5 ).

The users of PC banking have been the for runners in the Internet banking. They had learnt the freedom of time and place already there. As we saw, in 1995 there were already 230 000 PC-banking customers. As was mentioned the share of machine

readable or digital transactions rose from 24 in 1986 to 73 per cent in 1995. The OKO Group started Internet banking in January 1996 and Merita one year later. For instance, in 1995 in bill payments total of 611 million transactions were made (see Appendix 3). By excluding Batch file transfer transactions (235 million for corporate customers) we have 376 million transactions for consumers, 57 per cent (213 million transactions) of which were already under electronic banking by the definition of Choi et. al. (1997).

As mentioned OKO Group, as well as the other bank groups, planned well the switch from PC banking to the Internet. In 1993-1994 the OKO group backed PC banking while in 1995 telephone banking and direct debit. At the early 1996 the Internet was launched. They were prepared to jump from the lower S-curve (PC-banking) to the higher one (Internet banking) in Forster's (1986) typology. The user of PC banking was a good target group. They had already learnt the use of computer and the freedom of place and time. The positioning of the Internet banking was appropriate. Moreover, the employers provided probably to the most of the users of Internet banking the connection to the Internet. Moore's (1995) first bowling pin was there.

Because of long tradition in digital products and processes Internet services had clear content. People had paid and they have to pay bills. This is the other direction, the same content with new segments, in the bowling alley (Moore 1995, see Figure 6 page 7). However this content was not attractive for all consumers. There was no content for the largest user of the Internet, that is for youths. Young people let their parents pay their few bills. From now on the content creation in banking services will become a challenge. We can look the troubles in other industries faced with contents in their WAP services.

All digital channel technologies except the Internet have been invented or developed by the banks. The Internet was competitive enhancing technological change, since digital products and digital processes developed by banks could be used within the new agent, the Internet. Thus, all the efforts put in the digital product, digital process and digital agent in the 1960s, 1970s, 1980s and 1990s helped the launch of the Internet. Further more no bank was any more dependent in their consumer businesses on other banks, since the Internet is a universal net requiring no critical mass.

As mentioned the co-operation between banks in bank card machines for cash withdrawals started not until 14 years later of the introduction. In 1994 the OTTO system and trade mark was created. Reason for this co-operation were cost savings and the Finnish bank crisis. Ten years ago banks were co-operating within the TELMO project, which referred the MINITEL system in France. However, the Internet stopped the project and banks did not have to co-operate in creating a true virtual agent for consumers. Thus, the Internet was just a gift from the heaven for Finnish banks.

## CONCLUSION

As the success factors of the internet banking indicated there was a good ground for the virtual channel and well positioned services. All three dimensions, the virtual product, virtual agent and virtual processes, in Choi et. al.'s (1997) cubic (see Figure 1 on page 3) were well developed in January 1996 when Internet banking was launched. In 1995 the share of the machines readable or digital transactions was 73 per cent. The digital product and digital process have been used for years.

The Choi et. al.'s (1997) cubic suited well for the illustration of the evolution of the Finnish electronic banking. In the banking sector one of the dimension, the agent, was the most challenging. The agent is the x-axis or the first axis in the Choi et. al.'s cubic. When it is the first axis it means the starting point for Choi et. al. was the Internet or the virtual agent. This is the case in many industries. The product and processes were not at all virtual when the Internet was introduced. Thus, the Finnish banking sector provides a fascinating exception. Some of the products (on the y-axis) and some of the processes (on the z-axis) were virtual indeed well before the introduction of the Internet. This exception makes the generalisation of the results more challenging.

The target group (middle-aged, married, highly educated, well paid, civil servant) found by Mattila (2001) may have been the users of PC banking. It is interesting that Mattila (2001:105) reports in one interview of a person who had learnt the freedom of time and place in PC banking. "Ten years ago they gave me MS-DOS based disc without any advice or consultation. There hasn't been much social contacts between my bank and myself ever since. Old user, female, urbanite" Mattila (2001:105). In her sample there may have been many other similar people have had the possibility to use PC banking at work or at home in the early 1990s. Unfortunately Mattila's research was cross sectional and she did not include PC banking in her study. Thus the switch from PC banking to the Internet banking was not studied. The longitudinal research approach in causal studies is extremely important. The longitudinal data gives possibility to use several concepts, such as Foster (1996), Anderson and Tushman (1990), used in innovation management. Also good knowledge (including the history) of the industry is needed.

As mentioned although I belong to Mattila's (2001) target group I do not use internet banking. I neither go to a bank to pay my bills. In four years, from 1992 to 1995, PC-banking with a batch process had become such convenient (not depending on time and place) that there was no reason to switch to Internet banking in 1996. Sometimes changes come too fast and consumers start to balk new products (see Dhepar, 1996). The PC banking is still in use.

Diner's Club issued the world's first credit card in 1950 and Bank of America launched the first bank in the world in 1958. Bank of America's card became later the Visa card. As mentioned, the Visa card was launched in Finland in 1979. In Finland we receive bank cards of the present type in 1979. We can see that the credit card and the bank were introduced in Finland 30 and 20 years, respectively, later than in the US. Provided that the credit card and bank card processes in the US banks

have been digital for a long time then this difference between the adoption times of card has had an effect on the diffusion of the other virtual agents in bill payment. It is known that PC banking failed in the US ( Moore, 1995). The reason for this may have been the high diffusion of credit and bank cards. Ordinary people paid the bill already in retail stores or hotels. The same may have been the case also in Internet banking.

As we saw the launch of the Internet banking preceded many other changes in the Finnish banking sector (see Appendix 2). Bank giros were invented in 1939. Employers started to pay salaries and wages via banks in the 1960s. On-line connection between banks and branches were developed in the 1970s. The reference bank giro in the 1970s, as well. PATU, the bank security standard in the 1990s. In the Choi et. al.'s (1997) concept the banking sector went against the wind. All these and some other non mentioned changes or events have made the Finnish banking sector a unique.

Because of the differences in the adoption of credit and bank cards and the uniqueness of the Finnish banking industry all generalisations (especially to the US) of the diffusion of the Internet banking must be made with extra care. The issue is extremely important for studies using only cross sectional data such as Mattila (2001). On what basis the results of the cross sectional study Mattila (2001) can be generalised to other countries where the industry history is different? Can we generalise the results of the cross sectional study (Mattila, 2001)?

## **FURTHER STUDIES**

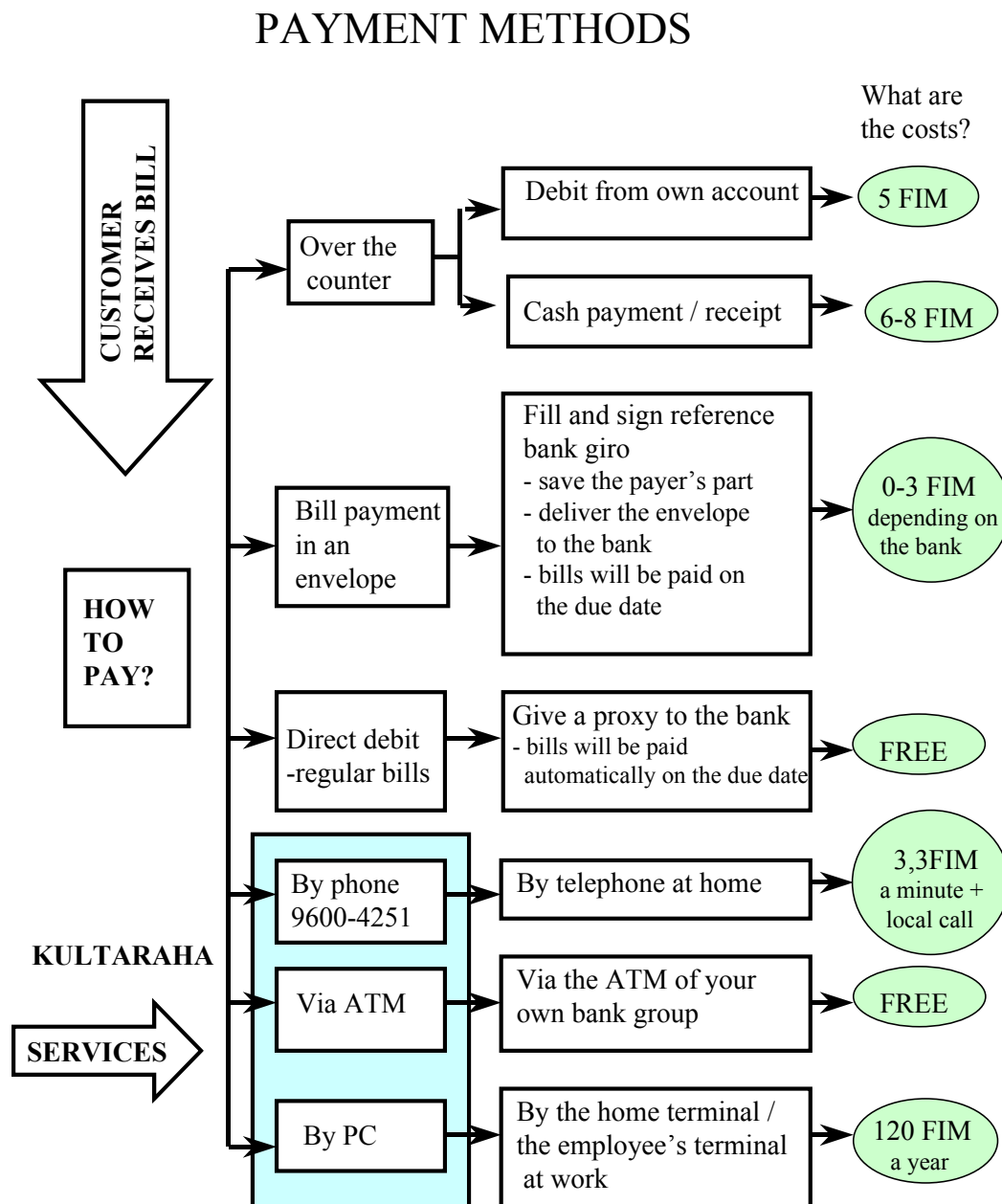
First, this study is a work in progress based on the secondary data and limited amount of interviews. In the further stages ore stakeholders should be included. Before any potential questionnaire to consumers the understanding of the industry should be deepened. The should be done by interviewing 10 to 15 persons and by analysing more in detail the secondary data. Second, the Finnish insurance industry has not been successful in adopting the Internet as its agent. It would be interesting to make a comparative study of the Finnish e-insurance and e-banking. Third, this study tried to increase our understanding of the diffusion of the Internet banking in Finland. As we saw the Finnish banking sector have managed well this switch to the Internet banking. The success factors, provided in the paper, and the history of Finnish banking have mad the Finnish case unique. One fascinating and challenging research project would be to use the Finnish case as a source to forecast (or even persuade) the coming changes in the European banking sector. Can the Finnish players, the Bank of Finland, banks, soft ware companies and research institutes, be at the front line in creating dominant designs or industry standards in the international payment systems in the future (see Leinonen). Usually research on technological changes looks back, that is ex post. In this research the concepts (the cyclical model of technological change, see Figure 3 on page 4 and the typology toward a sociology of technology, see Figure 4 on page 5) would be tried to use ex ante.

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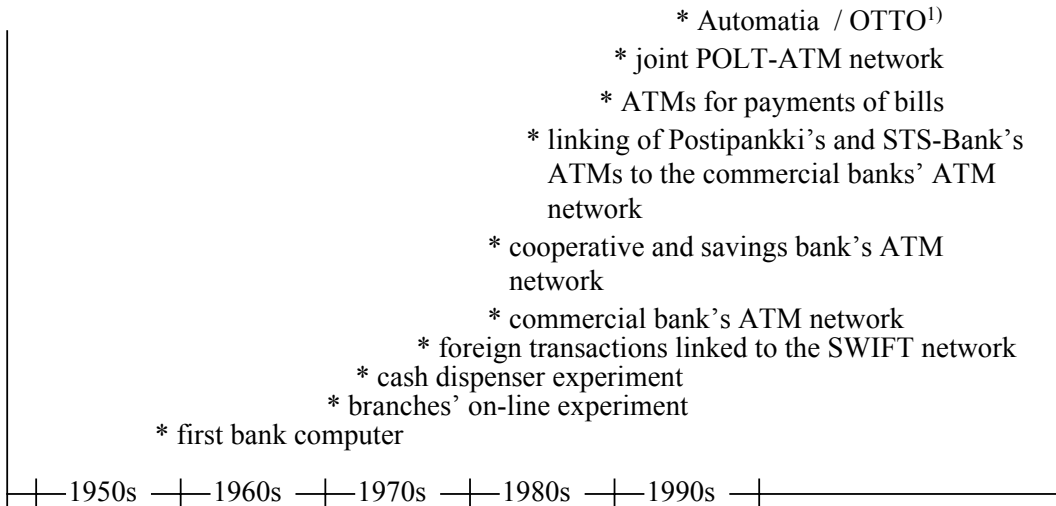
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## Appendix 1. The usual charges of payments (KultaYV, 2/1993:15)



## Appendix 2. Developments in services and data links (Hirvonen et.al. 1993:90)

### DEVELOPMENT IN BANKING TECHNOLOGY



#### Payment and payment instrument services

postal and bank giro (1939 and 1942)

- \* wages and salaries direct to bank accounts

- \* cheque

- \* reference bank giro

- \* bank card

- \* bank barcode<sup>1)</sup>

- \* common bank giro<sup>1)</sup>

#### Data-processing services for customers' systems

- \* recurrent payments and bill payment services

- \* on-line corporate customer terminal services

- \* corporate off-line transfer services

- \* home terminal services

- \* EFTPOS terminal services

- \* initial phase of TELMO

- \* TITO, statements as vouchers<sup>1)</sup>

- \* PATU, bank security standard<sup>1)</sup>

<sup>1)</sup> source: Kontkanen (1996:175-176)

### DEVELOPMENT IN CUSTOMER SERVICES

### Appendix 3. Bill payment transactions (The Finnish Bankers' Association)

