

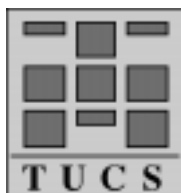
Building and Managing an Electronic Commerce System - Case PC-SuperStore

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TUCS Technical Report No 335

March 2000

ISBN 952-12-0631-4

ISSN 1239-1891

Abstract

PC-SuperStore is a leading Finnish computer and equipment retailer. They are also one of the Finnish pioneers using Internet-technology. This article describes an electronic commerce system and its evolution during a five-year period. The article explains in detail how, and why the case company's electronic commerce system, originally aimed at consumers, has evolved into a complex system, which serves also business-to-business customers and suppliers, and own employees. The importance of customer service in the Internet is also pointed out.

Some thoughts are also given to success measurement of electronic commerce systems. In the case company the revenues from electronic commerce do not justify the development costs, even through the company is one of market leaders. Yet the system is deemed successful. The author has been the responsible manager for the Internet-systems in the case-company from 1997 to early 1999.

Keywords: Internet, Electronic Commerce

1. Introduction

At the close of the 19th century the emergence and evolution of two networks, the electrical and the telephone, transformed business. Today Internet is doing the same and we also have similar kind of managerial problems as we had one hundred years ago. Mistakes are made by focusing just on the technological aspects of network; the real business value of networks is still missed by majority of managers. To understand the potential business value of a network, in this case Internet, network must be understood more as a social and cultural process than a technical novelty (Ball 1998, Downes and Mui 1998, Lederer et al. 1997, McBride 1997, Mulvenna et al. 1998, Shapiro and Varian 1999).

The Internet presents companies with many opportunities. Direct links to anybody, anywhere let companies build interactive relationships with customers and suppliers, and to deliver new products and services at very low cost. However, start-up companies like Amazon.com and Yahoo.com have mainly exploited these opportunities. Established businesses have been slow in reacting to these new opportunities, probably due to the fact that Internet and Internet-based electronic commerce is such a new phenomenon. Furthermore, as a business environment Internet is at the moment uncertain and even confusing due to the rapid developments in the area. It is not surprising that many managers are finding it hard to cope with these developments or understand the possibilities, challenges and risks that are associated to Internet-operations (Ghosh 1998, Kalakota and Whinston 1997, Shapiro and Varian 1999).

Successful management of the marketplace requires a comprehensive understanding of what activities generate customer perceived value. There is also a fundamental question: who are the customers. In a recent interview with an Internet-specialist from Merita-Nordbanken the author discussed this. The interviewee expressed that one key challenge in their attempts to market the SOLO-Internet payment systems to companies is to convince companies that Internet based electronic commerce is much more than selling CD's to consumers. A typical comment from companies has been "very interesting, but we aren't selling anything to consumers so we don't need this electronic commerce-thing".

In this paper a pioneer company in the field of electronic commerce is presented. The company operates in computer and related equipment retailing. The company has been a sort of odd bird in the sense that although established in their business, they took electronic commerce and Internet in general, very seriously from the beginning.

The article explains in detail how, and why the case company's electronic commerce system, originally aimed at consumers, has evolved into a complex system, which serves also business-to-business customers and suppliers, and own employees. The importance of customer service in the Internet is also pointed out.

Some thoughts are also given to success measurement of electronic commerce systems. In the case company the revenues from electronic commerce do not justify the

development costs, even through the company is one of market leaders. Yet the system is deemed successful. The author has been the responsible manager for the Internet-systems in the case-company from 1997 to early 1999.

2. Being a pioneer in electronic commerce

Being a pioneer in any field has certain advantages and disadvantages. At the electronic commerce field the pioneers have been able to try different approaches and solutions because there have not been “accepted standards” in visual design, functionality etc. The successful pioneers have in fact been setting these standards while learning what electronic commerce is all about. On the other hand the pioneers have made many mistakes and this combined with the need to constantly evolve has made it a relatively expensive process. A company starting in electronic commerce today can easily outsource the development needed or even purchase an all-in-one E-com solution; this was not a case just a few years ago.

The author has been involved with a Finnish computer retailer as electronic commerce manager and later as Internet technology manager during the growth of interest in Internet technology and thus been able to follow closely the diffusion of new technology at a practical level. This article focuses on the development of electronic commerce and other Internet technology systems in the case company.

The reason for the case company to use Internet-technology has been to attain competitive advantage, whether by using the Internet as a new sales channel, the enabler of error-free efficient processes, a customer service medium or other solutions described in this article. The nature of the article is descriptive/narrative. This is seen as a valid approach since most of the issues described have evolved gradually, in small steps. The nature of the evolution process can be described best as a continuum of "small decisions". Barney (1994) suggests that a company's competitive advantage seems to depend more and more frequently on numerous "small decisions" instead of a few "Big Decisions", that could make or break the company. He points out that through the accumulation of small decisions the company's resources and capabilities are developed and exploited.

2.1 Definition of electronic commerce

- In this article the author uses the term electronic commerce (E-com) in broad view. Electronic commerce is seen to consist of three types (Kalakota and Whinston 1997):
- Inter-organizational (business-to-business, Internet and Extranet-solutions)
- Intra-organizational (within company, Intranet-solutions)
- Business-to-Consumer (consumer focused Internet-solutions)

The aim of electronic commerce is seen as the online exchange of value between organisation and their partners, employees, or customers with the absence of geographical and time restriction” (Urbaczewski et al. 1998).

Also the author uses the term electronic commerce in a narrow sense. In this article the term includes only electronic commerce based on Internet-technology. Also some forms of E-com have been omitted, most notably consumer-to-business (example: www.letsbuyit.com) and consumer-to-consumer (example: electronic auctions), because these types were not viable for company's aims.

2.2 Why enter the Internet-age?

The rapid technological developments and an outstanding ability to transform technological advances into products for the masses have fuelled the information technology (IT) industry into one success after another. However, with increasing competition and the emergence of electronic markets, of which the World Wide Web (WWW, the Web) is the most prominent, technological excellence itself is no longer enough for gaining competitive advantage. The Web has opened up a whole new business arena with profound consequences for business practice and research (Glazer 1991, Rayport and Sviokla 1994, Benjamin and Wigand 1995, Sterne 1995, Hagel and Rayport 1997, Angehrn 1997, Hoffman and Novak 1997, Brännback 1997, Brännback and Puhakainen 1998).

In Finland the Internet usage has grown rapidly during the last two years. In the summer of 1998 there were 961.000 people who used Internet weekly, 463.000 used Internet daily (Finland has a total population of 5.1 million people). People from all demographics classes use Internet in Finland, but there are still notable differences in age, education, the place of residence and income. Of the people who have used Internet 43 % reported that they have used Internet from home, 42% from the workplace and 36% from universities and schools. Interest to purchase goods or services from Internet has also increased but not very much. Only 17% of respondents who had used Internet during last three months, reported having purchased something from there (Taloustutkimus 12/1998).

The products the case company, a computer and computer equipment retailer, sells are very well suited for electronic commerce. A multitude of research (see for example Foley et al. 1998, Guay and Ettwein 1998) shows that computer related equipment and entertainment (in this case computer games, multimedia programs) are among the most popular products in E-com. This is actually quite natural because at the moment electronic commerce purchases are done with computers, but this might change when for example digital-TV or WAP-based services become available

Most of the discussion about new business possibilities has focused to business-to-consumer electronic commerce. Business-to-business side of electronic commerce has not been so much in the spotlight (Timmers 1998, Charlton et al. 1998). It is estimated that although the number of consumers on the net by the year 2000 could be several 100 millions the business-to-business part will constitute the larger part of electronic commerce (Timmers 1998).

There have also been clear implications that in the near future governmental institutions will prefer suppliers who can deal with them electronically. Swedish government is actually proposing that in the year 2000 its suppliers must be able to conduct electronic commerce.

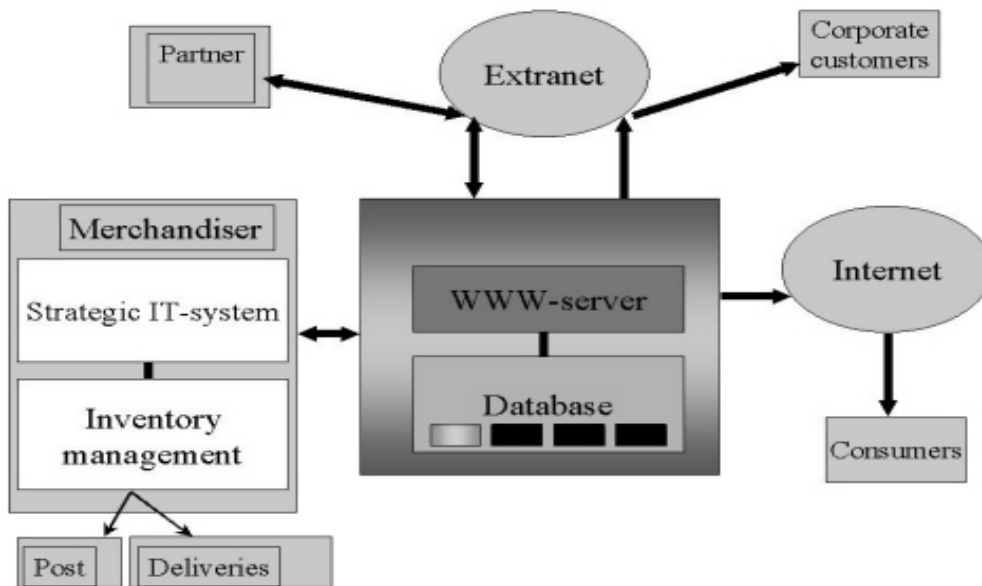
3. PC-SuperStore, 5 Years of Electronic Commerce

3.1 The Company Profile

PC-SuperStore Ltd. (PCSS) is the largest computer retailer in Finland with six stores in five major cities in Finland and one in Estonia. In 1997, the turnover was FIM 344 million (approx. USD 65 million). PC-SuperStore is a part of Nexor-SuperStore group, which had a turnover of 750 FIM million in 1998. The group consists of Mikrolog Ltd. (computer equipment wholesaler), Nexor Ltd. (computer related services) and PC-SuperStore. The companies belonging to the group merged in 1998.

PC-SuperStore has been among the pioneers in using internet-technology in Finland. SuperStore has targeted several different groups with different needs by using basically one www-system. This system has an ability to customize information and offer customized possibilities to different target groups.

Fig 1. The Electronic Commerce and Information System of PC-SuperStore



3.2 Business-to-Consumers Electronic Commerce, Internet-system

PC-SuperStore (PCSS) was a pioneer in Finnish electronic commerce when it launched in 1996 Finland's first webshop with around 20 products available. This was done in cooperation with Merita Bank, which wanted to test a new payment system that enabled real-time payment. Even if today the number of products that were available seems quite low, the small assortment made sense at the time to ensure the success of the pilot project. PCSS had launched its web-presence in 1994 with an electronic product catalogue with some contact and company related Information. Even at this early stage it was deemed necessary to automatize as much as possible of the updating of information. PCSS carries typically around 3500 products whose effective life cycle might be as low as three months. In addition the prices change very rapidly so the manual updating of information to the Internet was out of question and impractical, because this information was already available in other IT-systems.

The solution was to link the company's UNIX-based inventory management and sales system to the www-system (see Fig.1). This was done with the help of a SQL-database which links these systems, and which is updated once a day. Thus the www-system was able to broadcast following information:

- product information (technical specifications, marketing information)
- availability (whether the product is available and where)
- price

The UNIX-system was a logical choice, because the company cannot operate (for example sales in stores could not be made) if the information in the system is inaccurate. Thus it seemed logical to use it as a fulcrum for the www-system. The result of using the UNIX-system is that PCSS had a powerful system in use. Practically all products PCSS carries were available through Internet. One of the main sources for customer dissatisfaction with www-shops is the lack of large product selection. In the study by Lohse and Spiller (1998) one of the key reasons for not shopping in the Internet was found out to be the fact that only 5% of the Internet stores had more than 500 products and 62% had less than 50 products. In that sense the approach taken by PCSS was obviously right. However, in the same study it is also noted that large stores are less effective at converting traffic into sales. The most probable reason behind this is that customers are unable to find suitable products in big stores.

During 1996 and 1997 the www-system had five important updates.

1. The linking to the UNIX-system was improved. All orders made in the webshop were automatically fed into the inventory system, and printed automatically to the warehouse. In practice this meant that the system was now fully automatic. Thus the www-system could operate on its own. No continuous human involvement was needed. This was not, however, the ultimate goal. The aim was to minimize errors and lower transaction costs, or to make the system as cost-effective as possible and at the same time allow PCSS to concentrate on other issues than routine-like tasks like.

2. The addition of downloadable products. The company started selling dictionaries that the customer could download directly to his/her computer. Through not financially

important (no big revenues were expected) this showed the new way of delivering products.

3. The MICROTECH-price generator. Microtech is a clone computer made by PCSS that the customer can configure to his/her liking. Because the computer consists of dozens of components (motherboard, hard-disk etc.) all selectable from numerous options, and have (rapidly changing) different prices, the marketing and sales process was very prone to mistakes. With the configurator/price generator (www.pcss.fi/microtech) it was now possible for customers to simulate different configurations and make pre-purchase comparisons and calculations.

4. Inclusion of push-technology. The initial version of www-system relied on the customers searching products by looking at different product groups or using the included search engine. After the modification, the customer is shown different lists of products (what new, games top 20, these we have advertised), and the system also shows selected products automatically when a customer browses different product groups (customer looks at monitors, sees automatically one selected model before entering the group). After the inclusion of these actually quite simple techniques the sales were boosted 40%. These changes to the system were PC-SuperStores answer to the problem of converging traffic to sales, as described in the Lohse-Spiller study.

5. The creation of SuperClub, whose function is to gather customer information. Though the main system was kept open to all, a new part was added that required registration. The registration process asks the customers the following questions:

- name, address, e-mail
- what product groups are you interested in (computers, games, programs etc.)?
- what is the nature of your interest (professional, SOHO , entertainment)?
- do you want direct marketing?

In exchange for this information the customer gets specially priced products in restricted www-pages and also targeted information about new products via e-mail. It is important to realize that customers must be rewarded when disclosing information about themselves (Zimmerman and Mathiesen 1998, Sterne 1996). The rewards in PCSS-case were both price and personalized information.

SuperClub has been quite successful, with around 23000 users at the end of 1998. Direct marketing has at times been very successful, due to the ability of focusing on smaller groups. For example it is possible to market a new 21" monitor to all people who list themselves as professional users, and are interested in monitors. Direct marketing has also had positive side effects. For example, the number of people visiting PCSS-homepage always increased after direct marketing. Also the number of contacts not related to products marketed increased. In other words direct marketing keeps potential customers active ("I don't need this they are offering but I'll ask about this product I have been thinking"-effect).

3.3 The role of Customer Service in the Electronic Commerce System

Customer service in the Internet has grown in importance while electronic markets have developed (Sterne 1996, Handley 1998, Lohse and Spiller 1998). PC-SuperStore started its www-based customer service in 1994 unintentionally like many contemporaries. The

homepage contained a link webmaster@pcss.fi and customers started to use it to their different needs such as feed-back to webmaster about the www-pages, feed-back to physical stores and management, product and offer inquiries, and support requests.

For a while it was possible to handle the mails without any strategy. Messages were few and came seldom. The webmaster answered what he could and forwarded the rest to various people hoping that they would answer the customer. This approach had at least two major drawbacks. First, the company had no policy about e-mails from customers. Thus, very often they were simply not answered. Secondly, the webmaster really was not able to actively sell products, so when a customer asked for some product, he/she got an answer but only the basic information. In other words, the answers were like "yes/not available, contact nearest store for further information". A need arose for actively selling to those people who took time to write to the company.

In 1997 the amount of e-mail reached such levels that the company had to admit that a new contact form with customers was a reality. Automated mail-agents (which direct mail to right people) were considered. However, at the time they were found inadequate for numerous reasons (US products with problems with Finnish language etc.). The solution was to re-think the processes and responsibilities within the company. A new salesperson was hired for E-com. One of his main responsibilities was to co-ordinate e-mail traffic and actively sell to customers on this medium. Many employees not previously in direct contact with customers are now actively taking part in this mail traffic i.e. outside marketing specialists other employees of the company find themselves turned into "part-time marketers" (Grönroos 1994, Marion 1998). When needed the salesperson forwards mail messages to right people who either answer the customer directly or send their answer to the salesperson. This approach has suited well for PC-SuperStores purposes as the creation of a new process ensures that mails get answered. Also the inclusion of relevant employees allows valuable information about customers to flow to people not previously in direct contact with them. Interestingly, the sales via e-mail have exceeded the sales from automated E-com system. There is obviously a demand for human interaction within E-com. PCSS offers now its customers two choices within the field of E-com: automated and customer service-oriented. Depending on the nature of the purchase and the purchaser either approach can be used.

From the company's point of view, this customer service process has two more advantages:

- People responsible for answering e-mails can do it within a certain time. When a customer comes to the store or phones there, he/she needs instant service. In the e-mail field at least a one-day response time is accepted as good service (Sterne 1996).
- People have time to find out information to answer customers' questions. The customer never knows about the knowledge level or capabilities of the respondent. Thus answering the mails also serves as a good place for learning.

The customers raise the issue of on-line technical support databases from time to time. There is clearly a demand for more technical support. However, technical support to 3500 products is a very demanding process for a single retailer and insofar PCSS has decided to stay out of this field. There is also a second reason for this decision, actually

it is unclear whether the competitors would be the biggest beneficiaries of this service. Support databases are however used indirectly. Almost every product shown in www-pages has links to manufacturers technical information and support pages. This approach helps both customers and employees, and is at a moment adequate solution.

3.4 Business-to-Business Electronic Commerce System: Extranet

In PC-SuperStore about 50% of total sales come from the corporate and public sectors, where payments are usually made through billing the customer. PCSS realized quickly after launching consumer-focused system that it is not well suited for corporate use. Method of payment was one problem. Another was the lack of discounts the corporate clients expect. Basically however, the consumer system was deemed as a good fulcrum for corporate system because, as mentioned earlier, it is able to broadcast product information, prices and availability. It needed only a little work in order to meet the customer's needs.

Internally there was also a problem of possible channel conflict. Channel conflict usually is associated with the elimination of "middle-men" (Kalakota and Whinston 1997). In this case the problem stems from the fact that every corporate customer has a personal salesperson, who negotiates every deal with the customer and whose salary is dependent of these sales.

It was thus decided that salespersons are responsible for bringing their customers into Internet, and creating and maintaining customer specific www-pages. A salesperson prices products by groups, for example deciding that a customers gets a 5% discount on printer accessories, or that the price for these is the purchasing price + 4 %. A salesperson also restricts the use of these pages to only that specific customer by giving the user a password protected user account and also possibly sets an IP-protection that restricts the use of system to certain computers only. For his/her troubles the salesperson gets the same commission from www-sales as he/she would get from other sales.

This approach has given multiple benefits:

- The target group already has some ties and mutual history with PC-SuperStore, so it is easy to get customers in the system.
- Starting with a new medium usually involves a need to continually improve the system. This is best done with existing customers because the risk of customer defection is low when compared to a situation where all of the aimed customers don't have any bonds to the company. Improving the system with existing customers also gives the message that you do care, your customers can see their suggestions put into service (Puhakainen and Brännback 1998).
- PCSS does not, however, want to give an impression that it should deal with its customers solely with electronic systems. PCSS wants always keep in touch with its customers also by conventional means. A dialogue with customer is essential (Blattberg and Deighton, 1991), because with the Internet it is very easy for a customer to switch supplier without you ever knowing why. This system is seen as a

part of dealing with customer and more specifically a part that can be used if a customer wants.

There have been around 100 active customers using this Extranet-type system. Sales have consisted mainly of routine-like purchases, for example office supplies and computer equipment. PCSS has not designed the system to compete with for example DELL. It is seen that B-to-B electronic commerce system is ideal in lowering transaction costs with repeating, small, routine-like purchases (Puhakainen and Brännback 1998). Sales records support this statement. However, even though the system is not used much to purchase more expensive products it still generates more sales (approximately x2) than the consumer system.

3.5 Supplier/Partner Extranet

This system allows suppliers, or partners in general, several useful functions:

- The supplier can update the information about their products to the Unix-system via Extranet (see Fig 1.). This is quite helpful to both PCSS and the suppliers because it is in the suppliers' interest to ensure that information about their products is correct and plentiful. Also the unnecessary transmitting of product information via fax, post or e-mail that would then be input to the system is no more needed. Similarly the number of errors during the process is diminished (see for example Kalakota and Whinston 1997, Kalakota and Robinson 1999).
- Information is used both on the internet-system and the more crucial sales system in physical stores.
- Suppliers can follow the inventory levels of their products. Usually a supplier only knows that they have delivered x pieces of product to the retailer, they do not have any knowledge how the product is selling in the sales channel until the retailer orders more. This system allows the suppliers to follow up the sales and inventory levels in all PC-SuperStore stores. This information can be then used to suggest more purchases (via the Extranet-system) or for management decisions about purchases (product does not sell – lower the price etc.)

There is also a direct link from the Internet-system to one of the main suppliers, which creates orders and invoices to their system. This function ships automatically the products ordered through Internet (and which are not available in PC-SuperStores own warehouse) from the supplier's warehouse. Here is a glimpse of the future trend, which PCSS will probably pursue: as a virtual retailer it is no longer necessary to have all products in your own warehouse.

3.6 Intranet-system

Intranet in PCSS has focused in applications that help personnel in their everyday work. Information sharing has also had a noteworthy role. Access to the system is restricted to certain IP-addresses and also by allowing user privileges only to people whose information can be found in the Unix sales system. In practice this means that everyone

listed as personnel gain basic privileges to the system. Basic functions available to all are:

- Phonebook. In the phonebook it is possible to search people by different categories (name, cost center, job description). This is a very simple application but especially after the two mergers the information content is very valuable in everyday work.
- Make offer. This is a handy sales function allowing salespeople to use the shopping basket concept in internal use. Salesperson adds products to the basket, makes price adjustments and prints an offer to the customer. All customer www-shop search functions are available. Thus, it is for example possible to list all models that meet the criteria set by the customer. This accelerates customer service and the offer customer receives looks professional including correct information. All offers can be stored into the database, and can be retrieved when the customer comes back. It is also possible to input the offer to the sales-system by simply pressing one button: Hence, manual typing of remittances is not needed.
- Price tags printing. When a company carries over three thousand products whose prices change rapidly, the updating of prices on store shelves is problematic. The price tags generator lets personnel to print price tags for changed prices. Instead of re-pricing every product manually on the shelves the www-system now prints tags that are placed to shelves in front of products. This system has yielded considerable savings in manpower and lowered the number of incorrectly priced products in stores.
- Microtech-price generator. This system is actually the same system as mentioned earlier in the customer systems part. The personnel have certain added functions available allowing them to price the computer freely. It is also possible to store orders into the database and to feed in orders into production system. In the near future it is also possible to follow up the order through the manufacturing process.

There are also more restricted systems available that are mainly targeted for specific purposes to a limited number of users. These include:

- management tools for E-com systems and SuperClub customer database.
- management tools for product information updating
- tools for ordering products from suppliers (PCSS has internet-based connections to two of its suppliers who allow PCSS to see availability and price information and also generate all needed purchase documents into the Unix-system)
- tools for gathering financial and sales information from the Unix-system
- tool for ordering products from the company warehouse and certain suppliers to the stores.
- tools for checking inventory circulation
- use of the www-system in publishing PC-SuperStores paper catalogue, the SuperMagazine. Because this catalogue contains product and price information it is useful to use the information from www-system as a base for the catalogue. This both saves time and also ensures that products do have correct prices and technical information when the catalogue goes to print.

4. How to measure and success: Case PC-SuperStore.

4.1 Measurement of Electronic Commerce Success

Measurement of the success of consumer-oriented electronic commerce system cannot be based solely on sales (see for example Kalakota and Robinson 1999). The higher the percentage of total revenues comes from E-com, the higher is the role of sales in measurement. In extreme cases when a company is totally virtual we can claim that sales and profitability are all that matters. However, when a company does also have physical existence like in the case of PCSS, the answer is different. Although PCSS has been one of the biggest retailers in the field of E-com in Finland, the sales from the consumer-focused E-com constitute less than 1 % of total sales. The webshop has had on a typical day around 3000 visits, yet only about 10 purchases. What about those remaining 2990 visits, those people have certainly a reason to visit the webshop as well?

In PCSS the measurement of the system is based on seven accounts:

1. The number of visits per month. Hits are sometimes used as a measurement unit. However, they do not actually tell much, so PCSS counts visits. One page with nine objects count as 10 hits, and a typical visitor visits pages with different layout within the www-pages. Thus hits have no predictable relation to the number of visitors (Kalakota and Whinston 1997, Zimmerman and Mathiesen 1998).
2. The number of unique users. Visits count how many times a webshop is accessed. They are valuable in measuring the popularity of a system but they lack the qualitative aspect. The number of visits tells the gross number of occasions on which a user looked up the site. It does not indicate how many different users a system has or what is the nature of their visit. The number of unique users however tells the number of different individuals who access the system within the specific time. It is calculated by recording some form of user registration or identification (Kalakota and Whinston 1997, Zimmerman and Mathiesen 1998). In PCSS's case, this information is based on SuperClub.
3. Sales information: gross sales, gross margins, median purchase, and number of sales.
4. Number of leads. When people come to the physical store and inform that the purchase impulse came from Internet, these sales are recorded with special sales code. It is however important to notice that this information is very vague. Clearly people are looking for product information in the Internet and then purchase the product by other means than E-com. It is however impossible to track leads accurately, so the role of leads in overall measurement is low.
5. Feedback. This feature is handled with care, usually in comparison with competition queries. Feedback is by nature mainly negative. Important though, and in many cases if handled properly it can help in customer retention (Sterne 1996). However due to the negative nature it cannot be taken as a dominant customer view.
6. Competition queries. One very effective way of gathering information from customers is a competition, in which you answer some (usually multiple choice) questions and take part in a lottery. The questions PCSS has used range from "how do you rate our www-pages (excellent-unsalvageable), what magazines do you read, have you bought from Internet, if not why". Although not precise, results from these

competitions give some clue about customers, their interests and opinions. Usually a monthly competition had about 3500 participants.

7. Outside information. Usually this kind of information is received when PCSS has banner-ad campaigns for example in www.altavista.com. Other sources are commercial research agencies, for example Taloustutkimus. PCSS has fared fairly well in both. In a report about most popular Finnish www-pages by Taloustutkimus 11/98 we can see the following results concerning PCSS:

- Q: Which Internet-pages have you visited. PCSS was ranked the 12th most popular address. All homepages above PCSS's ranking were information broadcasters like MTV3 (TV-channel), Helsingin Sanomat and Iltalehti (both newspapers). PCSS was the first retailer on the list.
- Q: grade of usefulness of pages. PCSS got a grade 7.5 on a scale of 4 to 10. The highest two grades were 8.24 (Finnish Railways Timetables) and Finnkino 7.88 (information about movies and their showing times).
- Q: was not satisfied with pages. PCSS's ranking was again good with 7% of dissatisfied visitors.

Following conclusions can be drawn from this survey. First, PCSS is regarded as an information broadcaster. People come and check computer related information from PCSS-pages. PCSS's own competition surveys show similar results. This is a double-edged sword. On the one hand, the pages do have familiarity and the number of satisfied visitors is high, on the other hand, very many of those 2990 visits mentioned earlier lead to sales - to other companies. Secondly, the basic design and information content of the pages has been constantly good.

In the measurement of other systems, e.g. b-to-b customer focused Extranet, supplier focused Extranet and intranet-systems the focus has been set to (financial) savings in time and processes, error elimination and user satisfaction.

4.2 Designing a value adding system: case PC-SuperStore

A typical design process in the case company includes a semi-formal initiative from users with a quite narrow application in mind. This is then processed further together with www-development people. The process always includes a phase of evaluating if the planned system could be used more broadly. A typical example of such a process is the inclusion of availability information to the system. The original idea was that consumers should be able to see whether a product is available or not. However, some target groups demanded more accurate information (exactly how many products are available and where) so the system was designed to broadcast different information to different target groups.

Ideas are then discussed with programming people to get their views and ideas, and also a better understanding about possible problems and further possibilities. The actual production includes always a beta-testing phase before an application is deemed ready. The design process adopted by PC-SuperStore is illustrated below.

1. The idea. The original idea might come from several sources or combination of sources. Usual sources are employees, suppliers, customer feedback, other company's

www-pages (imitation is useful) and the people tightly associated with www-development.

2. Refine ideas to extract concepts from all process participants - the programmers, users and management
3. Evaluation of other possible applications that the idea might spawn.
4. Design. To be able to build something that is an amalgamation of all concepts, ideas and desires of all process participants.
5. Prototype, test and deliver.

In the PC-SuperStore case few individuals did the original planning and programming from 1994 to 1996. When the need arose for further considerations about fitting of Internet solutions to the company strategy and at the same time the demand for electronic commerce systems rose, two major issues took place. First, people responsible for programming and planning formed a separate company, partly owned by employees and partly by SuperStore. Today this company is probably the leading supplier of E-com systems in Finland. In a way it has set certain standards how E-com system should work and look. Secondly, PC-SuperStore saw the need for business-oriented Internet-technology manager whose main function can probably best be described as a mediator between SuperStore and the www-company. The job required the handling of phases 1-3 of design process, i.e. either inventing something or getting the ideas from personnel and further distilling them into some comprehensive form to be able to communicate with the programmers. The manager's role was of course quite visible in also phases four and five.

This process is of course not without flaws. Sometimes we were not able to follow market trends, or for other reasons could not generate enough ideas. Sometimes we had, in retrospect, good ideas that were turned down because of conflicting aims within the company or for fear of new ways of doing things. Perhaps the best example of the latter is the planned C-to-C auction. The original idea spawned in 1997 and suggested the creation of a virtual auction for second-hand computer equipment. The idea was to have a "magnet", which would draw consumers to the site by offering them a possibility to exchange used equipment and software - added value. However, the idea was turned down for two reasons. First, there was no pressing need for a magnet at the time; www.pcss.fi was among the most popular sites in Finland. Secondly, the idea was seen somewhat controversial in a sense, that it might lower the sales of new equipment and software. Also legal and imago issues were thought to be a problem. Who is responsible when consumer does not get what he or she purchased from the virtual auction? There were no clear answers to these questions, only a belief that the benefits would outweigh the disadvantages, and that was not enough.

5. Conclusions

As mentioned in the introduction, being a pioneer has certain advantages. There has been both time and possibilities to experiment with ideas and see how they affect the sales, customer satisfaction, internal and external processes and so on. Even though E-com has not risen to the expected levels yet, customers do have at the moment certain expectations that every new entrant must be able to fulfil or surpass. In another words, a

company entering E-com field today can for example probably not start with just a couple of products (at least if it carries thousands) like PCSS did or solve logistics problems as they are encountered. Also being the first in the market gave PCSS much free publicity, this combined with lack of competition ensured reasonable amounts of visitors. PC-SuperStore has also been in a fortuitous position in that sense that its products are well suited for electronic commerce, it has a strong brand and since the company is a computer reseller, it also has employees who are perhaps more familiar than average with new information technology and its possibilities. On the other hand having a good start in rapidly developing field does not ensure success in the long run unless the company remains vigilant about market situation and other relevant developments. This has probably been the most important challenge during the last couple of years.

Another key finding from the case is the flexible and constantly evolving nature of the E-com system. The development of individual applications has led to the development of other applications to match the needs of various target-groups. There has been a constant pressure both for updating and developing earlier applications and at the same time building totally new solutions. However, by choosing an operational IT-system as the fulcrum for www-system the company has the ability to concentrate on the development instead of manual updating and other mundane tasks.

E-com has forced, like mentioned, the company to constantly adapt to on-going developments. Some adaptations have been mostly of technical nature (for example automatic handling of invoices), but some have required more drastic measures. Customer service is a good example of the above-mentioned situation. The company had not anticipated the need for customer service in the Internet, so the adaptation process was quite chaotic. However, the company learned in this case, as in many others, that even the forced changes could offer many new possibilities. Customer service-adaptation for example increased the flow of customer information within the company. It was also noted that Internet-based customer service helped in allocating customer service resources and proved as a good place of learning for personnel.

It must also be noted that purely on financial sense the process has been costly. Direct sales gained from E-com do not justify spending millions to the development and maintenance of systems, but as mentioned in the measurement chapter, it is exceptionally hard to measure financially the effects of www-systems when the company is not purely virtual. Every company must probably find their own measurement methods. For a company thinking of entering E-com and especially if it does not have competencies in the www-field it would be advisable to externalize as much as possible.

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