Access Barriers

- from a user’s point of view

Olof Nilsson

Department of Information Technology and Media
Mid Sweden University
Title
Access Barriers – from a user’s point of view

Abstract
The aim of this thesis is to suggest a model to assist in the ability to judge access by private persons to Information Technology, IT, and to Public Information Systems, PIS. It has its starting point in the Swedish Government’s endeavour to turn Sweden into the first ‘information society for all’. When the available statistics concerning the access to a PC and the Internet in Swedish homes are studied it is easy to think that this vision may soon be realised. Of course, access to the technical equipment is a fundamental condition in order to be able to use the Public Information Systems, but unfortunately, is not the only one. A number of studies have shown that it is not possible to equate possession and use.

A number of access models or frameworks designed to judge whether or not a person has access to the ICTs do exist. However, it is my opinion that there is a deficiency in these models; they do not start out from the individual user’s prerequisites, but rather judge the external conditions available for possible access.

Assisted by four empirical studies, interviews and questionnaires, a number of access barriers experienced by the users have been identified. The studies show that in addition to the technological hindrances, a series of more elusive ones also exist originating from prevailing norms and values in the environment the user lives in. The barriers are categorised into five groups; to have, to be able, to will, to may and to dare. Together these notions form the User Centred Access Model, UCAM, which is suggested for use in charting and communicating the necessary considerations that must be taken into account in the development of Public Information Systems.

Keywords
User centred access, Information society, Access barriers

Language
English

ISBN, ISSN and KEY TITLE
ISBN 91-85317-17-9, ISSN 1652-893X

Number of pages
152
To mum and dad
Dear God:

Please remove the have nots, the can nots, and the do nots that invade my mind. Please erase the will nots, may nots, might nots that invade my heart. Please release me from the could nots, would nots and should nots that invade my life.

http://beliefnet.com/story/95/story_9522_1.html

(A prayer for the Information Society?)
Acknowledgements

There is only one name on the cover of this thesis, but it would have been impossible without support from my family, my friends and my colleagues and indeed this book would never have seen the light of the day had it not been for their help. In Sweden there is an idiom which translated into English says that 'you cannot teach an old dog new tricks’. During this process sometimes felt like an old dog, but thanks to all my trainers I think I can now perform some new tricks.

First of all I want to express my gratitude to my wife Kärstin and our children Ludde, Amanda, and Fanny. Without your support and your tolerance during these years it would not been possible for me to achieve this goal. It is also of great benefit to have good parents, Brita and Gösta, who always believe in you, or at least give the impressions that they do, no matter which long and winding roads you take through the life.

Colleagues often play an important role in your life. The assistant professors Anita Håkansson and Viveca Asproth, and Professor Stig C. Holmberg at the division in Östersund have earned special thanks because they believed in me and arranged it so that I had the possibility to achieve my PhD. Supervisors are also necessary in a PhD student’s way towards the goal. Professor Olov Forsgren, you have followed me the whole way and it has been a pleasure to work with you, especially at our unconventional meetings at among others Lønstrup, Åbo, and Notsand. Research as with good food and good wines has a synergetic effect. With all respects to PCs, the Internet and the mobile phones, without a regular contact face-to-face it is hard to carry through a mission like a thesis. During the last two years I have also had the privilege of having Professor Karl W. Sandberg as my supervisor. Thank you Karl for the pushing and pulling that finally took me over the finishing line. The others in the Informatics group in Sundsvall, Katarina, Katarina, Johanna, Mehdi, Fredrik and Johan, and also our statisticians Rolf and Prerna (my special lunch mate) have all had a finger in the pie. My thanks must also go to my colleagues at the Informatics division in Östersund and the lecturers and my fellow students at the Department of Informatics at Umeå University.
For some people is their work their life. So far, I must confess this has not been a problem for me. My private life has always taken the lead role over the years, where family and friends have given me the necessary injection to carry on. The problem to mention people by name in a context like this is that you take a risk that someone feels forgotten. But I will take the risk and mention a few, Stefan, my faithful armour-bearer with a sensitive ear, who has given the intellectual and philosophical chat a new dimension during both our yearly mountain hikes and our yearly week in the kitchen at the Urkult festival. You have really deserved your name here. Björn and Birgitta, who have never said no to a long walk while I have needed to blow my brain out, had also deserved special thanks.

And to all the forgotten ones I want to say - better luck next time!

Härnösand in November 2005
Olle
Access Barriers– from a user’s point of view
Contents

Contents

CHAPTER 1  INTRODUCTION .................................................................11
A VISIT TO THREE SWEDISH HOMES - AUTUMN 2003..........................11
FROM MOTOR CHAINSAWS TO KEYBOARDS .....................................15
PICTURES OF IT ..................................................................................18
THE PROBLEM ..................................................................................26
THE PURPOSE OF THE THESIS .......................................................26
EXPECTED RESULTS ........................................................................27
THE STRUCTURE OF THE THESIS ......................................................27

CHAPTER 2  IT IN THE SOCIETY .......................................................29
THE IT-SOCIETY .............................................................................29
CITIZENS AND INFORMATION .......................................................33
THE DIGITAL DIVIDE ......................................................................34
THE PERSPECTIVE’S IMPORTANCE ...............................................37
WHY DESIGN A BRIDGE? ...............................................................39

CHAPTER 3  METHODOLOGICAL REFLECTIONS..............................42
APPROACHING THE PROBLEM .....................................................44
THE HUMAN – TECHNOLOGY - SOCIETY RELATION .......................50
TO USE OR NOT TO USE, THAT IS THE QUESTION ..........................52
DRIVING FORCES OR BARRIERS? ................................................56
THE RESEARCH PROCESS .............................................................58

CHAPTER 4  THE ACCESS CONCEPT ...............................................60
SOME CURRENT ACCESS MODELS .................................................66
A PRELIMINARY USER CENTRED ACCESS MODEL .......................69

CHAPTER 5  POSSESSION AND USE .............................................75
THE STUDY SETTING .................................................................75
RESULTS .......................................................................................77
The Respondents ............................................................................77
Possession of computer and Internet at home ..............................79
Use of PC and the Internet at home ..............................................80
FINDINGS ......................................................................................84

CHAPTER 6  USING IT FOR SCHOOL – HOME COMMUNICATION ....87
BACKGROUND ...............................................................................88
THE GOTEBURG PILOT .................................................................89
The Study Setting .........................................................................90
Chapter 1 Introduction

A visit to three Swedish homes - autumn 2003.

Lotta, 50 years old

Lotta lives together with her partner and their two teenagers, a boy and a girl, in their own house situated in a small town in the middle of Sweden. The adults work as medical staff, Lotta as a nurse and her partner as a dentist. They both are highly-educated with university diplomas and the household’s economy is stable. In the home there is a PC, which Lotta bought through her employer a couple of years ago, with an ISDN connection to the Internet. Previously they had a modem connection but they became unhappy with the situation of not being able to use the telephone if somebody else in the household was connected to the Internet and vice versa.

The computer is considered to be a low status priority to the adults and they often look upon it as a source of problems and trouble. They see it as a necessary evil to be used infrequently, e.g. when Lotta recently joined a course at the university. Neither of the grown-ups are experienced users, and they lack any in-depth knowledge about it e.g. how to install new software, how to use many of the applications and how to solve the problems that inevitably occur on a more or less regular basis. Lotta finds it annoying because she often has to ask her neighbour for help with the PC or the Internet. This results in the computer standing idle for weeks at a
time. She would like to learn more but is not willing to spend the necessary time, because she feels that other things are of a higher priority. The PC is seldom used by the adults, and then primarily for e-mail and word processing. A series of virus attacks has further reduced its use.

Lotta is worried about the children’s use of the computer and the Internet. She is also suspicious of PC games and wants to see them before she allows the children to use them. She perceives a risk associated with the ease of access to pornography, violence and drugs, but also can see that its use may lead to a more passive and isolated lifestyle. An example of how her fears became a reality concerns her son, who consciously or unconsciously, visited a pornographic website which led to a couple of bills of several hundred Swedish crowns. Because of the adult’s fear of the Internet, the children have no access to the password for the Internet connection. When they want to use it they have to ask one of the adults. The time spent on the computer is also restricted. Lotta and her partner try to encourage the children to participate in other activities instead of using the PC.

Lotta cannot see any reasons for using the Internet any more extensively than it is at present. The only thing that could make her change her mind is if its use became much easier, safer and did not take so much time from other activities.
Jens, 35 years old

Jens lives together with his 10 years old son in a flat in the same town as Lotta. At the moment Jens has no permanent employment but earns his and his son’s living by doing a number of temporary jobs such as being a bus driver, doorkeeper and computer technician. He also receives unemployment benefit when the temporary employments insufficient. In their home there are three PCs connected to a local network which also is connected to the Internet via a high-speed broadband connection.

Jens regards himself as a very skilful and experienced user and is also a certified technician with diplomas in management and maintenance of computers and networks. He has no experience of higher education and started work after completing upper secondary school. The computers that Jens has himself built consist of components obtained cheaply. He uses the equipment to chat and to surf for information, to e-mail, private banking, download music and film and to play games. He is very fond of technical, electronic things and willingly buys himself the newest mobile phone, digital camera, DVD player and similar equipment.

His son is also a frequent user of computers and the Internet. One of the computers deemed to be his and it is mostly used to play different types of PC games. He has recently obtained an e-mail account and is busy learning how to use the chat room facilities. Jens does not see any risks associated with his son’s use, rather encouraging him to learn more. As a father he feels that it is important to have a
common interest and they sometimes even chat or e-mail each other in spite of both being at home.

Birgitta, 70 years old

Birgitta and her husband live in their own house close to the town centre. They have both been pensioners for the last ten years. During her working life Birgitta worked as a bank clerk and her husband was a chief civil servant in public administration, and they are, by their own account, economically stable. Neither has a university degree and it could be said of both of them, that they have taken the long route towards their final employment. Their time as pensioners is spent on travel, their summer house and their cultural interests. Birgitta is engaged in a charity organisation and is treasurer of a variety of non-profit-making associations. She also acts as an executor. At home they have an old PC obtained from one of their sons. The PC is connected to the Internet via a modem.

Birgitta has no education in computers and its use, but during her time in the bank she came in contact with terminals. The home computer is used by Birgitta for book-keeping in both her treasurer and executor capacities. She also pays the families bills via an Internet bank and writes meeting protocols with the help of the word processing facilities. Birgitta is struggling to find information and to use the e-mail program but with no success. She often has to resort to requests to her children or grand children to deliver the desired material or information. Her husband does not use the computer at all.
He attempted to learn word processing but felt that it was not worth the effort involved.

Birgitta is very sensitive to unexpected messages that could occur when she uses the computer. She has a great respect for the computer and is very frightened of destroying anything, so she does not trust herself when it comes to follow instructions occurring on the screen, e.g. a message that it is time to update the anti-virus program. When this happens she always contacts her son or grandchildren who live in the neighbourhood to ask for help, but she feels uncomfortable asking too often. This means that the PC may remain idle for several weeks.

Birgitta is happy to have the PC and thinks that it makes many of her tasks easier to perform, but she wishes that she was more skilled in handling all the problems that occur.

The three stories above are based on true stories and illustrate the situation in many present day Swedish homes. All three household could be found in the official statistics as households or citizens with access to an Internet connected PC in their home. Furthermore, they indicate two of the main ideas associated with this thesis, namely that possession, access and use are notions that cannot be treated as being equal, and that circumstances other than the purely technical must be taken into consideration in order to be able to judge the options available for citizens to have access to the Internet and the ability to use Public Information Systems, PIS.

From motor chainsaws to keyboards
I, myself was born too early to be considered part of the PC and Internet generation. Indeed I was 17 when I had my first brief contact with computers. During mathematics lesson my class had the honour of do-
Access Barriers– from a user’s point of view
Chapter 1 Introduction

ing a calculation using the school’s punched-card machine. It was a
great event as we usually used a slide rule (this was before the pocket
calculators had made their entrance) to solve our mathematic problems.
After that initial sortie, it was twelve years until my next computer ad-
venture which happened at Norra Skogsinstitutet (a former division of
forestry at the Swedish University of Agricultural Sciences) where I
obtained my academic diploma in forestry. Here there was an Amiga
computer used by the students to play the Worm. Further computer
free years passed which I spent as a forester for the Swedish National
Board of Forestry. This was towards the end of the 80-ties and the for-
estry branch was a male-dominated, traditional, and conservative
branch where the use of computers still was in its infancy. The admin-
istrative staff at the county head office used terminals connected to a
central computer, but in the field and at the local offices there were
typewriters, punch-cards and OCR forms used to register data. These
were sent to a data processing centre to be processed and long lists with
the registered information stored in folders were returned. I was sta-
tioned at the county head office and volunteered when a search was be-
ing made for someone interested in learning to manage and maintain
the computer. I thus entered the world of ones and zeros and became
experienced in the workings of computers.

A little later the Swedish National Board of Forestry introduced a pro-
ject called “Skogsdata” which was to be the starting point for a nation-
wide computerisation of the state forestry administration and field
work. All local offices, usually one in each municipality, were to be
equipped with a workstation which could be connected to the central
computer at the county office via a modem. At these workstations all
forestry data was to be registered by the local foresters and this would
replace the manual system of folders used until then. Every local dis-
trict was also equipped with a handheld computer to replace the punch-
cards or forms used in the field. The data registered in the handheld
computer were transferred to the local workstation via cable and then to
the computer at the county office via the modem.
Access Barriers— from a user’s point of view
Chapter 1 Introduction

My role in this project was to install and introduce the workstations, the handheld computers and the “Skogsdata” system to the local offices. The ‘victims’ in this crusade were experienced male foresters in their late 50’s who, at best, had previously used an electric typewriter. To cut a long story short; it was extremely difficult to convince, motivate and teach this group to use the new equipment, and was not a success in all the local offices.

Because of my involvement in this project I started to ponder as to why were there such problems in introducing new aids that I myself saw as a fantastic asset in reducing the manual paper work which had to be performed both in the field and at the offices. At a later stage, after leaving the Swedish National Board of Forestry in order to study Informatics many of these questions were answered. Looking back to the “Skogsdata” project I can now identify a number of possibilities which might have reduced the resistance against the computerisation. For example the project was not firmly establish among the users; the design of the system was made by a group of consultants who had either no or minimal experience of the conditions in which the system was to run; a two day introductory and training course about how to use the system and the computer was definitely inadequate for users with no previous experience; the motivation to change was zero as the users could see no way in which this would improve their work or make it any easier. Many of these ‘mistakes’ were experienced by me with my interest in the ‘Information Society for All’ when it was apparent that almost everyone was facing the same problems and the question became; how do we deal with this?
“The medium is like a library, a news wire, a deliberation room and a voting booth, all meshed together in a dynamic process at the tip of the citizen’s fingers.” (Richard, 1999)

Over the years many descriptions, dreams and visions have been offered, concerning the possibilities available through the introduction of information technology\textsuperscript{1}, IT. Many of these, such as the quote above, should not be considered only to be utopian but it must be realised that there is still a long way to go before it becomes a universal truth for all. It does not appear to be controversial to state that IT is here to stay, at least not for the foreseeable future.

The “today’s organizations are so dependent upon this technology that a removal of computers, software and networks would undermine the treads that makes organizations work” (Henfridsson, 1999).

The same thing could be said about present day modern society, where different kinds of IT are embedded and used at all levels, from the microwave oven in our kitchens and ATMs to the large administrative systems. The development and spread of technology, from being an advanced calculator for scientists, to an effective administrative tool in offices, to becoming an important and useful every-day instrument in

\textsuperscript{1} Information technology, IT, is the technology required for information processing. This general description includes a wide range of artefacts such as the telephone, fax, television and radio, but also language, books and letters. In this thesis the notion IT is used in a narrower sense; to represent the use of computers and the Internet to convert, store, process, transmit, and retrieve information. IT is also referred to when using the concepts the media or the technology, which are used to offer a greater variety and more pleasing text. ICT, Information and communication technology, is another acronym used in this area, but IT has been chosen because of it is more familiar outside the academic world.
society and in many homes, has taken place during only a few decades. Compared to other technological achievements, the development and spread of IT has taken place at a furious tempo, but has happened foremost in the industrialised parts of the World.

“For example, it took at least a century before the printing press touched 50 million individuals. It took 38 years for radio to reach the same number, and thirteen years for television. But the World Wide Web, in only four years, exceeded the 50,000,000 mark. Never before has a communications revolution spread so rapidly.” (Keniston, 2003)

In step with the technological evolution, or revolution, our way of living has also changed from a rural agricultural society, via the urban industrial society to becoming what is often called the knowledge or the information society (see e.g. Castells, 1996). The interest for, and the use of different kinds of IT that exists in the present day market is not only in authorities, organisations but also among private citizens. For the former, economic factors such as an increase in effectiveness and efficiency improvements have been the major driving forces for the implementation. However, other aspects such as more in-depth knowledge about democracy, an increase in public control and accessibility for the citizens have also been brought forward over the last few years. For citizens it is primarily factors such as amusement, entertainment or other private reasons which have led to the increase.

These changes, the development, implementation and use of IT, have been somewhat controversial and still are; either at work or in the private or public sphere (see e.g. Bansler, 1997; Barber, 2001; Kling et al, 2000; Kvasny and Trauth, 2002). The introduction of a new technology (and also new fields of applications) has always given rise to a number of more or less well-grounded conceptions and myths and so it is also with IT. These have covered, and still cover, the whole range, from pictures of its excellence to its ruinous properties. These pictures
Access Barriers– from a user’s point of view
Chapter 1 Introduction

arrive from all directions; from politicians and industry, from academia, newspapers, films, fictions, comics and nonfictions; all have contrib-
uted to form a picture of the technology in our minds (see e.g. Vedin, 1995; Johannesson, 1966; Orwell, 1948).

A widespread idea was the concept of the paperless office which was heralded by many analysts. All of the organisation’s information would be handled by IT which would reduce the necessity for paper to be more or less non-existent. However, it has become apparent that the consumption of paper has in fact rapidly increased in offices. Another common picture is the extension of people’s ‘freedom’ or the possibility to access data and information and to be able to communicate independent of time and place. However, this picture has some less visible constraints which are not often stated. Most people would agree that it is better to be able to connect to a text database to search and download documents instead of going to the library, but accept that if sitting in an aeroplane or in bed it is easier to work with a printed version. It is also a fascinating thought that although it is easy to communicate with people on the other side of the world perhaps it might also be better to talk to our immediate neighbours.

Picture 1-1: A homeless person in the Information Society
(http://www.skyzjx.com/archives/000076.php)
The technology has, as many of these pictures shown, qualities and inherent forces capable of directing the development of the society and its citizens in one way or another. On one hand, the technology is indeed the Saviour of our time, while on the other hand it has been described as a disaster waiting to happen. Between these two extremes there are naturally many other possible visions. No matter what the attitude is towards IT, there is no doubt that the adaptation of the technology has influenced, and still influences us in different ways. The statement applies equally well to both its most eager proponents and detractors and to the technological determinists and social constructivists. The discussion is instead about whom or what rules the development, its implementation and uses and the consequences for society, the environment and its citizens (e.g. Sclove, 1995, Feenberg, 1995, Mitcham, 1994).

A common picture of the Internet and its strength is that the media is quick, simple and interactive. It is the picture that the suppliers and providers wish us to have and indeed the way we would like it to be and it is easy to take this view for granted if sitting in front of a high-powered computer connected to the Internet through broadband. Mral (2000) claims that the picture presented today is not always correct and certainly not for the ordinary user. The speed is dependent on the capacity of the computer and its mode of connection. The simplicity is limited by technical circumstances, for example problems of downloading programs to make it possible to visit more complex websites or links. Finally the interaction is a qualified truth, if the term is used to describe the user’s active and equal participation in the communication. Another confusing aspect is that a PC in one home does not have to be the same as a PC in another home.

“In example of ‘home computers’, one family might acquire a PC with high quality audio and video capabilities to allow for many entertainment uses. Another might purchase one with minimal ‘multimedia’ capabilities to be used primarily for tasks as word processing. Not only would the uses made of the
two computers likely be very different, it would be no surprise if we were to learn that the children in the first family spend much more time using the computer than do the children in the second one.” (Kling et al, 2000)

One of the present day prevailing ideas in western societies is that the use of IT is a fundamental driving force for economic, social, and cultural survival and development. The technology is assumed to bring many benefits and must be taken advantage of at all costs. The situation where almost all efforts focussed on applications for commerce, administration and entertainment has now been joined by a new area of interest, namely that of electronic government or e-government and electronic democracy or e-democracy. But what lurks behind these new buzzwords? To give a brief answer to that question; it is different ways of using IT and the Internet as tools in the governance or in the democratic process rather than a new form of government and democracy (Ilshammar & Åström, 2001; Grönlund, 2001b).

In Sweden, and in other highly industrialised countries, these ideas can be found in the governmental endeavours to achieve what is often called ‘The Information Society for All’. It has become more noticeable recently in a number of governmental reports and bills, for example in the report “IT i demokratins tjänst” (SOU 1999:117, 1999) and in the bill ‘An Information Society for All’ (Regeringsens proposition 1999/2000:86) and in (EU, 2005), to mention but a few. It can now be found in different forms in central authorities’ and local governments’ websites. Today there are many e-democracy and e-government projects and experiments which are on-going, at local, regional, national and indeed international level. Together they cover a wide range of applications, from tools for the spread of information (e.g. www.riksdagen.se), tools for consultations (e.g. www.kalix.se) and tools for voting (e.g. www.eurovote.org). This growing interest for the use of IT and the Internet for democratic purposes is not only a question for the authorities and the political organisations. Commercial
companies and consultants have found a new area to act in, and form one of the major driving forces behind the development of new applications. The interest is huge, but is the information technology the hope for providing a more in-depth vision and indeed a strengthened democracy? It is not the intention to answer this question in this thesis. One thing is, however, certain; the Internet will not make our society more democratic per se. Internet is merely a technology requiring well thought-out and definite purposes, goals and target groups able to work together in an appropriate manner.

“If ICTs are to promote ‘strong democracy’, then attention must be paid to providing relevant information, in a user-friendly format, at times, in locations and at cost that do not present barriers to access” (Hague & Loader, 1999).

The question concerning democracy and the Internet is not only a technical problem. A priori it is a political question. It is also a question of convincing the Internet users, and the remainder of the citizens, of its potential benefits. According to a report from the World Internet Institute2, which conducted a study among 2 000 households, the Swedish Internet users do not share the optimistic view of e-democracy of the politicians, developers and other interest groups. The results concerning the question of visions and beliefs in e-democracy among the Swedish users show:

- 11% agreed with the statement that the Internet will give more political power to the people
- 12% agreed with the statement that the Internet would make it easier for them to influence the government
- 15% agreed with the statement that by using the Internet it would be easier for them to understand politics

2 http://www.worldinternetinstitute.org
• 9% agreed with the statement that by using the Internet the authorities will care more about people in general.

Achievement of this goal will place great demands upon the authorities as well as upon economic life and its citizens.

In the worldwide ongoing debate concerning the information society, a warning note is struck concerning the gap between the ‘haves’ and the ‘have-nots’ (see e.g. Cullen, 2001; Carveth and Kretchmer, 2002; Kvasny and Trauth, 2002; Hague and Loader, 1999; Boyd, 2002). The discussions are carried out from different perspectives, or from a different focus, at local, regional, national or international level. According to who is highlighting this gap, usually referred to as the ‘digital divide’, unequal access to the technology will result in an ‘information underclass’ with or without the possibility of taking advantage of the benefits expected from the use of IT. There are also those (e.g. Barber, 2001; Chonia, 2002) who argue that this debate is moving the focus from the ‘real problem’, namely the already existing inequalities in the world and in society, e.g. supply of food, clean water, healthcare and education. According to them, the spread of IT will reinforce an already existing gap, between e.g. rich and poor, men and women, old and young, rather than creating new ones. Others dismiss this debate with the following argument: if we allow free market forces to take care of this, everyone will sooner or later gain access to the technology, or to quote Mehlman

“In the other corner are the market determinists, who believe that market forces will drive the price of access down to the point where everyone can afford it.” (Mehlman, 2000)

Despite the standpoint in the discussion mentioned above, it is doubtful whether anyone today would argue that everyone does not have access to the information and communication technology, whether it is in Sweden, the USA, or anywhere else.
Sweden has for the last couple of years been ranked as the mostcomputerised country in the world (www.idc.com). The number of PCs and Internet connections in homes are among the highest in an international comparison, and this equipment is nowadays accepted as standard property. A spirit coloured by technological determinism has contributed to the rapid spread throughout society, in companies and among private citizens. Through efforts to stimulate private purchase and through educational campaigns, basic computer literacy can be considered to be very high, at least among the young and the middle-aged sections of the population. It is among this segment of the citizens that the highest rates of possession of private PCs and Internet connections can be found.

The majority of the official statistics regarding IT use does not however offer a picture of the actual use of the technology, but merely report the level of the technological prerequisites for the use of the PC and the Internet. This is similar to the number of cars in a country not actually stating anything about the number of active drivers. Previous studies in this area have shown that it is not possible to equate possession and use, possession and access nor indeed access and use (e.g. Nilsson, 2002a; 2002b; 2004; Selg, 2002; WII, 2004). Hague and Loader state that

“providing physical access to ICTs is one thing; giving citizens good reasons to want to make use of them is quite another”. (Hague & Loader 1999)

A great body of research has pointed out the inequalities in access to IT. I venture to say that it is now possible to have an overall picture of these inequalities. Generally speaking more men than women have access to the Internet, more young people than elderly, more highly educated than less educated, more employees than unemployed, more rich than poor, and so on. It is tempting to draw the conclusion that the inequalities in access to IT mirror previously existing societal disparities. In order to change these conditions, if indeed it is the ambition to one
day achieve the information society for all, surveys stating who are the ‘haves’ and the ‘have-nots’ are not particularly helpful. Instead it is necessary for us to seek understanding for the reasons behind why it appears as it does, i.e. why the user is a user and why the non-user is a non-user. By investigating and understanding these mechanisms or hindrances to access, we are better equipped with the necessary tools to complete or bridge the digital gap. Of course, it is often easier to bridge a problem than it is to remove it, but on the other hand is it easier to pull the bridge down once more?

To be able to utilise the technology access, is required. In this thesis the access concept will be used in a somewhat broad perspective, covering all the aspects I feel should be taken into consideration. In addition to the technical, physical and knowledge factors, economic, social, cultural and mental aspects will be included. This increased access concept will be discussed further in chapter 4.

The problem

Obviously there are circumstances other than the technological ones which act as a constraint to an individual having the option or will to use technology. To be able to design Internet based services that are intended to be accessible for all citizens these factors must be known and understood. This, in turn, gives rise to the following question, which this research project is intended to answer:

What factors hinder access to the Internet by the single user from home?

The purpose of the thesis

The purpose of this thesis is to identify and analyse barriers, which affect the individual user’s access to, and use of the Internet for personal use. Knowledge about this could contribute to increasing the possibility of taking feasible steps in order to draw nearer to the ‘information society for all’.
Expected results
The outcomes from this work are expected to form a basis for an understanding about how the single citizen experience their options for accessing and using Internet based services and information. This understanding could be used to reduce or remove barriers in order to enable all citizens to become members of the information society.

The structure of the thesis
After Chapter 1, which offered a broad introduction to the area of research, and also presented the problem and aim of this project, the thesis continues as follows.

In Chapter 2 will give a more in-depth discussion concerning the Information Society. The prevailing inequalities in access to IT, the ‘Digital Divide’, are described at different levels, or from different perspectives. The lack of focus on factors related to the individual’s context in current IT research are discussed and criticised. The chapter concludes that in order to understand and deal with the ‘Digital Divide’, the studies of access must include a wider definition of the access concept.

Chapter 3 presents and discusses the research methodology.

In Chapter 4 is the wider definition of the access concept discussed previously. From a starting point in Popper’s three worlds and a number of current access models, a proposal for a tool is formulated.

Chapter 5 presents and discusses the findings from two studies made in the municipalities of Sundsvall and Gothenburg during 2002 and 2005.

Chapter 6 presents and discusses the finding from a study made in the municipalities of Härnösand and Gothenburg during 2003.
Chapter 7 presents and discusses the finding from a study made in the municipality of Härnösand in 2001.

Chapter 8 concludes with a discussion on the findings of the thesis.
Chapter 2  

IT in the Society

“If our society in the first hand is commercial, private, material and a consumption society, the technology will also be commercial, private, material and directed towards consumption.” (Barber, B. 2001)

The IT-society

Our society is in a constant and continuing process of change. During the last century Sweden and the other countries in the western world have transformed, from being rural societies based on agriculture, via urban industrial societies, to become what is often called information societies. It is not only the means of earning our living that has changed, from being based on a manufacturing to a service industry, but also the way we live and communicate (e.g. Castells, 1996). Today is it not milk and honey that flows in the Promised Land, it is bits and bytes, ones and zeros.

Castells states that

"societies are organised around human processes that are structured by historical determined relations of production, experiences and power.” (p. 28)

To be able to talk about a new society paradigm, radical changes in these processes are required, according to Castells. Among others, he points out two important changes supporting his theories; a) changed forms for development and means of production; and b) the changing

3 E.g. “…are currently more people working in Indian restaurants in the UK than in the coal-mining, shipbuilding and steel sectors combined”
http://www.corporatetraining.ie/articles/information_technology/employment.php
retrieved 2004-11-11
role of information. In the previous agricultural society the means to an increased profit was via a quantitative increase in work and natural resources. This was replaced by the industrial society where the introduction of new energy sources and the ability to decentralise these was the key to success. Today, in the information society

“is the source to productivity, the knowledge generation, the data processing and the technique for symbol communication” (Castells, p. 30).

The major factor, which has made this transformation of the society and living conditions possible, is a long series of technological innovations, invented, created and used by humans, and in which different kinds of IT are merely the latest additions. As well as the primary production related changes, are the political, social, educational and healthcare systems changes, e.g. with the introduction of the universal right to vote, different kinds of welfare systems and compulsory schooling to mention but a few. The remoulding of society and the implementation of new technology has, in most cases, not been preceded by a democratic process in which the citizens have had an option to take an active part in the decisions, but has, instead, been conducted by the mythical market and a belief in technology’s inherent power. This deterministic spirit is probably one of the reasons why the technological innovations and other changes are experienced as frightening and uncomfortable for many in society, a phenomenon often referred to as technophobia4. Another way to study and describe people’s behaviour or relation to technology is suggested by Lindblad-Gidlund (2005) who used the dichotomies active-passive and dominant-subordinate to classify the users’ relation.

4 "The idea behind the term is to describe any kind of mild to moderate to severe discomfort with one or more forms of technology, in which case those experiencing the technophobia would, if at all possible, like to avoid technology. If they can't avoid technology, they have several different experiences. They believe the technology is not for them, and they don't believe they'll be able to understand it. For some, technology is downright intimidating.” (Weil, 1995)
The information society consists, as do most other societies, of both a private and a public sector. Commercial interests rule the development of the private sector, where the actors make their decisions concerning whom in the society they should turn to, which consumers they want to attract and where their company and its owner’s profit are seen as the determining factor. The only thing apart from the economic considerations that could interfere with the decisions about their activities is current or forthcoming laws and rules in the country or in some cases moral or ethical issues, e.g. environmental considerations. In a society based on a market economy system it must be accepted that these actors determine the rules regarding the access to their IT-based business and services, which frequently results in uninteresting or unprofitable customer groups being excluded. E.g. in the present-day situation it is more interesting for a telecommunication company to focus their efforts on the market in the highly developed countries or in the so-called tiger economies where there is a broad base of customers able to pay for these services, than it is to invest in e.g. many of the African countries where the necessary infrastructure is undeveloped and the inhabitants are poor.

The public sector has to act according to other conditions and considerations when planning and introducing its digital services. It must carry out decisions made by Parliament or local governments, or be regulated by current laws and decrees. Non-profit and public good have been the keywords in this area, but demands for economic considerations have increased over the years. We have become the government’s and the authorities’ customers instead of their citizens. According to the responsible Ministry it is

“the aim of Swedish IT policy to stimulate growth, employment, regional development, democracy and justice, quality of life, gender equality and cultural diversity, efficient public administration and a sustainable society” (Ministry of Industry, Employment and Communication, 2004).
The public administration’s endeavour to use IT to an increasing extent in its contact with its citizens, or customers, is brought forward as a benefit primarily for the individual. A democracy, with more active and participating citizens, who have increased options and freedoms via the 24/7-agency⁵ are some of the arguments used to legitimise the efforts towards these goals. Of course there are also other reasons lurking around the corner, which in themselves do not necessarily have to be in opposition to the arguments above. One of the more important reasons is the ambition of the public administration to be more effective and use fewer resources.

“A shrinking labour force will have to support an increasing number of people. To maintain the provision of good, equivalent services, public administration will need to undergo rationalisation and renewal.” (Government Offices of Sweden, 2003)

Despite the ongoing discussion concerning the benefits and the risks associated with the use of IT, it is assumed that the information society could, and should be a good society for all its members to live in. This good society will be achieved neither by itself nor by some intrinsic properties of the technology. Neither will it be achieved if the

⁵ By international standards, Sweden is well ahead in terms of integrating information technology (IT) into the workings of society. Current initiatives to develop public administration so as to meet our users’ or customers’ (citizens’ and business people’s) needs better may be summarised in the notion of the ‘24/7 agency’. Based on the fundamental values of democracy, the rule of law and efficiency, the Swedish Government aims to deliver public administration that affords:
– Accessibility, irrespective of office hours and location
– High-quality services and responses
– Openness to users’ opinions and ideas on how to improve public administration
– Simple, fair rules
– Optimal benefit to users through collaboration and continuous assessment and development of activities.
http://www.regeringen.se/content/1/c6/03/12/52/0377bd22.pdf
design and implementation of the technology and the applications that should enable this society are left in the hands of the free market forces. This implies that both the design of the goal, the information society for all, and the way it must be staked out in a democratic process, must include the society and all of its citizens.

At a later stage it is assumed that the Swedish authorities’ intention is, that in the information society for all, everyone should have the possibility to access and use the technology and the offered services in the way required by the individual, or as Lindblad-Gidlund (2005) writes;

“[...] in an enlightened and equal way make their own choices regarding information technology use”.

It is also taken for granted that the authorities’ endeavour is that the technology should be used to the fullest possible extent, with a corresponding reduction in the traditional ways of dealing with things.

**Citizens and information**

The use of the concept citizen in this text refers to everyone who lives in the society, and also includes those not possessing formal citizenship but who do live legally in the country. Of course it also includes nationals living abroad but who still retain their formal citizenship in their country of origin. Naturally, this excludes those countries, which do not allow citizens living abroad to retain their citizenship. Citizen information, in this case is the information required in the relationship between society and its citizens. Everyone who is a citizen of a country has a series of rights and duties, about which they need information in order to participate, or to fulfil these obligations (Steele, 1998). Rights could for example be: the right to take part in the democratic process; the right to vote; freedom of speech; the right to receive social services and benefits, to mention but a few. Duties include the duty to pay tax, to follow the law or to fulfil compulsory military service or compulsory schooling. Because of differences in e.g. language, education, and social, cultural and political background among the
citizens, great demands are made on the means of providing this information in an acceptable way for all.

The constitution, laws and other governmental rules in most countries determines what information should be provided.

“In a working democracy it is necessary that the citizens have access to knowledge and information to be able to participate in the democratic debate and in the social process. Therefore are the right to information protected in the constitution and are in force during as well under undisturbed as disturbed social conditions” (Nydén, 2000).

According to Nydén (2000), the biggest problems appear to occur in relation to the legal system, where there is a confusion as to whether the 24/7- authority fulfils the demands of the principle of public access to official records, the demands of an equal service and a well thought out protection of the citizens’ integrity.

It could also be a problem to define the individual citizen’s requirement for information (Steele, 1998). The individual could be unaware of the information he or she needs, either because of a lack of knowledge about the duties or rights, or because they do not know that the information could help them to solve a particular question or problem. The result of this is that it is not possible to juxtapose the necessity and demands for information.

The digital divide
In the present discussion concerning the use of different kinds of IT, a note of warning is given with regards to the unequal access to the technology. These differences in the access are usually called the digital divide or the digital gap. The term is a social construction that emerged after the Internet came into the public domain (Ryder, 2004). The notion is used to highlight the problems or risks these inequalities
Access Barriers – from a user’s point of view
Chapter 2 IT in the society

could cause for the unfairly treated, or to point out the differences between ‘the haves’ and ‘the have-nots’. Many definitions and explanations exist for this concept. They range from more general descriptions such as the difference between those who have and those who do not have access to the technology, to more specific ones such as;

“a common metaphor to describe the expected disadvantages for they who not can or choose to not use these technologies in their daily lives” (Cullen, 2001);

or

“the digital divide refers to the gap between those who can effectively benefit from information and computing technologies (ICTs) and those who cannot” (Ryder, 2004).

IT is not unique in this; it is possible to discover differences in access to all kinds of technological use, at the local, regional or indeed global level. The reason for the increased attention given to this technology is because of the importance it has been given in modern highly-developed societies. In a publication from the Swedish Ministry of Industry, Employment and Communication we can read that

“the importance of information technology for modern society may be compared with that of electricity and the combustion engine for the industrial society.” (2004, p.7)

When more and more private and public service information is offered via digital channels such as the Internet, the lack of access is assumed to be unfavourable to those not having this option. Statements loaded with subjective judgements, as i.e. ‘information underclass’ (Calamai, 1994), ‘information apartheid’ (Davis, 2001), or “America's digital di-
vide is fast becoming a ‘racial ravine,’” (Irving, 1999) are used to express the seriousness of the situation. The use of this type of terminology loaded with subjective judgements does reveal the standpoint adopted by the user in the debate.

Different studies point out different groups which are treated badly or ignored. It is usually groups which, in other contexts, are also looked upon as underprivileged, e.g. women, the elderly, poorly educated, unemployed, and immigrants. The fact that the same groups are mentioned here results in some researchers (e.g. Barber) arguing that it is incorrect to talk about a digital divide as being a new or isolated phenomenon, it is rather a reinforcement of existing problems in societies,

“the already unfairly treated are continued to be treated unfairly”. Barber (2001)

Chonia (2002) expresses a similar point of view with the question: ‘penicillin or Pentium’, or whether questions concerning IT should be removed from the agenda when there is a food shortage or a lack of healthcare, education, drinking water etc. Others discuss ‘the false digital divide’ and assert that there are public access points that everyone is allowed to use if they want to (e.g. Patel, 2000).

Keniston (2003) argues that there are four ‘digital divides’.

1) The divide that exists within every nation, industrialized or developing, between those who are rich, educated, and powerful, and those who are not.

2) A linguistic and cultural divide. In many nations this divide separates those who speak English or another West European language from those who do not. Approximately 60-80% of all Web sites in the world are in English while almost all the rest are in one of the major ‘Northern’ languages like Japanese, German, French, Spanish, Portuguese, and increasingly Chinese.
3) The growing digital gap between the rich and the poor nations.
4) The gap between those who are technically savvy and those who are not.

Despite the differences in opinion whether the differences in access to IT is an important or serious problem or not, it can be safely assumed that most would not deny that everyone, for whatever reason, does not have the option of using technology at present.

**The perspective’s importance**

The breadth and depth of the digital gap depends on the chosen perspective, and who has chosen the perspective thus the question becomes both actor and context dependent. The examples below show that the problems and the solutions have different characteristics depending on what is being studied when discussions take place concerning the digital divide.

**A global view**

In November 2000 slightly more than 56% of the Swedes had used the Internet during the previous three months, while the corresponding figure for Bangladesh was 0.02% (Cullen, 2001). There is a huge gap in access to IT between the industrialised countries and the rest of the world. Carveth and Kretchmer (2002) show that there is a relationship between GNP per capita and the number of telephone lines and computers in the country. In August 2003 only seven percent of the world’s 6.4 billion people had access to the World Wide Web (NielsenNetRatings, 2003). The studies above indicate conservation or reinforcement of an old problem, the huge differences in the living conditions between the rich and poor parts of the world. The possibility for change is more related to political and economic questions rather than to technical ones. From a market perspective, the problem is somewhat different. In this case, it is an economic question of priorities, which thanks to the enormous requirements for investment, in
Among others, the infrastructure, causes the developing countries to be less interesting to companies at the present time.

**USA versus Western Europe**
If, instead, the USA is compared to Western Europe another gap is found. Almost 60% of the Americans are Internet users while the corresponding number in Western Europe is nearly 30%. The same study shows that 26% of the Americans in the lowest socio-economic group used the Internet, while only 7% of the same group in Western Europe does so. Significant differences are also found in age and gender when comparing the two areas. As an example the difference in use between men and women is almost non-existent in the USA but is significant in Western Europe (NUA, 2000). Race or ethnicity is, on the other hand, a crucial factor in the USA, but does not have the same strength in Western Europe (Carveth and Kretchmer, 2002).

**North versus South Europe**
A look at Western Europe reveals other differences. During the same period that 65% of the Swedes were connected, 13% of the Greeks were Internet users, 28% of the Frenchmen, 36% of the Germans, and 57% of the Britons. Here, a gap can be seen between the South and the North, which could be partly explained by differences in GNP per capita. Other influencing factors are the deregulation of the telecom market in Scandinavia and in the UK, and a considerably higher share of the population with knowledge of English in Northern Europe (Carveth and Kretchmer, 2002).

**Sweden**
In Sweden there are different groups which are noted as being treated unfairly, neglected or ignored. In most cases they are the traditionally exposed groups such as low-income earners, immigrants, women, the elderly, disabled and unemployed (e.g. SCB, SIKA). All non-users do not belong to these groups, and a belonging to these groups does not automatically imply that you are a non-user (Selg, 2002). Sometimes the reasons for differences is use can be described as a cultural gap
because of cultural factors, such as age, educational level and ethnicity, which appears to be more crucial than the economic ones (Grönlund, 2001). An example of this concerns families with children of school age (7-18 years) where the number of ‘connected’ is 85% (Selg, 2002). Other studies show examples where economic factors are the dividing force. Nilsson (2002) shows that young people, 20-30 years old, who have left the parental home, have relatively low levels of access, and states that it is economic reasons which cause them not to be connected. The same study also shows differences which depend on the type of accommodation: broadband access is considerably higher in apartments than in private houses. Another concern is geographic location, particularly the differences occurring between towns and the countryside, but also between the sparsely populated north and the more densely populated south (Grönlund et al 2001, Cooper, Pease and Wright 2002). The geographic difference is primarily an infrastructural one; a question of bandwidth.

The Family
It is also possible to identify a digital divide at the family level. Several studies indicate that there is what could be called, a digital hierarchy in many families. In families with children, it is often the adult women, who are at the bottom of the hierarchy. The children and/or the man are usually the priority users. Also in households without children, the women mostly tend to be the unprivileged user. (e.g. Selg, 2002; Nilsson, 2004; Nilsson, Sefyrin, 2005).

Why Design a Bridge?
Information is a necessary component for well-founded decision making, but also for our daily life in the society. As citizens we are dependent on different kinds of information and services to be able to utilise our rights and to fulfil our obligations as members of the society. The information could be provided in various ways but it must somehow be made accessible to everyone. In addition to these civil tasks there are also a number of other every-day actions that must be done and which could be performed with the assistance of IT-based
services. A person who does not have the option of using these services, risks missing out on the possible positive consequences of the use and may instead be treated unfairly in e.g. economic, social and political issues. In particular, banks and travel companies are required by most people occasionally, charge a higher fee for those who do not use their IT-based services than for those who do use these services. At the social level, non-users are excluded from many possibilities offered via the Internet. In addition to the obvious communication possibilities such as e-mail and chat, nowadays many more television and radio channels offer their viewers and listeners new possibilities via the Internet. It could for instance be supplemental information, possibilities to interact during a programme or possibilities to download or subscribe to programmes which enable the user to take part in the programme at a suitable time for him or her. Another aspect of the social consequences is also that today when the computer and the Internet are considered to be commonplace, a non-user could be considered to be rather abnormal by many.

![Diagram](image)

**Figure 2-1: Some possible consequences of non-use.**

As mentioned previously, differences exist at the global, regional and local levels, with regards to the option available to use IT and to access information on the Internet. The inequality is only one among many other inequalities that must be faced in the World or in society
today, and is probably not deemed to be the most serious or indeed the one of crucial importance. This gives rise to questions such as: What makes this area so important that we can use a great deal of time and money to study and discuss it? What will we bridge and why? Who does the bridge favour, the authorities, the companies, the citizens, or everyone? What is the goal; should everyone use the technology or should everyone have the possibility to use it? Before we start to build the bridge to enable those on the ‘wrong’ side of the gap to unite with those on the ‘right’, we must discuss and answer the questions mentioned above. Without a plan, well thought out and deeply rooted in society, we will risk making bridges that will be pulled down before they have served their purpose. However, in addition to answering these questions and to work out this plan which grasps decisions at a society level we require knowledge about the individual citizen and their behaviour in relation to the technology.
Chapter 3  Methodological reflections

As mentioned previously, the aim of this thesis is to identify and analyse barriers, which affect the individual user’s experience, access to and use of the Internet for their personal use. A particular emphasis is placed upon the hindrances that limit access to and use of public information and services. The reason for giving these fields of application special attention is the stated endeavour from the authorities to transform the contact and communication between themselves and the citizens from the ‘traditional’ ways, such as e.g. telephone, personal contacts and mail, into electronic channels such as e.g. e-mail and web based self-services. To succeed in these efforts it is necessary to offer the citizens usable, use-worthy and easily accessible alternatives to the traditional contact means. There is also another and at least as important an aspect to be considered, which separates the public authorities’ information systems from the commercial ones, namely the democratic demands which cannot be ignored.

There are many system development methods, including SASD (Structured Analysis Structured Design) and IE (Information Engineering), which can guide the system developer through the process from the preparatory analysis to the management and maintenance of the implemented information system. From the 50s’ and 60s’ machine view of the user as a part of the system able to be handled in a similar manner to the other parts, a change has taken place in which more and more attention has been placed on the users as independent individuals not always acting or reacting in the same or even in a predictable way. This change in view has led to new approaches in the system development process where the human as a user has been put forward and new methodologies have seen the light of the day e.g. Participatory Design, DSDM (Dynamic System Development Method) and Rational. As long as the information systems was designed for the organisations or the company’s internal use all was fine.
There were a limited number of users, who were known and who could be controlled to a certain extent. Despite these conditions, report after report (see e.g. Standish Group, 2001; Gulliksen & Göransson, 2002; Keil et al, 1998) points out unsuccessful development projects where the failure was explained as being deficient user participation.

With the development of the Internet and the World Wide Web, WWW, the number of IT users has increased exponentially. However, not only has the number changed; there has also been a change from the known, more or less controllable in-house users to anonymous users sitting at home in front of their own equipment. The big challenge for the decision makers and developers, at present, is that every citizen should be able to become a user and have the option to use the systems. This places great demands upon the design of the information system which must now attract and be useable and use-worthy for all types of users from the computer novices to the experts, those with disabilities or those with different degrees of language competence and also be usable for different technical platforms. To be able to handle this situation knowledge is required about the users (i.e. the citizens) and their relationship with the technology. This knowledge could assist in the formation of some kind of tool, framework or guidelines to handle these problems in order to fulfil the demands.

The technical side of the problem will not be dealt with in this thesis as the necessary knowledge and skills appear to be already available. Instead the focus be on the individual user and how he or she experiences the options available to use the Internet based public information systems and information.

The thesis will be a contribution to the field of Social Informatics defined by Rob Kling et al. (2000) which refers to the body of research and studies examining social aspects of computerisation. It also includes the roles of information technology in social and organisational
change and the ways that these are being influenced by social forces and social practices. Studies and analyses of social impacts of computing, social analysis of computing, and computers and society are some examples of the content of the research area.

1. The context of ICT use directly affects their meanings and roles.
2. ICTs are not value neutral: their use creates winners and losers.
3. ICT use leads to multiple, and often paradoxical, effects.
4. ICT use has moral and ethical aspects and these have social consequences.
5. ICTs are configurable – they are actually collections of distinct components.
6. ICTs follow trajectories and these trajectories often favour the status quo.
7. ICTs co-evolve during design/development/use (before and after implementation).

Figure 3-1: Key Social Informatics Issues (Kling et al p.117)

Approaching the problem
A common way to categorise research approaches is to place them into the positivistic or the hermeneutical pinfold. As a researcher about to confront a problem, a number of considerations regarding its handling must be taken into account. In other words, it is necessary to decide upon both the question and the expected outcome. When studying the individual’s use of the Internet it is possible to collect a great deal of knowledge using positivistic, quantitative methods, but in this particular case the answers are already known because of the many surveys previously done by researchers, research institutes and others. In this thesis it is not the answers to the questions if, when, how often or to what, that are important to find, because a great body of knowledge concerning this is available. Instead the question to be answered is why it is used or not. The actual reason is also not of great interest; instead it is the occurrence of a reason that is interesting.
In some ways it is unfortunate that a positivistic method cannot be used as these can give answers which can be tested or proved in such a way as to make them appear to be the truth. But, when people and their behaviour are studied other things must be taken into consideration in order to be able to understand the reasons why they act as they do. As someone who is pleading for a hermeneutic approach to this actual problem I agree that I am coloured by my pre-understanding and that my interpretations will thus be influenced by that pre-understanding. Popper (1979) states that in all scientific observations the researcher play an “intensely active part”. He continues

“we do not ‘have’ an observation [...] but we ‘make’ an observation.” (Popper, 1979)

The observations made are preceded by an interesting problem thus the observations are selective. An observation is thus a planned and prepared perception.

Nowadays all of us are surrounded by, live with, and use technological artefacts to a greater extent than ever before, and the implications associated with this are that it will probably affect both thought and actions. These circumstances give rise to important questions concerning the relationship between technology, society and the individual. We all are in the same boat, but who is rowing and who is steering? These relations can be viewed using different spectacles, or from different starting points. The choice of perspective is crucial to determine how we will act and how we will handle the relationships mentioned above.

Henwood et al (2000) point out three dominant perspectives in both the popular and academic discussion regarding the relationship between technological and social changes. The deterministic perspective ascribes different properties and an inherent force to the technology, which both affects and changes society. In other words, the technology is born and is developed on its own, and we either want it or not.
The best way for us to act is to follow, to try to adapt, and to learn how to use it in a manner best suited to each individual. In fact, this perspective gives us the possibility to abjure responsibility for its development and use, as no choice is available. A common critique of the deterministic view is that it offers no option for society or the individual to choose or influence the technological evolution or its use. Many researchers, particularly from the social science field utilise this critique. For example:

”[t]echnology is created and changed by human action” (Orlikowski, 1992, p.405)

”[...] the societal, organizational and personal contexts without which the technology is meaningless”. (Rose, 1998)

”[...] technological determinism treats ICTs as information processing systems whose technical characteristics cause specific social changes when they are adopted and used. While technological determinism can be applicable and useful in situations are characterized by high degrees of control and short time frames, it has limited value in dynamic and complex situations that unfold over longer periods of time. Technological determinism cannot adequately account for interactions between ICTs, the people who design, implement and use them, and the social and organizational contexts in which the technologies and people are embedded.” (Kling, p.49-50)

The following quote from Sclove illustrates the meanings of these critical standpoints rather nicely;
"A television set is only useful so long as the viewers know how to operate it, it is protected from inclement weather, there is access to electricity, programs are being produced and distributed, and so on”. (Sclove, 1995, p.13)

The person pleading for a non-deterministic view of technology states that technological artefacts are created and developed by humans for humans, in a specific social context.

The neutral view looks upon technology as something that emerges and develops by itself. A technology does not carry any inherent qualities; instead it is the user through his or her actions who give the artefact its properties. It is also the human, as an individual or as a group, who choose and decide what shall be used and how. This view shows that the users could influence the eventual effects of the technological use. Sclove argues that we

“understand technologies in the terms of a primary function—or, occasionally, several functions—that each is intended to accomplish.” (Sclove, 1995, p.10)

According to Sclove we should have, over the past few decades, noticed that technologies also tend to give rise to ‘secondary’ or ‘unintended’ effects such as environmental and social consequences. Kling et al (2000) also give attention to the unintended effects of IT, and claim that it is the positive side of the coin which is put forward to legitimise an implementation. The 24/7-authority really does increase and simplify the possibility for many to access public information and services, but a simultaneous decrease in the ‘traditional’ contact possibilities implies a reduction for those who are unable to use it for whatever reason.
The constructivistic perspective sees the technological artefacts as human products, with a design and use ruled by individuals in a specific social context. The technological evolution is not separated from political, economic and cultural processes, instead is it conducted by it. In contrast to the deterministic perspective, which claims that the social evolution is the result of the technological, the constructivistic perspective gives the opposite picture; that technology is the product of society. Technologies, machines and things are not ‘just things’, they are a realisation of human ideas.

“A spider performs similar work operations as the weaver, and a bee build the wax cell with a skill that makes many human builder ashamed. But what in reality differ the worst builder from the most skilled bee, is that he had build the cell in his head, before he build it in wax. At the end of the work process it comes out a result, which already in the beginning existed in the head of the worker, so then it already existed ideally” (Marx, 1867/1981, p.153 f.)

MacKenzie & Wajcman (1995), Kvasny and Trauth (2002), Davidson (2002), shows how the development and design of technology are influenced by the dominating social conditions. An often-used illustration supporting the social-constructivistic perspective is Bijker’s and Pinch’s study of the early history of the bicycle (1984). It is not difficult to find support for this view when the artefacts surrounding us today are examined.

The description above shows the basic characteristics of the three perspectives. It is easy to end up in a ‘chicken’ or egg’ dilemma, i.e. what comes first, when discussing technology. Is for example the laptop a result of a human vision of the mobile workplace formed in an existing social context, or is it technological progress that has given it to us? The determinist should of course argue for the latter scenario while the constructivist would claim the former. In the same way will
a discussion about the technology’s eventual properties, e.g. if it is bad
or good, give different answers depending on the observer’s philo-
osophical standpoint. A common example is the question of the nuclear
bomb. From a deterministic point of view it is easy to have both
standpoints, while the technology carries different qualities. With a
technique neutral perspective the argument is that while the artefact
does not have any inherent properties it is the use of it that makes it
good or bad, a tool for death and destruction or a tool that can act as a
deterrent to starting a war. Also the constructivist argues that the in-
herent properties are missing and that the user is responsible for the
use and its consequences, but also that the origin of the artefact is a re-
sult of the context it was developed in.

It is not easy, or even possible to say who is right and who is wrong in
this discussion. From a relativistic epistemological view there is no
universal truth valid for everyone. All three perspectives carry argu-
ments that are tempting to accept while others not are. But, the de-
terministic standpoint’s disregarding human free will and the possi-
bility to influence evolution makes this perspective unacceptable to
me. The neutral view includes humans in the process but only after
the technology’s birth. While I am of the firm conviction that the hu-
man is the strongest and determining actor in this relation it causes
me to adopt a social-constructivistic standpoint in this thesis.
I look upon technological artefacts as products created by humans, or
in other words as realisations of human ideas. This creation, or reali-
sation, takes place in a specific social context, which also influences
the artefact and its relation to it, as much as the use. According to
Berger and Luckmann (1996) the process is where reality is con-
structed as seen below:

**Externalisation** is the process during which humans create something
that works as a visible expression of an idea or a thought, e.g. when
the idea of the 24/7-authority first was formulated.
Objectification is the process where an idea becomes a part of the objective reality, or in other words is created. Today the 24/7-authority has become a reality, even if it has not yet achieved its full potential. The implication of this is that other people, now and in the future will meet the artefact and react, analyse and interpret it in different ways. For everyone who meets the object it is a part of reality to which you must have a relationship and understanding.

Internalisation is what happens when people adopt the artefact, have a relationship to it, handle it and attempt to understand it.

From this view of the world around us, the reality is constructed by humans, a social construction. Thus individuals and groups of individuals are defining the reality.

The human – technology - society relation
My starting point five years ago is given in the figure below, which was my first attempt to visualise my view of how our conceptions about, and use of technology are formed.

![Diagram](image_url)

*Figure 3-2: Factors and relations effecting the usage of and attitude to the personal computer and the Internet. (Adopted from Stoltzerman, 2000)*
In the figure there are four keywords representing four clusters of factors which will affect the attitude to, and use of a technological artefact such as. the PC or the Internet. It also shows the relationships between these groups. The two-way arrows illustrate the interplay between them. *Technology* is in this context e.g. hardware, software, and infrastructure. *Conceptions* includes the individual’s ideas of the study object based on his or her experience, education, knowledge, social background, profession, culture and expectations, to mention but a few. *Usage* is about what, how, why and when different artefacts, applications and services are used. Finally *policy* includes aspects such as, current laws and rules, producers and suppliers, societal culture and traditions, which in some way or another influence the use.

The phenomenon studied here, i.e. the private use of Public Information Systems at the Internet, is viewed as the results of the relationship and an interaction between humans, society and technology. Popper (1977) describes processes in three dimensions or three worlds; the physical world (w1), the mental world (w2) and the social and cultural world (w3).

![Figure 3-3: Popper's three worlds (1977) (adopted from Wihlborg, 2000, p.33)](image)

Popper states that all human processes include aspects of the three worlds, even if one or two of them may be dominant. The interplay between the three worlds is illustrated in the picture above. The physical world (w1) consists of all physical phenomena that exist, e.g. things, buildings and physical infrastructure. Also our bodies belong to the physical world. The second world is our conscious and unconscious mental world (w2), our thoughts and ideas. We can move a physical object with interplay between phenomena in worlds one and
Access Barriers – from a user’s point of view
Chapter 3 Methodological reflections

two. Firstly we mentally (w2) decide that the object exists and then, even mentally, we plan that it should be in another place and, finally and in the physical world (w1), we move it. The third world (w3) is created by humans through our common actions, such as myths, narratives, social institutions and scientific theories (Wihlborg, 2000). If we apply Popper’s theory to the actual area of study we can say that e.g. the PC and the Internet belong to the physical body (w1) consisting of a number of connected components, which refers to the Technology in my model (figure 3-2). Our conceptions of what this artefact can do for us, or what we can do with it, are mental pictures (w2) or Conceptions (figure 3-2), which we can communicate to others through a common language (w3), Usage and Policy (figure 3-2). The third world’s social and cultural structure offers us the possibility to articulate and communicate our interpretations of phenomena either in an individual or in both worlds 1 and 2.

To use or not to use, that is the question.

“When it comes to the point, the user visits your web site because of its content. Everything else is secondary”. (Nielsen, 2001)

Without straying into psychological and sociological theories, three ways are pointed out that could be used to influence a person’s way of acting, which in this case is to make him or her use IT and the Internet.

Encourage  Facilitate  Compel

Use

Figure 3-4: Three ways to ‘make a user’
Firstly a person can be encouraged to use it in some way or another; i.e. supply with driving forces that stimulates the person to perform the desired action, namely to be an IT and PIS user. This stimulation could be done in many ways, e.g. offer benefits to the user, stress the advantage of the use, or establish rules that make it possible to obtain the necessary equipment on easy terms, to mention but a few. The high rate of PCs in Swedish homes is probably partly a result of the change in the income tax rules of 1997 (Prop. 1996/97:173), which made it possible for many to buy a PC at favourable conditions. Another example of successful encouragement is the Swedish National Tax Board’s campaign to return tax forms electronically. In 2005 the number of people who used the electronic alternative for the tax return was in excess of 2,1 million, which is more than double that of the previous year (www.skatteverket.se). The reason for the sharp increase was probably the promise from the Tax Board to deliver the tax refund before the summer holidays instead of after it, which was the case for those not taking the electronic option.

Use could also be facilitated by removing hindrances or barriers limiting the possibility or will to be a user. In many cases it is difficult to define the limits between driving forces and barriers, e.g. the exemption from taxes on computers bought via employers is a driving force for some while, for others, it is a removal of a barrier.

A third way to attempt to encourage people to use the Internet services is to more or less force them. This could be done, if the alternative ways of performing the tasks are so unattractive, disadvantageous or impossible that the user has more or less no choice. Examples of this strategy can be found in many travel companies ticket routines, where some types of low price tickets can only be bought via the Internet, or where there is an additional cost if the self-service on the Internet is not used. The risk of forcing this use is that the user’s attitude might be hostile towards the service or the organisation and other ways to perform the tasks may be chosen. It may also be difficult to determine the difference between compulsion and encouragement, but the offer
of some kind of reward for the user can be thought of as an encouragement while some kind of punishment for non-use may be seen as compulsion.

A common way to approach the digital gap is to study the driving forces that influenced our decisions to act in different ways. This approach can give us answers to the question: what made us use the technology? It looks back to find what factors caused the action. Often the notion is ‘a need’ used when driving forces are discussed, which gives the impression of the use as something it is impossible to manage without. The use of ‘a need’ here creates a vision of irresistibility or more or less imperative, which leaves us without a feeling of autonomy or free choice (Israel, 1999). It should be stated that nobody has ‘a need’ to pay their bills, or do their shopping via the Internet; on the other hand it be practical or rational for many to do so during certain conditions. Neither has anybody ‘a need’ to vote or communicate with the authorities through the Internet, but it could facilitate the process for many. In this context it is better to talk about ‘motive’ to describe what make us use the technology. Motives are reasons we ascribe to somebody that explains and justifies their actions. The motives often have a moral or legal meaning, and attempt to state the purpose or the goal for the action (Israel, 1999). It is possible to use the motives to explain a person’s actions in relation to the situation and the context in which they take place.

A number of researchers have proposed different ways to analyse what makes a person an Internet user or not. Selg (2002) suggests that the driving forces are studied because: a) they have a determining influence on the direction of every-day activities and also how they are prioritised; b) they also influence the choice of information activity; and c) they have vital importance for the outcome of which alternative is the most usable. He uses three concepts, ‘form of life’, ‘life cycle’ and ‘way of life’ to study and discuss the driving forces.
The ‘form of life’ deals with how a household earns their living and how this is mirrored in their family situation and their mode of living.

The ‘life cycle’ refers to where in the life you are, e.g. can a child determine his/her own time allocation or is it dependent on a parent who is responsible for the children, the home and being the wage earner. Additionally a pensioner has more time to spend on his/her own activities.

The ‘life style’ concerns the way we perform the activities we have to do or what we choose to do and how we choose to do it. Most of the activities can be done in a number of ways, and the decision regarding how to handle a specific task is done either consciously or unconsciously. All these different decisions form our life style.

Eftring (1999) introduces the notion ‘useworthiness’ as a determinate for the decision as to whether a person chooses to be a user or not. He states that usability is one thing but useworthiness is another. The concept useworthiness consists of three parts:

- Users high-priority needs
- Utility
- Usability
Access Barriers – from a user’s point of view
Chapter 3 Methodological reflections

A system could be excellent according to the usability criteria (Nielsen, 1993) but, at the same time, it could be of limited interest to a user when the use is perceived as having no or low value for him or her. In the same way a system with low usability could have a high value for the user. Despite the shortcomings, the tasks that could be performed are so important that the user does not consider the problems. One example of this is the huge use of SMS (Short Message Service) on mobile phones, a service that still leaves a great deal to be desired.

Driving forces or barriers?
If our goal is to bring about or facilitate a change it is more fruitful to look forward (Israel, 1990). The question to answer will then be: what are the hindrances for us to do what we want to do, or why do we act in a way we do not want to? The focus will be to identify and study the factors, the barriers, which the individual experiences as standing in the way of the everyday use of the Internet, for different purposes and in a desired extension.

<table>
<thead>
<tr>
<th>Driving forces</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causal</td>
<td>Intentional</td>
</tr>
<tr>
<td>Looking backwards</td>
<td>Looking forward</td>
</tr>
<tr>
<td>What made us acting?</td>
<td>What hampers the acting?</td>
</tr>
<tr>
<td>Tells what has happened</td>
<td>Tells what has to be changed</td>
</tr>
</tbody>
</table>

*Figure 3-6: Characteristics for driving forces and barriers (adopted from Israel, 1999)*

The driving forces and the barriers should not be looked upon as dichotomies or opposites of each other. The lack of a driving force does not imply a barrier, and similarly, the absence of a barrier does not automatically denote a driving force. A very common driving force for Swedes to obtain an Internet connected PC at home is school age children (SCB, 2004), but to be without children could not be seen as
a barrier, only as the absence of a driving force. For many the economic situation is a barrier, but a good economic situation is not a driving force, only the absence of a barrier.

Israel (1990) suggests hindrances or barriers should be studied at five levels:

1. Hindrance concerning our biological equipment and the structure of the physical world. The mission of technology is often to bridge these obstacles.
2. Existing economic, social, political and cultural processes in society, which limits our actions if we are willing to follow the rules and accept sanctions for breaking them.
3. Organisational structures such as e.g. family, school, workplace and organisations where we live and work have obstacles at two levels: a) the existing social division of labour and the power and authority conditions in these structures’ daily function; b) norms and rules in relation to their activities and goals as well as their resources has a limiting function.
4. Interpersonal relations and interaction could bring about two types of hindrance: a) formal rules and dictated roles which limit actions; b) the communication process.
5. Hindrance that originates from the individual’s own mind because of fear, uncertainty, or a lack of confidence in their own ability.

If Israel’s suggested barriers are adopted for this study then the following categories are obtained:

1. Technical and physical barriers
2. Economical, social, and cultural barriers
3. Cultural and social barriers
4. Cultural and social barriers
5. Mental barriers

These five categories (technical, physical, economical, social and cultural, and mental barriers) will, together with, in this context, a neces-
sary sixth one, namely knowledge and skill, be used in the next chapter to discuss and propose an access model to be used in the following empirical studies.

**The research process**

The results of this thesis could be seen as the product of a hermeneutic spiral. It had its starting point in the assumption that the access barriers primarily originate from material, socio-economic circumstances including income, occupation and education. All of these are conditions which are easy to measure by using quantitative statistical methods. There is presently an abundance of studies adopting this approach, which offers an easy means of determining who are and are not users. What is not known for certain is why the user is a user and why the non-user is a non-user, and what to do about it. When it is required to understand a human behaviour which is influenced by the environment he or she is surrounded by, an interpreting approach is necessary.

A common way to handle problems or to analyse or describe a particular situation is to use an existing tool, framework or model, or to create a new one if the existing ones do not prove to be satisfactory. The initial step was therefore to look for existing access models and see whether any were suitable for this approach. Four access models were identified and found to be interesting. These models were formulated by Aspden & Katz (1997), Clement & Shade (2000), van Dijk & Hacker (2003) and Poland (2004). The access models will be presented and discussed in the next chapter, Chapter 4.

To identify the access barriers to the computer and the Internet that individual users experience, four empirical studies have been used. A part of the “Sundsvall study” in Chapter 6 was made in cooperation with my colleague Johanna Sefyrin. The studies in Chapter 5 and 6 were based on a different original purpose to that of this thesis, but it was possible to reuse the material for a critical analysis of the given
answers. The study in Chapter 7 had the original purpose to identify experienced access barriers.

The given answers from these four studies were re-interpreted bearing this thesis in mind. The respondents’ answers had been interpreted and a number of experienced access barriers had been identified. These barriers had then been categorised and placed in the suggested user centred access model presented in Chapter 4. Finally the model and the findings were discussed.
Chapter 4  The Access Concept

“We are living under so peculiar conditions that the elderly has not more experience than the young ones. We are all novices because everything is new.” Joseph Joubert (1754-1824)

To formulate a definitive definition of the access concept is difficult, if not impossible. Many definitions with different focuses can be found. However, one thing is common to all these definitions; access is about the individual’s possibility to use something. The depth and the breadth of the description or definition depend on the purpose, or what should be studied or judged.

Figure 4-1: Three alternative ways to look upon access
The figure above illustrates three different ways to judge whether or not a person has access to technology. In the first case it is assumed that those in households with an Internet connected computer have access to the Internet. In case number two, the access concept is widened and gone into in more depth to also include the possibilities for people to actually use the equipment. The last case deals with the actual use for the given access. Obviously there are other possible ways to make this judgement. It will surely be claimed that it is sufficient that the possibility exists to use the technology in order to be considered as someone with access, regardless of whether the equipment exists at home or not. It can also be assumed that a person who uses the Internet has the possibility to do it, and thus has access.

The purpose of this thesis is to identify and analyse barriers, which affect the individual user’s experiences with regards to access, and the use of the Internet for personal use. To be able to fulfil this purpose, all the above aspects must be included, namely possession, possibility and use.

Clement & Shade (2000) suggest three questions whose answers could assist in the formulation of a feasible description of the access concept, adapted to the actual situation:

1. **Access to what?** What is it that the individual should have the possibility to use, and how should this possibility be provided?
2. **Access for whom?** Should this possibility be provided to everyone or merely for specific individuals or groups?

3. **Access for what purpose?** For what purpose is this possibility provided?

With regards to this specific context, namely the individual’s access to IT and the Internet, a description is required covering as many aspects as possible, which influence the possibilities for the individual citizen and his/her will to use the media. As a starting point for a detailed formulation of a description of access that serves this thesis’ purpose, use is made of the answers to the above questions.

The answer to the ‘to what’ question, will, in this case, be access to Internet-based public information and services. It should be provided in a way that does not limit the individual’s possibility of using the access. This implies that a computer with an Internet connection at home is a prerequisite for the possibility to use the Internet as a daily tool (Grönlund, 2001).

The second question, regarding **whom**, could only have one answer in a democratic country, namely everyone, i.e. all citizens. In Sweden and in a number other countries (e.g. the UK, Canada, and Australia to mention but a few) this requirement is stated in governmental bills or in other official documents. (e.g. the Government IT bill, 2000).

The **purpose** of providing the access could be viewed as two-fold; one is to make it possible for the citizen to take part in their rights and to fulfil their duties in a desired way, and the other to make the public administration less expensive and more effective.

Having come this far, consideration must be given as to who should make the judgement regarding whether or not a person has access. Is it the individual himself or herself who, based on his or her experiences and knowledge, makes a subjective interpretation, or should the judgement be made by anyone else based on a more objective basis?
From this question two different perspectives can be separated out, a ‘from-outside’ view and a ‘from-inside’ view.

<table>
<thead>
<tr>
<th>From outside</th>
<th>From inside</th>
</tr>
</thead>
<tbody>
<tr>
<td>External actors’ perspective</td>
<td>Individuals’ perspective</td>
</tr>
<tr>
<td>What are offered?</td>
<td>What are offered?</td>
</tr>
<tr>
<td>To who is it offered?</td>
<td>Am I able/allowed to use it?</td>
</tr>
<tr>
<td>What are the benefits for us?</td>
<td>What are the benefits for me?</td>
</tr>
<tr>
<td>More objective</td>
<td>Personal, subjective</td>
</tr>
</tbody>
</table>

*Figure 4-3: Two different perspectives to study access*

It is the opinion of the author that the main part of current research and official reports and statistics is primarily based on the latter perspective (e.g. SIKA, 2004; PTS, 2004). These reports and statistics have provided a substantial body of knowledge about what the individual is offered or provided regarding e.g. technology, education and information. It can be stated that it determines the external actors’ (i.e. the Internet Service Providers (ISP), the companies, the organisations and the authorities) activities and efforts, and the results in the form of the number of PCs and Internet connections in a country. It also provides demographic information about the users and non-users, and to what and to what extent it is used. This knowledge is of course necessary, but it is also necessary to know how and why the individual accepts or does not accept, use or does not use the provided technology and its applications. To handle these questions other visions such as the former, i.e. a ‘from-inside’ perspective are required. This means of tackling the problem will include the individual’s apprehension of the provided access.

The most commonly used pair of notions to describe the differences in access is that of the ‘haves’ and ‘have-nots’ (e.g. Carveth & Kretchmer, 2002; Boyd, 2002), which gives information about who has the technology at home and who has not. The shortcoming of this dichot-
omy is that it merely describes the possible physical access to IT, which is only one part of the problem as stated in Chapter 1. If my statement is correct then we could also find those who do not can, want, may or dare use the technology among the non-users. This provides four additional but at least as important dichotomies namely ‘want to/not want to’, ‘be able to/not be able to’, ‘be allowed to/not be allowed to’ and finally ‘dare to/not dare to’. That it is important to be aware of these latter dichotomies is underpinned by reports that show that physical access is not the same as the actual use (e.g. Selg, 2002a). According to Findahl (2004) 8% of the Swedes with an Internet connection at home did not use it. In the same way that it is insufficient to state that there is a car in the garage, the question should be concerned with e.g. to know how to, to want to, to be allowed to, or to dare to drive it, an Internet-connected computer at home states nothing about its actual use. When all these aspects are taken into account there are actually $2^5$ or 32 different scenarios or users (Figure 4-4). Of these 32, only one category is situated on the ‘right’ side of the digital gap, if the goal is that everyone should, or at least be able to use the Internet. In scenario 1 in the table below the person fulfils all the prerequisites for use of the technology.
It is possible to study each of these dichotomies separately, but such a study will not be meaningful because of the interrelations and interdependence between them. This implies a holistic approach to the area. Of course, the complexity of the problem makes it difficult to grasp the entire area at the same time, which could be dealt with by decomposing it, analysing the parts and then describing it. The conditions are also not static, and could, instead, change rapidly due to their connections and the environment.
Some Current Access Models
There exist a number of models that are used to examine and describe access. The ones of interest here are those which focus on the set of problems related to the use of IT. Aspden and Katz (1998) identify two categories of access problems, one concerning awareness and the other concerning usage.

<table>
<thead>
<tr>
<th>Awareness/Usage (1995 data): Summary of Key Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
</tr>
<tr>
<td>Awareness</td>
</tr>
<tr>
<td>Usage</td>
</tr>
</tbody>
</table>

The Aspden and Katz’s study shows that educational level, income, race or ethnicity and age affects awareness of the Internet, and educational level, income, gender and age affects its use. They state that class, here related to economic resources and educational achievement appears to be much more determining for the Internet awareness and usage than race/ethnicity or gender. Aspden and Katz predict in the same report that “the inequities of awareness and use will become increasingly urgent as more job-related services (postings of job opportunities, training), government functions and public service information become available via the Internet” (Aspden & Katz, 1998).

Clement and Shade (2000) describe “The Access Rainbow”, which is an attempt to cover the access concept, to describe what they call a
‘universal access’. With the 7-level model they have the ambition to include every necessary aspect of access. The first level contains the “carriage facilities”, e.g. the telephone network, Internet and other networks. The second level includes the physical devices such as PCs and workstations. The software tools form the third level. At the fourth level, the actual services people make use of, such as electronic mail, newsgroups, WWW, databases etc are to be found. In the fifth level are to be found the service providers providing network access to the users: Internet service providers, telephone companies, community networks, libraries, schools, and other publicly accessible facilities, community organizations, workplaces. Literacy and social facilitation form the sixth level, that is the skills people require to take full advantage of: information/communications facilities including basic literacy, innumeracy, computer literacy, access to education and training, technical support, assistance from friends, colleagues and neighbourhood ‘experts’. Finally, at the seventh level, governance and policy are to be found, the structures and processes of governing the infrastructure that should be publicly accountable, civically responsive, openly debated, and adequately funded.

<table>
<thead>
<tr>
<th>Aspects of access</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carriage facilities</td>
<td>E.g. telephone networks, Internet, other networks</td>
</tr>
<tr>
<td>Physical devices</td>
<td>E.g. PC, workstations</td>
</tr>
<tr>
<td>Software tools</td>
<td>Software</td>
</tr>
<tr>
<td>Actual services</td>
<td>E.g. e-mail, WWW, newsgroups</td>
</tr>
<tr>
<td>Service providers</td>
<td>E.g. telephone companies, libraries, workplaces</td>
</tr>
<tr>
<td>Literacy and social facilitation</td>
<td>The required skills to take full advantage of the media</td>
</tr>
<tr>
<td>Governance and policy</td>
<td>Structures and policies that governs the infrastructure</td>
</tr>
</tbody>
</table>

*Table 4-6: The Access Rainbow (Clement and Shade, 2000)*
Poland (2001) talks about three different categories of barriers to access. Technology barriers describe the availability on various platforms, such as PC or mobile phone, under realistic every day conditions. It also concerns different constraints to availability, e.g. network delays at peak times. Place and time barriers deal with practical constraints for the use of the service in particular settings. Finally Poland refers to social barriers, which address user attributes, such as language proficiency, literacy, disability or fear of technology, which restricts access.

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological</td>
<td>Availability on various platforms under realistic everyday conditions</td>
</tr>
<tr>
<td>Place and time</td>
<td>Practical constrains for use in particular settings</td>
</tr>
<tr>
<td>Social</td>
<td>Language proficiency, literacy, disability or fear of technology</td>
</tr>
</tbody>
</table>

Table 4-7: Access barriers according to Poland (2001)

Van Dijk and Hacker (2003) conceptualize access in terms of four hurdles, or barriers on the way to the information and network society. They argue that public opinion and policy focus on the material access, but the problem with information equality will not be solved at that moment when everyone has the ability to have their own personal computer and an Internet connection. According to van Dijk (1999) the access problems of IT will gradually shift from the mental and material to the digital skills and usage.
Access Barriers – from a user’s point of view
Chapter 4 The access concept

<table>
<thead>
<tr>
<th>Type of Access</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental</td>
<td>Lack of any digital experience caused by lack of interest, computer fear, and unattractiveness of the new technology</td>
</tr>
<tr>
<td>Material</td>
<td>Lack of possession of computers and network connections</td>
</tr>
<tr>
<td>Digital Skills</td>
<td>Lack of digital skills caused by insufficient user-friendliness and inadequate education or social support</td>
</tr>
<tr>
<td>Usage</td>
<td>Lack of significant usage opportunities</td>
</tr>
</tbody>
</table>

Table 4-8: Defining Access, van Dijk (1999)

A preliminary User Centred Access Model
As mentioned previously, it is possible to judge access on many levels, but to obtain as rich a picture as possible the argument in this case will be that it is necessary to have an access model which has its starting point within the user. Such a model should deal with the following aspects, adapted from Israel (see Chapter 3)

1. Technical barriers - the technological and infrastructural factors required to use the medium. This will include e.g. hardware, software, communication net, and Internet service providers.

2. Physical barriers - refers to the individual’s physical prerequisites needed to be able to use the technology. It could be technical means or software that makes it possible for people with different kinds of handicap to handle the technology.
3. Economic barriers - the individual’s ability to pay for purchase, maintenance, subscription, connection charge, and costs for usage. The economic access will also include the possibility to spend the time needed for the use.

4. Knowledge and skill barriers - the skills, knowledge and information needed for the use. It deals with necessary knowledge involving how to handle the tools, but also knowledge about how to find the information and how to handle it.

5. Cultural and social barriers - the question regarding whether the technology itself and its use are accepted in the individual’s social and cultural situation or environment.

6. Mental barriers - deals with the individual’s subjective experience of his or her relation with and possibility to use the media.

When the access models above is looked at and applied to these six categories of barriers the following result is obtained.

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Aspden &amp; Katz</th>
<th>Clement &amp; Shade</th>
<th>Poland</th>
<th>van Dijk &amp; Hacker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economical</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Knowledge and skills</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and cultural</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mental</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*Figure 4-9: Access models applied to the access barriers*

70
As can be seen, none of the above mentioned access models cover all of the suggested aspects. Thus it is necessary to take one step further in the attempt to design a user centred access model. The aspects could be seen as circumstances that affect the individual’s conception of, and to what extent he or she will, can, is allowed, and dares, to use IT.

![Diagram](image)

**Figure 4-10: Elements influencing experienced access (Nilsson, 2003)**

As shown in the figure above (4-10), the concept of access could be studied at two levels. Firstly, at an environmental or a contextual level, this comprises the provided possibilities for an individual to gain access. Secondly, at an individual level, includes factors related to the individual, which determines whether or not the person experiences access.

To *have access* describes the state of physical access to an Internet-connected computer. It could be argued that everyone in the Western world has physical access because of the public access points situated in libraries, schools, workplaces etc. That argument raises new questions: Can we take for granted that we are allowed to use working time for private Internet use? Who has access to the computers at school? How may you use it? Who has the possibility and are allowed to the use computers at libraries? Some researchers state that it is
necessary to have the access point at home to be able to use it properly (e.g. Grönlund, 2001). Others argue that if the market is allowed to rule, everyone will sooner or later gain access to the technology. Firstly the wealthy will obtain it, then the middle-class and finally the poor. Those arguing for the free market state that it is not a question of ‘haves’ and ‘have-nots’, rather ‘have-nows’ and ‘have-laters’ (Carveth & Cretchmer, 2002).

To be able demands that first that you have the physical abilities or the means of assistance required to handle the computer. At a later stage knowledge is required: both how to handle the equipment and also how to find the information or the service being sought. In a report from the IT commission (Selg, 2002a) the author states that the obstacle totally dominating the use of the Internet at home could be found in technical deficiencies. Knowledge about how to use the information or the service is also necessary. Harris (1996) calls this the ‘information capability’, i.e. the capability to obtain and use information for your own needs. He argues that it requires more than access to the information: you also need to be aware of its existence, how to get it, and how to use it. To be able also includes the economic aspect: you must be able to pay for the access in some way.

In order to want to use it, you must in one way or another be convinced of the benefits or the necessity of its use. This conviction could be based on knowledge or belief. The benefits could be economic or something else that makes your life easier or better. Eftring introduces the concept of useworthiness, which is

“the individual user’s assessment of the extent to which the technology meets the user’s high-priority needs.” (Eftring, 1999)

No one other than the user can determine what is worth using for him or her. Aspden and Katz claim
“as to reasons for using the Internet, socio-personal development appears to be the key driver, while nonusers have a decidedly different set of beliefs about the value of the Internet”. (Aspden & Katz, 1997)

Selg (2002a) argues that the conclusive decision as to whether or not to use the Internet is the medium surplus in relation to alternative courses of action. Rogers (1995) point out the extent to which an innovation is experienced as being better than that it replaces is the determining factor for its adoption. It could also be expressed in economic terms, as prestige, social status or as other benefits. The will, may be dependent on knowledge, but could also be influenced by attitudes. Some people make a conscious choice not to use the technology despite the fact they have the physical access and are able to use the technology.

To may, or to be allowed to use the technology, describes the fact that there is nothing that limits its use, i.e. laws, rules or other constraints. To be allowed to also includes unwritten constraints: e.g. that parents are free to use the computer placed in the children’s room, that every member of the family has the same right to use it, or that public access points are not occupied all the time. Social, political, religious or cultural constraints could also restrict the feeling of being allowed to access the media. According to Rogers (1995) the acceptance and the use of new technology are to a great extent influenced by social factors. Even if the innovations are excellent or have high quality, they will not gain the desired acceptance if they interfere with the dominant norm system.

To dare to use the technology addresses the fact that many people feel uncomfortable or have a fear of using unfamiliar technology. In a study including 1056 respondents, made in 1998 by SCB by order of the Swedish telecommunication company Telia AB, 51% stated that they sometimes felt a fear of using new technology (Norlin, 1998).
"A nationwide survey by Dell Computer Corp. point out that 55% of all Americans remain resistant—even phobic—when it comes to taking advantage of technology in their everyday lives" (USA Today, 1993).

These aspects actually do all affect, in some way or another, the possibility and the will to use the media. They are not independent or isolated from each other, which might be the impression gained from the above division. Instead they are intertwined or interdependent in a way that requires handling by a holistic view. To finally obtain a holistic picture, decomposition at this level is necessary. While the different aspects have been identified it would be easier to understand and deal with the relationships.

When, as a researcher, it is required to deal with a phenomenon it is often preferable to associate your own name with the concepts included in the study in order to make your study unique or to separate it from previous studies. A common means of doing this is to use notions with a ‘scientific touch’. Instead in this case, it has been chosen to name the barriers in the UCAM with the commonplace notions **have, want, may, able and dare** to make them easier to communicate to people who are outside academia.

<table>
<thead>
<tr>
<th><strong>Barriers</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Have</td>
<td>Technical, physical possibility to use</td>
</tr>
<tr>
<td>Want</td>
<td>Will to use</td>
</tr>
<tr>
<td>May</td>
<td>Allowed to use</td>
</tr>
<tr>
<td>Able</td>
<td>Knowledge to use, economical prerequisites</td>
</tr>
<tr>
<td>Dare</td>
<td>Familiar to use</td>
</tr>
</tbody>
</table>

*Figure 4-11: A preliminary user centred access model*
Chapter 5  Possession and Use

This chapter presents the results from an explorative survey made in the municipality of Härnösand, Sweden, during October and November 2001. 400 residents participated in a questionnaire survey concerning their private access to, and use of PC, the Internet and the local government’s web site, www.harnosand.se. The main part of this chapter is taken from a paper which was presented at the ‘Promote IT Conference 2002’ (Nilsson, 2002). The aim of the study was to obtain a picture of the status of home computing among different user categories.

Afterwards the results from the study were applied to the preliminary ‘user centred access model’ with the intention of identifying the respondents’ experienced barriers to using the PC and the Internet at home. This latter analysis identified a number of access barriers which limit the users’ possibility to use the PC and the Internet in their homes.

The Study Setting
This study had a quantitative approach. The tool used in the survey was a questionnaire. It was handed out to 500 inhabitants of Härnösand, born in 1985 or earlier, of which 393 answered the questions. The form consisted of 53 questions, of which 52 had fixed answer alternatives. The questions were about possession, use and experience of the computer and the Internet; to what and how often they used the technology; experienced problems connected to its use and finally a number of questions concerning their experience and opinion of the web site www.harnosand.se. The informants were invited to leave comments to any the questions if they felt limited by the fixed alternatives. Most of them took approximately 10 minutes to answer the questionnaire.
The respondents in the study were chosen strategically in order to cover as many different user categories as possible (Eneroth, 1984). There were several variables, based on available statistics (see e.g. SIKA, 2001; SCB, 2000) which were assumed could influence the use and the access to a computer and the Internet at home. The most important variables, which according to this assumption could be relevant, were sex, age, ethnicity, occupation and education. These are also the most frequent factors in related research (see e.g. Selg, 2002a).

A strategically chosen respondent group will not give a statistically significance result or a result representative of the whole of the Swedish population. However, it will still allow for the possibility to make statements about the findings in the selected sample, which could be used for further discussion and research. If the choice instead had been random, the risk of missing small but, for this research, significant informant groups, for example immigrants (the number of citizens in Härnösand who had not been born in Sweden was 5% compared to 12% in Sweden as a whole (www.harnosand.se)) would have been large (Eneroth, 1984). The numbers of respondents in each group do not correspond to a specific percentage of the group in the whole population. However, the number of informants will vary because of the size of the group. The informants were students and employers at Härnösands Gymnasium, at different kinds of local adult education and at Mid Sweden University. Furthermore there were local politicians and municipal employees on different levels and from various sectors, e.g. firemen, nurses, and home helps to mention but a few. There were also employers from different companies in the private sector, members from varying associations, unemployed and pensioners.

To ensure a high level of answers, personal contact was made with the schools on the various levels, different kinds of places of work, associations, and so on, in order to present myself and the survey to the potential informants. It also proved possible to be present during the
answering of the survey in the majority of cases. When this proved to be impossible it was noticeable that there was a reduced level of participation. The answers were coded and registered in a spreadsheet in Excel for further analysis.

**Results**

**The Respondents**

As mentioned above, 393 out of 500 answered the questionnaire. The respondents, 234 women and 159 men, were distributed according to sex and age as shown in the following table.

![Distribution of respondents concerning sex](image)

*Figure 5-1: Distribution of the respondents concerning sex and age in comparison with actual distribution among the inhabitants of Härnösand (SCB, 2000)*

The table above shows an uneven distribution between the study and the actual one, particularly with reference to the sex of the respondents. This was not based on sample selection, but was because the frequency of response was lower in male dominated workplaces. This could affect the results of this study, as previous studies have shown a lower level of use and a less positive attitude to IT among women.
Access Barriers – from a user’s point of view  
Chapter 5 Possession and use

Figure 5-2: The respondents’ main occupation

358 of the respondents were born in Sweden of Swedish parents. 22 were born abroad, or had parents from a country outside Sweden. 5 came from another Nordic country, 5 from Europe but outside the Nordic countries and 12 from a country outside Europe. 13 people did not answer those questions. 274 respondents lived in the town of Härnösand, 39 in small villages and 67 in the countryside. 239 lived in private houses, and the rest, 154, lived in flats.

Figure 5-3: The respondents’ education

78
The educational level is often mentioned as an influencing factor in studies concerning the use of PCs and the Internet. The respondents’ education varied as shown in Figure 5-3. One thing to bear in mind when using this factor in determining the use and experience of computers and the Internet, is that it could be misleading if not correlated to the respondent’s age. For example even though a teenager will not possess a university degree, it is possible for him/her to be fairly experienced as a user of the Internet, and similarly an elderly person with an academic education may well be computer illiterate. Figure 5-4 illustrates the respondent’s experience in the use of computers according to their age.

![Experience of computer use according to age](image)

*Figure 5-4: The respondents’ experience of computer use according to age*

**Possession of computer and Internet at home**

342 persons, or 87%, answered that they had a computer at home and 95% of those having a computer also were connected to the Internet. Almost everyone, with the exception of 2 people, was of the opinion that the computer and the Internet connection were valuable for both them and their households. The most common Internet connection was via a modem, in spite of the fact that there was a well-extended high-speed “city net” available in the population centre. The ADSL-
technique was also available in Härnösand. There was no difference between female or male respondents concerning possession. Instead there was a difference between the age categories. The reduction in figures the higher up the age scale is well known, even if the senior citizens are a rapidly increasing group of computer users. A more surprising divergence is that concerning the group between 26 and 35 years. With regards to the answers concerning the questions about the main reason for not having a computer or an Internet connection at home, almost all the elderly answered that they felt it was unnecessary whereas the younger respondents in that category answered that they could not afford it.

<table>
<thead>
<tr>
<th></th>
<th>16-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
<th>56-65</th>
<th>66-75</th>
<th>76-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>98%</td>
<td>85%</td>
<td>95%</td>
<td>91%</td>
<td>87%</td>
<td>66%</td>
<td>44%</td>
<td>87%</td>
</tr>
<tr>
<td>Internet</td>
<td>100%</td>
<td>82%</td>
<td>98%</td>
<td>94%</td>
<td>97%</td>
<td>91%</td>
<td>71%</td>
<td>95%</td>
</tr>
<tr>
<td>Modem</td>
<td>78%</td>
<td>67%</td>
<td>92%</td>
<td>89%</td>
<td>88%</td>
<td>86%</td>
<td>100%</td>
<td>84%</td>
</tr>
<tr>
<td>Broadband</td>
<td>22%</td>
<td>33%</td>
<td>8%</td>
<td>11%</td>
<td>12%</td>
<td>14%</td>
<td>0</td>
<td>16%</td>
</tr>
</tbody>
</table>

Figure 5-5: Possession of a computer and an Internet connection at home.

Use of PC and the Internet at home

Possession was not equal to use. In most of the households computer usage was shared. In approximately half, there were three or more users, and as most eight. The respondents possessing an Internet connected computer at home were asked to estimate how much time they spent on Internet use. The answers were distributed as shown in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Daily &gt; 1h/d</th>
<th>Daily &lt; 1h/d</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Yearly</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>3%</td>
<td>33%</td>
<td>46%</td>
<td>13%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Men</td>
<td>15%</td>
<td>39%</td>
<td>36%</td>
<td>5%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>8%</td>
<td>35%</td>
<td>42%</td>
<td>10%</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Figure 5-6: Time spent on the Internet at home
As shown in figure 5-6 there is a difference between possession and actual use. The measures are indeed very approximate but they give an overall picture of the frequency of use. The trends are similar to those found in the SIKA report (SIKA, 2001). Men appear to be more frequent Internet users than women. The group studied in this case appears to spend more time on the Internet compared to the average Swede according to the SIKA report. There is also a difference in proportion to age. The time spent on the Internet decreases with age for the average user. Another interesting aspect of the use is to determine what the time on the Internet is spent on. The informants had to rank the three most used services, which gave the following picture:

![Graph showing the use of the Internet among the respondents](image)

**Figure 5-7: The use of the Internet among the respondents**

E-mail and finding out information are the two most frequently used services, followed by use associated with work or studies and banking. There were a few people whose use was limited to just one service, e-mail or banking. It is also interesting to investigate who does what on the Internet. With regards to the females in the survey, they stated that e-mail was their most used service, followed by finding out information and work/studies. The males ranked finding out information as their most commonly used service followed by e-mail and work/studies. The age group affects what the Internet is used for. The same pattern emerges regardless of age group. The three most
used services are the same for all, but differences could be found if the remainder of the alternative activities are investigated. No-one in the group 16-25 years mentioned Internet bank. In this group, almost every chat user, game player and music downloader is to be found. The respondents who only use one or two services are generally found in the 66 and older age group. The majority of the respondents experienced some types of problems in connection with the use of the PC and the Internet. As expected it was more women than men and more elderly than the young who expressed these problems. The respondents were asked to specify which problem they experienced most frequently. The following quotations could illustrate these problems:

“My eyes get nervous and my back begins to ache if I sit there too long”.

“The children make changes in menus and icons”.

“Three children and only one PC”.

“The modem is too slow”.

“It’s hard to find what I’m looking for”.

“Virus attacks”.

“It [the PC] doesn’t do what I want it to do”.

“My deficient knowledge”.

Many of the informants, 73%, were aware of the municipality’s website, www.harnosand.se. Almost 58% of them had also visited it at least once, but it was not a voluntary visit for all as for the Härnösand’s Gymnasium it was the start page when using the Internet. Half the respondents expressed satisfaction with the design of
the site. Some of the problems mentioned in connection with the design were the lack of an alternative language, the combination of colours or the used fonts. The lack of option to change language, at least to English, was also mentioned as a problem. This limits the visitors to those able to speak Swedish. Even the problems associated with colours and fonts are important issues which must be taken care of if it is to be a site for all residents.

The dominant opinion among the participants was that the most important function for a municipality’s site is to provide its residents with different kinds of information and only 14% gave the answer that its most important mission was to provide information for others, for example tourist and companies outside the municipality. According to a report published by SKTF (2001), the web site of Härnösand fulfills both these requirements. That particular study was instead pointing out the absence of the possibility to take part in the political process through the web site. The respondents did not rank these functions highly. This should not be taken as an argument for not developing those kinds of functions. One possible reason for the moderate interest in, for example voting via the Internet is probably suspicion about new applications and new ways of acting, or simply that the respondents did not realise that this kind of use could be any better for them.

The respondents were also asked to answer the question; would you vote via the Internet, if it were possible? 47% of the participants gave the answer ‘yes’, 36% answered ‘no’ and 17% had no opinion. In a survey made by SCB (2001) almost 55% preferred to vote via the Internet, almost 40% would not prefer the Internet, and the rest did not know what they would do. One possible explanation for the difference between the two studies is the high proportion of women in the Härnösand case. Both studies show a less positive attitude among the women than among the men. Beside the gender difference, there is a significant difference between the attitudes in the various age groups. The most positive answers came from respondents in the age 26 to 35
years. 45% of respondents believed that the common interest for municipal question will increase thanks to the Internet and the local governments’ web sites, while 12% were of the opposite opinion. The remainder had no opinion about that question. According to the answers given, 17% thought that their own interest and engagement in municipal questions will increase, while 45% did not think that their interest or engagement will be affected.

**Findings**

After the study had been completed and presented, the material was reworked and a critical analysis concerning the new aim performed, namely to identify the barriers the respondents experienced as hindrances for their use of the PC and the Internet at home. In this new analysis the preliminary user centred access model was used.

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Have** | – Cannot afford the equipment;  
– Cannot afford an Internet subscription;  
– Cannot see any reasons for the use;  
– Do not feel any need for it;  
– Limited by the speed of the transmission; |
| **Want** | – Do not feel any need for it;  
– Cannot see any reasons for the use; |
| **May**  | – Many persons who shall share the time in front of the PC;  
– The use is limited by the cost for the Internet use; |
| **Able** | – Limited by the speed of the transmission;  
– Problems with size of fonts;  
– Problems with the combination of colours;  
– Problems with the language;  
– Lack of skills and knowledge; |
| **Dare** | – Virus attack |

*Figure 5-8: The results applied to the preliminary user centred access model*
As is clear from the presentation above, there was an unequal male/female distribution of the respondent group. It was felt that this would be mirrored in the answers and in the results, as other studies have shown a less positive attitude and a lower frequency of access and use among women compared to men. Surprisingly, this was not the case in this study as this tendency was not found. According to SIKA (2001) 76% of the Swedes were in possession of a computer at home. The share of men with access in the SIKA study was higher than the share of women. The corresponding figure in this study is 87%, with no significant difference between men and women. This result should be handled with care, but there are some conditions that could offer a possible explanation as in fact there is a higher level of home computing in Härnösand than on average in Sweden. A high level of education among the residents and the high rate of public employees who took advantage of the option to buy computers on easy terms, are two of the factors that could contribute to this result. Härnösand has only a few immigrants, approximately 5% compared to the general level of 12%, a fact that also probably has an impact on the figures.

There is a correspondingly high access to the Internet at home. Almost 83% of the respondents had access, while the corresponding result in the SIKA study was 65%. Almost everyone with a computer also had an Internet connection. Three groups differ from this overall picture, the respondents in the 26 to 35 age group, the unemployed and those over 76 years old. One reason for the divergence in the younger group is probably that most have left the parental home. Nearly everyone without computer and/or Internet in this age stated economic reasons for their lack. The same reason was given by the most of the unemployed. With regards to the elderly, a general lack of interest or perceiving any positive beneficial reasons for possessing the technology were the main answers given to this question.

It was felt that there should be a higher level of broadband connections because as a municipality centre, the town of Härnösand, has a
high-speed city net owned by one of the local companies. Probably the initial connection price has caused many residents to adopt a wait-and-see policy. Users of this net could be mainly found in companies and in blocks of flats where the owner of the building had taken the initiative to make the initial connection. Most of the student’s lodgings have this facility. For those who live in their own houses and who possess a broadband connection the ADSL-technique is the dominant one. A cheaper high-speed access would probably stimulate the use. Although there was no difference according to access between the sexes, there was a significant difference with regard to use. The men in the study were more frequent users than were the participating women, but when they use the Internet they use it for the same thing, primarily information seeking and e-mail. The most likely differences would probably be found in the type of information the male/female or young/old are looking for.
Chapter 6 Using IT for School – Home Communication

As an effect of the raised interest in society for e-democracy and electronic administration, many actors, both from the public and the private sphere, are looking for new ways to use information technology, IT, in their contact with the citizens. Today, all Swedish municipalities have their own web sites, through which they provide a variety of services, from information spreading to possibilities to take part in the local democratic process. While the compulsory school is a part of the municipal responsibility, it appears natural to attempt to include services concerning the school in the municipality’s web site. One example of this was the pilot project “Absence reporting at Your Site” in the municipality of Gothenburg, Sweden, and another is “Every-day communication, home-school” in the municipality of Sundsvall, Sweden. This chapter presents and analyses the results from two interview studies made in connection with these projects. The first was made in January and February 2002 with the purpose of evaluating a pilot implementation of an Internet-based school–home communication system in Gothenburg (Nilsson, 2002). The data collection was made by semi-structured interviews with the different concerned groups, the school board, the teachers and the other staff at the school, the pupils and their parents. The second study was made in January to March 2005 as pre-study for an Internet-based school-home communication system in the municipality of Sundsvall, Sweden (Nilsson, 2005; Nilsson & Sefyrin, 2005). The data collection was made by focus group interviews among the parents and individual interviews among the teachers.

Both studies reveal a number of factors that affects the citizen’s use of Internet based services, i.e. access barriers. The dominant or most frequently experienced barriers relate to knowledge and skill problems and to confidence in the technique. It also shows the heterogene-
ousity in the relationship and the apprehension concerning IT among the respondents.

**Background**

Today, many parents in Sweden with children in the compulsory school feel that a quick and easy means of every-day contact with their children’s teachers and schools is lacking. They express a lack of information concerning their own children’s schooling (Nilsson, 2002; Nilsson & Sefyrin, 2005). There is also an intense debate going on in society about Swedish schools. The debate focuses, among others, on the increasing number of pupils who leave the compulsory school sector without a complete school-leaving certificate. Deficient communication between the school and the parents is stated as being one of the contributing causes to this situation (Swedish National Agency for Education, 2001). The lack of communication is expressed both by the parents and the staff at the schools, but their opinions concerning the reasons differ (Nilsson, 2002; Nilsson & Sefyrin, 2005; Nilsson, 2005; Swedish National Agency for Education, 2001). The problem, the gap between the home and the school, grows with the age of the children, which is explained in different ways. The shift from a class teacher to specialist teachers in the 7th form is one explanation. The fact that as the pupils become older they want more independence from their parents is another (Mathiasson, 1995). A third explanation could be problems associated with language, culture or social circumstances (Swedish National Agency for Education, 2001). The responsibility for a working communication and relationship lies on both sides, while it is impossible to communicate without an opponent. The compulsory school curriculum states,

“the school’s main task is to mediate knowledge and in co-operation with the homes promote the pupils' development to individuals and members of the society conscious of their responsibility.”(Swedish National Agency for Education, 1994)
This quotation places the responsibility on the school to establish the contact. In addition to the compulsory school curriculum every municipality in Sweden has its own school plan valid for the schools in its own region. The plan provides the framework for the local schools’ work. E.g. in the municipality of Sundsvall the Child Services and Education Office has passed a communication strategy which states that IT is

“the leading tool for spreading of information and communication” and that “all parents who want to communicate with the school via electronic communication channels should have the possibility to do that”. (Sundsvalls kommun, 2004)

The details concerning how to run the school-home communication is the responsibility of the head teacher. In practice, most teachers handle this in a way which suits them. Probably the entire range can be found at any school, from regular personal or telephone contact with the parents, to a letter sent home via the pupil at the end of the term.

The Gothenburg Pilot
At the beginning of 2002, a pilot scheme for an Internet application named “Absence reporting at Your Site” (Frånvarorapportering på Din Sida), was launched in two town districts in Gothenburg, Sweden. This pilot was part of the project “Din Sida”, driven by the city of Gothenburg and the telecommunication company Telia AB. It was aimed at attempting to find feasible Internet-based services in order to make the schools’ and the teachers’ administrative tasks more effective, to provide the parents information concerning their children’s schooling, and to simplify and deepen the contacts between the school and the homes. The parents of 455 pupils at four lower secondary schools were offered the opportunity to take part in their children’s absence from the school via a web site on the Internet. The service was in place from January 10 to February 28 2002.
The service was based on a software application for timetabling called ‘NovaSchem’ (www.novaschem.com) and the supplemental routine for absence reporting ‘Historik’. From ‘Historik’ there were several output alternatives; reports and statistics for a specific pupil, for a group, for the whole school or for different periods could be printed out. The current registration in ‘Historik’ was handled by the responsible teacher, and was mostly done directly after a completed class. At every registration occasion the teacher obtained a picture on-screen with the actual group of pupils and made the necessary notes. Even if there were no absences the class still had to be signed. If the sign is missing the class will be marked with red lines as a reminder to the teacher. Every teacher had access only to his/her own classes and to the pupils he or she was the contact person for. The system was running on the schools’ own servers, but to make the web publication possible a daily replication of the database was made to Nova Software’s server. From here the database could be accessed through a web interface at ‘Din Sida’.

A letter with a presentation of the project, the aim of the project, and an instruction regarding how to subscribe as a user informed all concerned parents. As a registered user it was possible for the parents to log in to the web site to obtain information about their own children’s attendance at school. A second letter was sent out after four weeks due to the low number, 10%, of registered users. This second letter encouraged the parents to try the service. At the end of the test period 66 of the 455 parents (15%) had used the service at least once.

**The Study Setting**

An initial interview was carried out on 16 members of staff, eight, from each of two schools, a week after the launch of the system was made. The respondents were selected at random from those directly affected by the system. The two head teachers, ten teachers, one school assistant, one administrator and two from school healthcare were interviewed individually. The semi-structured interviews took place at the schools, and took approximately 20-30 minutes each.
With the support of an interview guide five areas were discussed: a) their own computer knowledge and skills; b) their knowledge about the new system; c) their opinion of the new system; d) their expectations of the new system; and e) their apprehension of ‘their parents’ reaction to the new system. The interviews were recorded and transcribed at a later stage. The aim of these initial interviews was to determine the expectations of the service among the staff, and to obtain a picture of the existing routines at the schools.

A second interview with the same group took place eight weeks later. These interviews were also performed as semi-structured, individual interviews that were tape recorded. The questions discussed at this time were; a) their opinion of the use of the system; and b) reactions experienced from pupils and parents. At this time were, twenty-two pupils and twenty parents were also interviewed. The aim of these interviews was to obtain the opinions, reactions and experiences of the actual pilot. The respondents in the pupil interviews volunteered to participate after a request in the classes involved. The interviews with the pupils took place during the school day at the actual schools. The questions discussed concerned: a) what they knew about the service; b) if their parents had used it; c) if there had been any discussion between the pupils about the service; d) their own opinion of using IT for services such as this; and e) if they had discussed it with their teachers or others on the school staff. These interviews were semi-structured and were made in groups containing three or four pupils. The interviews were tape recorded and transcribed at a later stage.

The twenty parents, ten men and ten women, were chosen from a list provided by the schools and interviewed by telephone. The selection of the respondents was made with the following criteria in mind; the respondents should be split equally between men and women, and two of each sex should be of an ethnicity other than Swedish. While the only available information was the list of names, the surnames were used to decide the ethnicity. The names on the list were numbered and the telephone calls started with number 1. After a opening ques-
tion concerning the respondents sex and ethnicity, they were asked questions about: a) if they knew the service; b) if they have used it or were intending to use it; c) their opinion of using IT to contact the school; and d) their knowledge and skill in handling the equipment.

Results from the First Interview Round

The school board

The two head teachers were interviewed as representatives of the school board. They do not teach and therefore do not have daily contact with Historik and the absence reporting activity. They do not deal with ordinary contacts between the school and the pupils’ parents. On the other hand the head teacher has overall responsibility for the school’s activities and for its personnel and pupils. The application Historik made it possible for the head teacher to put together different kinds of reports and statistical material concerning the pupils’ absence in a rational way. It also gave them the possibility to follow up the teachers’ use of the routine and gave a clear indication of unreported lessons. Neither of the head teachers used this control possibility regularly.

“I made it a few times during the autumn, but it has now been a long time since I did it. As long as I have a feeling that there are no problems, there is no reason for me to do it. I think that the contact teachers take care of it, if there is any delay in the reporting.” (Male head teacher)

“I have not checked out how the different teachers handle their reporting. I know how to do it, but I will not create a feeling of supervision. I will probably do it in the future. I think the contact teachers have a good control and take the necessary steps.” (Male head teacher)

---

6 Quotations from interviews 020116-020117, translated into English by the author.
None of the headmasters had noticed any parents who had asked for this service.

“The interest seems to be pretty low.” (Female head teacher)

One of the head teachers expressed great expectations for the project;

“I have a hope that this little project, this little step, should point out a smart way for using IT in our everyday life to make our work easier. We have to work less to reach a better result. I also have a hope that this should be a step towards closer relations to the parents and the pupils’ homes.” (Male head teacher)

**The teachers**

All of those interviewed had heard about the service, but only a few knew that the service was in operation. None of them had looked at the demo available on the municipality’s web site. They had also missed the information about the attest function, i.e. that the parents sign the absence report after they have seen it, which is very important for their work with following-up the absence.

Few of the interviewed teachers could spontaneously express any expectations regarding the offered service. The following points of view could illustrate the opinion of the teachers’ thoughts about how the service will affect the pupils.

“They who do not bother about anything, who are tired of school, or have other problems, they will not care. They will skip school anyway.” (Male teacher)

“Maybe they will think twice before they take an hour or a day off, now when they know that mummy or daddy could see it almost at once.”(Male teacher)
"Perhaps could it help them on the border. We could catch them before it has gone too far. But a parent who cares keeps the contact also without this service, and the others will not care now either." (Female teacher)

There were also hopes that more easily accessible information could possibly raise the parents’ commitment to, and interest in their children’s schooling. To reach them, the service must be extended with more information about the school. As example of other kinds of information that could be provided, were schedules, examination schedules, school holidays and the menu from the school restaurant. Furthermore the service could result in reduced work for the teachers with written letters and reports to the homes, when the information could be distributed via the Internet instead. Everyone agreed that it was possible to use the Internet for this, but it should not be used as a replacement for personal contacts with the parents.

“The use of such a site will be dependent on if we consciously try to encourage the parents to use it, or if we offer them all information the traditional way too.” (Male teacher)

There has not been any real discussion among the teachers about the service. This fact was explained by a lack of information about the project, which could be illustrated by the following quotation from one of the schools;

“We do not know if the parents know, we have not informed them. Maybe we have to write about it in the weekly letter.” (Male teacher)

There is a difference between the schools according to the information to the homes.
“We have mentioned it at parent-teacher meetings and at the personal meetings we have with the parents and their children.” (Female teacher)

“We informed them before Christmas when it should have started, but it was delayed. They do know that there is something going on.” (Male teacher)

Other staff
The expectations of the project among the other staff were similar to those of the teachers. They thought that the notorious truants will persist, but by means of a quick reaction from the school and the parents there is a possibility to break the behaviour before it has gone too far.

“I think that the advantage with the system is that you can act at an early stage. You can see patterns in the absence which is necessary for catching them before it has gone too far.” (School nurse)

“There are pupils who get tired of school and disappear, and it takes often too long before somebody react.” (School help)

Results from the Second Interview Round
The school board
The two head teachers had not noticed any reactions from the parents at their schools, except at meetings with the school committees. One of them describes the attitude to the actual service among the parents in the committee as ‘cold’, while the other had noticed a positive reaction from one of the parents. One of the head teachers had noticed that nineteen of “their” parents had used the service at least once. Both

7 Quotations from telephone interviews 020304 – 020305, translated into English by the author.
8 At the Swedish compulsory schools there is a school committee (skolråd) with representatives from the different school staff categories and the parents.
of the head teachers thought that the missing response from the parents was based on the fact that the schools provide the parents with this information as well as about the system. The parents trust the schools to contact them if there are any problems. Another possible explanation could be the brief period the service has been in operation, or that the information about the project was deficient.

**Teachers and other school staff**

There were very few reactions from the concerned parents to the teachers and the other school staff regarding the service. One of the teachers had received a phone call from a divorced parent who was very positive about this new possibility. For him it was a very valuable service because it gave him the chance to take part in his son’s schooling. Despite this, everyone thought that there are very few parents who have used the service. They believe that the reasons for this are a lack of information, both to the homes and to the concerned personnel, or that the information has been given through the wrong channels. They believe that if the schools had given the information to the homes, instead of by a letter from the municipality, the response would have been bigger. Another reason given by some of the teachers was that they already had good contact with the parents about the pupils’ absence and because of that there was no immediate need for this new application. The teachers and the other staff missed some kind of feedback from the project group.

There was no reaction from the pupils either. One teacher said that he had heard that some pupils did not like it. The reason for this dissatisfaction was that the system makes it more difficult to skip school without bringing it to their parents’ attention. Several of the interviewed stated that parents outside the test group asked for the service. Also parents of future pupils had heard about the service and had shown a positive attitude to it. All the interviewed were of the opinion

---

9 Interviews 020225-020226
that the service should be made permanent if it could contribute to a reduction in the teachers’ burden of work.

The parents

Twenty parents, ten men and ten women, were selected from a list of parents in the classes involved and interviewed on telephone. All of them knew the service through the information letter sent out from the project. Some of them had also been informed at school. A good half of the respondents had used the service at least once and the majority several times. All, except one man, answered that they were positive or very positive about this opportunity, and were of the opinion that it should be made permanent. The most positive reactions came from two divorced parents who argued that they finally were offered a possibility for insight into their children’s everyday life. The negative one said he had a feeling of “supervision or acting like a police”. He also claimed that a parent who cares does not need this kind of tool. There was also a common opinion among those interviewed that

“those really needing this service will probably not use it”. (Father)

Those who not had used the service left various reasons for this. A general lack of interest in computers, lack of time, a belief that their own children were never away from school without their knowledge, and an opinion that they receive all information in other ways, to mention a few of these reasons. One of them was intention using the service, but changed his mind when he was made aware of Telia’s involvement in the pilot. A parent of a child, who skips school frequently said

“I will not see the misery.” (Single mother)

10 Quotations from telephone interviews 020304-020306, translated into English by the author.
There were a unity among the respondents that the service, or the site, must be extended to raise its acceptance and attractiveness. Merely using the absence report is insufficient to motivate frequent use. Suggestions for future extensions were:

- To offer e-mail instead of the paper notes in use today. Many of these paper notes do not reach the parents, or are delivered too late. 15 of these 20 parents would prefer an electronic message;
- A possibility to overview all absence during the term, also the already attested;
- A function for a two-way communication connected to the absence report, to give the possibility to the parents for leaving comments;
- Extend the site with other kinds of school information, for example holidays, e-mail addresses and telephone number for the teachers, electronic blanks for applying for time off, and schedules;
- A web site for every class with schedules for homework, schedules for tests, and information about what is going on at the moment in the different subjects.

The pupils

Twenty-two pupils were interviewed at the two schools. This participation was on a voluntary basis. All of them knew about the absence reporting at the Internet. Only a few had got the information at school. The rest had heard it from their parents. Six of the pupils knew that their own parents had used the service. Five of them needed to help their parents to use the service, due to their parents’ lack of knowledge about computers.

“I have to help mummy when she wants to have a look.”

(Girl, 15 years)

Another pupil said that

---

11 Quotations from interviews 020225-020226, translated into English by the author.
“mummy wants to use the service, but I told her that it is not possible with our old computer. Now I hope she will buy a new one.” (Girl, 14 years)

Two pupils said that their parents tried to register as users, but there were some problems with the passwords so they gave up.

None of the pupils experienced the service as a threat or supervision. They had not taken part in, nor had they noticed any discussions among the other pupils at school. They argued that it was no difference for them if the parents could see their absence on the Internet or receive information about it via a phone call or a letter. The majority thought that the absence without permission would be reduced, except amongst those who do not care. They also said that it is a good service because it makes it easier for the parents. Two of them argued for an extended use of the Internet and e-mail in the contact between home and school.

“Why can't the teachers use e-mail instead of all these papers which always disappears?” (Boy, 15 years)

The pupils also wanted access to the site, in order to see their own absence and to have a possibility to control the teachers’ registration.

**The Sundsvall Study**

In December 2004 a request came from the Child Services and Education Office in Sundsvall to take part in a project aimed at increasing the school-home communication. Together with the Research Institute for Public Information Systems and the Child Services and Education Office at the municipality of Sundsvall the outlines were drawn up to build an Internet based communication system. In contrast to the Gothenburg pilot, the decision was made to start this pro-

---

12 [http://www.miun.se/mhtemplates/MHPage_____18613.aspx](http://www.miun.se/mhtemplates/MHPage_____18613.aspx)
Parents with children of school-age are not a homogenous group with common interests. Often the only unifying factor is that they have children in the same class. This was clearly visible in the interviews in this study. In a similar vein, teachers can also not be thought of as a homogeneous group. To design one electronic communication system suitable for all must be regarded as more or less a utopian ideal, but it could be a good complement to existing communication forms.

In most Swedish compulsory schools the school-home communication is handled in a similar way. In addition to the communication described here there are some local variations both in frequency and in the use of media. Generally you can say that the frequency in the communication decreases the older the children become. The most common means of informing or communicating with the parents is via written messages which the pupils bring home. In the lower forms it is usually a loose-leaf system with a weekly letter or a ‘logbook’ with information about the past week and the coming one. At the senior level messages are sent home more infrequently. In addition to the written communication it is routine to hold a teacher-parent meeting once a term or year to which all parents in a class are invited, and a personal meeting with the teacher, the pupil and the parents once a term when the pupil’s personal development is discussed.

**The Study Setting**

The study was initialised with a semi-structured group interview with eight female teachers from three different municipal compulsory schools, and the aim was to enable us to help form the parental groups for the following focus group interviews (Fern, 2001). Based on the result from this preparatory interview it was decided to carry
out the focus group interviews with employees at five different workplaces in order to have respondents representing a broad range of social status. According to available official statistics and reports (see e.g. Selg, 2002a; SCB, 2004) the knowledge, attitude and access to the Internet are often influenced by factors such as gender, educational level, ethnicity and socio-economic situation. The workplaces were chosen from companies and organisations which are partners in the Research Institute for Public Information Systems. The selected workplaces were: a) a process industry; b) an IT-consultant company; c) a telecommunication company; d) a central authority; and e) the municipal old-age care. At the workplaces a request was sent out to the employees about participation in the interviews to which they then volunteered. Each focus group consisted of 5-6 employees, who were also parents to children in compulsory school. The focus group interviews took place at the different workplaces and lasted for approximately 50-70 minutes. They were recorded on tape and transcribed at a later stage.

The aim of these interviews was to obtain a picture of; a) how parents with children in the compulsory school experience the present contact with their children’s school; b) their visions as to how contact could be improved; and c) their attitude to using different kinds of IT to enable this contact to take place.
Figure 6-1: Distribution of the respondents concerning to sex and workplace.

Twenty-six people, ten men and sixteen women were interviewed. Together they represent a broad spectrum of workplaces, profession, work tasks, education and social status.

**Focus group 1: industrial workers** – four men and one woman working full-time in the process industry of which three are shift workers and the other two work only during the daytime. All of them work in production but two also have additional duties as a foreman and as a representative for the union. One has a university exam while the others have finished their education at the upper secondary school or at the compulsory school.

**Focus group 2: civil servants** – two men and four women who work in a civil service department. They all work full-time with personal management, budgeting or systems development. One has an exam from the upper secondary school and the rest from the university.

**Focus group 3: IT-consultants** – four men and one woman employed at a smaller IT-consultant company. They all work full-time with system development and two of them also have managerial positions. All have exams from the university.

**Focus group 4: service staff** – five female municipal employees who work as cleaners or in the kitchen at a block of service flats for elderly. Four of them work full-time and the fifth part time. They all have an exam from the upper secondary school.

**Focus group 5: clerks** – five women employed at a telecommunication company. One of them works with customer agreements while the others are engaged in user support. One is a part-time employee and the others are full-time. Four have an upper secondary school exam and one an exam from the university.
After the data from the focus group interviews had been analysed, it proved necessary to extend the study with interviews with teachers. Nine teachers, six women and three men, from five different municipal compulsory schools in Sundsvall were interviewed individually. The schools were chosen by a person at the Child Services and Education Office at the municipality of Sundsvall in order to obtain schools from different areas with different structures of the population. The respondents volunteered to take part in the study after a request that was sent out to the chosen schools. They represented all levels of compulsory school. The interviews lasted for 25-35 minutes were taped and at a later stage were transcribed.

The communication between school and home was categorised into three groups with reference to content and form. The three categories have unique qualities which make it necessary to discuss and handle them separately (Nilsson, 1999).

1. **General information** from the school to the home concerning rules, holidays, contact information, routines for pupil’s absence from school, menus for the school canteen etc. This type of information is the same for all at the school and is produced centrally at the school, in the municipal school management area under one head teacher, or at the municipal office. It is a typical one-way communication where it is the
Access Barriers– from a user’s point of view
Chapter 6 Using ICT for school-home communication

school’s responsibility to inform the homes, which is usually done in writing. It is distributed either by post, personally handed out at parent-teacher meetings, or sent home with the pupils.

2. **Class specific information** from the teachers to the home regarding for example invitations to parent-teacher meetings, information about class activities or arrangements, homework, schedules or tests. The information is produced by the class teacher. Also this type of communication is mainly one-way, but sometimes notification or other responses are requested.

3. **Pupil specific information** from the concerned teacher to the parents or vice versa. This type of communication includes results from tests, absence from school, grades. Characteristically, the content is unique to a specific pupil and could be initiated by both parties and is in most cases a two-way dialogue.

Results from the Parental Interviews

PC, Internet and use at home

As expected the rate of possession of Internet connected PCs in the homes was very high. Based on available statistics, families with children in the school age group generally have the highest level of home-PCs (SCB, 2004). All respondents except three, stated that they had at least one PC connected to the Internet via broadband or ADSL at home. Two of the respondents who did not have an Internet connection, stated that the reason was consideration for the children.

“We do not have Internet at home because I have been told that there are nasty and dangerous things for the children there”. (Female civil servant)

13 All quotations translated into English by the author
The third one stated that his home was situated at a place where Internet connection was not available. These three persons have access to and use a PC and the Internet in their daily work.

The experience of handling computers and the knowledge about the Internet and its possibilities range from experts to cautious novices among the respondents. All of them have used a PC and can handle basic tasks such as e-mail and word processing. In all the households there is either a child or another adult who can assist if a problem occurs.

“I’m all finger and thumbs when it comes to the computer, I always have to ask my daughter”. (Male industrial worker)

The user frequency varies a great deal among the family members in the households. In many families it is the children who dominate the usage, in others the man, and in some the use is spread out fairly equally among them. The spread in the answers was so wide that it was not possible to discover a dominant pattern. To use the computer at home requires time devoted to its use and, additionally, that the PC is not occupied by anyone else in the family.

“I believe that in most families the woman has a lot of housework to do while the old man sits down in front of the computer”. (Female service staff)

Parents’ opinion about the present school-home contact

“I think we are pretty well informed both from the school and from the pre-school, but you don’t know what information you miss or what they miss to inform you about”. (Male civil servant)

The opinions about the every-day contact with the school range from a real dissatisfaction to lyrical descriptions. Both the dissatisfied and
the satisfied refer to the vital role of the teacher. All respondents were in agreement that they would be happy to receive more information, for example about what happens at the school and in their child’s ‘own’ class.

“The mother gets all information because she is the ‘head owner’. I get information only when the girl stays in my home.” (Male industrial worker, divorced)

There is a sharp difference in the opinion about the present communication between families where both parents live together with the children and families where the parents are divorced. A common opinion among divorced parents is that they lack information about the children’s schooling, especially if the relationship between the parents is strained. Messages which are sent home with the children often only reach one parent. Information which is delivered by mail is generally addressed to the mother. One person states that all mail goes to the mother in spite of the fact that the son lives with him.

There is a common idea that the teacher’s role is of vital importance in how the communication works. Many of the parents are very critical as to how the communication with certain teachers works.

“Probably we have drawn the winning ticket, because when we hear parents with other teachers it does not work at all.” (Female civil servant)

Parents with experience of different teachers and different schools points out the differences strongly. They are of the opinion that they themselves play an important role in the communication, but if the response does not occur this acts as an annoyance. When it comes to urgent problems, e.g. an accident at the school, several of the female respondents stated that the school always attempts to contact them first despite the fact that they have telephone numbers for both parents.
“When the children come home and something has happened at the school during the day, it feels hard or troublesome to know if you should call the teacher or not; you take up their spare time.” (Male civil servant)

Many parents are of the opinion that it is annoying to contact the teachers in the evening. They feel that they are disturbing them during their spare time. It is problematic to reach the teacher by telephone during the day because they spend most of their time in the classroom. With regards to this issue there is a clear difference between the parents. Some are of the opinion that it is the teacher’s duty to be accessible and give the parents information when the parents want it, while others accept that they get what they get. The respondent’s professional role is clearly mirrored here; those who are used to arguing, negotiating, or have a managing role make greater demands than the others.

“Teachers are middle-aged women who are hostile to technology, who most of all want to use nice pencils in different colours and write with a first rate handwriting.” (Female clerk)

Some of the respondents say that they have sent e-mail to the teacher without receiving a response. Others have asked for information via e-mail but the teacher has refused it with an explanation that it takes too much time or that they do not use it. There are also parents who say that e-mail communication does indeed work well.

Parents’ opinion about the responsibility for a working communication

“Either you get information or you take it. If I’m interested I see that I get the information I will have.” (Male consultant)
All respondents are of the opinion that they as parents have the main responsibility for a well-working communication with the school. However, they also point out that there must also be an engagement from the teacher in order for it to work. The responsibility has different meanings for different parents. For some of them the implication is that it is their responsibility to check their children’s schoolbag to see if there are any messages, while for others it means taking a more active role such as appealing to the teacher or the school for information. In the same way, messages which reach the parents can be looked upon as a working communication, while other parents require a more active contact to be satisfied. It is clear that there are great differences between the teachers when it comes to how to handle contact with the parents, but it is also clear that this difference is to the same extent among the parents when it comes to how much information they want and in what way they want to get it.

“It should be the head teacher’s responsibility to demand that all teachers use the same routines for the contact with the homes, and if it isn't good enough for them they maybe are sitting on the wrong position” (Female clerk)

The communication between the school and the parents should be handled in a similar way by all to minimise the effect of being dependent on the teacher your children have. It is not always so easy to know if you have got the information or not.

“I need to know what I should get information about”. (Female clerk)

The regular information, like the weekly letter, could be asked for if it is missing, but other messages sent home with the children can pass unnoticed if the children do not remember to hand them over. Most of the respondents stated that it is the women in the families who have the chief responsibility for contact with the school, but some of them said that they shared the responsibility.
“My wife handles 98% of the contacts with the school.”
(Male consultant)

Some state that the school and the teacher turn primarily to the mothers with information about the children, which reinforces the pattern in which the women have to take more responsibility for the children. This fact does not fit in with the school’s endeavour for gender equality.

Parents’ opinion about IT as a communication tool
All the respondents were more or less positive about using different forms of IT as a tool for the school-home communication.

“The contact with the school depend on the engagement, it will not change with an IT-solution.” (Male consultant)

Some respondents point out that an IT solution could have the opposite effect if parents restrict themselves to only using the technology instead of personal contacts.

“It makes it easier when you can choose a time that fits you.” (Female clerk)
However, the opinions about how and to what extent it should be used varied. All of them agreed that general information such as holidays, contact information, school canteen menus, rules and so on should be placed on an easily accessible website. Also those who do not have access to the Internet from home and those who not use the Internet were positive about its use. It was also pointed out that an informative and up-to-date website could work as a good marketing tool for the school, which has become more important with the advent of the pupil subsidy\textsuperscript{14}. There was also a wish to use sms for some types of messages. Examples for the sms use were e.g. notification of illness and reminders of teacher-parent meetings.

Many argued for class related information such as home work, time for parent-teacher meetings, and other arrangements and events specific to the class, at the website.

“You must understand how wonderful it is when you can have the full control. If your child says that they not have any homework, you can check it out yourself at the website.” (Female clerk)

They saw this means of obtaining information as a complement to the information they got from their children. When the information is accessible electronically it is easy to control the child’s information. Another advantage is that divorced parents both gain access to the same information, which makes it easier to gain an insight into their child’s schooling even if the child is not living with them.

\textsuperscript{14} In Sweden is fixed sum subsidies dedicated to each pupil which fall to the school the pupil choose.
“Private things that only concern the individual pupil will I handle personal with the teacher, not via e-mail or the web”. (Female clerk)

A common opinion was that personal matters must be communicated either by telephone or face-to-face. E-mail was not seen as being secure, especially not with personal integrity in mind. A few thought it does not matter how they get the information, the only essential fact is that they receive it.

“It must absolutely not replace other contacts but be a complement. I want both the weekly letter and an e-mail.” (Male consultant)

The ‘rucksack mail’ is generally considered to have an important pedagogical function. The children learn to take responsibility through their role as messengers between the school and the home. Because of that most of the parents want to retain the ‘rucksack mail’, but want e-mail as a complement. A few stated the pupils already take on enough responsibility by having to decide what they should bring home in order to do their homework, bring suitable clothes for activities etc, and felt it was unnecessary to reject the ‘rucksack mail’.

“An electronic forum for discussions could maybe be a way to engage them who not show up at the teacher-parent meetings. It is always the same parents who attend and the same who do not.” (Female industrial worker)

The possibility to use chat and electronic forum was also discussed. In this case opinions also diverged, which in some cases is based on a lack of knowledge about these techniques among the respondents. The positive ones saw it as a good option to discuss questions concerning

---

15 A common metaphor in Sweden for information sent home to the parents in the pupils’ schoolbags.
Results from the Teacher Interviews

“All of us write a weekly letter, some once a week, other once a month or at least once a term. I think everyone send some kind of information sometime”. (Female teacher)

At just one of the schools in the study was there a common policy with regards to handling contact with the parents. At the others it is up to the teacher to decide how they want to do it, which results in wide variations. Another complicating circumstance when you are talking to the teacher is the confusion of ideas as in the quotation above. When everyone says that they write a weekly letter it is easy to obtain a picture where every pupil brings home a letter to their parents once a week. During the interviews it appeared that the notion of the ‘weekly letter’ was more or less synonymously with written message. The real picture is that some teachers communicate with ‘their’ parents every week, while others do it every two weeks, once a month or just once a term.

“I think it is primarily the mothers I have contact with and it is them I often call if it is something. It is not a conscious choice, it just happens; maybe because it is them you meet most often.” (Female teacher)

The interviewed teachers experience that in most cases it is they who initiate all contact with the pupils’ homes.

“Sometimes I can see message tiredness among the parents and I guess that many of my messages go directly to the recycle bin.” (Male teacher)
There are also great variations with regards to the teachers handling of contacts with divorced parents. Some have a routine to send messages to both parents; others do it if it is requested and the rest just to the parent where the child lives most of the time. The same variation could be seen in how they arrange the personal meetings with the pupil and the parents once a term when the pupil’s personal development is discussed. Some offer separate meetings with the each of the divorced parents and the pupil while others just offer one meeting based on the opinion that it is the parents’ problem to solve their internal communication.

“My basic principle is to send the messages to the parent where the pupil lives mostly, and then it is up to the parents to solve the rest.” (Male teacher)

There is a prevalent opinion among the teachers that problems that occur at the school should firstly be solved in the school without involving the parents. Often it relates to the character and the frequency of the problem as to whether the parents are informed or not. The contact is sometimes taken immediately by phone, and sometimes the parents are informed later. They feel that it is not always easy to be frank or come straight to the point in their contact with the parents. In some cases they have to use their subtle intuition and take the pupil’s home background into consideration.

“Most often it is when there is some trouble I contact the parents, because when things keep going there is no reason to do it.” (Male teacher)

All of the respondents have access to a PC and the Internet at the school, and most of them also at home. They all can handle e-mail, but the use of it varies. Some of them prefer to use e-mail to contact the parents and they also prefer that the parents contact them the same way. Others think that it takes more time and is less personal to send e-mail compared to a handwritten message. One says that the weekly
letter is written as much for the pupils as for the parents and an e-mail will make it harder for the pupil to be a part of the message.

"I prefer to get an e-mail instead of a phone call when it comes to more every-day questions." (Female teacher)

**Findings**

While analysing the results from the two studies a number of access barriers can be identified, which may hamper the use of the service. The preliminary user centred access model proposed in Chapter 4 will be used in the analysis of the results, or for the identification of the barriers. The respondents will be regarded as citizens who are offered the possibility to use the Internet for service and information they need and have right to obtain. It will also be emphasized that it is almost impossible to isolate the different access barriers as they are often more or less interdependent. A removal of one barrier could result in another also disappearing, but it could also give rise to new ones.
<table>
<thead>
<tr>
<th>Barrier</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Have** | • Lack of PC;  
• Lack of Internet connection due to infrastructural circumstances;  
• Lack of Internet connection due to considerations for the own children;  
• Slow transmission due to bandwidth;  
• Attitude to the service provider;  
• Registration problems; |
| **Want** | • Unattractive service;  
• Lack of useworthiness;  
• Lack of interest in the technology;  
• Lack of time;  
• Gets all necessary information the ‘traditional way’;  
• Threat against the personal contact; |
| **May** | • Limitations in use opportunity due to the division of the domestic work;  
• Limitations in use opportunity due to the number of family members;  
• Limitations in use opportunity due to the placing of the equipment; |
| **Able** | • Lack of skills and knowledge;  
• Information incapability;  
• Lack of time; |
| **Dare** | • Risk for personal integrity;  
• Risk for the children to get in contact with inappropriate persons or material;  
• Risk for the children’s’ health;  
• Replacement of the personal contact; |

*Figure 6-4: The identified access barriers applied to the preliminary UCAM*
Based upon available statistics (e.g. Internetbarometern, 2004) and the statements in the above studies, it can be concluded that the technical aspect of the ‘have’ barrier is fulfilled for almost everyone in this segment of citizens, i.e. households with children in the school-age. The first service was offered to the group of citizens with the highest rate of Internet connection at home, which was also intended for the second one. In 2003 88% of Swedes in the 9-17 age range, had at least one computer with Internet connection at home (Internetbarometern, 2004). Almost 9 out of 10 homes thus had the theoretical possibility to use the Internet. On an average day 26%, or one out of four parents with children of school-age use the Internet at home (Internetbarometern, 2004) which falls in line with the opinion that possession and use are not equivalent. 8% of Swedes with an Internet connection at home do not use it at all (Findahl, 2004). The respondents in the studies who did not have access to the Internet at home stated infrastructural reasons or consideration for the children as reasons.

With regards to the ‘want’ factor or the will to use the media, all the respondents showed a will to use the Internet to obtain services and search for information in general. It should be observed that even they have limited skills the less-frequent Internet users were also positive. In most cases this positive attitude among those who seldom use the Internet could be explained by the circumstance that there were others in the household who were better able to handle the media, which also ensures access to the services and the information. However, some of them put forward objections against this specific use, while they were of the opinion that they will not accept the replacement of personal contact with an IT-solution. Also aspects such as the choice of Internet provider for the service affected one of the respondent’s will to use it. The content and the scope of the service were also stated as a trigger for the will to become a user. A new service must offer some kind of advantages to the user compared with that already in existence, i.e. to encourage the change to something new (Rogers, 1995), and it must be experienced as being use worthy (Eftring, 1999). In the Gothenburg case the parents expressed a lack
of motivation for use because of the offered service’s limited content. Probably the lack of information with regards to the pilot scheme also affected the will to use it.

The ‘may’ factor or the allowance to use the PC and the Internet is somewhat difficult to deal with. This factor describes whether there is something that limits the use, i.e. laws, rules or other constraints. According to earlier studies (e.g. Selg, 2002b) unwritten constraints exist in many families and in the individual’s mind due to the prevailing norm system in society. For instance that parents in many cases do not feel free to use a computer placed in the children’s room, or that every member of the family does not feel that he or she has the same right to use it as the other family members, or that the woman in the family has to do the domestic duties before she can use the media. Some statements from respondents in these two studies confirm the existence of such normative constraints, i.e. the woman who said that her husband could sit down in front of the PC directly when he comes home, while she had to take care of the household first. In addition this also applies to the man who felt that he “acts like a cop” if he uses the service on the Internet to control his children’s attendance at school and confirms the presence of such mental constraints. Orwell’s (1948) ‘big brother’ is still alive in many minds.

The physical aspects according to the ‘be able’ barrier are not able to be judged here, but none of the respondents brought up anything that could be interpreted as a barrier that originated from physical circumstances. Economic aspects were also not stated by the respondents as being a limitation for their own use, but in some of the families there are two or more computers which offers a better possibility to use the technology. The level of knowledge and skills about how to use the media varied greatly among the participants, from beginners to advanced users. The same could be said about the respondents’ ‘information capability’, or how conscious they are about the service or information’s existence, how to get it, and how to use it (Harris, 1996). This was clearly noticeable in the Sundsvall case where some of the
respondents had problems in discussing and judging some technical solutions such as electronic notice boards, chat, and other electronic forums. The experienced users saw the advantages with the possibility to use such applications, while the novices asked for simpler solutions such as e-mail or web sites. As mentioned above (in connection with the ‘want factor’) all the inexperienced respondents have some kind of support or help at home when it comes to IT-related problems, which gives the household at least a theoretical possibility to use the service. The lack of time for use was put forward by some of the respondents and could in many cases be seen as a question of priority, i.e. how you choose to spend your time.

The ‘dare’ factor which addresses the fact that many people feel uncomfortable or have a fear of using unfamiliar technology could be found in a number of the respondents statements. The technology itself was not unfamiliar for the users in these cases; rather the consequences that the use could lead to were considered. Risk for the integrity if private or sensitive information is sent by e-mail or published on a web site were one of the reasons why many of the respondents wanted to limit the content in the actual services. Also fear about what the children could come into contact with if they used the Internet was put forward as an argument as to why one family had chosen not to subscribe to the Internet. Another statement illustrates health risks connected to the use such as becoming sedentary, overweight and isolated.
Chapter 7 Hindrances experienced in relation to the Private Use of a PC and the Internet

This chapter presents the results from a questionnaire survey made among parents with children within the 6 to 12 age range in the municipalities of Härnösand and Gothenburg, Sweden. The aim of the study was to identify hindrances experienced that limit access to and the use of the Internet for personal use at home. The study was conducted during the spring 2003. All parents or guardians at two compulsory schools, one in Härnösand and the other in Gothenburg were asked to answer the questionnaire. 289 out of 500 returned an answered form. The respondent group was chosen due to the high rate of possession of Internet connected computers at home, which was expected to be a help in answering the question as to why the frequency of use is not at the same level as possession.

The study strengthened the view that it is not only necessary to have an Internet connected computer at home to become a regular user, but that this will not necessarily lead to use. It also shows that the confidence in the technology is an important area to highlight.

The study setting
This study took place among the parents at two Swedish compulsory schools; one in the municipality of Härnösand and the other in the municipality of Gothenburg. The two schools were chosen due to their similarities in the number and age of the pupils. A questionnaire was used to gather the data. The form contained thirty questions with tick boxes with fixed answer alternatives. Nine of the questions also had follow-up questions where the respondents were asked to give the motivation behind or explain the given answer. The respondents were
Access Barriers– from a user’s point of view
Chapter 7 Hindrances experienced in relation to the Private use of a PC and the Internet

asked questions concerning areas that are pointed out as areas affecting the use of PCs and the Internet at home. E.g. questions about the number of persons, computers and Internet users in the household; type of Internet connection; the placing of the equipment; problems and risks experienced concerning the use; and if they felt that they could use the technology in the manner they wanted to, to mention a few of the issues involved. The questionnaires were handed out via the schools to all those with children in the first to the sixth form at the actual schools. This respondent group, i.e. families with children of school age were chosen because these are, according to current statistics (SCB, 2004), the households with the highest level of private Internet connections. With the aim of identifying hindrances experienced in relation to the use of the Internet for personal use at home, it was assumed that the chosen group was the most appropriate for this study as it was expected that most of the respondents had the technology at home.

Traditionally it is the woman in the family who handles most of the contacts between the school and the home and it is usually the man who takes care of the technical issues (Selg, 2002b). With these conditions in mind there was a risk that the respondents would be; either mostly women because the questionnaire was delivered via the schools and it could therefore be seen as a school matter, i.e. a traditional woman’s responsibility; or either mostly men because the questionnaire was dealing with IT and consequently a technical affair. In order to minimise this risk two forms were handed out to each household, with a request that in homes with two adults both should answer the questionnaire.

500 forms where distributed to the homes and 289 parents from 182 different families answered the questionnaire. Of the respondents 158 were women and 131 men, primarily in the age range 30 to 49.
The Results of the Study

Family structure and possession
The majority of the families in the study have at least one computer connected to the Internet at home. Approximately half of them have a broadband connection and the other half are connected via a modem. There are also those among the respondents who have two or more computers connected via a private network, which in turn are connected to the Internet. Apart from in a few families there are two or more people in the households who must share the time in front of the computer. In many of the families they have rules for the use, both when it comes to what you are allowed to use it for, when you can use it and for how long on each occasion. The latter limitation was mostly intended to limit the children’s time in front of the computer. In families with modem connection the Internet use is often restricted to evenings and weekends when the fees are lower. These users are charged per minute of use which could also act as a constraint, especially for low income households. For the ‘broadband families’ neither the time nor the time of day affects the bill.

“I can’t use it [the Internet] in the extension I want to because of the cost”. (Woman)

“Economical reasons limit the use in our family”. (Man)

There is no clear pattern or dominant hierarchical order in the families in the study when it comes to who has the right to use the equipment. Instead the respondents cover the entire spectra, from families where the adults have priority over the children, to families where the children are the prioritised users. Between them you can find homes where work related business goes first, homes where studies are number one, but also homes where first come, first served is the rule. These variations could also be found in the reasons why the family
decided to purchase the equipment. For example, parents who bought the computer for the children’s sake would probably see them as the first-hand users. Those who stated that it was bought as a necessary tool for their work will prioritise that kind of use. Other stated reasons to acquiring the computer and the Internet connection were: of own interest, or that they received an offer they could not resist.

The pattern of use
There were only two of the respondents who stated that they do not use the Internet at all. The others display the ‘regular’ use pattern for people in this age segment, i.e. e-mail, information retrieval and private bank affairs dominates their use. The Internet is also used to a certain degree for tasks related to work and study, and for authority services and contacts, and shopping. Other areas of use such as chat, games, and film and music downloading occur sparsely. These last-mentioned applications are, on the other hand, used by the children and youths in the households. The users are users both at home and at other places such as work, school or at other public access points like e.g. libraries. The seldom-users or the non-users at home are also the seldom-users or non-users at the other places, which supports Grönlund’s (2001) statement that it is necessary to have the access point at home to be a proper user. That indicates that public access points could not be seen as realistic alternatives to providing an Internet access for all.

“A library is not a place where you carry out your private things. It doesn’t feel comfortable or safe to log in to your Internet bank or to communicate with the authorities if you have other, unknown people around you.” (Woman)

The frequency of the use is in most cases related to the type of Internet connection there is in the household, and those possessing a broadband connection are more frequent users than those with a modem.
Some tasks are also more or less impossible to carry out on a modem connection, e.g. to download music or film. Another circumstance that limits the modem holders’ possibility for use is the technical design of the web site, which affects the time for downloading.

**Skills and use problems**

The respondents were asked if they felt that they had the knowledge and skill to use the computer and Internet to use it as required. Not surprisingly many more women then men considered that they did not have the knowledge and skill to feel free to use the computer and the Internet for their required purposes. Whether the men in the respondent group are indeed better users than the women, or if they overestimate their capability will remain unsaid.

Approximately every other respondent stated that they had experienced some kind of problem either often or ever so often when they use the computer and the Internet. There is a minor predominance of female users among those who express problems with the use, but not so obvious that it is possible to argue for a gender difference in this case. The problems that the respondents refer to could be divided in two groups; a) problems of a technical character; and b) problems with confidence in, or scepticism with regards to what can be found on the Internet.

The technical problems mentioned by the respondents could be separated into those having their roots in the hardware and those originating from the design. With reference to the former, transmission problems, modem problems, and old equipment are mentioned. In the latter not-working hyperlinks, unwanted pop-up messages, and system messages are examples of the stated problems.

“I want to use it more but there is always something either with the PC or the connection”. (Women)
The confidence problem is probably harder to tackle when many had already formed a preconceived idea about the Internet not based on facts but on hearsay or media pictures. Because of the answers obtained in the survey it is easy to gain the impression that most of the problems that increase the distrust were not actually experienced by the respondents themselves, but they have heard or read about it. Many of the respondents express a deeply rooted scepticism about what they read on the Internet. In many cases it is a healthy questioning but not when it disqualifies everything on the Internet.

“It is hard to know how trustworthy the information is”. (Women)

“It’s just a lot of rubbish that nobody wants”. (Man)

Other experienced constraints

The placing of the computer in the home is in some studies referred to as a limiting factor (e.g. Selg, 2002a), which is illustrated in following quotation.

“The computer is in the children’s room and there you cannot work in peace.” (Man)

This opinion was not a dominant one among the respondents while in most of the households the computer was placed either in a separate working room or home office, or in the family’s living room. Apart from the man quoted above no-one claimed that the placing of the computer was a reason for not using it more often.

Experienced risks

There was a prevalent opinion among the respondents that use of the Internet is associated with some kind of risk. The risks that they mentioned are almost exclusively of two kinds; risks for children and
youths, and technical risks. To generalise, the female respondents brought up the first kind of risks while the men brought up the other. Of course, there were some women who also mentioned e.g. viruses and men who see risks for the children. The dominant risks experienced by the respondents are illustrated by the following quotes:

“If you press a button maybe you have to pay.” (Man)

“Children are exposed because they do not know the risks.” (Woman)

“Virus, hackers and modem napping.” (Man)

“You could be addicted.” (Women)

“Unauthorised person can trespass on your computer.” (Man)

“It is asocial, they should see friends instead.” (Women)

“Unintentional registration and risk for fraud.” (Man)

“Illegal sites with drugs and pornography.” (Women)
Access Barriers– from a user’s point of view  
Chapter 7 Hindrances experienced in relation to the Private use of a  
PC and the Internet

Figure 7-1: Experienced risks with Internet use

It is not possible to decide whether these risks were something that the respondents had actually came into contact with, or whether they were risks that they have heard or read about, i.e. some kind of second hand information. Some of the statements are of such a character that it is tempting to think that it is what they have heard from others or from media. Every time a new virus appears media such as newspapers and television give it a great deal of attention. It has also been a selling trick from the tabloid press to highlight things like this on their news bills.

Findings
As in the two previous chapters the user centred access model will be used to analyse the results.
## Access Barriers– from a user’s point of view

Chapter 7 Hindrances experienced in relation to the Private use of a PC and the Internet

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Description</th>
</tr>
</thead>
</table>
| Have    | – Economical constraints;  
|         | – No need;  
| Want    | – Unwanted pop-ups and spam;  
|         | – Unreliable information;  
|         | – No need;  
| May     | – Family situation;  
|         | – Normative constraints;  
| Able    | – Economical constraints;  
|         | – Lack of skill and knowledge;  
|         | – Information incapability;  
| Dare    | – Risk for the children to get in contact with inappropriate material;  
|         | – Risk for the children to get in contact with unwanted persons;  
|         | – Risk for the children’s health and social life;  
|         | – Risk becoming addicted to the use;  
|         | – Risk for virus, modem napping and unauthorised trespassing;  
|         | – Risk for fraud;  
|         | – Risk for the personal integrity |

*Figure 7-2: The identified access barriers applied to the preliminary UCAM*

The respondents in this study belong to the same segment of the population as the respondents in the studies in Chapter 6. As in that case it could be established in this case that the ‘have’ factor is fulfilled for almost everyone, which was not a surprise.

Apart from a few, the respondents showed a certain determination to use the technology at least for private correspondence, private banking and for information seeking. Some respondents stated that they did
Access Barriers— from a user’s point of view
Chapter 7 Hindrances experienced in relation to the Private use of a PC and the Internet

not have any need for the computer or the Internet at home. Most of these lacked experience of Internet use which possibly could be the reason why they not could see any advantages for its use. It must be accepted as a standpoint, not to ‘want’ to use the Internet, but as long as it not is grounded in knowledge it must be seen as a barrier for eventual use.

No one stated that there were any clearly expressed prohibitions for anyone in the household to use the Internet at home. A lack of this kind of restrictions, on the other hand, does not automatically mean that you feel that you are allowed. If you as a parent do not want your children to spend a lot of time in front of the computer you could feel that you should not do it either to be a good example. Even if you are of the opinion that you use it for more important matters it could be hard to convince the children of this, which in turn may lead to you feeling rather constrained about its use. In this survey, as in others, women generally feel a lack of time to use it while in most households they still have the main responsibility for the children and the domestic work. Statements such as “I cannot use it [the Internet] in the way I want because the computer is mostly occupied” and “there is always somebody else in the family who is sitting there” reveals that there are restrictions in the possibility to use it.

None of the respondents in this study complained about any physical disabilities hampering their possibility to use the Internet. Instead some other limitations were put forward such as the families economic situation and lack of knowledge and skills. One woman stated that “I can’t use it [the Internet] as much as I want to because of the cost. The bill will be too high then.” One of the male respondents referred to their “economic reality” as the reason why he does not use it at all.

The ‘dare’ factor does really lurk in the background in this study. Many of the respondents, men as well as women, do mention risks associated with the use of the Internet. The risks could be divided in
two main categories; a) risk for the children, and b) risk for the equipment or for fraud. As mentioned earlier a rough picture is that the women are most worried for their children and that the men are more worried for the equipment and the family’s economy. This condition reinforces the picture of the man as the breadwinner and the ‘technical expert’ and the woman as responsible for the children’s wellbeing.
## Chapter 8  Discussion & Conclusions

### Findings

**The identified access barriers applied to the UCAM**

The analysis of the empirical studies in Chapters 4-7 reveal a number of hindrances that the respondents experienced in relation to the use of IT. A summary of these hindrances is categorised below and applied to the User Centred Access Model.

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Experienced hindrances</th>
</tr>
</thead>
</table>
| **Have** | • Lack of PC;  
|          | • Lack of Internet connection due to infrastructural circumstances;  
|          | • Lack of Internet connection due to considerations for the own children;  
|          | • Registration problems;  
|          | • Economic constraints;  |
| **Want** | • Slow transmission due to bandwidth;  
|          | • Unattractive service;  
|          | • Unwanted pop-ups and spam;  
|          | • Attitude to the service provider;  
|          | • Unreliable information;  
|          | • Lack of useworthiness;  
|          | • Lack of interest in the technology;  
|          | • Lack of time;  
|          | • Gets all necessary information the ‘traditional way’;  
|          | • Threat against the personal contact;  |
| **May**  | • Limitations in use opportunity due to the division of the domestic work; |
### Access Barriers— from a user’s point of view

#### Chapter 8 Discussion and conclusion

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Limitations in use opportunity due to the number of family members;</td>
<td></td>
</tr>
<tr>
<td>• Limitations in use opportunity due to the placing of the equipment;</td>
<td></td>
</tr>
<tr>
<td>• Economic constraints;</td>
<td></td>
</tr>
<tr>
<td><strong>Able</strong></td>
<td>• Lack of skills and knowledge;</td>
</tr>
<tr>
<td></td>
<td>• Information incapability;</td>
</tr>
<tr>
<td></td>
<td>• Economic constraints;</td>
</tr>
<tr>
<td></td>
<td>• Lack of time;</td>
</tr>
<tr>
<td></td>
<td>• Registration problems;</td>
</tr>
<tr>
<td></td>
<td>• Problems with the size of fonts;</td>
</tr>
<tr>
<td></td>
<td>• Problems with the language;</td>
</tr>
<tr>
<td></td>
<td>• Problems with the combination of colours;</td>
</tr>
<tr>
<td><strong>Dare</strong></td>
<td>• Risk for the children to get in contact with inappropriate persons or material;</td>
</tr>
<tr>
<td></td>
<td>• Risk for the children’s health;</td>
</tr>
<tr>
<td></td>
<td>• Risk for the children’s social life;</td>
</tr>
<tr>
<td></td>
<td>• Replacement of personal contacts;</td>
</tr>
<tr>
<td></td>
<td>• Risk becoming addicted to the use;</td>
</tr>
<tr>
<td></td>
<td>• Risk for virus, modem napping and unauthorised trespassing;</td>
</tr>
<tr>
<td></td>
<td>• Risk for fraud;</td>
</tr>
<tr>
<td></td>
<td>• Risk for the personal integrity</td>
</tr>
</tbody>
</table>

*Figure 8-1: The identified access barriers applied to the UCAM*

### Conclusion 1

The first conclusion to be drawn is that it was possible to use the User Centred Access Model to categorise the identified barriers. All of the hindrances experienced by the respondents in the empirical studies could be placed in a feasible category. The use of the UCAM also offers the possibility to present the access barriers in a structured way that is easy to understand and communicate both with experts and the uninitiated. It is also possible to claim that none of the other presented

Conclusion 2
Further on I will state that the identified access barriers, which can be divided into two rough categories or groups according to their origin or causing factors. These two groups are:

- Access barriers whose origins are in, or are caused by the infrastructure, the design of the applications and the equipment, the use and political and economic circumstances.

- Access barriers that have their origin in, or are caused by prevailing values and norms in society or in the user’s environment or own mind.

In the first category are placed e.g. constraints such as the possibilities to obtain a broadband connection, slow modem transmission, old equipment and software, hyperlinks that do not work, virus attacks, and design problems to mention but a few. It can be stated that this category of access barriers is not the major problem in the endeavour towards the ‘information society for all’. Of course they cannot be ignored, as they must also be taken care of while they obstruct the possibilities to using technology. This statement is based in my firm conviction that today the knowledge and skill are available to remove these access barriers; it is merely a question of money, politics and will.

The other challenge when an equal possibility to access is the goal is to remove the barriers that exist in an individual’s own mind, formed by the structures and norms in the social and cultural environment we live in. The shaping and the presence of these individual concepts of technological artefacts, and also the individual’s relation to them are shown by e.g. Lindblad-Gidlund (2005), Bijker and Pinch (1984) and
Access Barriers— from a user’s point of view
Chapter 8 Discussion and conclusion

Popper (1997). These barriers, experienced by the individual, are more difficult to handle when they are based on their own feelings, interpretations and concepts. This does not only concern gender issues, education or income, but also how we regard the way we should live our lives, or our form of life, life cycle and life style to use the notions suggested by Selg (2002).

“if our society in the first hand are commercial, private, material and a consumption society, the technology will also be commercial, private, material and directed towards consumption.” (Barber, 2001)

Conclusion 3
In the Swedish Government’s bill 1999/2000:86 there are three prioritised areas that are pointed out as where the efforts should lie in order to create the information society for all, according to the suggested direction for the Swedish IT politics. The areas are:

- the confidence in IT
- the competence to use IT
- the accessibility to the services in the information society

When the identified hindrances experienced by Swedish citizens are looked at in this study, it can be realised that a great deal of work still remains before the focus can be moved from these three prioritised areas. However, all of the identified barriers could be placed into the three areas if the interpretations of these areas are widened.

There exists an obvious lack of confidence in both the technology and its use among the respondents. I dare to state that this is the most crucial ‘piece in the puzzle’ which requires all possible attention and efforts. Confidence must be seen as a subjective factor which is dependent of the individual observer, and also a dynamic one that could change very quickly. Our ideas concerning the technology are formed, affected and changed by not only our own experiences but
also the environment we live in. Newspapers, radio and television, strongly influence our trust or distrust in IT. Headlines such as the examples below will not contribute to making those who feel dubious any more friendly to their own use of technology.

"Giant bluff against Nordea – false website panic closed net services" (Aftonbladet, 2005-10-04),

"Passport problems trying for personal. […] Employers and the union are agreed that it is the new computer system, which should handle the passport that not works." (DN, 2005-10-17),

"SEBs bank card out of use today. […] A software problem in one of the base systems…..the bank’s 1.5 million customers could not pay with their cards, withdraw money from ATMs, or use the Internet bank.” (Expressen, 2005-10-17)

But, in the same way as media scares the users or the potential users it also encourages or stimulates them to use technology with lyrical descriptions and stories about different equipment or applications fantastic qualities. In e.g. DN (2005-10-19) you could read that

“iPod is the first technical apparatus that makes it possible to carry with you a part of your cultural heritage. An extra memory to your brain that could be filled with that, that have stamped and formed your identity”.

Many of the respondents in my studies showed a lack of confidence in using the Internet for economic transactions, and stated the risk of fraud as a serious problem. E.g. to give the number of your bank card or credit card at the Internet or to use an Internet bank causes severe suspicion among the respondents. According to a study made by SCB
(2004) approximately 40% of the Swedes in the age group 16-74 use an Internet bank, a number I interpret as being low in relation to the possibilities. Beside the mistrust in the technological artefacts, the applications and the eventual unwanted consequences the use can give rise to, there is also an expressed lack of confidence in their own capability or skill in handling the machine and using the applications. A third experienced area of confidence problems is the reliability of the information and sources associated with the Internet. This result corresponds to the results in the report from the World Internet Institute (2005) that shows that 58.7% of the Swedes trust at least half of the information at the Internet. Among the Swedish Internet users this number is 61.1%. A common feeling of uncertainty and anxiety was expressed particularly among the female respondents, when it came to risk associated with the use of the Internet. These feelings were not related to their own use, but to the children’s use. Almost 80% of the Internet users also experience concerns that the authorities and the employers gain the possibility for increasing control and supervision (WII, 2005). The same study shows that 86.9% of Swedes are worried or greatly worried about being attacked by data virus.

The competence to use IT is the second prioritised area. A common opinion among the users was that they did not feel that they had sufficient knowledge or skills to feel comfortable in front of the computer. As long as everything worked as it was supposed to work, and everything on the screen looked as it usually looked, there were not many problems. Unfortunately this is an idealistic situation which is not very common. For many it is sufficient to encounter an unexpected pop-up window or a change in the appearance of the desktop, to feel insecure as to how to act. Many of the confidence problems originate from a lack of knowledge and skills and will probably decrease as competence levels rise. But some of them, e.g. the worry to be attacked by a virus is 79% of those who consider themselves as very experienced users (WII, 2005).
For approximately ten years the PC and the Internet have become daily tools and a more or less natural part of young peoples’ lives. The technology is used in every school in the country and in almost every home where there are children of school-age. A tool that you grow up with is often seen and experienced as a natural part of your life and environment and thus undramatic. Problems with skills and knowledge are therefore not a significant problem with this section of the population, which is not to say that they all are experts or confident users. The middle-aged and elderly, for whom the introduction of the technology has occurred later in life, more often adopt a wait and see attitude, or are suspicious with regards to its use.

Often public access point, in e.g. libraries, and access points at workplaces or at schools are used as an argument for everyone’s possibility to use IT. If you, for one reason or another, do not have the necessary equipment at home you are expected to use it in some other place. The participants in my studies put forward a number of arguments for why they did not see these external access points as a realistic alternative for their private use of the Internet and Public Information Systems. The lack of privacy at a public access point limits the services you feel comfortable in using, and you are also restricted to the services hours, thus reducing the advantages of the 24/7-authorities. At many workplaces the private use of the Internet is strictly limited, either by the employer or by the employees own conscience. These arguments support e.g. Grönlund (2001) who states that access to the equipment at home is a requirement to become a daily user.

**Conclusion 4**
The occurrence or experience of a specific access barrier is not a static condition but changes over time, for example, the differences in use between men and women is decreasing (SCB, 2004). The elderly have always been noted as being a group who have been unfairly treated in this context, but according to a new report from the European Union named “eInclusion revisited: the local dimension of the Information Society” (2005a) “the elderly are crossing the digital di-
vide”. This is perhaps not so surprising, as the group referred to as ‘elderly’ is defined as those who are 55 or older, and there is a huge difference between a 55 year old today and one of ten years ago with reference to the options and availabilities offered by the information technology.

**Conclusion 5**

I will also draw the conclusion that Israel’s suggestion (1990) concerning changes of an unwanted situation; it is more fruitful to concentrate on the barriers than the driving forces and this is supported by the results of this work. A number of the access barriers identified here are not possible to overcome simply by means of increased driving forces. This includes the worry many parents felt for their children and the lack of design expressed by some users will not decrease by means of a driving force. Other barriers e.g. the lack of reasons for the use could on the other hand be stimulated by a driving force.

**Reflections upon the use of the UCAM**

In the figure above we can find the identified experienced access barriers from the empirical studies in chapters 5-7. To place the barriers in the correct category in the model requires a deeper insight into the barriers. As can be seen in the figure, some barriers do occur (or are placed by me) in more than one category e.g. ‘economic constraints’, which could be found in the ‘have’, ‘may’ and ‘able’ group. The reason for this is that a person or a family has some kind of economic framework in which they take their conscious or unconscious decisions regarding how to live and spend their money. If we only have a person’s or a household’s total income as the basis for determining whether they have access or not, we are on an unstable ground. The total income could tell us whether they have a theoretical possibility to gain access but what it all boils down to is that how they prioritise. The ‘economic constraints’ that are placed in the ‘have’ category do refer to economic reasons or decisions that limit the possibility to buy
a PC, and to subscribe to an Internet connection. Those placed in the ‘may’ category refer to those where economic reasons are put forward as a hindrance for use. E.g. many with a modem connection do restrict their use to low tax periods i.e. evenings, nights and weekends. Finally the ‘economic constraints’ in the ‘able’ category are the limitations that makes the access impossible whether you want to or not.

Many stated that they have got the necessary equipment for their children’s sake, but it is also a common opinion that the use does not only have positive effects. The children’s wellbeing is a factor that seems to worry many parents. The easy access to drugs, violence, pornography and unwanted or inappropriate contacts affect the confidence in the technology, but also there is a fear that the use itself could harm the children’s physical and mental health. The former problems are difficult or impossible to deal with for a parent unless there is a definite control, sensible children with a critical mind, or to forbid use of the Internet. These problems are also more real or concrete than latter ones, about which opinions are divided. In fact, there are research reports that point out the risks associated with computer and Internet use such as becoming overweight, violent behaviour and social isolation among others, but there are also those who state that these effects are not the result of the use. The fact that the discussion concerning these latter problems, irrespective of the fact whether they exist or not, is very often exposed in newspapers and other media which contributes to the worry that many parents feel.

There is room for more analysis for some of the other identified access barriers, but this cannot be dealt with in this study. The main point of the above discussion is to point out the necessity for a close look at every stated hindrance.

**To use the User Centred Access Model**

To be able to deal with the access problems that originate from the individual’s own conditions and understandings, a tool is required which makes communication with people who have different conditions
easy. It is felt that the User Centred Access Model is indeed this kind of tool, and feasible to use when dealing with these questions. The development of an information system should start with an analysis in order to chart the requirements of the system, but also those of the perceived users. As discussed at an earlier stage the users of a Public Information System are a heterogeneous crowd, thus greater efforts must be spent on the preparatory analysis in order to succeed. I conclude that the UCAM and its easily understandable categories will facilitate the analyst with a means of designing and performing the analysis.

The contribution, the used methods and the applicability of the results

“And thus the native hue of resolution
Is sicklied o'er with the pale cast of thought” (from Shakespeare’s Hamlet)

While approaching the end of a project it is time to reflect upon what has been completed, how you have done it, and last but not least is it usable for anything or how does it contribute to the area of research.

The purpose of this work was to identify and analyse barriers, which affect the individual user’s experience of access, and use of the Internet for personal use. At a later stage these should be used to design a tool to facilitate and support the categorisation and communication of these barriers. I feel that I have fulfilled this purpose and the result is the User Centred Access Model.

The question that this research project was intended too answer was: *What factors does the single user experience as hindrances to accessing the Internet from home?* I am of the opinion that the question has been answered and the results are shown in the summary of the identified access barriers (figure 8-1).
Furtheron I will state that this thesis’ contribution to the research field is the User Centred Access Model, UCAM. The model should be used as a help to understand and communicate the barriers the individual user experiences as hindrances to access the Internet and the Public Information Systems provided by the authorities. My vision is that with the help of this model we could increase the understanding for these problems which in turn could improve the design and implementation processes in a way that takes us a step towards the ‘information society for all’. The identified access barriers do of course also have a value, but their primary mission in this work is as a means to design and test the possibility to use the UCAM as a tool to categorise the hindrances experienced by the users. The majority, if not all, of the access barriers identified here have already been pointed out in previous studies (e.g. Selg, 2002a, Selg 2002b, SCB 2004). This should not be regarded as a problem but rather seen as an additional confirmation to the existence of these barriers. It cannot be claimed that other access barriers do not also exist, i.e. that these studies have covered the entire picture and dealt with all aspects and hindrances an individual user can experience. It has not been the ambition and is not necessary in this work whose main purpose has been to design a model to structure and handle the barriers.

Due to the methodological choice I have made in the work associated with this thesis, i.e. a critical analysis of four empirical studies of which three had different original aims than the aim of the thesis; I will argue that I have shown that it is a possible way to identify access barriers experienced by individuals which was the purpose. This approach, the critical analysis, is not a new one; it has been used with success by established researchers e.g. Kvasny and Trauth (2002). However, if I was given the option to restart this research project from the beginning, I would probably have tackled it in another way. I would for example have designed the interview guides and the questionnaires in a way that was more directed to the problem area, i.e. the experience of access barriers. I cannot say that the results would have
been different using that kind of approach, but this was not the method chosen.

Further I will claim that the reliability and the validity of the findings in this work are high. While the purpose not was to quantify but to point out the experienced access barriers existence, the selection of the respondents was not a crucial factor here for the reliability. It might have proved to be problematical if the ambition had been to find all existing access barriers, but that was not the case. Validity denotes that you really have investigated what was intended to be investigated and nothing else (Thurén, 1991). The intention in the work was to identify experienced access barriers and I will state that it has been done.

The analyses also display a heterogeneity among the citizens concerning these relations which stresses the importance of taking these questions into consideration. It is not a realistic thought to turn to every single citizen and ask for what type of change they require in order to become a user of IT and the Public Information Systems, and then perform these desired changes. It would be “an awful lot of designs” to quote a well-known Swedish TV comedy. Compromises are necessary, but to make these compromises in a way that is as suitable and acceptable as possible for the great majority of people it is necessary to communicate and tackle the access problems.

Another factor that must be taken into consideration is the possible extensions of the result. The generality could be judged at different levels, e.g. if the result is general only for a specific geographic area such a Sweden or Western Europe or the whole World, and if the result is general only at a certain time or also in ten or twenty years. I will claim that the UCAM is general and usable all over the World, now and in the future. The experienced access barriers will vary for different geographical areas in the way that the occurrence and the emphasis will be dependent on different hindrances e.g. the infrastructure, the social and cultural conditions, and the standard of living.
to mention some factors. According to the generality over time there will hopefully be changes in the occurrence and emphasis placed on the hindrances generally experienced and in this case we would have failed in our endeavour.

The User Centred Access Model, UCAM, as suggested in Chapter 4 and put into practice in Chapter 5-7 could be one possible way to deal with the access questions. The intention of the model is to provide a tool to increase the understanding and to communicate the access barriers that limit the citizens’ possibilities and will to use the technology and the applications. A use of the UCAM will not provide the solution or offer the answers as to how to provide access to IT and PIS for everybody and neither is it intended to do so. An awareness concerning the access barriers among decision makers and developers could increase the possibility that they are taken into consideration during the design, construction and implementation phases.

The continuation

“This is not the end. This is not the beginning of the end. Perhaps, it is the end of the beginning.” (Churchill, W. 1943)

The User Centred Access Model, UCAM suggested here, is the first version of the tool which must be used, evaluated and perhaps improved on a number of occasions. This continuation of the process to consolidate the model has not been possible inside this research project. Future research in order to consolidate the UCAM ought to be done in the perceived area of use, in other words to capture the thoughts for the user’s requirements in the initialising phases of the development of Public Information Systems.
Access Barriers-- from a user’s point of view

References


Barber, B. (2001) Open lecture at Örebro University 2001-03-30


143
Access Barriers– from a user’s point of view

References

Calamai, P. (1994) *The Emerging Information Underclass*, in Media 1, April, 1994, Canadian Business and Current Affairs


Access Barriers– from a user’s point of view
References


Findahl, O (2004) Svenskarna och Internet 2003, World Internet Institute, Gävle, Sweden


Grönlund, Åke, (2001b), IT, demokrati och medborgarnas deltagande, TELDOK & VINNOVA, Stockholm, Sweden

Access Barriers– from a user’s point of view

References


Henfridsson, O (1999) IT-Adaption as Sensemaking – Inventing New Meaning for Technology in Organizations, Dept of Informatics, Umeå University, Umeå, Sweden


Internetbarometern 2003 (2004), Medienotiser, NORDICOM-Sverige, University of Gothenburg, Sweden,
Access Barriers– from a user’s point of view

References


Lindblad-Gidlund, K. (2005) Techno Therapy, a relation with technology, Doctoral thesis, Department of Informatics, Umeå University, Sweden

147
Access Barriers– from a user’s point of view
References


Nielsen, J. (1993) Usability engineering, AP Professional, Boston, USA


Nilsson, O (2002a) The use of, and access to PC, Internet and a local government's web site, A study of a strategic chosen group of resi-
Access Barriers– from a user’s point of view

References

dents in Härmösand, in Proceedings of Promote IT Conference 2002, Skövde, Sweden

Nilsson, O (2002b) Confidence or Control, in Proceedings of ITiRA 2002 Conference, Rockhampton, Australia


Orwell, G (1948), Nineteen Eighty Four,
Access Barriers– from a user’s point of view

References


Access Barriers– from a user’s point of view

References


Selg, H (2002b) *Om kvinnors användning av Internet eller ”När kvinnan äntligen har tid sitter mannen framför PC:n”*, IT-kommissionens rapport 49/2002, Stockholm, Sweden


151
Access Barriers— from a user’s point of view

References


Sundsvall kommun, Barn och utbildning (2004), *Kommunikationspolicy för barn- och utbildningsförvaltningen,* Sundsvall, Sweden


Access Barriers– from a user’s point of view

References

Tema Teknik och social förändring, Linköpings universitet, Linköping, Sweden
