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TO JUDGE ACCESS
- A USER CENTRED APPROACH

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Abstract

The aim of this paper is to suggest a model which assists in the ability to judge the access offered to the public by Information Technology, IT and 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'. A study of the available statistics concerning the access to a PC and the Internet in Swedish homes could make one think that this vision may soon be realised. Naturally, 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. Several 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; their starting point is not the individual user's prerequisites, but rather they 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 more elusive set also exists, originating from the prevailing norms and values in the user's environment. These 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, access barriers, digital divide, Public Information Systems

1. Introduction

A number of studies reveal that a PC and Internet connection in the home does not automatically imply that all the members of the household are users [e.g. Selg, 2002a; Selg, 2002b; Nilsson, 2002a; Nilsson, 2005a; Nilsson and Sefyrin, 2005; Findal, 2004]. In spite of this, all these individuals are to be found in the official statistics as users, or households or citizens with access to an Internet connected PC in their home. This indicates two of the main concerns associated with this paper, 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 judge the options available to citizens to have access to the Internet and the ability to use Public Information Systems, PIS.

A significant body of research has pointed out the inequalities in access to IT. I venture to say that it is now possible to offer 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 [e.g. SCB, 2004; Findal, 2004]. It is tempting to draw the conclusion that the inequalities in access to IT do mirror previously existing societal disparities [Barber, 2001]. In order to change these conditions, if indeed it is the ambition to one day achieve the 'information society for all', more surveys stating who are the 'haves' and the 'have-nots' are not particularly helpful. Instead it is necessary for us to understand 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.

1.1. IT and Society

It does not appear to be controversial to state that IT is here to stay, at least not for the foreseeable future. This statement is supported by e.g. Henfridsson [1999] who writes that 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". 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 governmental administrative systems. The development and spread of this 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 society and in many homes, has taken place during the last few decades. "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]

The interest for, and the use of different kinds of IT that exist in the present day market not only exists 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 behind 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 come to the fore during the last few years. For the citizens, the primary factors that have led to the increase have mainly concerned aspects such as amusement, entertainment or other private reasons.

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

A common conception of the Internet and its strength is that it 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. A similar aspect is pointed out by Kling et al [2000] who point out that a PC in one home does not have to be the same as a PC in another home, or "ICTs are configurable – they are actually collections of distinct components".

One of the prevailing ideas in western societies today 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. 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' [Governmental bill 1999/2000:86] and in the resolution 'Council Resolution on the implementation of the eEurope 2005 Action Plan' [EU, 2005b], 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, tools for consultations, and tools for voting. This growing interest in the use of IT and the Internet for democratic purposes is, however, not only a question for the authorities and the political organisations. Commercial companies and consultants have found a new area for participation, and form one of the major driving forces behind the development of new applications. One thing, however, is certain; the Internet will not make our society more democratic *per se*. The 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 and Loader, 1999].

Sweden is considered to be one of the most computerised nations in the world. The number of PCs and Internet connections in Swedish homes is amongst 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 both companies and private citizens. Through efforts to stimulate private purchase and through educational campaigns, basic computer literacy can be considered to be very high, at least within the young and the middle-aged sections of the population. It is within this segment of society that the highest rates of possession of private PCs and Internet connections can be found.

The majority of official statistics regarding IT use do 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. 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 [1999] state that "providing physical access to ICTs is one thing; giving citizens good reasons to want to make use of them is quite another".

1.2. The Access Concept

Access is required in order to utilise the technology. In this paper the access concept will be treated from a somewhat broad perspective, covering all aspects thought necessary to be taken into consideration. In addition to the technical, physical and knowledge factors, economic, social, cultural and mental aspects will be included. To formulate a definitive definition of the access concept is difficult, if not impossible. Many definitions with different focuses can be found [e.g. Aspden and Katz, 1998; Clement and Shade, 2000; Poland, 2001; Van Dijk and Hacker, 2003]. However, one common factor runs though all these definitions; access concerns the options available to the individual to use something. The depth and the breadth of the description or definition depend on the purpose, or what should be studied or judged.

We could either assume that those in households which possess an Internet connected computer do indeed have access to the Internet; or assume the possibilities for the household members to actually use the equipment must be added in order to talk about access; or, beyond possession and possibility, the actual use must be included for the given access in order to obtain the correct picture. Obviously, other possible means are available in order to make this judgement. It will surely be claimed that the existence of the possibility to use the technology is indeed sufficient to consider someone to have access, regardless of whether or not the equipment exists at home. It can also be assumed that a person who uses the Internet has the possibility to do it, and thus has access. To be able to fulfil this paper's purpose, all the above aspects must be included namely possession, possibility and use.

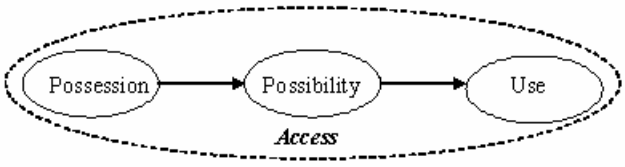

Figure 1: The widened access concept [Nilsson, 2005b].

Clement and 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 of using, and what are the possibilities of providing it?

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 the Internet and Public Information Systems, a description covering as many aspects as possible, is required, which influences 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 paper's 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 such a way that it does not limit the individual's possibility of using the access. Studies have shown that many people do not feel that it is convenient to use public access points, e.g. at libraries, for their private affairs. Additionally, many lack easy access or the permission to use their work technology for private use. 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**, can only have one answer in a democratic country, namely everyone, i.e. all citizens. The **purpose** of providing the access could be viewed as two-fold; one is to make it possible for the citizens to take part in their rights and to fulfil their duties in a desired way, and the other is to make the public administration less expensive and more effective [The Ministry of Industry, Employment and Communications, 2004].

Having come this far, consideration must be given as to who decides 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.

From outside	From inside
External actors perspective	Individuals perspective
What is offered?	What is offered to me?
To whom is it offered?	Am I able/allowed to use it?
What are the benefits for us as providers?	What are the benefits for me?
More objective	Personal, subjective

Figure 2: Two different perspectives to study access [Nilsson, 2005b]

It is the opinion of the author that the main part of current research and official reports and statistics is primarily based on the former perspective [e.g. SCB, 2004; Findal, 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 to handle the question regarding how and why the individual accepts or does not accept, use or does not use the provided technology and its applications, a 'from-inside' perspective is required. This means of tackling the problem will include the individual's apprehension with regards to the access provided.

The most commonly used pair of notions to describe the differences in access is that of the 'haves' and 'have-nots' [e.g. Carveth and Kretchmer, 2002; Boyd, 2002], which gives information about who has the technology at home and who has not. The

shortcoming of this dichotomy is that it merely describes the possible physical access to IT, which forms only one part of the problem. We could also find those who do not, want, can, 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 as previously mentioned.

1.2.1. Driving Forces or Barriers?

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

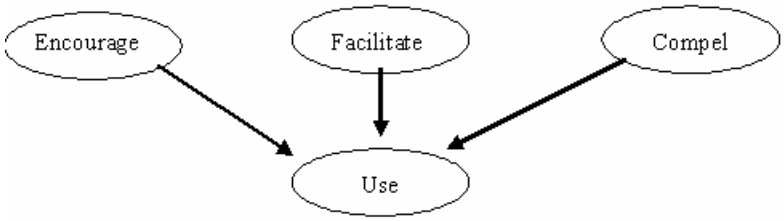

Figure 3: Three ways to 'make a user'

If our goal is to bring about or facilitate a change it is more fruitful to look forward than backward [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 and barriers, which the individual experiences as hindrances to their everyday use of the Internet, for different purposes and in a desired extension.

Driving forces	**Barriers**
Causal explanation	Intentional explanation
Looking backwards	Looking forward
What made us act?	What hampers the acting?
Tells what has happened	Tells what has to be changed

Figure 4: Characteristics for driving forces and barriers [adopted from Israel, 1999]

1. 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 involves 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: a) Hindrance concerning our biological equipment and the structure of the physical world. The mission of technology is often to bridge these obstacles; b) 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; c) Organisational structures such as e.g. family, school, workplace and organisations where we live and work. d) Interpersonal relations and interaction; e) hindrance that originates from the individual's own mind because of fear, uncertainty, or a lack of confidence in their own ability.

1.2.2. Forming an alternative access model

When Israel's suggested barriers are adopted for this study then the following categories are obtained: 1) Technical barriers; 2) Physical barriers; 3) Economic barriers; 4) Cultural and social barriers; and 5) Mental barriers. These five categories will, together with, for this context, a necessary sixth one, namely knowledge and skill barriers, be used in the following empirical studies to discuss and propose an access model.

Four current access models, Aspden and Katz [1998], Clement and Shade [2000], Poland [2001] and Van Dijk and Hacker [2003], were studied and applied to these six categories of barriers which gave the following result.

Barrier	Aspden & Katz	Clement & Shade	Poland	van Dijk & Hacker
Technological		X	X	X
Physical			X	
Economical	X			X
Knowledge and skills		X		X
Social and cultural	X	X	X	X
Mental	X		X	X

Figure 5: Access models applied to the access barriers [Nilsson, 2005b]

It is my opinion that none of the above mentioned access models cover all of the suggested aspects (Figure 4). Thus it is necessary to take one step further in the attempt to design a user centred access model, UCAM. The aspects could be seen as circumstances that affect the individual's concept of, and to what extent he or she will, can, is allowed, and dares, to use IT. The barriers in the UCAM have been named using the commonplace notions *have, want, may, able, and dare* to ease communication with those outside academia.

To *have* describes the state of technical and physical access to an Internet-connected computer. It could be argued that everyone in the Western world has technical and physical access because of the public access points situated in libraries, schools, workplaces etc. Others argue that if the market is allowed to rule, everyone will, sooner or later, gain access to the technology, which then turns the question into the 'have-nows' and 'have-laters' [Carveth and Cretchmer, 2002]. I support

Grönlund's [2001] opinion that it is necessary to have the access point at home to be able to use it properly. I base my support on the fact that private use is limited at many workplaces, that many individuals feel uncomfortable in using public access points, but also that access to access points outside the home is generally limited by e.g. opening hours.

In order to *want to* use it, people 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 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 [1997] 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". Selg [2002a] argues that the conclusive argument for using the Internet or not, is the medium's surplus in relation to alternative courses of action. Rogers [1995] points out the extent to which an innovation is experienced as being better than that which it replaces is the determining factor for its adoption. It could also be expressed in economic terms, such 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, means that there is nothing limiting its use, i.e. laws, rules or other constraints. To may also includes unwritten constraints: e.g. that parents feel or are free to use the computer placed in a child's room, or that every member of the family has the same right to use it, or that it is possible to use a workplace computer without feeling that this is somehow wrong. . Social, political, religious or cultural constraints could also restrict the feeling of being allowed to access the media. According to Rogers [1995] both the acceptance and 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 be *able* firstly demands that the physical abilities or the means of assistance required to handle the computer are available. Knowledge and skills are also 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 which was totally dominating the use of the Internet at home involved 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 ones own needs. He argues that it requires more than access to the information: people must also be aware of its existence, how to get it, and how to use it.

To *dare* to use the technology implies that feeling blocked by uncertainty or fear of using the technology does not exist. Today many people feel uncomfortable or have a fear of using unfamiliar technology. In a study including 1056 respondents, made in 1998 by SCB for 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 from a holistic view. To finally obtain a holistic picture, decomposition at this level is necessary. Identifying the different aspects involved makes it easier to understand and deal with the relationships.

Barriers	Description
Have	Technical, physical possibility to use
Want	Will to use
May	Allowed to use
Able	Knowledge to use, economical prerequisites
Dare	Familiar to use

Figure 6: The user centred access model, UCAM [Nilsson, 2005b]

2. Using the UCAM

This study was performed as a critical analysis [Kvasny and Trauth, 2002] applied to the results from four empirical studies, made during the period October 2001 to May 2005. From these studies, a number of access barriers were identified and categorised in the UCAM as technological, physical, economic, knowledge and skills, and social/cultural/psychological barriers.

The first empirical study was made in the municipality of Härnösand during October and November 2001 [Nilsson, 2002a]. The tool used in the survey was a questionnaire. It was handed out to 500 people, born in 1985 or earlier, of which 400 completed the form. The form contained 53 questions, of which 52 had fixed answering alternatives. The informants were invited to leave comments to any the questions if they felt limited by the fixed alternatives. 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 the available statistics [see e.g. SCB, 2001] which it was assumed could possibly influence the use and 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.

The second study was an interview study made among parents of pupils at two schools in two different town districts in Gothenburg, and took place in the end of February 2002 [Nilsson, 2002b]. The data collection was made by means of semi-structured interviews. Two head teachers, ten teachers, one school assistant, one administrator and two from the school healthcare service were interviewed individually. The respondents were selected at random from those directly affected by the system. 20 parents, with children in the age-group 13 to 15, were interview by telephone. 10 men and 10 women were chosen from a list provided by the schools. 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. Finally 22 volunteer pupils were interviewed in groups at the schools.

The third study was carried out in April and May 2003 [Nilsson, 2005b]. 500 forms were distributed to all the pupils' homes and 289 parents, 158 women and 131 men, from 182 different families answered the questionnaire concerning their use of Internet at home. Two forms were handed out to each household, with a request that in homes with two adults both should answer the questionnaire.
The last study was an interview study among parents of children of compulsory school age and teachers at schools in the municipality of Sundsvall [Nilsson and Sefyrin, 2005; Nilsson, 2005a]. The parental interviews were made as focus group interviews [Fern, 2001]. The 5 focus groups, with 5-6 parents in each, were formed from employees at five different workplaces in order to have respondents representing a broad range of social status. The respondents to teacher interviews were selected at random. Nine teachers from five different schools, representing one form each, were interviewed individually.

The identified access barriers have been categorised in the five groups or categories. A summary of these hindrances was categorised and applied to the User Centred Access Model in the table below. These categories are not independent of, or isolated from each other, but are, rather, considered to be interdependent. This means a factor could occur in more than one category, and could affect one or more other factors.

Barrier	**Experienced hindrances**
Have	• Lack of PC; • Lack of Internet connection due to infrastructural circumstances; • Lack of Internet connection due to considerations for their own children; • Registration problems; • Economic constraints involved in buying or subscribing;
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; • Obtains 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; • Economic constraints limits the use;

Able	• Lack of skills and knowledge; • Information incapability; • Lack of time; • Registration problems; • Problems with the size of fonts; • Problems with the language; • Problems with the combination of colours;
Dare	• Risk for the children to get in contact with inappropriate persons or material; • Risk for the child's health; • Risk for the child's social life; • Replacement of personal contacts; • Risk of becoming addicted to the use; • Risk for virus, modem napping and unauthorised trespassing; • Risk of fraud; • Risk for personal integrity

Figure 6: The identified barriers applied to the UCAM [Nilsson, 2005b]

3. Discussion

To place the barriers into the correct category within the model requires a deeper insight into them. 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' and, 'may' group. The reason for this is that an individual or a family has some kind of economic framework within which they take their conscious or unconscious decisions regarding how to live and spend their money. If the total income for a household is the only basis for determining whether or not they have access, we are on unstable grounds. The total income could tell us whether there is a theoretical possibility of gaining access, but it does not determine their priorities. The 'economic constraints' that are placed in the 'have' category do refer to economic reasons or decisions that limit the possibilities of buying a PC, and of subscribing to an Internet connection. Those placed in the 'may' category refer to those where economic reasons are suggested as a hindrance for use and might include those with a modem connection who restrict their use to low charge periods i.e. evenings, nights and weekends.

Many stated that they obtained the necessary equipment for the sake of their children, but it is also a common opinion that there can be positive and negative effects associated with use. The wellbeing of their children is a factor that concerns many parents. Easy access to drugs, violence, pornography and unwanted or inappropriate contacts affects the confidence in the technology, but there is a fear that the use itself could harm the physical and mental health of the children. The former problems are difficult or impossible to deal with for a parent unless there is definite control, sensible children with a critical mind, or to forbid the 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 whether or not they exist, 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 will not be dealt with in this study. The main point of the above discussion is to point out the necessity to thoroughly investigate every stated hindrance.

To be able to deal with the access problems that originate from the individual's own conditions and understandings, a tool is required which enables easy communication with people under a variety of conditions. It is felt that the User Centred Access Model is indeed this kind of tool, and is 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. 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. It is also possible to claim that none of the other studied access models, [Aspden and Katz, 1998; Clement and Shade, 2000; Poland, 2001; van Dijk and Hacker, 2003] offer the same possibility.
At a later stage it will be stated that the identified access barriers can be divided into two rough categories or groups according to their origin or causal factors. These two groups are: a) access barriers whose origins are in, or are caused by technical conditions and economic circumstances, more or less out of reach of the single citizen; and b) 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.

I will argue that the barriers in the first category are not the major problem in the endeavour towards the 'information society for all'. Of course they cannot be ignored, as they must also be dealt with while they obstruct the possibilities of using the technology. This statement is based on my firm conviction that the knowledge and skills are available today to remove these access barriers; it is merely a question of money, political ambition and will. The real 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 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 live our lives, or our form of life, life cycle and life style to use the notions suggested by Selg [2002]. Barber [2001] states "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."

In the Swedish Government's bill 1999/2000:86 three prioritised areas are highlighted as to where the efforts should lie in order to create the information society for all, according to the suggested direction for the Swedish IT politics. These areas are the confidence in IT, the competence to use IT and the accessibility to the services in the information society. When the identified hindrances experienced by Swedish citizens are investigated in this study, it becomes apparent 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 their interpretation is widened. An obvious lack of confidence exists 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 on 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 in which we live. Newspapers, radio and television are all very strong influences in our trust or distrust of IT. However, in the same way that the 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 fantastic qualities associated with particular applications. 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. giving the number of your bank card or credit card over 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. Besides the mistrust in the technological artefacts, the applications and the eventual unwanted consequences usage 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 area where confidence problems are experienced involves 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 risks associated with the use of the Internet. These feelings were not related to their own use, but to their 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.

Often public access points, in e.g. libraries, and access points at workplaces or at schools are used as an argument for the possibility for everyone 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 as to 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 available for comfortable use, and there are also restrictions in 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.

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 an unfairly treated group in this context, but according to a new report from the European Union "the elderly are crossing the digital divide" [2005a]. 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.

I will also draw a similar conclusion to that of 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. However, the use of driving forces should not be neglected. It is not possible to overcome a number of the access barriers identified simply by means of increased driving forces. This includes the worry that many parents felt for their children and the deficient design expressed by some users will not be decreased 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.

4. Conclusions

"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 the paper it is time to reflect upon what has been completed, how it is done, and, last but not least, has it any uses 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. This should involve the design of a tool which facilitates and supports the categorisation and communication of these barriers. I feel that I have fulfilled this purpose and the result is the User Centred Access Model. I suggest that this paper's contribution to the research field is the 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 assistance of this model, we could increase the understanding associated with these problems, which in turn could improve the design and implementation processes in such a way that it counts as 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 of designing and testing the possibility of using the UCAM as a tool to categorise the hindrances experienced by the users. It is highly probable that all of the access barriers identified here have already been pointed out in previous studies. However, 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.

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 in this case was not a crucial factor 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 of the work was to identify experienced access barriers, and to use them for the design of the UCAM, and I state that this has been satisfied.

The studies also display heterogeneity among the citizens concerning these relations, which reinforces the importance of taking these questions into consideration. Compromises are necessary, but these must be made in ways that are suitable and as acceptable as possible for the great majority of people. This merely confirms the necessity of communicating and tackling access problems. Another

factor that must be taken into consideration is the possible extension of the result. I claim that the UCAM is general and usable all over the World, now and in the future. The access barriers experienced for different geographical areas will vary based on their occurrence and, in addition, the emphasis will be dependent on different hindrances e.g. the infrastructure, the social and cultural conditions, and the standard of living to mention but a few. According to the generality over time there will hopefully be changes in the occurrence and emphasis placed on the experienced hindrances, but the categories will remain.

The User Centred Access Model could be one possible means of dealing with access questions. The intention of the model is to provide a tool which increases understanding and to communicate information concerning the access barriers that limit the possibilities and will of the ordinary citizen to use the technology and its applications. Its strength lies primarily in its simplicity, which makes it usable not only by professionals but also by novices. 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.

A prayer for the Information Society?

"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)

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