PATTERNS OF IT DIFFUSION IN FINLAND: 1996-2002

JUHA NURMELA
MARJA-LIISA VIHERÄ

ABSTRACT

This article reviews national sample data on how far and how fast Finland has advanced in its use of information and communications technologies, which Statistics Finland has monitored with large representative surveys since 1996. New technology has become an integral part of most people's everyday life, with the exception of those of retirement age and small households in remote areas.

The results suggest that once people have begun to use the Internet (or mobile phones), their specific uses are quite similar to each other, regardless of whether the user is younger or older, employed, a student, entrepreneur or unemployed. It seems that there is no cause for concern about marginalization from information and communications technologies, at least as a phenomenon separate from other marginalization due to lack of income or low level of education. One question is whether the use of IT is becoming more diversified during this period that has seen the fastest growth and development of the information society. It is questionable to automatically interpret the non-use of certain information or communications media as a sign of marginalization, when it is unclear from what are people being marginalized?

_____
Juha Nurmela (Ph.D., Helsinki University) is a Head of Research of Survey Research Unit in Statistics Finland, where he studies the use of information and communication technology. juha.nurmela@stat,fi, phone +358 9 1734 2548

Marja-Liisa Viherä (Ph.D., Turku School of Economics and Business Administration) is Director of Research of Teliasonera (the biggest teleoperator in Finland), and she has studied communication and interaction since 1980's marja-liisa.vihera@teliasonera.com, phone +358 40 501 581

The new information and communications technologies change first and foremost our possibilities to communicate. Of course, new PCs do classification, calculation and so on much more effectively than before, but digitization means easier data transmission, so people can use new digital channels for contacting each other. Earlier Finnish studies of the information society (Viherä 1999; Nurmela & Viherä 2001; Nurmela 2001) have analyzed the basic dimensions of communication capabilities with the help of the three basic concepts of access, competence and motivation shown in Figure 1.

Irrespective of the technology, communication capabilities are the basic dimensions of interaction, upon which each new device and system brings its own addition and makes its own demands. This means that media diversity, reflected in the number of communication modes, keeps growing and new hybrids are born from them continuously. An ever-growing number of users combine different communication modes in their networks of interaction. Viherä (1999) shows that the factors underlying the motivation in Figure 1 are the basic needs of existence of doing, being organized and belonging, as shown in Figure 2.

Human needs and, thereby, motivation for activity must be studied in several ways. These needs refer to such basic necessities without which an individual would suffer. Individuals not only suffer from poor housing conditions and poverty, but also from lack of love and recognition (Allardt 1998). The motivation for communication is here viewed from a non-hierarchical perspective, with consideration of the basic needs of human existence as presented by Turunen (1988 p.193), who recognised three human existential needs: to be organized, to belong and to do. The existential needs are inner needs that have substantial personal importance. These needs structure the human personality and influence the way individuals relate to the external conditions of their lives.

Becoming organized happens through thinking, belonging is realized through emotions, and doing is an actual physiological necessity and, thus, in a sense an end in itself. *All these basic existential needs grow and develop in interaction with others.* Therefore, they are vital motivators for communication capabilities.

1) *The need to be organized* is satisfied by the development of thinking through discussion and by the acquisition of knowledge together with others irrespective of time and place. Becoming organized is essentially an interactive process.

2) *The need to belong* is satisfied by emotions when an individual bonds with his or her physical and spiritual surroundings and with other individuals. In the information society an individual may also seek to bond virtually and with virtual realities. Interaction is an important intermediary in the fulfilling of the need to belong. An individual is inclined to choose as his or her basic mission a certain way of life, hobby or type of work, which
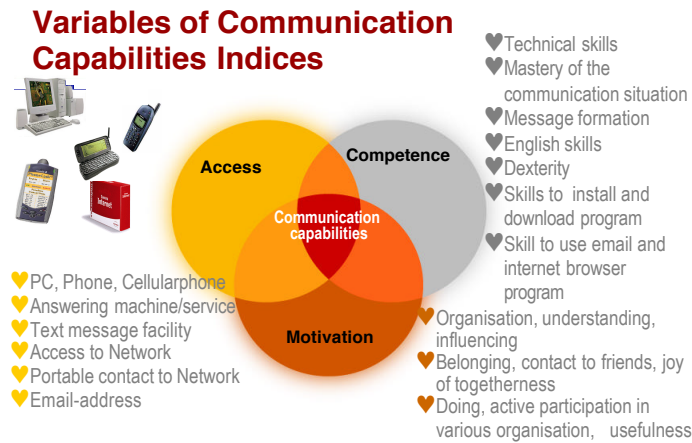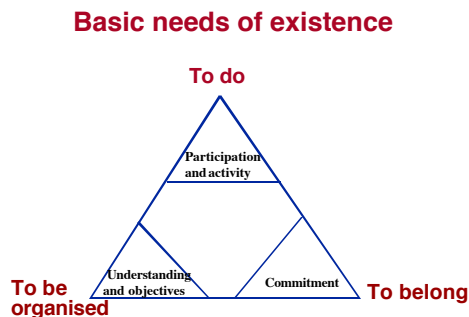
FIGURE 1 : COMMUNICATION CAPABILITIES

Variables of Communication Capabilities Indices

♥Technical skills
♥Mastery of the communication situation
♥Message formation
♥English skills
♥Dexterity
♥Skills to install and download program
♥Skill to use email and internet browser program

Access

Competence

Communication capabilities

Motivation

♥PC, Phone, Cellularphone
♥Answering machine/service
♥Text message facility
♥Access to Network
♥Portable contact to Network
♥Email-address

♥Organisation, understanding, influencing
♥Belonging, contact to friends, joy of togetherness
♥Doing, active participation in various organisation, usefulness

FIGURE 2 BASIC NEEDS OF EXISTENCE

Basic needs of existence

To do

Participation and activity

Understanding and objectives

Commitment

To be organised

To belong

will form the heart of his or her identity. Finding or establishing this basic mission is a deep existential need.

3) The narrow core of the *need to do* can be described as the basic mission adopted by an individual (Turunen 1988 p. 204). An individual needs a role and the respective position this gives in life. The role is formed in a community and the community produces the role for an individual. The role sets the frame for doing.

Over the past decade, information and communication technology (IT) has developed quickly, which has meant that former communication skills have become inadequate. In a situation like this, social communication can involve three main problems from the lack of requisite: a) access, b) competence or c) motivation, as shown in Figure 3.

Figure 3 also highlights how, at the early stage of diffusion of IT innovations, the early adopters end up in a situation where they are only able to use the older modes for communicating with most of their social networks. When the majority already use new communication devices, the so-called late adopters can easily be left out of the interaction for the reasons

FIGURE 3 : POSSIBLE PROBLEMS WITH SOCIAL COMMUNICATION
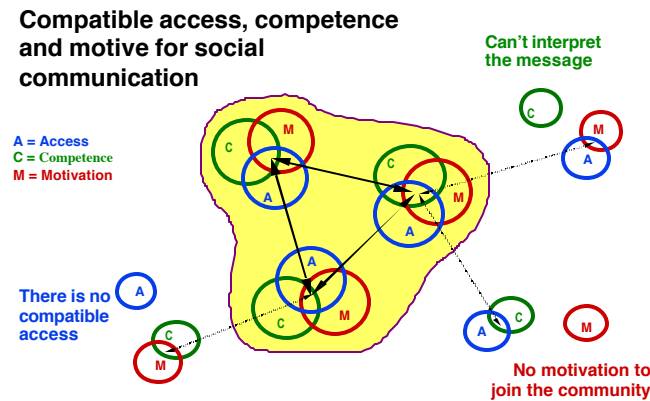
suggested by Figure 3. Whether someone becomes excluded is dependent both on the late adopters' own motivation to start using new devices and on the willingness of the others within the social network to continue to use the old communication channels.

Media diversity and digital divide have to be understood in an analytical study more broadly than just as computer and Internet use. Media diversity also provides good opportunities for becoming active via the Internet. The standard interpretation of digital divide is largely based on push factors, that is, producers and marketers tend to define the Internet system from their own points of departure rather than those of the interests of the users. Rifkin (2001) has described the effects of "push" factors, but the perspective of digital equality (Heinonen et al. 2003) can be used as an alternative starting point. The growth of media diversity means that new channels compete for people's time. Internet surfing needs time, which is taken from other hobbies or tasks. This viewpoint is necessary if one tries to understand digital exclusion or digital divide within a larger framework.

In 1999 and 2002 people who used their PC for more than five hours a week were asked how the time they spent in front of the screen had affected their other time use. Most said that they watched less television. Almost the same proportion said that they spent less time "just lounging around". In the youngest age groups, about one-third thought that they slept less and read less. Less than 10 per cent said they spent less time with friends. Since the activities affected by PC use are not particularly active or social, from this point of view there is no great risk that people's social contacts will suffer on account of frequent PC and Internet use. (Nurmela & Ylitalo 2003 p. 40)

The question here is whether the new information and communication technologies will change the operative structure of the whole society, as the motor car did in the past. What kinds of irreversible changes are taking place or emerging? The aspect that is particularly interesting with regard to information and communication technology is interaction, because the feedback mechanisms of the communication systems are much stronger than those of many past innovations. The actors and structures mould each other in real time (Pantzar 2000, 2002).

Different channels are substitutes for each other. One person reads a newspaper, listens to the radio or watches the TV to learn about news and information about new goods, while another surfs the Internet for the same reasons. In the same way, the mobile phone and SMS may substitute for email, postal letters or face-to-face conversation (Nurmela & Ylitalo 2003, p. 32-33). For this reason, mere consideration of the PC and Internet is insufficient, since the mobile phone has an essential role in the study of interactive communication. Besides, the computer, Internet and mobile phone will soon begin to merge.

SURVEY METHODS

The research results presented in this article are based on extensive random samples of Finnish respondents using computer-assisted personal face-to-face and telephone interviews drawn from the Central Population Register. Finland and other Nordic countries are among the few countries with a reliable register covering the entire population. The household samples have included at least 1,500 respondents and the personal samples at least 2,000 respondents, with response rates ranging between 65 and 75 per cent. The samples based on registers have been weighted by sex, age and region to population figures.

Problems in comparing information societies: International comparisons would be much easier to accomplish, if they used harmonized concepts and research designs. In the statistical world several organizations are now working to promote this goal, including the UN, the OECD and Eurostat. It is rare that statistical inquiries addressing national needs are directly comparable to those conducted in other countries, in spite of their apparent similarities. Many commercial research organizations also use the same concepts to collect information in different countries, but serious questions arise over the comparability of this information with official sources. (Nurmela, Parjo & Ylitalo 2002)

For example, Finland was regarded as some kind of IT wonderland with high mobile phone and Internet penetration rates, but the statistics available at the time also lent themselves to biased interpretations. The most widespread of the false images suggested that the number of Internet connections in Finland or USA was extraordinarily high. Indeed, when one looks at the per capita number of PCs connected to the Internet, this figure is still higher than in other countries in the world – but this says nothing about the actual use of the Internet, because the statistics are based upon registered ip addresses. This indicator does not provide a true reflection of the extent of Internet access.

Similar problems are encountered in comparisons of the penetration of telephones. For fixed lines the accuracy of the figures collected is reasonably good, but statistics on the number of mobile phones are not entirely accurate, at least in all countries. In particular, statistics on prepaid subscriptions may include 'dead subscriptions' as users switch to a different operator or purchase a new prepaid simcard. In Finland, prepaid

subscriptions account for only a minor proportion of all mobile phone subscriptions, but for instance in Italy, they represent at least 60 per cent of the total.

Surveys conducted in different countries are aimed at different target groups, and the age of the respondents may vary from children over 3 or over 15 to people aged 64 or 74; sometimes there are no age limits. In addition, the surveys may be concerned with consumer behavior during periods extending from two weeks to three months, or the past calendar year, or the last 12 months. Sometimes data are collected for an average month, or 'recently' or 'in general'.

In some cases the results reported are based on inquiries among individuals, in others among households. Since the sizes and structures of households vary widely from country to country, the results of both individual and household surveys may obviously vary quite considerably. It is an entirely different matter whether 50 per cent of households have access to the Internet, or whether 50 per cent of persons aged 15-74 have Internet access from home. Some surveys are concerned with the use of the Internet from home, others are interested in all uses, including from school, the workplace or a public library. Comparability is also reduced by differences in methods of data collection: it is important to exercise caution in comparing the results from postal questionnaires, personal face-to-face interviews and telephone interviews. Furthermore, it should also be possible to weigh the impacts of representative samples drawn from population registers with those based upon quota sampling.

Therefore, one should be careful when making comparisons between different countries. It is advisable to first study descriptions concerning the sampling and data collection methods. Generally, the data provided by national statistical institutes is of good quality, with OECD statistics being the most reliable source of data for international comparisons. (OECD 2001, 2002)

Penetration of PC and the Internet in private households in different countries: In many countries the majority of households have a PC, yet there is only a handful of countries where even half of all households have access to the Internet from home (Figure 4). In some countries the number of Internet connections has been growing very rapidly, but in Finland there has been only slow growth since 2001. The highest figure was recorded for Denmark, but even there the figure was below 60 per cent. The United States and Canada lag some 10 percentage points behind Denmark. Finland ranks in the middle, just ahead of New Zealand and Switzerland. In the United States and Canada only one in ten PCs in private households are not connected to the Internet. In Finland the corresponding proportion is one in four, in Germany one in two and in Belgium two in three.

It seems that household size has a bearing on having a PC at home in different parts of the industrialized world. In the United States 30 per cent of one person households had a PC at home in 2000, while in 2-4 person households the figure was 58 per cent and in 5+ person households 63 per

FIGURE 4: HOUSEHOLDS WITH ACCESS TO THE INTERNET AS A PERCENTAGE OF ALL HOUSEHOLDS IN SELECTED COUNTRIES IN 2000 OR 2001
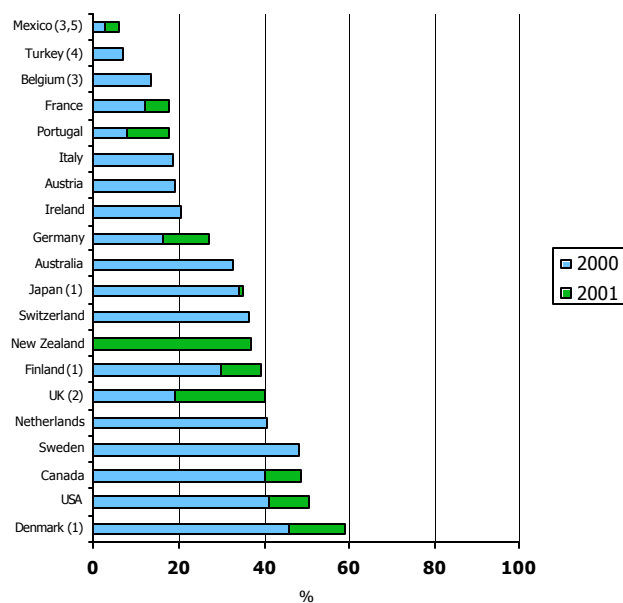
1. Beginning of 2002.
2. March 2001- April 2002 instead of 2001.
3. 1999 instead of 2000.
4. Households in urban areas only.
5. 1999, households in urban areas
 with more than 15,000 inhabitants only.
* Internet access via any device except for Denmark,
the Netherlands, Ireland, Austria, France and Turkey
 where Internet access is via a home computer.

cent. (U.S. Census Bureau http://www.census.gov/population/pop-profile/2000/chap10.pdf). The figures for France and Finland reveal a similar pattern: the bigger the household, the more likely it is they have a PC in the home. The result is the same when one looks at households with and without children. In all (western) countries a PC and an Internet connection are more common in households that have children than they are in those where there are no children.

INTERNET USE IN FINLAND AND THE REST OF EUROPE

Multinational data on Internet use in the population aged 15 or over were collected in December 2001 in the so-called Flash Eurobarometer, an instrument used by the European Commission for its instant research needs. In this case the target population was asked whether they use the Internet, anywhere and generally speaking, without any specific time frame. About 48 per cent of the EU population aged 15 or over said they used the Internet. Nordic EU Member States, as well as Iceland and Norway, recorded figures clearly above the EU average, while the figures for southern Member States remained below the average. The figure for Finland, about 64 per cent, is at more or less the same level as indicated by the data collected by Statistics

Finland in November 2001, according to which 59 per cent of the population aged 15-74 had used the Internet during the past three months. Irrespective of who commissioned or conducted the survey, and irrespective of the age groups or time frames used, Finland invariably ranks among the countries with the highest Internet usage figures.

THE INCREASING USE OF HOUSEHOLD IT IN FINLAND

Figure 5 illustrates long-term trends in IT use in comparison to other traditional household appliances. The curves show that the increase in the number of home PCs and Internet connections has not accelerated to any significant extent, although the proportion of home PCs with Internet access is growing somewhat faster than the total number of home PCs. (As far as mobile phones are concerned, less than 10 per cent of all households have decided to make do without one, and more than 30 per cent of households only have a mobile phone).

Figure 6 describes the increasing penetration rates from left to right. In all size categories the proportion of households that have acquired a PC and Internet connection has increased, but in most cases the growth rate has clearly slowed. In 2002 the share of two-person households that acquired a PC and Internet connection grew somewhat faster than for other households. The differences between family households of different sizes are less pronounced than previously: even in three-person households the standard of equipment is approximately at the level of larger households. This is explained not only by purchases of new equipment, but also by children leaving many households that formerly had four or five members. When the last child moves out, one gets a new two-person household with or without a PC.

From the outset one of the underlying assumptions of this Finnish research project has been that the stage in the household's life cycle has a major impact on IT adoption. One-person households examined in Figure 7 are feared to be at serious risk of being marginalized from the information society. There have been two outstanding trends in development in the diffusion of home PCs since 1996. First, women aged under 40 and living alone have purchased large numbers of home PCs; the difference compared to men remains significant only in the youngest and oldest age groups. It seems that age is still a factor in the acquisition of home PCs, but its influence has shifted to older age groups.

Internet access from home is regarded as one of the most important indicators of information society development. In this regard, together with the penetration of home PC, it produces some quite interesting findings. In the Spring of 2002, the number of PCs connected to the Internet was not highest of all in one-person households of young men, while in 1996 they recorded by far the highest frequency of connections. Women aged 30-39 and living alone had access to the Internet more often than men under 30. In all, the increase in Internet connections was faster among female than male one-person households. These results draw attention to the motives for taking out an Internet subscription.

FIGURE 5: THE PENETRATION OF CERTAIN HOUSEHOLD APPLIANCES UNTIL AUGUST 2002, PER CENT (AT LEAST ONE APPLIANCE)
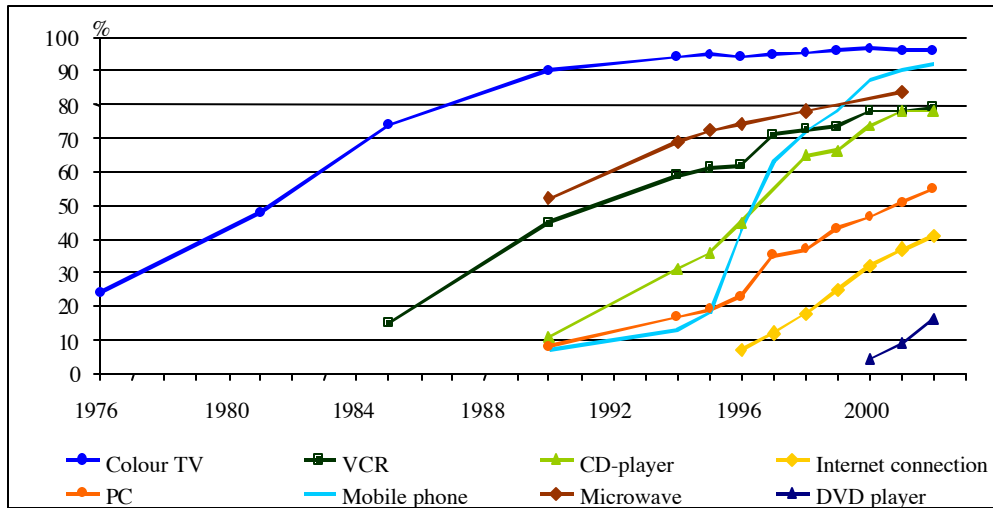

FIGURE 6: HOUSEHOLDS WITH A PC, CD-ROM DRIVE OR INTERNET CONNECTION, (PERCENT BY HOUSEHOLD SIZE -- IN AUTUMN 1996, 1999, 2001 AND 2002, HAVING AT LEAST ONE APPLIANCE)
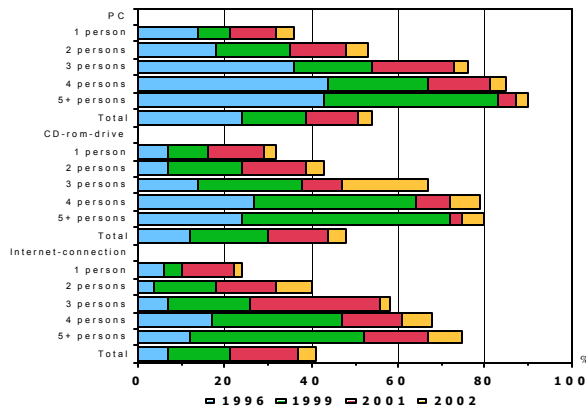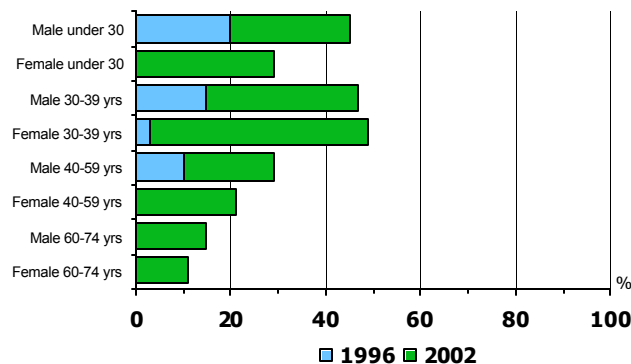

FIGURE 7: ONE-PERSON HOUSEHOLDS WITH INTERNET ACCESS AT HOME, (PER CENT BY TYPE OF HOUSEHOLD AND GENDER IN AUTUMN 1996 AND SPRING 2002)

Income level is often claimed to have a significant influence on household IT acquisition. A simple way of analyzing the aggregate significance of income level and household size is to use the size of a household and its income decile, based on consumption units (disposable income) as predictors. This is probably the most reliable, yet rarely used, way of examining the aggregate influence of household size and economic resources on the acquisition of a PC, Internet connection or mobile phone – as is done in Table 1.

Table 1 shows no linear influence in one-person households, since there seem to be more computers and Internet connections in households in the two lowest income deciles than in higher-income deciles. There is a linear increase in the frequency of appliances only in households within the three highest income deciles. The situation seems to be similar with two-person households. Improvement of the income level fosters the acquisition of appliances clearly more apparently in three-or-more person households than in households of a smaller size. Family households demonstrate a kind of penetration that appears to occur stepwise.

The clearly lower PC and Internet penetration among the highest income deciles of one-person and two-person households compared with households of larger size indicates that decisions about IT acquisition are made on the grounds of motivation rather than money. The reason why small households may be less eager to acquire these appliances is not necessarily their unwillingness to do so -- but because they may weigh carefully the benefits for a small household, especially one with only a couple of members. (The high penetration of the mobile phone clearly indicates that a device that can facilitate personal communication will become popular regardless of the income level of its buyer).

The results from earlier research indicate that two-person households differ markedly from one-person households in terms of the IT equipment they own, and that they are beginning to approximate the standard of equipment seen in family households. Youngest couples do not have the largest number of Internet connections, and the number of Internet connections in two-person households was around 10 percentage points higher than in one-person households. In single-parent households, Internet penetration is only slightly lower than in two-person households in the age bracket of under 50, but is clearly lower in family households.
This comparison of households of different sizes and at different stages of the family life cycle has shown that PC ownership and Internet access has grown most particularly among women. It seems that today's male and younger consumers are in fact less interested in getting online than are middle-aged women. The differences between family households remain minor. Looking at how the number of households that have purchased a PC and subscribed to the Internet has increased over the past six years, there are good grounds to argue that the concerns voiced about digital marginalization are probably unfounded, at least as far as hardware access is concerned.

TABLE 1: PENETRATION RATES OF HOME PC, HOME INTERNET AND MOBILE
PHONE BY HOUSEHOLD SIZE AND INCOME DECILES / CONSUMPTION UNIT IN 2001

Consumption unit	Personal Computer			Internet Connection			Mobile Phone		
	One person house-hold	Two person house-hold	Three or more person house-hold	One person house-hold	Two person house-hold	Three or more person house-hold	One person house-hold	Two person house-hold	Three or more person house-hold
0	31	35	50	12	15	28	66	83	97
1	27	25	57	17	14	34	52	75	96
2	12	34	72	5	15	49	48	72	96
3	11	43	71	4	28	51	47	84	97
4	13	35	77	5	23	56	49	80	99
5	14	40	75	4	25	53	57	93	98
6	23	46	91	5	28	75	73	88	99
7	34	42	88	17	29	75	85	95	99
8	42	66	86	28	47	78	88	95	98
9	52	73	93	38	63	84	85	95	98
Total	26	47	75	13	32	57	64	87	98

Source: Household budget survey 2001, Statistics Finland

Consumption units have been calculated by giving the value 1.0 to the
first adult, the value 0.7 to any additional adult (older than 16), and
the value 0.5 to each child in a household.

Why Finnish households have not gone online: The Spring 2002
interview also asked about why those households that did not have Internet
access had decided not to go online. The majority of the small households in
this category did not even have a PC. First of all, among young people who
lived alone, access to the Internet somewhere else was a major factor in the
decision not to take out a subscription at home.

In many households the perception of the Internet as uninteresting or
useless also significantly affected their motivation to get Internet access. It
seems that this was a major decision factor especially in small middle-aged
and elderly households. High cost was cited as a major decision factor only
among young people living alone, although it also figured to some extent in
the decisions of young couples and families with children. Setting up an
Internet connection was not in itself considered difficult, although a small
number of respondents in the oldest age group did refer to this as an
obstacle.

To what extent have various IT innovations made their breakthrough
in Finland, and to what extent are they now in regular everyday use? The
analysis begins with an overview of the past trends in development from
1996 through to 2002, and it then moves to look at the extent to which the
services are used today.

Internet use has grown almost as rapidly as the use of mobile phones.
In particular, the number of women Internet users has shown quite
phenomenal growth. Although part of this is no doubt explained by use at

work, women's increased interest in home use is certainly a major factor here. In the youngest year of birth cohorts virtually all people used the Internet. As in other aspects of technology, men born before 1942 were clearly more active than women in terms of Internet use. In all other age groups women showed the same level of interest as men.

In 2000 Finnish people used the computer more often the more extensive their basic education. However, there appears to be no correlation with basic education among people aged under 25, whereas people aged over 25 show quite marked differences in this respect. People aged 45 to 55 and with tertiary level of education used the computer twice as much as people in the same age group with a comprehensive or secondary level of education. With people aged over 54 that difference was three-fold. This is not a surprising finding, since education explains occupational tasks and thereby the use of information technology. Upper-level salaried employees and students are the most frequent (96+%) computer users, while 85 per cent of lower-level salaried employees and 54 per cent of wage earners used the computer. Nearly half of self-employed persons in agriculture and 70 per cent of other self-employed persons used the computer. Occupational tasks seem to have a noteworthy influence on the use of information and communication technologies, at least in Finland. (Tilastokeskus. Koulutus 2002, p. 73)

Age, region and consumer uses of the Internet: Analysis of the extent of Internet use gives some idea of how integral a part all of this has become in users' everyday life. There have been no major differences between men and women. In the oldest age group there was still very little regular Internet use, and the majority of regular users were men. Women probably have more access to a PC and the Internet at their workplace. Likewise, the fact that a larger proportion of students are women than men probably contributes to the higher rates of use among women. The regional differences are greater in Internet use than in PC use. In all age groups the metropolitan Helsinki region is ahead of other regions. In other regions the differences by degree of urbanization begin to show in the 30-39 age group and then increase steadily with age.

Information searches on products and services has become surprisingly widespread in all age groups and in all regions. Within the broad age range of 20-49 years, this has indeed become a routine for the vast majority: clearly online information provided on consumer goods is useful to both the producers and the shops selling the goods. Roughly one in four of the people who have searched for information on the Web have actually purchased goods online as well. The number of consumers who have shopped online during the past three months is not very high in absolute terms, but if the numbers were compared to the range of products available, the picture would probably be quite different. The Net Commerce Survey indicated that many people who used to shop from mail order catalogues or by phone are now buying over the Internet. In several age groups online shopping has been most common in sparsely populated rural areas.

If people had access to the Internet, their uses were very similar regardless of whether they were employed, unemployed, studying or entrepreneurs. The only group recording lower activity were pensioners, but the difference was not very great. The time use and the nature of activities among pensioners also differ in many other ways from people of working age; pensioners generally tend to be less active.

ATTITUDES TOWARD THE INFORMATION SOCIETY

Since people's attitudes may influence whether they use IT or not, this survey asked two questions to provide useful insights into feelings of "digital exclusion" (Nurmela & Ylitalo 2003). The first was *"I feel completely overwhelmed by the advance of new information technology."* These experiences of exclusion decreased towards the end of the 1990s, but no longer at the beginning of the 2000s, when the positive sense that one could cope with information technology was no longer stronger in the age group over 30 -- although it did continue to strengthen among younger age groups. Among ages 10-30, the fraction who fully agreed with the statement was no more than 3 per cent, among those over 30 the figure was 22 per cent, so few people had a strong sense of being left out. Throughout the period under review the sense of exclusion has been lowest among men aged 10-30.

The sense of being left behind or overwhelmed by the advance of new technology was clearly strongest among people of retirement age. After retirement the role of IT use changes quite significantly when compared to the workplace uses. People who are retired may use information technology for purposes of social interaction, for running errands, for shopping or for leisure activities. These provide ample options and opportunities, so there should be little concern, even if pensioners do feel somewhat left out. In the age bracket 35-59 the sense of being overwhelmed by the advance of information technology may present an obstacle to learning and using information technology. It might well be justified to provide nonusers in this age bracket instruction to help them cross the hurdle, even though PCs or the Internet and email are certainly not needed in all jobs.

Another factor that should impact the future development of the information society is the media preference people have to run their daily errands -- over the counter, by phone, by mail or by e-mail and Internet. This is monitored by respondents' acceptance of the statement, *"I prefer to run my errands by phone rather than by mail or computer".*

In this comparison, the telephone remains people's firm favorite. Although this preference has shown some signs of weakening over the past six years, four in five people in Finland still prefer using the phone rather than the Internet or letters to run their errands. Clearly, the immediate contact provided by the telephone is considered useful. The proportion of those who are willing to use other media apart from the phone for purposes of running their errands has consistently been highest among women under 30. Their share had increased significantly during the period from 1999 to 2002.

Young people under 30 living in rural and sparsely populated rural areas disagreed with the statement far less often than their age peers living in other areas. In the middle-aged group, the numbers who were eager to use non-phone media declined from town centers towards more sparsely populated areas. In the age groups over 55 there were no regional differences. Internet use clearly increased people's willingness to use other media at the expense of the phone, but still the proportion of those who disagree with the statement was low.

The difference was particularly clear in the youngest age groups, but even among the middle-aged a larger proportion of women than men were willing to use the Internet to run errands. The gender difference was also systematic when studied by five-year age groups. One possible explanation for the greater willingness of women than men to run their errands by non-phone means may have to do with their experience gained at the workplace with the Internet, or with the fact that women probably are more pressed for time in their everyday than men. The Internet and email have the great advantage that women can run their errands whenever they can find the time to spare, regardless of the time of day. It is also possible that women are more shy than men in communication, and they therefore prefer to use other media than the telephone to run their errands. On the other hand, men may be more used to delegating and therefore will more readily pick up the phone to get things moving, rather than attend to the matter themselves.

So, as far as digital exclusion is concerned, there is good reason to suppose that the high willingness to run errands by phone or over the counter might be a mental obstacle for using digital means. From the point of equal communication, talking face-to-face or over the phone are much more interactive than email or Internet. In a real time conversation the power structure is much more equal than in the non-real time interaction using email or the like. For digital interaction, one can use the descriptive term, "diplomatic exchange". If e-government means more digital diplomatic exchange, authorities must possess high self-discipline so as not to misuse their position.

CONCLUSION

Overall the majority of people in Finland have embraced IT within a very short space of time, with many new users being recruited even from older age groups. New technology has become an integral part of most people's everyday life, with the exception of those of retirement age. Small households in remote areas also still have quite limited access to PCs and the Internet.

The results suggest that once people have begun to use the Internet (or mobile phones), their specific uses are quite similar, regardless of whether the user is younger or older, employed, a student, entrepreneur or unemployed. It seems that there is no cause for concern about marginalization from information and communications technologies, at least as a phenomenon separate from other marginalization due to lack of income or low level of education. What concerns public services in a democratic

welfare society must be served through many channels, over the counter, by phone, by mail or by e-mail and Internet. (As yet, there is little reason to talk about digital divide in the public sector, because even Swedish-speaking people in Finland can use their native language to communicate with the public sector. In the same way people without access, skills or motivation to get online should have the right to run their errands over the counter, by phone or by mail).

Now that the large majority of people in Finland are active IT users, it is interesting to see what kinds of widespread applications the extensive everyday use of these technologies will generate. Will one see new successful charged services? One of the first serious candidates is represented by positioning services in mobile phones and other portable equipment. Equally, once a workable system has been created on the Internet for collecting small charges, the supply of expert information is bound to increase rapidly, and the content producers that are already online may try to fund their operations from sources other than advertising revenue. (Castells & Himanen 2002)

Alternatively, one might see large numbers of users creating completely new types of content with the new equipment. In any event this period after the great migration to the information society will show whether Castells (2002) was right in predicting that IT would become an integral part of the infrastructure of modern society, a universal facilitator comparable to electricity. At least so far the trends seem to lend strong support to this assumption.

REFERENCES

Allardt, E. 1998. Hyvinvointitutkimus ja Elämänpolitiikka. In Roos, J-P & Hoikkala, T. (eds.) *Elämänpolitiikka toi.* Gaudeamus, Tampere

Castells, M. 2002. T*he Internet Galaxy: Reflections on the Internet, Business and Society.* Oxford University Press

Castells, M., Himanen, P., 2002. *The Information Society and the Welfare State: The Finnish Model.* Oxford University Press

Flash Eurobarometer, n:o 112 Internet and the General Public. http://europa.eu.int/comm/public_opinion/archives/flash_arch.htm

Heinonen, S., Hietanen, O., Manninen, J., Suvinen, N., and Viherä, M-L. *Digitaalinen Tasapaino ja Viestinnän Siltapalvelut, Tulevaisuuden tutkimuksen keskus,* due out September 2003.

Nurmela J., 2000 *Digital Discrimination* Foresight/ vol.02, no.02, Apr.00, Journal of Futures Studies, Strategic Thinking and Policy. Cambridge, UK p218-223

Nurmela, J., Ylitalo, M. 2003. *The Evolution of the Information Society; How Information Society Skills and Attitudes Have Changed in Finland in 1996-2002.* Reviews 2003/4. Statistics Finland. Helsinki

Nurmela, J., Parjo, L., Ylitalo, M. 2003. *A Great Migration to the Information Society. Patterns of IT Diffusion in Finland 1996-2002.* Reviews 2003/1. Statistics Finland. Helsinki

Nurmela, J. 2001. *Three Years of the Information Society. A Longitudinal Survey of the Use Made of Modern Information and Communications Technology in Finland*. Reviews 2001/4. Statistics Finland.

Nurmela, J., Heinonen, R., Ollila, P., Virtanen, V., 2000. *Mobile Phones and Computer as Part of Everyday Life in Finland.* Reviews 2000/5. Statistics Finland. Helsinki

Nurmela, J., Viherä, M-L., 2001. *CommunicationCapabilities An Intrinsic Determinant For Information Age (an article).* Futures 33(2001) p. 245-265

OECD 2001. *STI Scoreboard 2001.*

OECD 2002. *Information Technology Outlook 2002*.

OECD 2002. *Measuring the Information Economy 2002.* http://www.oecd.org/sti/measuring-infoeconomy

OECD 2002. *The Digital Divide: Diffusion and Use of IT's.* Pierre Montagnier, Elisabeth Muller, Graham Vickery. London, 2002. http://www.statistics.gov.uk/iaoslondon2002/default.asp

Pantzar, M. 2002. Homo Oeconomicus - Vihdoinkin Totta. In Uusitalo, L. (ed.) *Kuluttaja virtuaalimarkkinoilla.* Edita 2002.

Pantzar, M. 2000. Tuotegenetiikka ja Tavaraekologia. Kohti Tavaramaailman Orgaanista Kuvaa. In Lemola, T. (ed.) *Näkökulmia Teknologiaan.* Gaudeamus.

Rifkin, J. 2000: *The Age of Access: The New Culture of Hypercapitalism Where All of Life is a Paid-For Experience.*

SIBIS 2002. *General Population Survey* http://www.sibis-eu.org/sibis/

Tilastokeskus. Koulutus 2002:5 *Osallistuminen Aikuiskoulutukseen*, Aikuiskoulutustutkimus 2000 (Participation in Adult Education and Training in Finland. Adult Education Survey 2000) Statistics Finland. Helsinki

Turunen, K. E. 1988. *Ihmisen Kasvatus.* Ateena kustannus, Gummerrus Jyväskylä

U.S. Census Bureau http://www.census.gov/population/pop-profile/2000/chap10.pdf

Viherä, M-L. 1999. *Ihminen Tietoyhteiskunnassa - Kansalaisten Viestintävalmiudet Kansalaisyhteiskunnan Mahdollistajana* (English summary People an Information Society: The Citizens' Communication Skills and the Opening on New Propects for the Civil Society). Publication of the Turku School of Economics and Business Administration, Series A-1:1999