

# The Estonian Information Society Developments Since the 1990s

---

Author(s):

Pille Pruulmann-Vengerfeldt, University of Tartu, Institute of Journalism and Communication,  
pille.vengerfeldt@ut.ee

Tarmo Kalvet, PRAXIS Center for Policy Studies, tarmo@praxis.ee

Tallinn, 2008



**Leonardo da Vinci**



This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



# Content

---

Abstract .....	5
Introduction .....	6
Digital stratification and adoption process .....	7
Stages of Internet (and its services) adoption process .....	8
Internet user and non-user typology .....	9
Contact and perception of Internet .....	11
Skills as most important barrier to Internet use .....	12
Overcoming the barriers .....	14
Bibliography.....	17



# Abstract

---

Since the 1990s Estonia has made remarkable successes in information society development. The current article describes achievements in key fields and discusses the main factors that have made such developments possible. It asserts that the major factors that have affected as well as contributed to the evolution of information society in Estonia include the economic factors, active role of the public sector, technological competency, and socio-cultural factors. It is argued that telecommunications and banking sectors are the cornerstones of Estonian information society developments; they are also behind major initiatives dedicated to computer training and awareness raising. Activities of the public sector have been also crucial in providing favourable legislative environment, but also in launching infrastructural projects and in implementing innovative e-services. Public sector developments have been strongly influenced by some non-governmental organisations. ICT skills and R&D competencies, a lot of which is Soviet inheritance, have been also crucial.

**Keywords:**

Estonia, information society, economy, benchmarking

# Introduction

---

The objective of the Network for Teaching Information Society (NETIS, 2006-2008<sup>1</sup>) is to increase knowledge and competence of students on information society and also to broaden and deepen their understanding on the topic by introducing a course on information society in tertiary education institutions. According to the mission statement:

*Europe depends on competent and aware people to manage and progress the information society as it develops. NETIS aims to improve the skills and competences of students, teachers, researchers, experts and wider public by developing widely accessible, relevant, innovative and sustainable e-learning course on information society. Through a constructivist approach we use a modular course-design and take advantage of international synergies to produce adaptable, reliable content. By these means NETIS expects to increase the participants' awareness and reflections on the impact of information society on everyday life.*

This paper gives an overview of a research project commissioned by the Estonian Ministry of Economic Affairs and Communications which attempted to better understand the complexity of Internet usage practices with special emphasis on small-scale use and non-use.<sup>2</sup> Analysis focused on Internet users and non-users in order to understand the motivations that support and hinder Internet use and take-up. It is based on seven focus group interviews and analysis of quantitative studies.

---

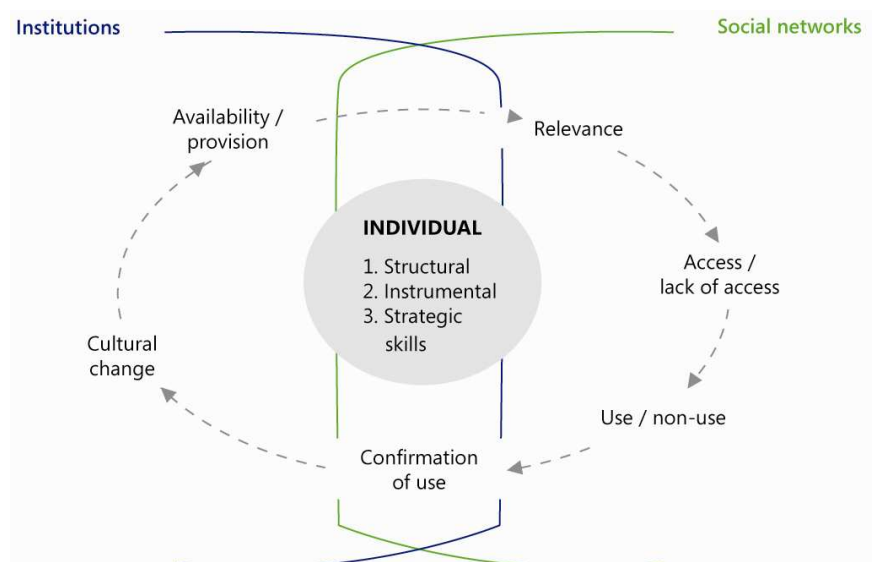
<sup>1</sup> See <http://www.itk.hu/netis/> for details.

<sup>2</sup> Authors are grateful for support from the Estonian Ministry of Economic Affairs and Communications; translation and editing of this English summary was supported from the NETIS project. For the full report see Pruulmann-Vengerfeldt and Kalvet (2008).

# Digital stratification and adoption process

The theoretical basis of the study is founded on the concept of digital stratification. This points to an approach where people are distinguished based on their ability and motivation to use various information and communication technologies (ICTs) and the level to which they can use these technologies to raise their everyday quality of life. All in all, it is important to understand that as the Internet adoption takes place in overall institutional and social context of society, work, friends etc, then the reasons and relevance of ICTs in individual's lives depends from variety of factors (see also Pruulmann-Vengerfeldt, 2006). 1st Figure gives an overview of the Internet adoption contexts distinguishing institutional and personal aspects of the adoptions processes. Individual in the centre of this scheme is guarded by its skill-set necessary to position him/her in the digital stratification ladder. Skills related to use of ICTs can be clustered in three 1) structural skills (the ability to understand online content); 2) instrumental skills (the ability to use technology); 3) strategic skills (the ability to understand the relevance of the technology).

1st Figure: Circle of adoption for Internet or Internet applications



Source: Authors adaption on Lievrouw, 2001

Adoption of ICTs and its various applications consist of six basic stages and although in the context of this paper those stages are presented linearly, the process in real life may not always be this straightforward. The cycle can easily be interrupted and not always each stage is clearly distinguishable. However, in the context of Internet users and non-users, it is important to understand that for the use of each new application one must pass these stages over again and sometimes even new design can force new adoption process. In case of simpler and more straightforward applications the adoption process may consist of one time use, so that person doesn't have to acknowledge the process at all, whereas it can be very complicated and long term process in other cases. Talv (2008) illustrates this with an example where adoption of new online banking environment has forced older users to newly adopt the whole online banking processes paralleled with "learning a new poem". As in 1st Figure, the adoption process has six important stages and they can be outlined as follows.

# Stages of Internet (and its services) adoption process

---

1) & 2) Availability and cultural change are situated in the institutional framework. Availability can be both technical (existence of Internet connected computers) or online content or services related. Cultural change emerges when enough people (or relatively influential people) enforce cultural change (e.g. understanding of “taken granted” existence of some service or application) and thus this change supports public understanding and perception of availability. Next stage is Relevance – whether people see Internet or service as relevant enough for them to seek access to it. Relevance needs not to be rational, or conscious, it can also be from outside pressure (e.g. social networks of relatives or co-workers). Overcoming motivational barrier happens thanks to the strategic skills. Therefore level of strategic skills indicates the ability to decide on relevance of each application for that person’s personal context.

After recognition of the relevance, next stage is seeking access. For instance, in Estonia, technically, everyone has access to Internet through Public Internet Access Points (AIP). Accessibility for a person is still dependent on many factors: e.g. a) is AIP open when suitable for me, b) do I know where they are, c) do I have access to it? Seeking access can also mean seeking access to services in the internet. This can be limited to people’s skills in finding appropriate information and is strongly related to public information available on that information.

If access is found, one needs to try using the service or information. Here instrumental and structural skills play important role as well as usability of the service and alternative costs. E.g. is learning worth the benefit I get from using the service online? How accessible and usable are other channels for this service or information?

If the use of the service is successful, this may lead to next stage which is confirmation of the use – although first use experience may be successful, this doesn’t necessarily mean that person will become long-time user, as not everything may be remembered or learned with first use. Many of the participants in the research told that despite the fact that through Look@World project (for detailed overview, see Ehandi, 2001 and Ehandi, 2002) provided them with initial use experience where they had once used particular information or application – they still didn’t remain users as the confirmation stage was not possible. They were not able to test their newly acquired skills in practice. Thus the sixth stage can lead to confirmation or also rejection of the use.

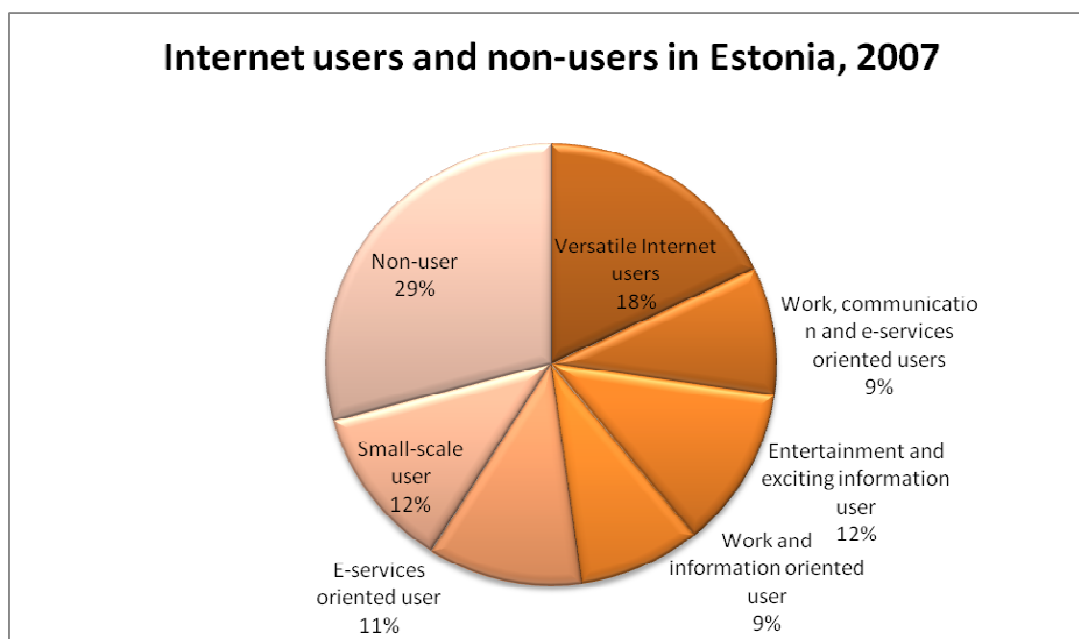
As mentioned before, cultural change can come from several people’s positive experience, but also from influential persons opinions or attitudes. E.g. positive or negative experience of an institutions leader can influence employees’ attitudes towards technologies.

It is important to understand that each new application (but also new look of an application) needs another adoption process. Although technically most services on the Internet are equally accessible to all, people’s understanding of their needs, skills, lifestyles and possibilities, user experiences and confirmations of them can differ a lot and thus also use of those services differs. This leads to differentiation of Internet user types.

# Internet user and non-user typology

In today's Estonia, it is difficult to find people who do not know what Internet is and who have no previous contacts with it. Based on the latest statistics, 70% of Estonians are using the Internet and 61% of them have used the internet in last 7 days. In general, one can distinguish 6 Internet user types which have shown relative consistency over the years and the types of practices are fairly similar over the years (Runnel, Pruulmann-Vengerfeldt, Reinsalu submitted). These six types can be seen on 2nd Figure.

2nd Figure: Internet users and non-users among Estonian speaking population in 2007 (N=803)



Source: University of Tartu, Institute of Journalism and Communication

1. Versatile user's Internet use is characterized by versatility and over average active participation on all listed activities. They are mostly aged between 18 and 44; and there are more people with higher income in this group.
2. Work, communication and e-services oriented users are relatively active Internet users and they feel that their usage is characterized mostly by communicating with friends and family, seeking information related to work, using e-services and seeking advice and help. Least characteristic are online participation and seeking exiting information. This pragmatic user type has 72% of women and one third of them are aged between 25-34.
3. Entertainment and exciting information oriented users feel that their usage is first and foremost characterized by seeking entertainment and exciting information. Information from state, Intranet and Internet services are the least likely activities to characterize their use. Mostly aged 18-34, makes this type characteristic to the younger population.
4. Work and information oriented user is positively characterized by use of Intranet, seeking information from state and work and study related information. They consider seeking using Internet services, Internet for practical information and reading online journalism also characteristic to their Internet use. At the same time seeking entertainment and participation in forums are significantly negatively associ-

ated to their Internet use. These Internet users are mostly aged between 35-64 and there are most people with higher education in this group. Their income is average or above average.

5. E-services oriented users feel that their Internet use is most clearly characterized by use of e-services like banking, tax office and other form-filling. They are fairly passive Internet users and they could be seen as single-application users (Pruulmann-Vengerfeldt and Kalvet, 2008). In Estonia mainly this application is e-banking. Seeking information from state and using job-search are marked slightly above average, but still can be considered characteristic. In comparison, participating in forums, seeking entertainment, and seeking advice and help can all be considered significantly less characteristic activities than average to this Internet user type. One third of Internet users in this type are aged 45-54 and nearly half of them have higher education.
6. Small-scale users are not characterized by any of the listed activities they are the most passive group. Of the listed activities, they feel most associated to the Internet services (banking, tax office and form-filling), but still on much smaller scale than other Internet users. This is the oldest user group, having nearly one fourth of them aged over 55.

The seventh type is Internet non-users – those who said that they have not used Internet or did not list any characteristic activities leaving all variables blank. The average Internet non-users is older, female, Russian, non-working or does manual labour, lives in rural areas. This corresponds to earlier findings of the Internet non-users on 2002, where they also were mostly “blue-collars” and “retired” group (Kalkun and Kalvet, 2002b). Based on theoretical materials, non-users can be outlined as four groups: 1) those who do not use and do not want to; 2) those who do not use, but want to start using; 3) those who have used before, and stopped using as a result of their own choice; and 4) those who have used before, but have stopped using as a result of outside factors (Wyatt, 1999).

# Contact and perception of Internet

---

The survey conducted in 2007 outlines the key reasons for non-use to be high price of computers and Internet and lack of skills. Less important is lack of motivation or interest. In the focus group interviews we investigated all those reasons further and found that in many cases the straight-forward explanations had more complicated relationships. Thus for example many of the people participating in our study did not know what computers cost and they were considered more expensive than they actually are.

In today's Estonia, it is very difficult to find people who have no contact neither with computers nor Internet; majority of the non-users have also experienced the benefits from the Internet. This indicates that in addition to the theoretical typology of non-users, we can also add another – those who don't use the Internet themselves, but benefit from others around them using it for their good. These people can be called as “soft experts” (Wyatt, 2001) and they are mediators of the knowledge from the Internet. Those experts mediate experience or are a good source of initial training.

Internet non-users are generally fairly well informed about the Internet. They relate Internet services to communication, information, news and banking. Computers connected to Internet are perceived as possibility to save time by providing operative information. In general the associations are positive, while the older generation still feels Internet to be as one of many media rather than having potential to replace other channels.

Some of the Internet non-users had also experienced benefits from the Internet through above-mentioned soft experts, they had tried applications like MSN and Skype for communication with members of family and/or friends and used online banking with assistance of other people. At the same time, they still considered themselves as non-users as the actual handling of the technology had been done by someone else. One of the best time-savers was considered to be transport information, many parents and grandparents also liked e-School even if they didn't have direct user experience.

Despite the common assumption that once household has internet connection, everyone living there will also use the Internet, many in our sample had Internet connections at home, but were still non-users as other family members occupied home computers. Thus the perception that “Computers are becoming personal things” is also acknowledged by non-users.

In addition to communication and information from the Internet, those who had just recently starting using the Internet, also mentioned services related to hobbies, health, learning, holidays and public sector. When compared to perceptions about Internet and knowledge of services and applications available, Internet non-users and small-scale users don't differ significantly from the small-scale users group. They are often single-service users using only banking or on a very small scale also news, weather reports or transport info. This indicates that the line between non-users and Internet users is very blurry and in time will become more mixed anyway.

If Internet is used on small scale, or is fairly recently adopted, then the use is mostly pragmatic, services and applications that help to save time and money are considered most important.

Of the other services considered interesting, many people mentioned applications that are already available. People are interested in health information, hobby information and they want to have good advice on family and relationship issues. However, they key resource people lack is searching skills.

# Skills as most important barrier to Internet use

Compared to previous studies (especially Kalkun and Kalvet, 2002a and Kalkun and Kalvet, 2002b), it appears that the importance of lack of access as a barrier prohibiting Internet use is diminishing. Although in surveys, it still comes out as number one reason for non-use, the interviews indicate that even behind access barrier there is actually a barrier of skills that hinders seeking access to Internet. One of the key changes between 2002 and 2007 studies (see 1st Table for more detailed comparison) is that the importance of motivational skills barrier is decreasing. When considering why is it important to work on Internet adoption issues, the key answer is that a lot of those who don't use the Internet today, would still like to become Internet users. The good general knowledge on Internet content can be seen as helping to support the adoption processes.

1st Table: Comparison on Motivation, Skills and Access barriers based on 2002 and 2007 studies.

<b>Motivation barrier</b>	
<b>Description of barrier in 2002<sup>3</sup></b>	<b>Change in 2007</b>
Internet is “not for me”, people can't relate Internet to their personal needs	Internet is considered to be necessary to be in the centre of life.
Existing media and communication channels can satisfy all the primary needs – communication, information and bureaucratic procedures.	Although both in 2002 and 2007 people were aware of the functionality of the Internet, in 2007 progress can be seen. Besides searching information and banking services, people have also acknowledged other applications: newspapers, transport info, communication (especially MSN and Skype).
Non-users have not considered why they don't use the Internet or they don't feel the need for it.	In 2007, people could identify several reasons why they didn't belong to Internet user group. They had well considered where and how they could use the Internet, but they had encountered barriers (esp. skills barrier).
Computer is only important for children for school work or for adults at work.	Importance of the Internet use is also extended to other areas of life and computer is seen as tool to change their lives for the better. Internet and computers are for “all who want and are interested and can”. One can also see somewhat more critical attitudes towards children's use of the Internet.
<b>Skills barrier</b>	
The lack of skills is seen as only third barrier (first mentioned lack of access, secondly lack of need) may also indicate to the logic of Estonians: first I need to have computer with Internet, then I need to have need and only then if I need, I will also learn.	Non-users considered skills barrier as most important, but skills were a barrier also for Internet users in extending their Internet use. General attitude was very positive and people expected more training opportunities both on professional and individual level.
Internet use is complicated by difficult user interfaces, including language issues, learn-	Same ideas were also confirmed in 2007; without possibility to confirm new knowledge

<sup>3</sup> Authors based on Kalkun and Kalvet, 2002a.

<p>ing skills in the elderly age and lack of practicing possibilities that also brings fear of ruining expensive technology or make other mistakes.</p> <p>Although people have learned computer skills, they are still uncertain. Without long-term practicing possibilities, the relationship with computers is very uncertain.</p>	<p>acquired in training courses, skills barrier will not be broken. Although younger generations bring elderly to computers, they can sometimes also become barriers of their use.</p> <p>Belittling attitudes towards learning ability of the elderly can often lead to “doing things for them” not “teaching them how to do things themselves” and thus hinders learning.</p>
<p>Strong social fears for learning in the groups or using Internet in public places: people are afraid of being left behind and appear incapable.</p>	<p>Same fears re-appeared in 2007. Good training and good teachers are those who have time for individual need and also time for repeating the activity.</p>
<p>The non-users are characterised by the fact that life-long learning is not appreciated, life is evaluated in the existing framework, strong hierarchies and need for order, somewhat less entrepreneurship and creativity, if barrier is encountered people will rather give up than try to find alternative solutions.</p>	<p>Life-long learning is less acknowledged among the elderly.</p>
<b>Access barrier</b>	
<p>Internet non-users would like to use Internet at home</p>	<p>This continues to be expectation of non-users and small-scale users.</p>
<p>Most if non-users can't got to Public Internet Access Point or they don't want to</p>	<p>Public Internet Access Points are considered for skilled users only.</p>
<p>Most important barriers are economical, that allow people to buy computers for their home.</p>	<p>Economic barrier is continuously important, especially among the lower and medium income groups and for elderly who live alone. At the same time, there is lack of understanding when it comes to the price of computer or Internet.</p> <p>Giving away old computers to financially less secured or giving computers to children and grandparents is becoming increasingly popular and expected.</p> <p>People also felt that they have no business to computer store, as they don't know what to answer to the computer salesman and they don't want to appear ignorant.</p>

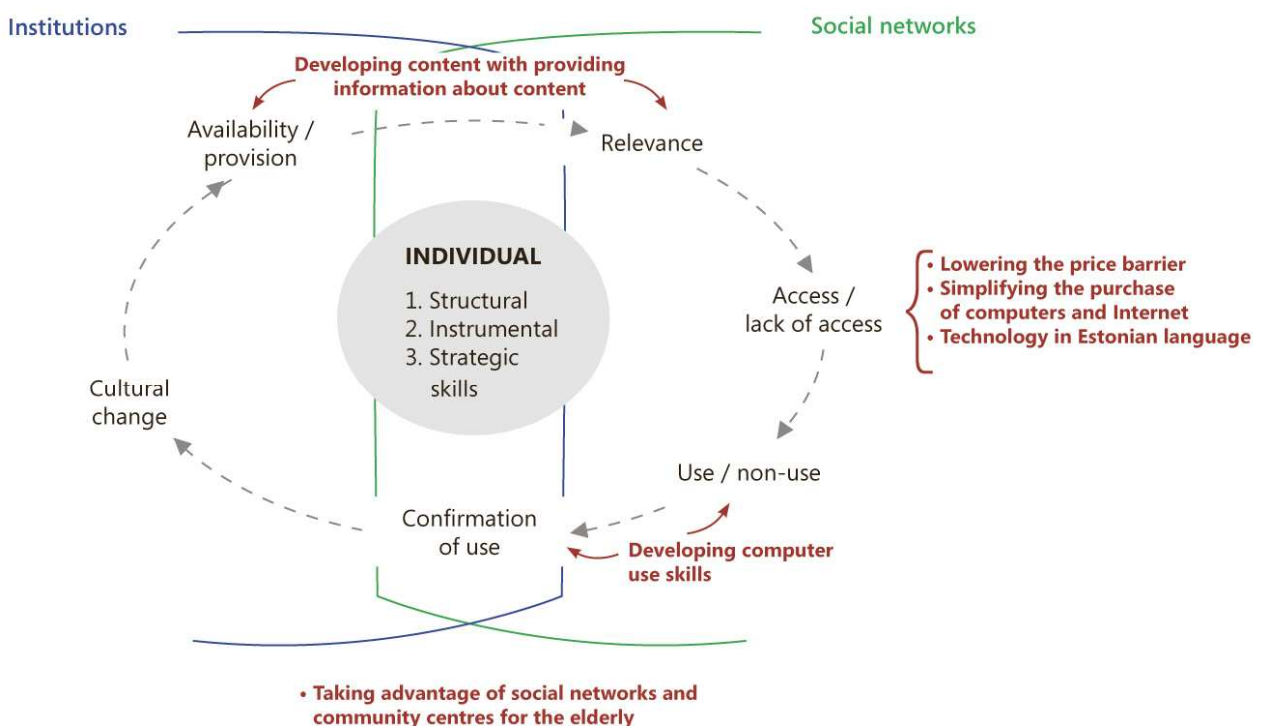
Although the large-scale internet training programme Look@World (Ehandi, 2002) can be seen having had at least some impression on Internet use and adoption, the training programme was still considered to be too short, too fast moving and most importantly not enough user-centred. Searching skills are important key factors that support continuous learning by the user him/herself and are vital in extending one's user practices and adoption of new services.

# Overcoming the barriers

In general Internet access barriers as been in the focus of many policy measures, but today we can say that by using existing strategies e.g. extending the network of Public Internet Access Points will not solve the access issue. Analysis shows that best way to take people to using the Internet is to provide them training that also supports confirmation of the use at home or in small groups of like-minded people. The high purchase costs are mostly for people in the low-income brackets and those are re-affirmed by the fact that they have no knowledge of the appropriate cost of the Internet connected computers. As shopping for computer is considered “a job for an expert” and IT salesmen are seen to be asking many “difficult” questions, then often people are not ready to take the first step to buy a computer even if they can afford it.

The reason why it is important to help people in overcoming the barriers hindering Internet adoption comes from peoples basic rights (everyone has right for equal treatment) and when we manage to diminish the stratification in the society caused by unequal use of ICTs, we support that equal treatment notion. Policy recommendations summarised in 3rd Figure come from information gathered from our focus groups and expert round-table conducted in January 2008.

3rd Figure: Digital stratification policy recommendations in relation to specific stanges of Internet adoption process.



Lack of skills is a barrier for both Internet users (for extending their Internet use practices and adopting new applications) and non-users and therefore one of the most influential measures is to continue to provide training programmes. The format of the training needs to follow the target groups and the content needs to focus on skills that support further self-learning processes (e.g. searching skills). The network of Public Internet Access Points needs to reform itself also in order to become a point of advice and training for non-users and small-scale users. Another important opportunity is to introduce public sector services in places where people most often communication with civil servants.

However, the first instance where Internet non-users have connections with Internet connected computers are homes, therefore existing social networks can also be included in the engaging people with Internet activities. Information about price/quality ratio of various Internet connections or partial compensation of the cost to the end-user may help to overcome the price barrier for the home-access.

One of the important emotional costs of the purchasing new computer is related to perceived need of expert knowledge in buying a new computer. This indicates that there is market for even better promotion of ICT products where the focus is not on technical parameters, but more on the usage possibilities.

Despite the fact that today we have PC operating systems and programmes that have Estonian user-interface, most of the people in our focus groups had contacts with English language systems and they were considered most uncomfortable. There is an expectation that computers should communicate in Estonian language and more communication from computer's salesmen could support small-scale or non-users in purchasing their Estonian operation systems and programmes. This obviously means that training programmes and study materials also need to be adapted to Estonian.

Although many of the Internet related services are available for Internet non-users, small-scale users and recent adopters, it is important to continue to develop new online content as with use, also the expectations related to content raise. Through training programmes that support people searching skills it is possible to extend the Internet use practices to wider variety of services. However, there seems to be market for special portal which connects services for elderly and also services where user is in centre (rather than bureaucrats). In order to decrease the digital stratification among Russian speakers, there is increasing need for content in Russian as otherwise, they will be "isolated" in Russian-Internet and will have little knowledge of the services and information available in their homeland Estonia. Developing all services and applications needs to be connected to raising awareness.

Developing Internet in connection to social networks of the elderly would enable to overcome the specific barriers in that particular group. ICTs should be available and introduced also in the community centres.

All those recommendations are developed for cooperation of the different sectors, but most importantly see that most beneficial would be focus on supporting third sector initiatives as they have closest connections grass-roots level activities.



# Bibliography

---

- Ehandi, A. (2001): The Look@World Project: An Initiative from Estonia's Private Sector to Boost Internet Use (in: *Baltic IT&TR Review*, No 2 (21), <http://www.ebaltics.com/00705261>, accessed 4 July 2008)
- Ehandi, A. (2002): The Look@World Foundation – Internet Training for 100,000 People in Estonia (in: *Baltic IT&TR Review*, No 2 (25), <http://www.ebaltics.com/00705123>, accessed 4 July 2008)
- Kalkun, M. – Kalvet, T. (eds.) (2002a): *Digital Divide in Estonia and How To Bridge It*, E-book (PRAXIS Center for Policy Studies, Tallinn, [http://www.praxis.ee/diglohe/digital\\_divide\\_Emor\\_PRAXIS.pdf](http://www.praxis.ee/diglohe/digital_divide_Emor_PRAXIS.pdf), accessed 4 July 2008)
- Kalkun, M. – Kalvet, T. (2002b): Estonia's Digital Divide and Ways of Bridging It (in: *Baltic IT&TR Review*, No 3 (26), <http://www.ebaltics.com/00705085>, accessed 4 July 2008)
- Lievrouw, L. (2001): New media and the 'pluralization of life-worlds': a role for information in social differentiation (in: *New Media and Society*, 3(1), lk. pp. 7-28)
- Pruulmann-Vengerfeldt, P. (2006): *Information technology users and uses within the different layers of the information environment in Estonia* (PhD Thesis, University of Tartu) (Tartu University Press, Tartu, <http://hdl.handle.net/10062/173>, accessed 4 July 2008)
- Pruulmann-Vengerfeldt, P. – Kalvet, T. (2008): Infokihistumine: Interneti mittekasutajad, vähekasutajad ning hiljuti kasutama hakanud [Information stratification: non-users, small-scale users and recent starters], (in: *PRAXIS Working paper 41*, PRAXIS Center for Policy Studies, Tallinn)
- Runnel, P. Pruulmann – Vengerfeldt, P. – Reinsalu, K. (submitted): Estonian Tiger Leap from Post Communism to the Information Society: from policy to practices *Journal of Baltic Studies* submitted for publication in 2009.
- Talv, T. (2008): *Interneti kasutuse oskused ja vajadused üle 40 aastaste kasutajate hulgas [Internet usage skills and needs among over 40 year old users]* (unpublished BA thesis, University of Tartu)
- Wyatt, S. (1999): *They came, they surfed, they went back to the beach: why some people stop using the internet* (<http://virtualsociety.sbs.ox.ac.uk/reports/surf.htm>, accessed 4 July 2008)
- Wyatt, S. (2001): The Information Society? What it means to be out of the loop (in: E. Pantzar – R. Savolainen – P. Tynjälä (eds.): *In Search For A Human-Centred Information Society*, Tampere University Press, Tampere)