A learning ICT policy for growth and welfare

ITPS final report on its assignment
of evaluating the swedish ICT policy

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Foreword

The Institute for Growth Policy Studies (ITPS) has been commissioned by the Swedish Government to make an evaluation of the Swedish ICT policy. A large number of consultants and other experts have participated in the assignment. This main report is based on a number of studies, other material and ITPS' analyses.

ITPS would like to thank all those who have made themselves available for interviews and discussions. ITPS would also extend special thanks to librarians and researchers at the National Institute for Working Life and the ICT University in Kista.

Martin Ahlgren, Gunilla Almqvist, Sabine Ehlers, Thomas Forsberg, Elisabet Frankenberg, Michael Ohlsson, Aurora Pelli, Naito Shigeyuki, Sofia Wirberg and Åsa Sjödin have participated in the project. Hans-Olof Hagén has been responsible for the work at ITPS and Kurt Lundgren has been project leader.

Stockholm in November 2003

Sture Öberg,
Director General

List of reports on studies:
- ICT in School, *PLS RAMBØLL Management AB*
- ICT policy in the USA, *ITPS*
- ICT and confidence, *Metamatrix*
- ICT in universities and university colleges, *Metamatrix*
- Divisions of responsibilities and controls in the ICT policy, *Eurofutures and Frontwalker*
- The broadband policy – an evaluation at half-time, *ITPS*
- ICT and Democracy, *Jan Grönlund, Örebro University*
- ICT for all, before all other countries!, *ITPS*
- A review of the ICT policy in the Netherlands and the UK, *a group of researchers at SPRU, University of Sussex*
- IT promotion by the Japanese government, *ITPS*
- ICT and culture, *Metamatrix*
- An economic analysis of accessibility, *Econ*
- ICT for healthcare, *PLS RAMBØLL Management AB*

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1 Background

1.1 The assignment

ITPS has been given the assignment of planning and being responsible for an evaluation of the Swedish ICT policy. It is intended that the evaluation should shed light on relevant aspects of the national ICT policy. The analysis should consider individual policy areas and applications and also contain an overall evaluation that covers all sectors. The material that is presented within the framework of this assignment shall constitute one of the bases for assessments between specific fields in the ICT policy as well as for standpoints for drawing borderlines between the different stakeholders involved in the ICT policy, for example the scope and focus of the central government (public) undertakings under the ICT policy, the division of roles and responsibilities between the government and government agencies and between central government and the municipalities, and for the forms available to the Government for management and control purposes (rules, directives, performance management etc), funding issues (principles), follow-up, evaluation and controls and audit.

In the Government assignment it was stated that procurements for the evaluation of ICT use in the public sector should be made in cooperation with the Agency for Administrative Development. It should also be possible to use the evaluation as a basis of any ICT policy decisions in 2004. The report on the evaluation should be submitted to the Government no later than November 15, 2003. The report presented here is ITPS' main report on the evaluation. It contains the main conclusions drawn by ITPS and is based on ITPS' own evaluations and its assessment of the reports submitted by the consultants engaged by ITPS for the evaluation.

1.2 Summary

Requirements for the new ICT policy

- It should have a long-term perspective and focus on strategic problem areas in society.

- The ICT policy should be durable and consistent, i.e. a learning policy.

- The ICT policy should focus on users, not on producers.

Proposed themes for the new ICT policy

- The enhancement of activities and operations with the support of ICT for the achievement of growth and welfare

- From broadband to a network society

- The information society as a learning society.

In this section the general analysis is summarised (1.2.1) and a summary is also provided of some of ITPS' more important recommendations (1.2.2).

1.2.2   Summary of analyses and conclusions

1) Focus
ITPS has called this report "A learning ICT policy for growth and welfare".

ICT must now be an instrument to achieve important general policy goals. It is particularly important that ICT is an instrument for meeting the challenges to growth and welfare represented by demographic trends.

Shortages of labour will be considerable in the future. For example, the Swedish Association of Local Authorities has estimated that during the next ten-year period the municipalities will need to recruit some 600 000 new employees. During the same period, this will be approximately the number of persons who actually enter the labour market.

ICT alone cannot do anything to change the possibilities available to us to meet this situation. However, without good use of ICT in companies, in municipal admini-strations, in healthcare and in homes we will not succeed at all in improving growth and welfare.

2) The ICT policy vision
The strategic objective of the ICT policy in recent years has been that Sweden should be "an information society for all" and that this vision should be realised in Sweden "before all other countries". In the opinion of ITPS, the vision of "an information society for all" should remain the objective of the long-term ICT policy. This vision must now be linked to different policy areas and applications and it is important that the aspects of "an information society for all" that the Government considers to be particularly important are specified.

The objective of the ICT policy has an internal distributive dimension – "for all" – and an international comparative dimension –"before all others".

3) On the way to "an information society for all"
ITPS has interpreted the objective as an ambition that existing differences in re-spect of participation in the information society shall be reasonably well dispersed, regardless of sex, age, ethnic origin, education etc.

In a review of available data, it would appear to be the case that Sweden has been fairly successful in creating broad participation in the information society. When a new technology is spread throughout society, it is absorbed in different ways by different groups. The question is whether these differences level out over time or whether there is a process of stagnation in access to or use of the new technology among certain groups. In certain respects, for example access or use by women and men, these differences have diminished, but it is a cause of concern that the participation of immigrants in the information society appears to have stagnated during the last three years. Many elderly persons also remain outside the informa-tion society, which can be problematical in view of demographic trends. Not participating in the information society can be more discriminatory when levels of access are high and society increasingly expects access to ICT to become more widespread, compared to a situation when access was limited.

4) "Before all others"

In comparative international studies, Sweden has most often achieved a very high ranking position and has frequently been top of the list. This has been the case not only when different fields have been included in a common index, but also in most fields measured. What seems to be happening now is that, in general, Sweden still has a very high position but that one or two countries have overtaken us in most fields. There can be two explanations for this. Firstly it is natural that countries coming from behind have a *catching-up* effect, have the ambition to draw level and then automatically pass the leaders. The second explanation is that the ICT evolution in Sweden has come to a standstill and that our earlier comparative advantages are no longer equally important. It is still too early to determine which of the interpretations is correct.

5) Can we synchronise?

Without exception, in all policy areas and applications local stakeholders have rapidly been able to take initiatives to start up different development processes that have most often had a local range. The decentralised public administration in Sweden and the management philosophy of dialogue and consensus in trade and industry, together with the existence of considerable social capital, have made this rapid progress at the local level possible.

The major problem that is now surfacing in municipalities, in the broadband policy, in healthcare and so on is *how these locally developed systems should be synchronised with each other at the next level*. Many international observers are of the opinion that the decentralised public administration model will then fall short of requirements. Is there a solution how Sweden, within the framework of its advanced decentralisation in both the public and private sectors will be able to synchronise the systems, eliminate obstacles, and make it possible for the "isolated islands" that exist today to communicate with each other?

6) Consistent lack of goals in the ICT policy

Strongly decentralised implementation requires visions, goals, strategies and effective evaluations in order to function properly. The consultants that have collaborated with ITPS in this evaluation are of the opinion that Sweden has the lowest degree of political control among comparable countries studied, that levels of preparedness are relatively low, that in international comparisons Sweden is unique in not having produced goals for its ICT policy that can be monitored and followed up, and that Sweden, despite a high level of ambition and with many ongoing initiatives, lacks a strategy to achieve the strategic goals.

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7) Lack of an overall picture

From the Government downwards, the horizontal links between policy areas and activities have not been developed and this has made progress difficult. It has also had the effect that the systematic work of producing programmes on ways in which ICT can be used as a form of support in different policy areas has only been started in a few places and the development of policies has come to a halt at the ICT policy instruments: confidence, access and skills, i.e. the focus has been on conditions rather than on the activities themselves. There is a risk that lack of an overall perspective and a systems approach will have a negative effect in the long term on conditions for further positive development of the information society in Sweden.

8) Shortcomings in the acquisition of knowledge

The ICT policy is characterised by shortcomings in the acquisition of knowledge as a form of support for development processes. In many fields covered by the ICT policy, new ground is being broken, the issues are complex, and experience is limited. It is often the case that, when decisions are to be made, freedom of action is restricted by earlier decisions. What has happened is irreversible and cannot be done again. This means that it can often be of value to reflect, plan, and create knowledge and experience so that the "right thing is done" rather than making it necessary "to be first" at all costs.

Processes with specific sub-goals, control stations, and successive evaluations of the situation including dissemination of knowledge and learning from the experience of others can lead to the achievement of the final goals more rapidly, even if the number one position is not held in every sub-process. To gradually introduce aspects of "a learning ICT policy" into the system, to systematically use in-depth studies of good models in important areas for Sweden are indispensable elements for making a durable and consistent ICT policy possible.

9) Requirements for a long-term perspective and consistency

The future ICT policy must be improved in several ways to enable Sweden to continue to develop as an ICT nation and to enable ICT to be an instrument in important policy areas.

As part of its assignment, ITPS should discuss the future ICT policy. ITPS has therefore chosen to make concrete proposals for the discussion. Above all, in the opinion of ITPS it is important to discuss the necessity of making three demands on the new ICT policy in order to make it successful:

- It should have a long-term perspective and focus on strategic problem areas in society.

- It should be durable and consistent, i.e. learning.

- It should focus on the users and not on the producers.

10) Three themes for the future ICT policy

1) Enhancement of activities and operations with the support of ICT for the achievement of growth and welfare

This theme is aimed directly at the challenges to welfare and growth posed by demographic trends. The enhancement of activities and operations with the support of ICT for growth and welfare with the aim that fewer people shall do more, and do it better, for more people must begin now. This is an urgent matter for all sectors in the economy. ICT in isolation does not solve any problems but, unless we use its potential for rationalisation and regeneration, it will be difficult to maintain our present standard of living.

2) From broadband to a network society

Sweden now faces the mission and the possibility of giving broadband and the urban networks substance in order to make them major instruments for broad economic, social and cultural development processes and in order to introduce the Internet's global dimension into local communities.

3) The information society as a learning society.

If the ICT policy's vision of "an information society for all" is to be realised, the vision of the information society as a learning society must also be developed and realised. The education system has a key role in developing ICT as an instrument for learning. The universities should naturally be a leading force in finding new forms for using ICT in the learning process and, in this respect, also constituting a bridge to working life. This theme also takes up the issues of the ways in which ICT can contribute to realising the vision of the open university, be an instrument for life-long learning, and bring together working life and the education system.

1.2.3   Summary of major recommendations

Among the recommendations made by ITPS in this report, prominence can be given to the following:

An information society for all
As access to PCs and the Internet improves, the Government should give greater attention to those groups that are in danger of ending up permanently outside the information society. In particular, the issue of the stagnation in ICT use on the part of immigrants should be studied in depth.

Competencies
There is no need for major government programmes of the type ITiS (IT in School) in the foreseeable future. On the other hand, the long-term need of in-service training in ICT for teachers is, in the opinion of ITPS, a key issue for further Government action. The government agencies concerned should be brought together to create a programme of this type. University schools of education should take the lead in this respect.

As proposed in the Budget Bill for 2003, there should be a ceiling on tax allowances for the purchase of PCs. Trends should be followed closely and a review of the situation should be made after two or three years.

The Government should establish a group or a "Delegation for ICT and Learning" that can draw up goals and strategies for the development of ICT and learning in both the education system and in working life. The interfaces between the education system and working life must be extended and the level of ambition in the ICT policy should be raised in respect of both individuals and companies with goal-oriented measures to enhance skills.

Confidence

The concept of increasing confidence as one of the cornerstones of the ICT policy has not been defined and is therefore difficult to interpret and to link to an evaluation and follow-up programme. ITPS therefore recommends that, if the concept is to have this central position in the ICT policy in the future, it should be clearly defined.

The broadband policy

The focus is now shifting away from broadband and the technology towards a vision of a network society in which ICT is used as a form of support for economic, social and cultural development processes.

As a consequence of this, ITPS proposes that attention is now given to the network's structure, synchronisation, openness and business models. However, at the moment there is no need for government intervention. Instead the stakeholders, i.e. the residents, property owners, municipalities and service providers should be given the time for discussions and reorganisation. All the problems described should be taken care of with a view to 2005. This means the *preparatory work* for new decisions on the broadband policy should be started and be given high priority.

Democracy

The future policy for this field should be based on knowledge acquired in recent research. The Delegation and the Strategy Group should work together to find ways that guarantee further consultations, which are also made the subject of scientific analysis and evaluation.

Sustainable development

ITPS proposes that the Strategy Group works together with the ministries and government agencies concerned to find forms for funding the work that has now started in Forum IT and the Environment so that work in this field does not come to a standstill when Forum IT and the Environment's mandate expires in the near future.

Culture

An inventory should be made, by the Strategy Group and the Delegation, of the ways in which ICT enters the cultural field, regardless of the question of ministry "ownership" of the policy area. Furthermore, a working group consisting of representatives of the Ministry of Culture, the Strategy Group and the Delegation should start work on drawing up a common vision for ICT in the culture policy and goals for this vision.

The development of broadband and the end of analogue TV broadcasts will raise many questions concerning both copyright and issues of a *must carry* character, standards etc that must be discussed in the work on a medium-term vision for the broadband policy (i.e. up to 2010).

Economic growth

A user perspective should consistently permeate the ICT policy and all elements that can lead any confusion between the ICT policy and the industry policy should be consistently eliminated.

The future ICT policy should be based on the crucial importance for ICT-related growth and for the future of the ICT industry of how the 95 per cent of the economy that uses ICT is able to absorb, use and develop the technology as a tool to achieve their operational goals. The public sector should seek ways in which it can cooperate with, strengthen and establish a process of mutual learning with the private sector for the enhancement of its activities and operations with the aid of ICT and the development of electronic trade and electronic services.

Healthcare

In order to achieve a higher degree of coordination and integration in the methods used in healthcare, ITPS proposes that the stakeholders take firm action to develop a general form of information support for patients that is common to all care providers, and which is accessible wherever the patients may be in the healthcare chain. Carelink's coordination function should be strengthened and, provided that the organisations responsible for healthcare make contributions and give Carelink extended powers, the government should devise a system that supplies the county councils with an incentive to cooperate rather than to choose local solutions.

ITPS proposes that the newly established Delegation for the Development of Public e-Services is given the assignment as soon as possible of drawing up a proposal for the solution proposed by ITPS in this report.

The public sector as a precursor in the use of ICT

It is essential that the visions relating to the electronically coordinated network administration and the 24/7 agency are extended and clearly defined. The Government's ambition must be specific, have a clear focus on the demographic challenges and have the aim of testing the possibilities of introducing more extensive organisational and institutional changes. The central government agencies should provide good examples of how "fewer people can do more, and do it better, for more people", i.e. higher levels of productivity. It is necessary to draw up incentives that encourage the integration of ICT solutions within and between the different sectors in the public administration. International comparisons should be made in the form of studies of *best practice* and *benchlearning* in important areas for the Swedish public sector.

Central government should develop incentives that encourage government agencies, municipalities and county councils to work together on the development of common platforms vis-à-vis the citizens and the 24/7 agencies, to work on the electronically coordinated public administration, and to work openly with the goal of mutual learning in relation to trade and industry. *Public-Private Partnerships* (PPPs) should be developed in these fields.

A horizontally coordinated ICT policy

ITPS considers that there are strong reasons to retain a general, horizontal IT policy in order to avoid sub-optimisation, to create synergy effects and to make it easier for the political system and for the citizens to obtain a holistic picture of ICT and its effects on society.

Every policy area must be given – and take – a clear and formal responsibility for the realisation of the overriding goals in each policy area. This can be done for example by the Government taking the initiative to give the ministries concerned the assignment of drawing up a strategy for ways in which activities in each policy area should be designed in order that full advantage can be taken of the potential of modern information technology, and to follow up and revise these strategies every second year. These strategies can also form the basis of the normal management and control of government agencies exercised by the Government and ministries.

1.3   The ICT policy

1.3.1   "A learning ICT policy"

The background to the assignment that ITPS received from the Government was in the Government's annual directives to ITPS for 2002, in which ITPS was commissioned to draw up a proposal for the evaluation of the development of ICT and the effects of the ICT policy in respect of the goal of "an information society for all".

ITPS' proposal for this evaluation "A learning ICT policy – proposal for an evaluation" was submitted to the Government in September 2002[1]. The title of the evaluation had been chosen on the basis of Parliament's wording of the ICT bill of 199/2000, in which attention focused on the possibility of monitoring and evaluat-

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[1] *The report, ITPS A2002:009, (in Swedish) can be downloaded from ITPS' website.*

ing the policy, on the development of indicators, and the need of not only making assessments of results but also of the role the political measures had had in the achievement of the results. Through its selection of the title, ITPS also emphasised that the work of developing a policy that is possible to monitor and evaluate must be regarded as a process in which the choice of political measures and the wording of objectives are based on experience and that the formulation of the policy is thereby gradually improved. At the same time the wording of the policy should take into consideration the need for flexibility and the difficulties of describing causal relationships between measures and their effects. The concept also includes the assumption that goals and the selection of strategies are well motivated, that the proposals on which decisions are to be based are of good quality and have been the subject of critical assessments from different perspectives and fields of knowledge.

1.3.2 What is the ICT policy?

What then does ITPS mean by the expression "ICT policy"? ITPS has used, in principle, three types of sources in this evaluation:

- The ICT bill "An information society for all"[2]. This bill contains a comprehensive presentation of adequate ICT policy measures and ways in which ICT affects different policy areas. The bill also provides a structure for the ICT policy that other stakeholders can then refer to and that various future measures can fall under.

- Other ICT policy decisions, in the ICT field or on ICT applications in other policy areas, annual directives, ordinances etc.

- After the ICT bill was presented, a number of initiatives have been taken in respect of the 24/7 agency and legislation on electronic communication has been passed by Parliament. In the summer of 2003, a Strategy Group was formed. It was located in the Government Offices (Ministry of Industry) and a decision has also been made to establish a Delegation on Public e-Services, In November 2003, the Government also decided to establish an e-Agency with the task of working with standards and norms.

1.3.3 The structure of the ICT policy

ITPS has chosen to see the wording of the ICT policy as lying on three levels (see Figure 1). The first level, the strategic objective of the ICT policy, is to create "an information society for all" and that Sweden shall achieve this objective before all other nations.

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[2] *Swedish Government Official Report 1999/200:86 (in Swedish).*

In order to create an information society for all, central government shall, where systems of rules, education and training and infrastructure are concerned, give priority to achieving improvements in the fields of:

- increasing confidence in ICT

- developing competencies in using ICT, and

- promoting access to the services of the information society.

In the presentation of the ICT policy, a classification is then made of the measures that can be placed in these areas under the headings of *confidence, competencies* and *access*. ITPS has chosen to call them the "ICT policy instruments" (Level 2). The three ICT policy instruments shall then lead to "a good and broad use of ICT" and, via this, Level 3 can be achieved. Level 3 can be described as the achievement of better goal fulfilment by the Government in a number of policy areas and applications with the support of ICT.

The Government formulates the goal in Level 3 as its ambition that, during the next two years, the ICT policy should contribute in essentials to increasing the degree of goal fulfilment" in a number of specified general policy goals such as sound finances, economic growth, an increase in job opportunities, that Sweden shall be a leading nation in the field of knowledge, that security, justice and welfare shall be strengthened, that environmental problems shall be solved, that the entire country shall grow, and so on.

The bill points out a number of policy areas and applications that should provide guidance for the ICT policy. ICT should create growth, employment, regional development, democracy and justice, life quality, and an efficient public administration.

There are more or less specifically worded objectives at all the three levels.

In order to realise the strategic objective of "an information society for all" the Government uses the policy in two dimensions. Accordingly, the first dimension of the ICT policy creates instruments to achieve a good use of ICT and the second dimension uses ICT to achieve different goals established by society.

Thus, the ICT policy could also be described as a horizontal level that cuts across different vertical policy areas that could be likened to downpipes.

Figure 1 Levels in the ICT policy

Level 1	**ICT policy goal:** An information society for all

Level 2	**The ICT policy instruments:** Confidence, competencies, access

	ICT use

Level 3	ICT as a tool to achieve general policy goals such as growth, sustainable development, a strong democracy etc.
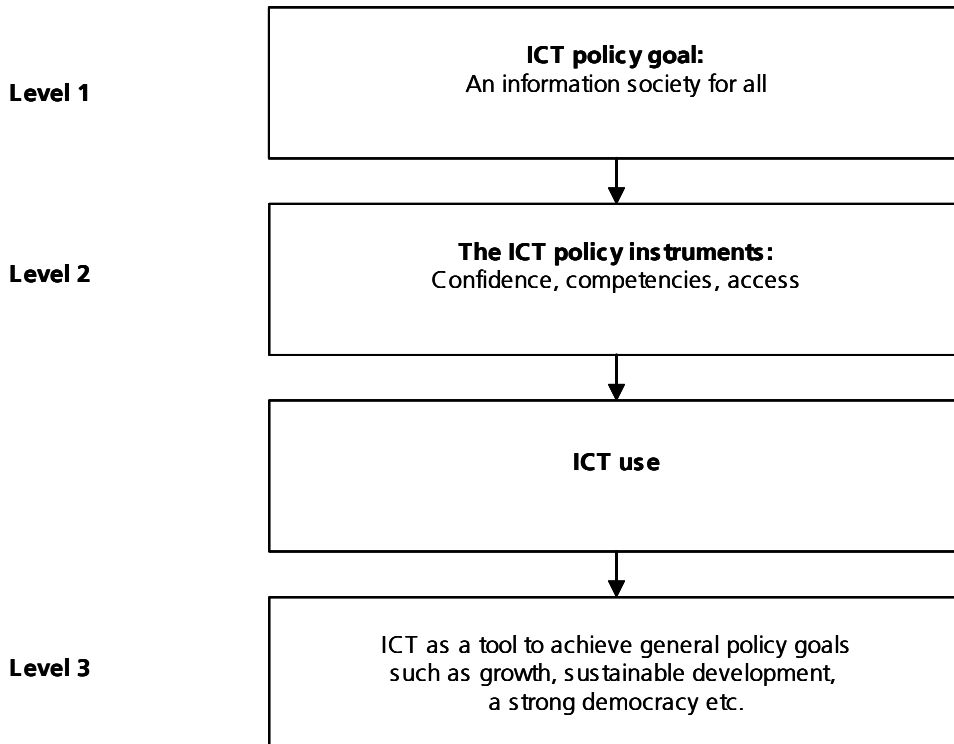
1.4 ITPS' evaluation work

This section presents the reasoning and the restrictions that have characterised the work done by ITPS on the evaluation, and the ways in which ITPS has performed its assignment.

1.4.1 The Parliamentary Standing Committee on Transport and Communications and the SMART criteria

The processing of the ICT bill by the Parliamentary Standing Committee on Transport and Communications should be seen in the light of the trend towards management by objectives and performance management in central government activities that was started at the end of the 1980s[3]. In particular, this trend has led to a reduction in detailed controls of agencies and the focus has been shifted away from the allocation of resources and funds towards the results of activities and operations, i.e. performance and effects. This means that Parliament and the Government lay down the goals, aims, and framework for activities and that the agencies are responsible for making decisions on the ways in which activities should be implemented, under given conditions. This delegation has the effect that requirements in respect of reports and analyses are strengthened and that the focus of the process is

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[3] *See "Financial management for efficiency and transparency", Ministry of Finance 2000:63 (in Swedish).*

shifted away from budgeting towards monitoring and evaluating the results of activities.

Experience gained of this method shows both gradual improvements and shortcomings. The problems that the new system has created include:

- A lack of a holistic perspective and transparency at all decision-making levels.

- Unclear linkages between performance management and financial management

- Shortcomings in information on effects and goal fulfilment

- Unclear goals for central government activities, as well as unclear linkages between goals at different levels.

- Shortcomings in respect of the quality of information on results and the assessment of results.

In the work of improving management and controls, attention has been called to several areas that are in need of improvement. The management and control of activities makes considerable requirements on the wording of the *goals*. "The goals describe what should be achieved by the activity in question. The requirements that goals are possible to monitor can be met by both quantitative and qualitative goals."

Parliament has also emphasised the importance of making the goals measurable and possible to follow up in order that they can be compared with costs and can be expressed in such a way that they can constitute points of departure for political priorities and discussions. In turn, this has the effect that the goals should meet the so-called SMART criteria. According to these criteria, a policy measure should be *specific, measurable, approved, relevant and time-bound*. One example of a specific goal was the political goal that open unemployment should not exceed 4 per cent of the labour force by the year 2000.

The SMART criteria reappear on several occasions in this evaluation.

1.4.2 The time perspective

When Parliament processed the ICT bill and during ITPS' discussions with the Government Offices and Parliament, requests have been expressed for a follow-up and evaluation in areas with widely different time perspectives. When the Standing Committee on Transport and Communications processed the ICT bill, requests were expressed for, among other things, an analysis of the possibility to evaluate and to specify causal relationships which were regarded as important inputs for future decisions, and the Committee also pointed out the problems that the complexity and the rapid pace of development cause for decision-makers and for the formulation of the policy.

At the same time a request was received from the Government Offices for information for a possible ICT policy decision in 2004. It should be possible to start assembling this information in 2003.

In principle requests and demands can be divided into two main classes, each with its own special focus, skills requirements and time perspective.

Table 1

	Focus	Competencies	Time perspective
Main class 1	ICT policy for 2004	Overview, close to activities	Autumn 2002 – autumn 2003
Main class 2	Understanding, long-term human resource development	Analytical, academic	

The aim of this report is to provide information for the ICT policy for 2004 and *not* to make well-supported analyses of effects of the policy or analyses of the long-term consequences for society that are the result of ICT developments.

1.4.3   Themes and projects

ITPS' plan for the evaluation divided the ICT policy into five themes.

1. An information society for all

2. The ICT policy instruments

3. Policy areas and applications

4. The ICT policy in an international perspective

5. The long-term consequences of ICT development on society

Theme 5 is part of the long-term development work and is not taken up specifically in the reports that form the basis of this report.

Theme 1: "An information society for all"
Project
ITPS made its own review of indicators and statistics that had a bearing on the goal of "an information society for all" and has also supplemented this information by collecting and analysing important factors for the ICT policy that are not covered by existing statistics.

Theme 2: The ICT policy instruments
By this concept ITPS means the general parts of the IT policy that are intended to function as a platform for different policy areas and applications, i.e. confidence, competencies and access.

Projects:
- Confidence. The assignment has been performed by Metamatrix
- Broadband policy. This has been done internally by ITPS.
- An analysis of the PC reform. Performed by Econ.
- Competition policy in the telecommunications industry. Performed by Econ.
- ICT in School. Performed by PLS RAMBØLL
- ICT in universities and university colleges. Performed by Metamatrix.

Theme 3: Policy areas and applications
Projects:
- Public sector use of ICT in an international perspective. Assignment performed by Booz Allen Hamilton.
- Divisions of responsibility and controls in the ICT policy. The assignment has been performed by Eurofutures and Frontwalker.
- ICT in culture. Performed by Metamatrix.
- ICT for an ecologically sustainable society. Has been performed in cooperation with the Swedish National Environmental Protection Agency.
- ICT and democracy. The assignment has been performed by Jan Grönlund, Örebro University.
- ICT in the healthcare services. Has been performed by PLS RAMBØLL.

Theme 4: The ICT policy in an international perspective
Projects:
- The Swedish policy in an international perspective. The assignment has been performed by a group of researchers attached to SPRU at the University of Sussex.
- ICT development and ICT policies in the USA. Has been performed by a member of ITPS' staff, Martin Ahlgren, at ITPS' office in Los Angeles.
- ICT development and ICT policies in Japan. Has been performed by Sabine Ehlers at ITPS' office in Tokyo.

1.4.4   Inputs

The various inputs used in the evaluation have been of the following types:

- evaluations and "meta evaluations", i.e. analyses of effects and causal relationships, in areas where it is possible to make analyses of this type,

- participation in discussions and workshops with various ministries and government agencies on the role of ICT for enhanced goal fulfilment,

- analyses of the role of ICT in different policy areas and applications as a stage of the development of goals and strategies,

- analyses of statistics and indicators and the collection of new data in fields considered important by ITPS in order to supplement existing statistics,

- reviews of knowledge in fields where no information is available for evaluation purposes.

2 "An Information Society for All"

The Swedish Government bill is entitled "An Information Society for All". The wording that Sweden should be "an information society for all before all other countries" has been construed by ITPS as the strategic objective of the ICT policy.

2.1 Wording of the objective

The wording of the ICT policy objective, i.e. to create "an information society for all" indicates an ambition to link political decisions on ICT to the everyday lives, needs and aims of the people. This means that it is *individuals* rather than companies or government agencies that are the goal of the policy and the Government emphasises that the fruits of the ICT policy should be harvested by *all*, i.e. not only those in working life or in education programmes, but *all*. Therefore it is natural that steps taken and the selection of indicators for measuring the development of the "information society" are based on this explicit ambition. Behind the wording there seem to be apprehensions that the expansion of ICT may lead to new divides in society, or to strengthening existing divides. In the text of the bill (page 23) it is emphasised that the ICT policy is not basically a technical project but rather a democratic project that has the aim of giving everyone access to the potential offered by the new technology.

The choice of the wording of the strategic objective is based on an assumption that "Sweden is already a leading ICT nation". The next stage is to attempt to counteract the injustices that can result from the so-called "digital divide" and to make ICT accessible for all. The concept "for all " can also be interpreted in such a way that the ICT policy should be so broad that everyone living in Sweden should be able to find something in it that suits his or her preferences, inclinations and tastes.

This focus and title have also been chosen by a large number of other countries. In the plan for the evaluation of the ICT policy, ITPS pointed out that this wording made it difficult to define the ICT policy, to make it operational, and therefore also to measure it. Was Sweden supposed be the first country in the world to be "an information society for all" in *all* respects? Or is it rather the case that the Government considers it to be of particular importance that we are first and best in a number of priority areas that are regarded to be of special importance just for Sweden? Unfortunately there is no clarification in this respect. Instead a large number of policy fields and fields of application are listed for which the ICT policy should either provide "support" or "guidance". For this reason the formulation of the bill gives the impression that it enumerates the potential that has been found in the use of ICT in different policy areas rather than identifying the policy areas the Government has chosen to give priority to during the period of time covered by the ICT bill.

When proceeding to the international objective, i.e. that we shall achieve "an information society for all before all other countries", it becomes even more complicated. A dimension is now introduced in which the objectives change over time as progress is made in comparable countries. This also means that the Government does not define its undertakings to achieve the goal "before all other countries". The wording can be interpreted to mean that the Government applies a reactive policy. If Sweden is first, everything is satisfactory and the Government will continue to proceed along the path it has already chosen for its ICT policy, but if other countries overtake Sweden, the Government intends to increase its efforts and find other ways of reaching the leading position in the field of "an information society for all".

The assessment of how well Sweden has succeeded in its ICT policy is based on the identification of a number of indicators of good and broad use of ICT. With the aid of these indicators, it is possible to compare trends in two dimensions: of differences in ICT use by different groups in Sweden ("for all"), and of ICT use in Sweden compared to other countries ("before all others").

2.2   "….for all"?

What progress has Sweden made in creating "an information society for all before all other countries"? There are a large number of sources of statistics that describe access to PCs and Internet use by different categories. Statistics Sweden, the Swedish Institute for Transport and Communications Analysis (SIKA) and the National Post and Telecom Agency (PTS) publish reports at various intervals that describe ICT in many dimensions. Before writing this report, ITPS had access to the new EU surveys of individuals and companies made by Statistics Sweden in 2003. Statistics Sweden also included some additional questions on skills - proposed by ITPS - for the two questionnaires. In addition ITPS also had access to the section on Sweden of a Nordic study on e-Business and the results of the other Nordic studies. This study was made by PLS RAMBØLL, a Danish consultant that has made similar studies in Denmark for a number of years. Finally, ITPS was given access to a survey made by the Swedish Trade Union Confederation (LO): "Computer use at home and at work". For the international comparisons, recent OECD data has been used to which ITPS was also given access. This material is very comprehensive, but ITPS' purpose with the analysis of all this information has been to try to provide an extremely comprehensive and simple picture. ITPS' intention has been that it should be possible to see the forest and not all the individual trees. However, the labour market policy aspects of the skills concept are not taken up here, they are taken up below in the section on competencies.

With the aid of the responses to the EU questionnaire that was distributed to individual persons and Statistics Sweden's computer use survey of 2000, both of which supplement the labour market surveys, ITPS has analysed factors that create "digital divides" and has tried to assess their size and where possible their trends. If women who are immigrants, in the upper middle age bracket, and do not have a higher education only use Internet to a small extent, is this due to their sex, age, income, ethnicity or education? The task has been to separate these factors so that the effect of each individual factor can be seen individually, without it being influenced by other factors.

The phenomenon that shall be analysed is the way in which the new technology is spread and how the spread of the new technology differs for different groups[4]. Figure 2 shows this in principle.

Figure 2 Outline of trends in ICT use for groups of men (M) and women (K).
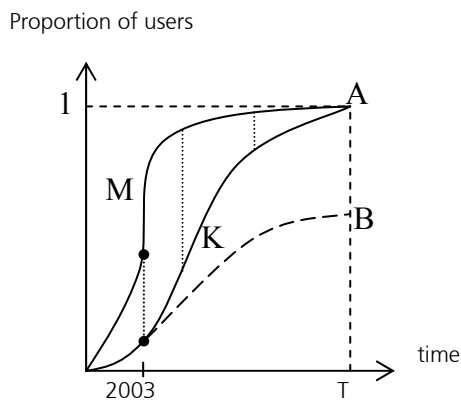
The course of events can be divided into three different phases. During the initial phase the increase is small in absolute figures but the percentage rate of increase is pronounced, particularly during the latter part. During the expansion phase, growth in the absolute number of users is extremely high but lower proportionally, and when the market starts to become saturated, the rate of increase gradually declines. In the middle of the expansion phase the category that absorbs the technology most rapidly is at a considerably higher level than the slower category, as in our example above, but this does not provide certain information on the final result. In one case the differences will be gradually evened out until everyone in the two groups have become users. This occurs at point in time T. It is also conceivable that the course of events can be entirely different − instead it follows the broken line from the situation in 2003. In this case it ends in point B instead of point A in year T. Should

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[4] *The discussion that follows has been influenced by Katz, J.E. and Rice R.E. (2002),* Social Consequences of Internet Use: Access, Involvement and Interaction. *MIT Press. Those who are interested can also easily compare trends in Sweden with those in America. It is particularly important to see similarities and differences between the groups for whom the "digital divide" does not appear to be diminishing.*

this occur, a considerable part of this group will never be users and the "digital divide" would become permanent. The aim of the analysis is to attempt to determine which of these two courses of events that current trends appear to be following.

The analysis has mainly concentrated on the goal of the ICT policy, i.e. IT use. Since the goal has not been defined in detail, ITPS has been obliged to define it, and also to choose the dimensions in which the "divides" shall be measured. For year 2003, users have been defined as those who use Internet at least once a month. However, an attempt has also been made to study the ICT policy instruments of competencies, access and confidence, which are assumed to explain use, but there is no information on all respondents that can be used to define those who have confidence and those that do not, the only indicators that can be used are on those who are users already. In respect of use on the one hand and skills and access on the other, it has also been necessary to use somewhat different definitions for 2000 and 2003, since the questions in the questionnaires are different.

The factors that can be considered to create digital gaps for which information was available were: sex, income, education, ethnicity and age. Those who responded to the questionnaire have been divided into two groups for each of these variables, see Table 2.

Table 2 Factors and groups

Factor	Groups
Sex	Men and women
Income	Income over median and under median
Education	Higher than upper secondary school and no higher than upper secondary school
Origin	Swedes and immigrants
Age	16-39 years and 40-64 years

One of the categories for each variable thus consists of women, those with a lower than median income, those with at most an upper secondary school education, immigrants, and those between 40 and 64 years. The other categories consist of those who do not meet these criteria, i.e. men, those people with a post upper secondary school education and so on.

A comparison between 2000 and 2003 for the different categories is not very meaningful in respect of access and skills since the definitions are so different. In 2000 access was defined as having access to a computer with an Internet connection at home, at work or at school, while in 2003 it was limited to having access to a computer in the home only. Therefore, more people were defined as having access in 2000 than in 2003, despite the fact that access has actually increased. The definitions of skills differ even more. In 2000 it was thought sufficient to define those who considered that computers were complicated to use as less skilful, while in 2003 it was possible to define skills on the basis of the things persons had actually done with a computer. However, it is nonetheless meaningful to identify the categories in which the differences between the groups were greatest in the two years.

If a simple table is constructed for access and skills for the five categories, the result is difficult to interpret. It is certainly true that, for example, more high-income earners than low-income earners have access to a computer with an Internet connection. However, this can partly be due to the fact that more men are high-income earners, and that men have more access to computers than women, or that those with high incomes tend to have a higher education and people with a higher education are more interested in computers and therefore tend to purchase more computers.

It is therefore necessary to eliminate these effects statistically in order to ensure that the results can be interpreted in a meaningful way. With the aid of statistical methods, it is possible to compare the ICT skills of women and men that would have been the case if both groups on average had had the same education, income, age and the same proportion of immigrants. It now emerges that young people are far more proficient than old people. Furthermore, men were more proficient than women as were those with a higher educational background compared to those with a lower level of education, but these differences were far smaller than the difference due to age. Even smaller than this were the differences between those with high and low incomes and, even if Swedes were more proficient than immigrants, this difference was insignificant.

However, when studying corresponding differences in 2003, it must be borne in mind that the definition is now different and more objective in comparison with 2000 when it was more subjective. In 2003 it was also the case that the difference between young people and old people was very striking. However, in 2003 the immigrants' responses to the skills-related questions were less positive than those of Swedes, and the difference was just as great as that between high levels of education and low levels of education. Differences resulting from sex and income were now, in principle, negligible. The greatest cause for concern is the fairly large difference between young and old people. On the other hand, it is positive to see that there were no differences relating to sex or income in 2003 where basic IT skills are concerned.

In Table 3 it can be seen that the proportions of people who had access to the Internet in 2000 were, in principle, more or less the same between men and women and between immigrants and Swedes. On the other hand, income and age appear to be significant. However, education appears to have had most significance where access to computers is concerned. As mentioned above, access in 2003 was restricted to access at home. As a result, differences are larger, but level of education is still the reason for the largest divides. Age differences are also of great importance, while income is of less importance and of the same size as in 2000. Where access to computers with Internet facilities are concerned, differences between women and men are non-existent now, while Swedes have a certain advantage over immigrants. All in all the PC reform has not succeeded in eliminating the differences, even if they have been reduced.

Table 3 The "digital divides" in respect of Internet access and ICT skills in Sweden in 2000 and 2003

		Internet access		IT-skills	
Factor	Proportion in each group	**2000**	**2003**	**2000**	**2003**
Sex	(Men-Women)	0,4	1,0	6,5	1,4
Income	(High-Low)	6,5	6,9	4,0	0,2
Education	(High-Low)	10,5	13,3	5,7	6,8
Origin	(Swedes-Immigrants)	0,6	4,5	2,6	6,8
Age	(40-64 – 16-39)	6,2	10,7	11,7	11,6

The effect on skills and access of each factor individually, with the influence of other factors eliminated. The effect is measured as the difference in the proportion who have access and who are proficient.

The problems in defining the three IT political instruments (access, confidence and competencies) in the same way for the two years have the effect that it is not meaningful to analyse the "digital divides" in two steps, it is only meaningful to do it directly. The relevant question then becomes how great is the "digital divide" in respect of sex, income, education, ethnic origin and age where Internet use is concerned? It then proves to be the case that if a person is a man, a high-income earner, with a high level of education, a Swede and young, the probability that this person is a user is greater in the year 2000 than if the person is a member of one of the other groups.

It can also be seen in Table 4 that the difference between the two income groups was small in 2000. If the fact that, in total, 76.3 per cent were defined as Internet users in 2000 is taken into consideration, this means that more than 80 per cent of those who had an income above the median were users, but less than 73 per cent of those whose income was less than the median, provided that both groups were evenly distributed over the other categories, for example young and old etc. Furthermore it can be seen that age and education were of great significance, while the difference between men and women was halved. The smallest difference was that between immigrants and Swedes.

As mentioned above, the definition of users was not completely the same in the two surveys. In 2000 those who responded that they used the Internet were classified as Internet users. On the other hand persons defined as Internet users in 2003 were those who use the Internet at least once a month. This means that requirements were set a little higher in 2003, which has the effect that the proportion of users is somewhat lower than it would have been if the definition had been the same as that in 2000. Despite this, the proportion of Internet users was higher in 2003, 82 per cent compared to 76 per cent in 2000.

Table 4 The "digital divides" in Internet use in 2000 and 2003

		Internet use	
Factor	Proportion in each group	**2000**	**2003**
Sex	(Men-Women)	8,9	4,7
Income	(High-Low)	7,5	7,1
Education	(High-Low)	17,0	14,7
Origin	(Swedes-Immigrants)	4,3	11,9
Age	(40-64 – 16-39)	19,5	17,9

- The largest divide refers to age and it has only diminished marginally

- The education divide is the second largest divide in both years and only shows a small decrease

- The divide between the sexes has been halved with the effect that in 2003 it is the smallest divide

- The income divide is smaller, but is the same in both years

- The divide explained by ethnic origin has increased considerably, from being the smallest in 2000 it is now in the middle.

However, one group had the same proportion of users in both years, which means that the increase in Internet users in this group has been entirely absorbed by the stricter requirements for consideration as an Internet user in 2003. This group was immigrants and this has the result that the divide between Swedes and immigrants is considerably larger in 2003 than it was in 2000. However, despite this, this divide was smaller than the divides that can be explained by age and education. However, these divides were somewhat smaller than they were in 2000. The small income divide was more or less the same in both years. The most positive trend was in respect of the divide between women and men. It was almost halved and was the smallest divide in 2003. This is also naturally the most positive result. The sluggishness in the decrease in the large age and education divides is a cause for concern. However, what is possibly most alarming is that Internet use among immigrants appears to be stagnating.

The largest differences are still between different ages. In the material above, only groups in the occupationally active age (16-64) were included. However, in other surveys it has been demonstrated that today pensioners use ICT to a much smaller extent than those in working life. It is possible that this problem will be solved automatically when young generations who are accustomed to using computers grow older. However, it can also be the case that one major reason why middle age people own computers is to enable their children to have access to IT and this reason is no longer valid when the children leave home. The financial situation of people after retirement can also have the effect that many pensioners do not use their financial resources for ICT investments. A student project performed in

Vällingby, a suburb of Stockholm, in the spring of 2003 also indicates that the issue of ICT skills for older people must be taken seriously[5].

According to ITPS there is also reason, at least in certain contexts, to give the remaining effects of the "digital divides" serious attention. It is quite clear that the access that schools have to computers is not capable of giving the students sufficient access to ICT and the Internet of the type that enables them to develop their knowledge of ICT on the basis of the computers available in the schools. This means that the ICT skills of school students are largely related to the availability of ICT at home. When access at home was lower than it is today, it was less discriminating for a student not to have access to a computer at home than it is today when computers and Internet connections are available for "almost everyone". For older persons who have chosen to remain outside the information society, this is not necessarily so serious, but the question is given a different dimension when it is related to children and young people.

2.3 "…. before all other countries"?

What progress has Sweden made in creating "an information society for all before all other countries"?

There are several reasons why it is extremely difficult to answer this question. Firstly there are no criteria for those aspects in which Sweden should be first to achieve the goal. Secondly there is an inherent difficulty in that the goal is flexible which means that the criteria for what shall be regarded as "IT maturity" are also flexible.

Nor is it possible to find international statistics of the above type that enable an assessment to be made of the "digital divides" in Sweden compared to other OECD countries.

At the point in time of the drafting of the IT bill, access to a computer at home and use of the Internet were the indicators that were most frequently discussed, while the indicator that attracts considerable attention today is broadband.

"Broadband" includes all the technologies that provide access to the Internet at a fixed price: satellites, cable TV, electricity networks, radio waves, local networks or via the fixed telephone network with the aid of DSL technology.

Moreover, as a result of technical advances, the speed of broadband is also a flexible goal. In Sweden, in order to call a service broadband, some people speak of a minimum of 2 Mbit/s. Others speak of 5 Mbit/s and of twice this speed in a few years.

In international comparisons, the current definition is at least 0.25 Mbit/s, even if extremely high speeds are also common in countries such as Korea and Japan.

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[5] *http://2g1319.ssvl.kth.se/ Life-form, life-cycle and life-style as a basis for service development*

On the other hand, it is possible to find data on these indicators of access. A comparison between Sweden and most other OECD countries in respect of computers in homes, access to Internet and access to broadband lead to the conclusion that Sweden is one of the leading countries but that there are several countries before us in all these categories. Relatively speaking, today - in the middle of 2003 – our lowest position refers to access to broadband. Our position can be seen in Figure 3.

Figure 3 Broadband penetration 30.6.2003
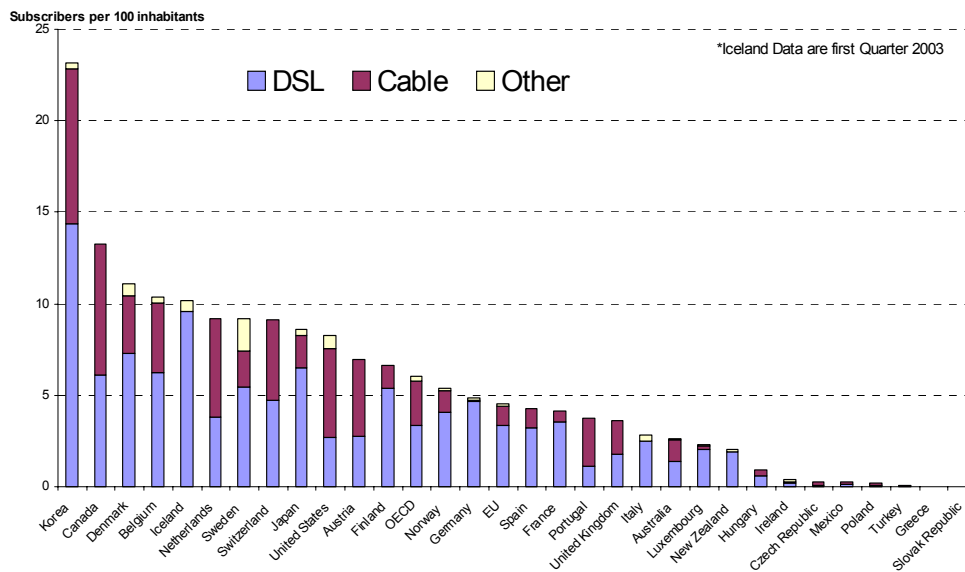
Source: Broadband update 2003. OECD

Since the indicator in Figure 3 is subscribers per 100 inhabitants and in most countries there are on average more than 2 persons in each household, this means that, apart from Korea where at least half the population have access to broadband, there are a number of countries in which at least every fourth household has access to broadband, while the corresponding figure is less than every fifth household in Sweden.

Even in other rapidly growing fields of technology, such as public access points for wireless local access networks (wlan), Sweden is quite clearly not at all among the most advanced countries. This is the case regardless of whether it is a question of public hotspots, or use of portable computers and wireless networks in working life.[6]

There is only one pure user indicator, namely Internet use. However, this is problematical, partly since only half of the OECD countries report information on this and partly since the latest available year varies between 2000 and 2002. However,

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[6] See for example, the article "Sweden falling behind" (in Swedish) in Computer Sweden 72 2003

an attempt to interpret the data gives the result that Sweden appears to have the highest use in 2001-2002.

There are no indicators that show "digital divides" except for individual countries and categories. However, those that exist for differences in income and between women and men indicate that Sweden has smaller divides than some other countries.

2.4   Indicators and statistics

In its work on the concept "A learning ICT policy", ITPS has emphasised the importance of expressing the goals of the policy in terms that permit monitoring and evaluation. The strategic main goal for the Swedish ICT policy is that Sweden should be "an information society for all before all other countries". To what extent can this goal be evaluated?

As discussed above, the goal can be broken down into one part "for all " which merely refers to the domestic breadth of the IT society. Naturally this goal must be clearly defined in order to make it possible to say whether, and to what extent, it has been achieved. The analysis in 2.1 above merely provides answers to the question of whether the spread of Internet use appears to lead to wider or smaller divides. This is ITPS' interpretation of the concept – it is possible to interpret it in another way. To make it possible for a goal to be really followed up, a clear-cut definition of the goal is needed, which must naturally be revised as rapid changes in reality make it necessary. The other part of the goal is in the international comparison where Sweden should be the first country to achieve, "an information society for all". An evaluation has to be made in an international comparative perspective. However, this is even more difficult since apart from the fact that the above-mentioned definition must be made nationally, it is also necessary that it is possible to follow it internationally.

The goal of establishing "an information society for all before all others" was selected on the basis of an assessment that Sweden had already fulfilled its earlier ICT policy goal of being one of the world's leading ICT nations. Existing databases show in many ways that there is no reason to believe that Sweden is not a leading IT nation. This is quite clear if one makes a simple "visual inspection" of e-Economist, IDC or OECD statistics. By and large Sweden appears to be defending its position as a leading IT nation even if, as mentioned above, we are not the leading country in almost any respect any longer. Many countries are also coming from below and can clearly outstrip us in certain respects, for example South Korea where broadband is concerned. In many cases where Sweden once was the leading nation, other countries are catching up and differences between Sweden and the outside world are becoming smaller and smaller.

At the same time there is every reason not to draw far-reaching conclusions based on these ranking lists. Apart from the OECD material, the quality of the data is often difficult to check and the key ratios that are compared are – often of necessity – not standardised. The lists can give a general indication if something is about to go wrong, but they do not say much at all about what it is that is going wrong. On

the other hand, if there are considerable underlying problems in certain areas, they can be concealed when different indicators are compared and combined. Thus an erroneous interpretation of the overall result can lead to a picture being formed that is far too self critical and which impedes development. Different ranking lists are interesting but they must function as control stations and constitute the basis of comparisons – they should not govern policy.

However, work is taking place in both the EU and OECD on developing indicators and on making the data of different countries more comparable. In the EU in particular, the possibilities of achieving improvements are considerable since it is an organisation which make decisions on new statistics. In a few months' time, when Eurostat publishes the results of the EU questionnaires that have been distributed to individuals and companies which ITPS has had access to on behalf of Sweden, it will be possible to improve comparisons considerably for all EU member states. It should be possible to see the extent of different "digital divides" as a consequence of age, sex, education etc in each country. In the future these surveys will be made annually. Then it will be possible, at least at the overall level, to follow how successful we are compared with the other EU member states in creating an ICT society for all.

However, as a basis for the concrete policy, more detailed comparisons may be necessary. Then it can be rational to shift interest towards the most advanced ICT countries that are also reasonably comparable with Sweden. One important component in the international comparative work is that it can be largely directed towards specific comparisons and benchlearning in relation to the countries which, in important areas for Sweden, represent one form or another of best practice.

In the opinion of ITPS, it is the municipalities that, in many respects, are currently the most important arena for ICT development. In Sweden the regional differences and the differences between municipalities are considerable where different aspects of ICT development and ICT use are concerned. In order to evaluate the work done in different municipalities and to encourage the municipalities to construct good programmes, ITPS considers that a database should be constructed that reflects indicators that are of interest to the ICT policy. A database of this type could contain information on the present situation in respect of, for example fibre-optic cables to homes, ADSL, levels of IP telephony, the use of ICT in schools, health-care at home, development of a "24/7 municipality" etc. In the work of developing indicators that make these comparisons possible, ITPS proposes that the Swedish Association of Local Authorities, the Swedish Federation of County Councils, the Swedish Institute for Transport and Communications Analysis and Statistics Sweden should establish a joint working group.

2.5   Conclusions and recommendations

Conclusions:

There is no possibility of assessing how well Sweden has succeeded in its ambition of being an information society for all before all other countries. This is due to shortcomings in the definitions of the respects in which Sweden should achieve this goal. Access to reliable and comparable international statistics will be considerably better in the EU in the near future. OECD statistics are also being constantly improved. However, making international comparisons will never be easy and problem-free and therefore Sweden should be a driving force for improving the situation in both these areas.

Even if Sweden is not "best" in all areas that can be referred to the goal, there is a great deal that indicates that, in relation to other ICT mature countries, Sweden has succeeded rather well in achieving progress in ICT that has been broadly accepted and supported in Sweden. However, it would appear that our leading position has been taken for granted and that various countries have caught us up and overtaken us in most areas. However, it is still to early to say whether this should be interpreted as meaning that it is quite natural that Sweden cannot remain in first position when other countries reduce our lead, or as a sign that Sweden has started to lose its leading position in the long term.

Recommendations:

- Prior to drawing up new ICT policy goals the Government should describe and give priority to the aspects that it considers are of special importance for Sweden to achieve in an information society and the aspects where we should be before other countries.

- Sweden should act as a driving force in international ICT development work in the EU and OECD on the development of relevant indicators.

- One important component in the development work should consist of the Government making a study of best practice in different aspects, particularly in those areas given priority by the Government and which thus have high demands made of them. In this respect the opportunity should be taken to learn from the experience of others in specific fields.

- In order to continuously monitor international trends and also to develop a database to follow up developments in Swedish municipalities, a statistics and indicator group should be formed by Statistics Sweden, the Swedish Institute for Transport and Communications Analysis and the Swedish Association of Local Authorities. The work of this group should be closely followed by the ministry.

- Since access to PCs and the Internet is becoming increasingly broader, the Government should give more attention to those groups that are at risk of ending up permanently outside the information society. In particular the question of stagnation in ICT use among immigrants should be studied in more detail.

3 Competencies

One of the Government's priority areas in the ICT bill for the promotion of "good and broad" ICT use is ICT skills. The Government also emphasises the importance of broad and specialist ICT skills to enable Sweden to be a leading ICT nation. A number of measures have been taken where ICT skills are concerned.

The PC reform of 1998 is usually classified under the heading of "skills" but it could also be regarded as falling under "access". In order to develop computer skills, the project "ICT in School" was extended to the end of 2002. The Government also presented a bill on the importance of the new technology for teacher training. In this respect it was proposed, among other things, that a national centre for teaching aids should be established. As early as in the summer of 2001, the Government commissioned the National Agency for Education to promote the development and implementation of the national ICT policy in the school sector. The assignment included drawing up a strategic soft infrastructure programme for information management in the education field. It also included designing standards and producing recommendations, as well as developing and designing prototypes for practical services for schools. This assignment is now being completed by the National Agency for School Improvement. An increase in the number of places at universities to 89 000 places over a six-year period, with a focus on science and technology, was initiated. The Government allocated, for example, new funds for permanent places at the Royal Institute of Technology, among other things in order to develop the ICT University in Kista, a suburb of Stockholm. A skills centre for Internet technology and an industrial research institute in the silicon technology field were established. Furthermore, an amount of SEK 30 million was allocated to support a national programme for the improvement of ICT skills in small businesses.

At the same time the wording of the ICT bill lays down that universities and university colleges shall have a specific strategy and action plan for all their work on ICT. In 2001 the Net University was also established.

In this evaluation programme, ITPS has made the following inputs:

- It commissioned a "meta evaluation" of PCs by ECON

- It commissioned an analysis of ICT in schools by PLS RAMBØLL

- It commissioned an analysis of ICT in university colleges by Metamatrix

- It provided questions on ICT skills for the EU questionnaires that were distributed to businesses and individuals, and co-financed the Swedish part of the Nordic questionnaire on e-Business, which also included questions on skills related to the companies' strategies for e-Business.

3.1   PCs

The study made by ECON on the PC reform provides strong arguments that the PC reform was a factor that accelerated the spread of PCs during the expansion phase, i.e. during the phase when the large majority of households absorbed the new technology. A comparison has been made with the other Nordic countries. Finland has not had a programme while Denmark and Norway have had small programmes of this type. This comparison has led to the conclusion that the proportion of the population that without a PC in the home would have been 10 percentage points higher if we had not had a programme.

According to a report produced by the Swedish Trade Union Confederation[7], there has been a considerable levelling out in access to computers in the home between members of the Swedish Trade Union Confederation (for blue-collar workers), the Swedish Central Organisation of Salaried Employees (for white-collar workers) and the Swedish Confederation of Professional Associations (for the professions) between 1997 (the year before the reform) and 2002. If the response to the question "Have you used the Internet yourself at home during the last twelve months?" is used as an approximation of computer skills, it is in this field that a considerable levelling out took place between the three groups in the period 1998-2002. There is also a similar trend where computer use at work is concerned. The availability of computers for employees increased from approximately 35 per cent of employees at the beginning of the 1990s to over 60 per cent in the year 2001. However, the "traditional" difference between the members of the Swedish Trade Union Confederation, the Swedish Central Organisation of Salaried Employees and the Swedish Confederation of Professional Associations still exists. The proportion of people who use computers at work is more than twice as large in the latter two groups compared with the first group, even if the difference has diminished. Consideration should also be given to the continued decline in the jobs done by blue-collar workers and the increase in the jobs of white-collar workers.

The purpose of the PC reform was not least to increase employability. However, there are no analyses of this effect, but the cost of unemployment is so high that it was only necessary for relatively few people to have been employed for considerable gains to be made. In any case, if one person in twenty of those who acquired as computer as a consequence of the reform retained their jobs as a result of the improvement in their IT skills instead of being made unemployed, the reform was easily financed. This can be compared with the fact that one person in ten still considers that he or she does not have adequate IT skills for the job (EU questionnaire to individuals).

However, ECON maintains that the effect of the PC reform is declining as computers become more widespread. ECON therefore considers that a review could be appropriate, and the Government has recently decided to initiate a review. ECON's hesitation in respect of a continuation of the programme is based on the conception that those people who acquired a computer as a result of the programme have understood the value of computers and the Internet, and will therefore have

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[7] *"Computers, class, sex and age", September 2002 (in Swedish)*

computers in the future, without any special subsidy. However, this is not a matter of course. Therefore, it would be unfortunate if the review led to a rapid phase-out of the programme. Instead, the effects should be studied in depth and trends should be followed closely over a period of, say, two years. In addition there were some groups that were not covered by the reform and there is therefore good reason to consider whether they should also be given some support, for example children of parents who live on social benefit, and recipients of social benefit themselves. Other groups that were not included in the reform are students and the self-employed. However, the largest group that was not covered by the reform are pensioners and most pensioners clearly have lower levels of ICT skills that those in working life. It is true that possible programmes for this group cannot be justified for labour market reasons. However, programmes for them can be justified by solicitude for their life quality, and indirectly by ways in which healthcare services for them can be designed in the future.

3.2   ICT in schools

ITPS/PLS RAMBØLL emphasise in their analyses that ICT in schools has reached a critical point. Two major central programmes have been implemented: the Knowledge Foundation's school programme that started in 1995 and the IT in School programme (ITiS). Both these programmes have now ended. In their analyses, ITPS/PLS RAMBØLL have not found any strong reasons for continuing the work in the form of major, central projects in the future, or any strong advocates for doing so. Prior to any continuation of the projects, it is the role of the municipalities and the individual schools to pursue IT development even more explicitly and in the form of a continuous process.

3.2.1   The legacy of ITiS

According to the evaluation made by PLS RAMBØLL, the Knowledge Foundation's programmes paved the way for ITiS. ICT issues were put on the agenda and the schools became accustomed, for better or for worse, to having good access to resources in the form of computers. However, the evaluation of the project "Pedagogics, technology or economy?"[8] points out that the programmes were implemented without any broadly accepted linkages to goals and aims. In this respect ITiS was different, for example each participating teacher was given a computer and the project was implemented in the everyday working life of the teachers.

The ITiS project has been criticised on many points by several evaluators. Without doubt the reform cost a lot of money. However, one important effect is that it provided a good impetus for ICT skills among the teachers. Experience from earlier school projects has shown that, if ICT is to be integrated with teaching and instruction, it is necessary for the teachers to have requisite ICT skills. With the aid of the ITiS project, 75 000 teachers, i.e. half of the teachers in Sweden, were able to develop IT skills and were given access to a computer to use in their work. In

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[8] *Jedeskog, G, U. Riis, 1997. A baseline study of the Knowledge Foundation's municipality-based school development project, Department of Education at Uppsala University, 1997.*

other words, a large proportion of the resources were allocated for computers, which would normally have been the employers' responsibility.

One point of view often encountered by ITPS is the very fact that personal access to a computer is of extremely great importance in the development of the types of ICT skills that could be used as a tool in educational work. In PLS RAMBØLL's interviews that were conducted in connection with this assignment, the impression given by the respondents was that ITiS set a lowest acceptable level for ICT skills rather than created cutting-edge skills. In other words it is felt that ITiS has primarily tended to broaden ICT skills rather than to deepen them.

3.2.2   An international comparison

How "ICT-mature" are Swedish schools in an international perspective? In other ICT-mature EU member states, access to the Internet in the schools is at a high level (March 2002), ranging from 92 per cent in Holland to 100 per cent in Denmark[9]. In comparison with these countries, Sweden has good access – 99 per cent. Variations in access are larger in respect of numbers of computers per 100 students (March 2002)[10]. Here, Denmark once again is in a good position, with 25 computers to 100 students. Finland and Great Britain have 12 and 10.6 computers respectively per 100 students. Holland is also at a lower level in this respect, with 5.4 computers per 100 students. In this comparison Sweden's position is not so good since our computer density is 11 computers per 100 students.

In their report, PLS RAMBØLL also made a comparison, on behalf of ITPS, between Sweden, Denmark, Norway, Finland, Holland and Great Britain (for a detailed description of the situation in these countries, please refer to appendix 5 of the PLS RAMBØLL report). All countries included in this study have implemented major programmes to stimulate ICT use as part of their ICT strategy.

Like Sweden, the five countries have given ICT in schools a high position on the agenda. However, it is only the programme in Holland that resembles ITiS. Apart from this, the international comparison also shows that all the countries pursue one or more web-based services that are directed towards schools. In Sweden this would correspond to the Swedish Schoolnet and the National Resource Centre for Educational Media. Another observation is that most of the countries included in the study *have had a specific focus on enhancing ICT skills in teacher training programmes as one method of stimulating the use of ICT in schools* (ITPS' italics).

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[9] *http://europa.eu.int/information_society/eeurope/2002/benchmarking/list/2002/index_en.htm*
[10] *http://europa.eu.int/information_society/eeurope/2002/benchmarking/list/2002/index_en.htm*

3.2.3   The future

ITPS/PLS RAMBØLL would state that both the Knowledge Foundation's school programme and ITiS were projects. They were based on a given time schedule and a fixed budget. As mentioned above, in the future ICT in schools will be a continuous issue for municipalities or for individual schools. To ensure that ICT in schools is part of normal activities, it is necessary that the large central government projects are replaced by mechanisms that have long-term effects. A transition to continuous activities also should coincide with a transition to a situation in which specific responsibilities are assumed by municipalities and individual schools[11].

PLS RAMBØLL makes the assessment that there is a need for future ICT programmes at municipal level rather than *one* future ICT programme initiated at central level. It is the municipalities that now have the responsibility for being the driving force for ICT in schools in the long term. PLS RAMBØLL makes this assessment since it is only when the municipalities have the principal responsibility in this matter that they will seriously realise that it is their actions, in their capacity as the authority responsible for schools, that will be of decisive importance for the degree to which ICT becomes a natural tool in the teaching in schools. A new, extensive ICT programme would delay this process of transition.

This focus is also in line with the report *E-learning as a challenge*, the final report of the working group that has had the responsibility for proposing a new national IT strategy for schools.

3.2.4   Views on ICT in school from other perspectives

ITPS agrees in essentials with the description of development provided by PLS RAMBØLL and its assessment of the central government ICT programmes for schools hitherto. Furthermore, ITPS agrees with the assessment that no new major ICT projects similar to ITiS are needed and that the task is now to ensure that there are active long-term resources in the municipalities that should take over the responsibility for ICT development. The "handing-over" of responsibility to the municipalities is a question that, in the opinion of ITPS, should not be over-dramatised. The municipalities have had the principal responsibility for schools for a long time. Central government has its responsibilities and they will not be changed. What has happened is that a number of central programmes: computers in schools, the Knowledge Foundation's programme and ITiS, have come to an end, but the possibilities available to central government to exert an influence on developments – with the aid of goals, evaluations and different types of other programmes – remain intact. The work with computers or ICT in schools has now been in progress for a period of ten years, the central programmes are no longer running and the National Agency for Education has now been split into two agencies, the National Agency for Education and the National Agency for School Improvement. This has had the result that two central government agencies have had reason to reflect on the situation. The National Agency for School

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[11] *Final report of the working group for a new national ICT strategy for schools, 2002. E-Learning as a challenge.*

Improvement, the Ministry of Education and ITPS are of the opinion that these contributions can supplement the analysis made by PLS RAMBØLL in an interesting way.

National Agency for School Improvement

The National Agency for School Improvement is of the opinion that the Swedish policy never actually established any real goals for the ICT programmes in compulsory school[12]. ICT has mainly been regarded as a tool for reaching other goals and, to a lesser extent, as a phenomenon that the students needed to have knowledge of.

The Agency emphasises that ICT offers new opportunities to adapt material and working methods to the special conditions and needs of each individual student. ICT makes it possible to open the classroom to the outside world: to the local community and to international engagement.

Where the consequences of the end of the central programmes are concerned, the Agency writes:

> *"From having taken little action in the shadow of the ITiS delegation and the Knowledge Foundation, the Agency will now get to grips with the issue and take an overall responsibility. This makes it necessary for the Agency to clarify the concept of ICT in schools and the goals it plans to work towards."*

In other words, what is taking place is a "normalisation" of the situation on the "national" side and that ICT development in schools is now entering a "normal" situation in respect of relations between central and local government in respect of shared responsibility. On this matter, the Agency writes as follows:

> *"In a corresponding way, there are shortcomings in management skills, a lack of municipal strategies and a lack of coordination and participation in the use of information technology. It is no longer merely a question of the meeting between teachers or between teachers and students, not merely a matter of pedagogics. Instead it is a question of shared responsibility and of the possibility of encouraging and supporting municipalities that are unable to meet their undertakings."*

Working group for a new national ICT strategy for schools

In the summer if 2001, a working group was established in the Ministry of Education which was given the task of drawing up proposals for a new national strategy "with the aim of further developing, broadening and intensifying knowledge of ICT in schools"[13].

The working group feels that experience shows that "when the government stimulus disappears, many local projects are in danger of coming to a standstill.

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[12] *Strategy for IT in School. National Agency for School Improvement, 2003. (In Swedish)*
http://www.skolutveckling.se/
[13] *The next step. Interim report from the Working Group for a new national ICT strategy for schools. (In Swedish)*

The difficulty centrally is to create incentives and to provide support that are linked to and reinforce dynamic local processes. Now there is a need for structures and support for schools and municipalities in order to abandon time-limited projects and programmes and proceed instead to an integration of ICT use in daily activities..."

The working group paints a picture of the future that is not too optimistic. It draws attention to assessments made by the Swedish Association of Local Authorities that four municipalities in five will exceed their budgets for care of the elderly in 2002, that 60 per cent will exceed their budgets for compulsory schooling, and 50 per cent their budgets for upper secondary schools.

The working group proposes a nine-point programme for the work of central government with ICT in schools in the future:

- Human resource development programmes directed towards teachers

- Further work with the local supervisors who were trained in the ITiS programme

- Educational resources (web-based material, websites etc)

- Support for municipalities in technical issues

- Support for international cooperation

- Directives for schools. The working group is of the opinion that there are good reasons to take into consideration the long-term and short-term effects of ICT in the curricula, and not least its importance for the development of schools.

- Goal fulfilment of teacher training programmes. In this respect the group is of the opinion that it is important to examine whether teacher training programmes live up to the requirement of providing ICT skills to newly graduated teachers.

- Development and research triangles (the need of systematic documentation on processes of flexible learning).

- Special pedagogics

The working group refers to studies of American and Swedish experience of teacher training in which the conclusion has been drawn that "the teacher training programmes and the students often demonstrate a sceptical attitude to the educational work of using ICT." A certain improvement seems to be taking place in teacher training programmes but the working group draws the conclusion that experience gained from this is not being systematically transferred to ordinary activities and "it is still the case that many universities do not have a purposeful and in-depth discussion on the long-term effects of ICT on schools, on the role of teachers and not least on the subjects taught in school".

3.2.5   ITPS' assessment

A central issue for ICT in schools is that central government has specific goals for activities (formulated in curricula and in the ICT policy) and that, in its regular evaluations, central government monitors the ways in which these goals are implemented in the schools. One important signal to the schools would be to introduce central examinations at different levels in order to test the ICT maturity of the students.

In its activities, the National Agency for School Improvement has also emphasised the importance of giving school principals further education and training in ICT. ITPS considers that this priority is totally in line with ITPS' conception that schools should be an important instrument in the implementation of the ICT policy.

The various project-oriented programmes seem to have been both good and bad. They have initiated processes but on the other hand they have not always matched the possibilities available to municipalities or schools to "take care of" the central government initiative. Both PLS/RAMBØLL and the working group point out the necessity for interaction between several factors, at both central and local level, in order to achieve positive results.

ITPS considers that all the points taken up by the working group are well-founded. However, ITPS would emphasise in particular the importance of the existence of effective basic education and further education programmes in "ICT and learning" for all the teachers in the country. This is a model that is being followed in other countries and, without a well-developed further education mechanism, there is an obvious risk that the school cannot be at the cutting edge of new learning and of new working methods in working life that are necessary for the development of society. In this respect, the schools of education could play a role, at least in the education of new teachers. However, at the point in time of the completion of this report, ways in which the expertise and experience of the teacher training colleges in this field should be assessed were still not clear to ITPS[14]. In this respect, the Net University could possibly provide support for the compulsory school via further education and cooperation with the schools of education. On the basis of the pieces of the puzzle that are now in place, i.e. the National Agency for School Improve-

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[14] *When this report was being finalised, The Knowledge Foundation published a report "IT in Schools. An annual survey of attitudes towards IT in schools by the Knowledge Foundation", October 2003. "As many as 74 per cent of the teachers who finalised their studies in 1998 or later are not satisfied with the knowledge they acquired during their teacher training programmes on ways of using ICT in teaching. Last year's survey showed that young teachers use computers in their teaching less often than older teachers. This is confirmed in this year's survey. The reason can be that newly trained teachers have not been given enough instruction at schools of education on ways of using ICT in their teaching" In a comment on the survey, Peter Fowelin, who is responsible for the Knowledge Foundation's schools programme stated:" The fact that so many are dissatisfied with the ICT instruction they received in their teacher training programmes is clear evidence of the failure of the programmes in this respect. The programmes to teach Swedish teachers to use ICT have been successful. It is therefore a cause of concern that newly trained teachers have low levels of ICT skills, so low that some municipalities have sent newly trained teachers back to school to enable them to catch up with their older colleagues." (http://www.kks.se/pressmeddelanden/).*

ment, the Net University, the schools of education, the National Resource Centre for Educational Media, the Knowledge Foundation etc, it should be possible to make a joint effort to provide effective programmes of further education for teachers. One instrument that, according to PLS RAMBØLL, has functioned well in Denmark and in Norway is an educational ICT driving licence for teachers. This is a further education programme leading up to a test. According to evaluations made in these countries, it has been an effective instrument for integrating ICT into educational work.

Where ICT in schools is concerned, ITPS would also draw attention to the fact that access to computers by students depends to a very great extent on the availability of computers outside school. The study quoted above by the Swedish Trade Union Confederation on ICT use at home and at work draws the conclusion that access to a computer at home is much lower in the families of blue-collar workers than in the families of white-collar workers. This gives a significant difference where opportunities for the children are concerned. Furthermore, ITPS considers it to be of utmost importance that central government continues to develop its standpoints on its role in the new situation. The strategic objective of the ICT policy is "an information society for all " and in this concept the "breadth dimension" is important inasmuch as all students shall be guaranteed opportunities that are as equitable as possible to acquire good knowledge of ICT use during their school careers. Central government cannot decentralise this responsibility.

3.3 ICT at universities and university colleges

The universities and university colleges are large work places that pursue broad and deep educational activities and advanced research. In addition, the universities have an important role in spreading knowledge and modern working methods to working life and they thereby also function as a role model and forerunner where ICT use is concerned. In a country that not only has the ambition to be a leading ICT nation but also the country that should be "an information society for all before all other countries", special demands are made of the universities and university colleges and, in particular, their ability to disseminate knowledge of, and to be a good model for, ICT use.

Where this criterion is concerned, ITPS has chosen to use the Metamatrix report as its point of departure and to comment on this report.

3.3.1 Integration of ICT in teaching

In its report Metamatrix emphasises the difficulties of measuring ICT integration in teaching and that there are shortcomings in the available data.

As a rule, the universities have well-developed programmes on ways in which ICT should support their activities and a large number of educational development projects are underway. Metamatrix is of the opinion that it is difficult to make relevant international comparisons but states that Sweden has regularly won prizes in an international competition on teaching aids for academic studies - the European Academic Software Award (EASE), which is held every second year.

However, Metamatrix is of the opinion that the major breakthrough has not yet occurred. Swedish universities are not alone where the difficulties in achieving far-reaching integration of ICT in all their activities are concerned. Metamatrix quotes a recently published international review of ICT use in higher education in Europe where it is stated that, even if there is a general understanding of the fact that ICT is an extremely important factor that drives processes of change for higher education, it is difficult to actually implement major changes.

"It is estimated that in Europe only a few institutions have actually fully completed the process of strategic decision making, and that many institutional leaders feel ill-equipped to face these major changes. There is more often a general notion of keeping up with the competition and fear to be left behind in the ICT race, than an actual and clear vision on the role that ICT could and should play in the institutions' mission and actions."[15]

Metamatrix states, with the reservation that it lacks real evidence for its standpoint, that it is nonetheless its assessment that this description is also largely valid for the Swedish university system. In the evaluation quoted above of IT projects in universities, the evaluators arrive at conclusions that are largely similar to those quoted above. It states that:

"Multimedia has, for example, been regarded during the last decade as an important innovator in the educational field, but with the fairly extensive experience that we now have, it can be said that the element of multimedia in different practical contexts is relatively small. At universities its use is still marginal and there is no sign that we are about to see a dramatic increase. At a educational level and in terms of providing support for new forms of interactivity, the majority of these products have not had an innovating effect..."[16]

However, despite these critical statements, the evaluators are of the opinion that the programme of the National Agency for Higher Education has promoted the enhancement of basic higher education and it has stimulated new thinking and experimental and innovative activities that would otherwise not have been implemented.[17] Furthermore, the evaluators maintain that the knowledge threshold for the introduction of new technology in education programmes should not be underestimated.

There were variations in the responses to the question of what can be the most important action to take to raise the level of educational ICT use in universities, among those interviewed by Metamatrix. Even if most respondents stated that the most important measure was human resource development programmes for the academic teachers, some were of the opinion that, as long as there was no inner driving force and self-interest among the academic teachers, attempts to provide further education would be fairly meaningless.

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[15] *Van der Wende, M:* A Mirror of Europe: *The Use of ICT in Higher Education in Van der Wende and* Van de Ven: *"The Use of ICT in Higher Education" Lemma Publisher, Utrecht 2003, p13 et seq. (Our italics)*

[16] *Eldsjälar och institutionell utveckling (Enthusiasts and institutional development),p 62*

[17] *Ibid, p 65 et seq*

Metamatrix is of the opinion that the overwhelming proportion of the educational development work on ICT done by the universities seems to be spent on the development of distance learning programmes and, to a smaller extent, on the development of distance learning methods. Furthermore, it would appear to be the case that a most of the educational innovations occur in the work of developing and implementing new distance courses. According to the persons interviewed, this spills over to the ordinary programmes and thus a certain degree of educational regeneration takes place.

3.3.2   ITPS' comments

ITPS agrees with the assessment that Swedish universities do relatively well in an international comparison. In an international comparison it would also appear as if the Swedish educational tradition of *creating understanding* among the students could offer a sound foundation for continuing this work. The *general* potential available to Swedish universities to improve their positions appears to be good.

ITPS agrees with Metamatrix' conclusion that the "threshold of knowledge for the introduction of new technologies in educational programmes should not be underestimated". ITPS shares the opinion that educational development work is taking place particularly in connection with the development of distance education programmes. This brings up the question of the ways in which experience from this work is disseminated, not only to other parts of the university system but also to the education system in its entirety.

ITPS agrees with the assessment that university teachers have little incentive to develop distance courses in view of the large amount of work involved. Aspects relating to contracts and copyright should be studied in more detail.

3.3.3   Schools of education

Metamatrix writes:
"There seems to be no reason to assume that teacher training programmes in general have a higher degree of ICT maturity or a more extensive or advanced educational use of ICT compared with other parts of the university system. The overall picture is complex and uneven - excellent educational programmes and well considered and well implemented strategies are mixed with a lack of interest in recognising the educational potential of ICT. In comparison with the compulsory school, educational ICT use in teacher training programmes, and in other university programmes, stands out as being as uneven and, all in all, not very advanced. There is therefore reason to assume that examination requirements in the Higher Education Ordinance are not strict enough or specific enough to encourage general improvements in teacher training programmes."

In the Government bill on innovative teacher training[18], a certain degree of importance is attached to ICT. Requirements in respect of knowledge and skills that students at the schools of education shall have acquired at the end of their education programmes are, according to the bill, considerable. But the long list of requirements in the bill was only given a small amount of attention in the new formal examination requirements that entered into force in 2001.

ITPS' comment
The schools of education should be the natural link for transmitting the experience gained in research and development work to the school environment. The fact that, on average, schools of education appear to be less advanced than compulsory school is therefore completely *unacceptable*.

3.3.4   Distance courses

In its recently published annual report[19], the National Agency for Higher Education stresses that "since the middle of the 1990s the number of students in distance education programmes has increased more rapidly than the number of students attending education programmes at each university in the normal way. The increase has been particularly rapid in the last few years. Through the establishment of the Net University in 2002, both the number of courses available and the number of students have increased."

In the annual report it can be seen that, in the academic year 1993/94, there were 21 500 distance students (which corresponds to 8.4 per cent of all students). The figures have increased steadily since then and, in 2001/2002, there were 44 300 distance students (12.5 per cent). Accordingly, the number of distance students has doubled in ten years. It can also be seen that a large proportion of the distance students are older than the average student and that two-thirds were women, which is above average for the entire student population.

The Swedish Net University Agency has contributed to speeding up developments not least through the additional payment universities can receive from the Agency for courses of a distance character. Another driving force is the development of municipal learning centres which are being established at an ever increasing pace throughout the country.

In the report "Courses offered by the Net University 2002"[20] published by the Swedish Net University Agency, it can be seen that, at the beginning of November 2002 there were 2 771 courses which the universities themselves had classified as distance courses.[21] Of these, 2 394 were courses offered by the Net University.[22]

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[18] *Government bill 1999/2000:135, p 64*

[19] *Universities and university colleges – Annual report 2003,*
http://www.hsv.se/sv/FileServlet/doc/1317/inlaga03.pdf

[20] *http://www.netuniversity.se/download/539/x/N%E4tuniversitet%20kursutbud2002.pdf*

[21] *The courses are those which, at this point in time, were in the course catalogue published by the National Agency for Higher Education and include distance courses that started in the autumn of 2002 or later.*

[22] *The difference is due to the fact that not all distance courses run by universities and university colleges are notified as courses in the Net University.*

The total number of courses and programmes in higher education were, at the same point in time, approximately 22 000. Of the Net University's courses, approximately 50 per cent were five point courses (equivalent to five weeks of full-time studies). No more than 5 per cent consisted of longer programmes. These figures should be similar to those on the total courses on offer.

ITPS' comment

ITPS finds the developments that have taken place after the establishment of the Net University to be very positive. The question here is the extent to which this development can be related to the additional payment the universities could receive and what the consequences would be if this support were to cease. Experience gained from, for example, the PC reform shows that support for developments during an early expansion phase can be an effective instrument for speeding up the process.

3.3.5 Distance education

Metamatrix describes in its report how different countries have met the growing need for distance education by providing various national programmes. These programmes are often collected under the heading "virtual university". The concept is expressed concretely in three ways:

- a separate university unit that merely provides distance education nationally and internationally and with the support of new media and ICT (Open University),

- a consortium formed by a number of universities that coordinates its network-based courses, often via a common portal,

- a separate unit/agency that does not supply its own training programmes but which coordinates development work and research, administers support functions, and acts as an adviser to decision-makers and clients.

Sweden selected the third alternative when it established the Swedish Net University Agency in March 2002. The choice is natural in light of the fact that Sweden has deliberately chosen to invest in the development of regional university colleges instead of an out-and-out "virtual" expansion of higher education. This strategy has, in all probability, given rise to vigorous regional development in the places where the university colleges have been located. Now that distance education is being expanded, the possibilities of offering blended learning will reasonably be better than if Sweden merely had large universities. It is well known that blended learning gives better results than pure distance studies. One possible disadvantage is the lack of a "spill-over effect" which many observers maintain occurs when extensive distance education programmes are introduced.

ITPS' comments

In the opinion of ITPS, there is one field in this context that has not yet been exploited. The ICT bill describes the possibility of distance education becoming an instrument in a strategy to realise the vision of life-long learning. In the ICT context, the Swedish Trade Union Confederation has often expressed a vision of further education with a method that is not merely "e-mail based", but based on interactive pedagogics with strong elements of video and voice transmission. In this respect there are also links to the Ministry of Education's bill on the open university[23] that could be linked to the visions of the ICT policy with the aid of distance education.

3.3.6   Diversity

Metamatrix writes.

"Issues relating to ways in which gender and cultural/ethnic background influence the choice of studies and professions are one component in the broad public debate. At the same time these issues have an immediate topicality for by and large all universities. The reason for this is the obvious imbalance in relations between women and men or in the capacity to make best use of the skills possessed by persons with different cultural/ethnic backgrounds which are regarded today as problems that make it difficult for universities to achieve their goals and visions.

To that extent it can be believed that the debate of recent years has borne fruit in a deeper realisation of the role and function of universities in society. It is also clear that, without exception, the universities have produced documents that describe their visions and action plans in these matters. This can be seen as a result of the new demands made of them in recent years. Another explanation can be that, from the recruitment point of view, it has become necessary for the universities to turn to broader groups when the traditional recruitment groups, consisting principally of young Swedish men, start to falter. In the long term this will probably change the composition of the student body from the perspectives of gender equality and the equal value of people in general. A combination of deeper structural changes together with continued political interest seems at present to be the most successful way of creating universities that are promote gender equality and the equal value of people in general."

ITPS' comment

A greater degree of diversity in recruitments to programmes of higher education in the ICT field is not merely a question for the universities, it is also essential for the sector to enable it to see its technical solutions in a broad, multifaceted social perspective as one way of meeting user-driven challenges in ICT development.

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[23] *Government bill 2001/02:15. The Open University*

3.4   ICT skills in working life

One of the Government's most important goals of improving ICT skills is to increase the employability of the labour force. In this respect, in addition to programmes in schools and universities, the PC reform was also a central measure.

In order to improve the data for making assessments of the ICT skills of the labour force, ITPS acted for the inclusion of some supplementary questions on ICT use among companies and individuals in the EU surveys made by Statistics Sweden during the spring.

From responses received to the questionnaires, it can be seen that, where individual persons are concerned, only one in twenty stated that they had refrained from applying for a job that they were otherwise qualified for on account of deficient ICT skills. In addition, only 10 per cent that state that they do not have sufficient ICT skills for their daily work and just as many state that they are hindered by this lack of skills in their professional development. At first sight these figures can seem to be relatively low, but nonetheless it is still every tenth person who has problems in his or her daily work due to inadequate ICT skills. This ten per cent can be compared with the 7-8 per cent of the labour force that are unemployed or participating in labour market programmes. There is also a risk that individuals underestimate demands in respect of ICT skills. In order to supplement the picture, some questions were also included in the ICT questionnaire that was distributed to enterprises.

When companies were asked to assess whether they had problems in respect of applicants for jobs that had inadequate ICT skills, less than five per cent considered that this was often the case, but between 30 per cent (companies with 10-19 employees) and 60 per cent (in all groups with at least 100 employees) considered that this was sometimes the case. This gives a somewhat problematical picture. It is reinforced by the fact that one-third of the large companies (with at least 100 employees) considered that inadequate IT skills among the personnel have hampered the development of the company. However, among the smaller companies, this proportion is lower. Despite this, it provides a clear signal that there are shortcomings in ICT skills in the Swedish labour force.

As mentioned above, ITPS has also co-financed the Swedish part of a Nordic study of the so-called e-Business of companies. From this study it can be seen that, among the Swedish companies, more than 25 per cent consider that their personnel totally lack adequate ICT skills for implementing their plans for e-Business and a further 33 per cent consider that their employees only partly have the necessary skills. These are figures that are clearly lower than the corresponding figures in Finland where the companies seem to be much more aware of the need to invest in ICT skills among employees. All in all, this gives a picture that the ICT skills of the Swedish labour force must be improved even if the great majority know a certain amount already. However, now that companies and the public sector seriously intend to make use of ICT to build entirely new organisation structures and to change ways of working, a considerable step forward in skills is essential.

A few years ago, the EU Directorate for the labour market propounded the thesis that the information society must also be a learning society and that the "learning society" concept would be a better metaphor to describe the character of the society that is emerging as a result of the interaction between technical and social changes.[24] According to the expert group, a shift in focus of this type could lead to a more positive and specific discussion on the information society than had been the case up to that point in time. Even if some time has now passed since this report was written, the discussion taken up by the working group is just as topical today. Life-long learning and the role of ICT in this process have been discussed in the political arena for a long time and, even if the Swedish education institutions provide many opportunities for education and further education during different epochs in life, the major breakthroughs, for example for further education supported by ICT, have not yet materialised.

ICT as an aid for learning (regardless of whether we use the terms "ICT-supported distance education", "flexible learning", "e-Learning" or "ICT-supported learning") is a relatively new phenomenon. The Internet has existed in commercial applications for little more than ten years and it is therefore not surprising that ICT-supported learning has not yet made a breakthrough as the dominating educational method. The American economist and sociologist (and Nobel laureate in economics), Gary Becker, who among other things is well known as one of the pioneers in analyses of human capital, has joined the ranks of the supporters of ICT-supported learning.[25] Becker is of the opinion that the modern economy makes it necessary for people to invest in acquiring knowledge, skills and information during most of their life. Nonetheless, the main method for learning is still the same as it was when Socrates lived, i.e. that teachers and students meet face to face for lectures and discussions. Becker now says that the Internet has the potential to change this by linking people together, regardless of time and space.

The working group for a new national ICT strategy for schools[26] states in its report that the traditional form of work in schools is that teachers and students are at the same place at the same time, while distance education has previously been characterised by the fact that teachers and students have been in different places. The introduction of ICT now means that the boundaries between these forms are in the process of being erased and that different forms of work are being constantly blended.

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[24] "Green Paper: Living and Working in the Information Society" EU. Dg V.1996
[25] Becker, G.S. (1999). "How the Web is Revolutionizing Learning", Business Week 12/27/99. Issue 3661. p.40
[26] "e-lärande som utmaning" (e-Learning as a challenge) .p. 59.

In a research report produced some years ago by the National Institute for Working Life[27], a description was given of experience gained from the further education programmes for engineers in Sweden organised by Ingenjörssamfundet (a professional association for engineers) that have been held for many years. Some of the conclusions of this report can be summarised as follows:

- ICT-supported learning has shown that it has the potential to integrate further education with the needs of practical training and working life.

- The flexibility offered by distance education is an important prerequisite for programmes of further education to reach the occupationally active.

- However, experience indicates that distance education is not a simple panacea for the human resource development problem but is rather an extremely demanding form of study and development that requires a great deal of discipline and a high degree of motivation.

- The social environment for studies in the form of personal support and specific tangible and intangible rewards must be developed in order to persuade the occupationally active to take on more extensive programmes of further education and programmes to supplement existing skills.

In connection with these studies at the National Institute for Working Life, surveys were also made of ways in which ICT affects learning in working life. These showed that the learning processes associated with the acquisition of knowledge, data or information that was needed to do the job in the immediate future ("just in time learning") were being rapidly developed in working life. On the other hand, the learning that was relevant in a longer time perspective and which was concerned with the possibilities available to the individual to acquire more breadth or depth, or the possibilities to start a new career, had not been developed in a positive way.

What is happening is that forms and methods for learning at school, at university and in working life are becoming increasingly similar in many ways. A great deal has happened in recent years in schools, universities and working life, but no breakthrough has occurred. Programmes directed towards working life are conspicuous by their absence and the motor for developing and disseminating knowledge on electronically-supported learning which the teacher training colleges could provide is not working. At the same time, industry and working life are faced with great challenges that require advanced use of ICT for the development of their operations, as a method to increase productivity, and as an innovative force.

ITPS is of the opinion that central government should take a comprehensive grasp on ICT and learning. The driving forces for the development of ICT and learning and the dissemination mechanisms must be strengthened and working life must be part of this development.

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[27] *Lundgren, K and L.M. Liljenwall (2001). Distance education as a form of support for life-long learning in working life. National Institute for Working Life: Working Life in Transition (in Swedish) 2001:5.*

The requirements in respect of skills mentioned in the ICT bill focused on the ability to handle computers and the Internet. The level of ambition in this respect should now be raised and be linked above all to knowledge of how ICT is used in relation to different goals, for example in the form of support for the development of operations.

A delegation for ICT and learning, of the same type as the Delegation for Public e-Services should therefore be established with representatives of the education system and working life.

3.5 Conclusions and recommendations

Conclusions:

- The Government's programmes in the field of human resource development have provided considerable scope for those in working life or in studies. Measures directed towards those who are not part of these groups are fragmentary and unplanned. The link to the goal of "an information society of all" is therefore weak.

- The PC reform has, in all probability, had a clear effect on the rate of diffusion in the expansion phase and has speeded up access to PCs in the home. If a country that already has a high degree of penetration wishes to increase the spread of PCs, it is reasonable to assume that the effects of the reform in relation to its costs would tend to be increasingly smaller.

- ITiS has made a strong contribution to giving half of the teachers in Sweden good ICT skills and computers of their own. This is regarded by ITPS as an important platform for future work with ICT in the compulsory school. However, programmes of this type for schools must be coordinated with the phase of development the schools or municipalities are actually in, so that there is recipient expertise for the central government programmes.

- It is only in a few places that ICT has been an important tool for renewing teaching and instruction in schools or in universities and university colleges.

- However, there are still clear shortcomings in the ICT skills of the Swedish labour force and these are, above all, a problem for the next phase of IT development, when the potential of IT will be used for building up society in a completely different way than has been the case hitherto.

Recommendations

- There is no need for new, extensive, governmental project-based programmes similar to ITiS in the foreseeable future. On the other hand, central government should use the instruments that it has at its disposal, for example goals, curricula, central examinations and school inspections, to stimulate development.

- The long-term need for further education of the teaching body in the ICT field is, in the opinion of ITPS, also a key issue for government involvement in the future. It should be possible to offer regular advanced further education programmes in ICT and pedagogics to the schools on reasonable conditions. The government should assemble the agencies concerned for the creation of a course programme of this type.

- The evaluation made by the National Agency for Higher Education of the schools of education should be supplemented by a special evaluation of the ways in which the education of new teachers in the field of ICT and education have been run.

- The incentives for university teachers to develop distance programmes seem to be weak in view of the large amount of work involved. Contractual and copyright issues relating this should be the subject of a detailed study.

- Since the costs to central government for PC purchases are high and a large proportion of the costs are incurred through purchases of relatively expensive computers, a ceiling should be introduced on tax allowances for the purchase of PCs. This was in fact laid down the Budget Bill for 2003. Trends should now be closely monitored and a review made in two years' time. It is important that they are not phased out too rapidly and a thorough analysis must be made of the consequences so that it does not lead to a considerable decline in the use of computers and the Internet among groups given priority in the policy. It may also be necessary to make a study of ways in which access can be strengthened for pensioners and whether the cost of access to computers and the Internet should be included in standard social allowances. Students and the self-employed have also been left completely outside the existing system. This is not least important in light of future developments in healthcare as well as in other social sectors. The problem should also be solved in a context in which the conditions for the broadband policy have become clearer and the work on 24/7 agencies and the electronically coordinated public administration has had a greater impact.

- The Government should establish a group or a "delegation for ICT and learning" to develop goals and strategies for the development of ICT and learning for both the educational system and for working life. In addition to representatives of the National Agency for School Improvement, the Swedish Net University and the National Resource Centre for Educational Media, the group should also contain representatives of the Swedish Association of Local Authorities, adult education employers and trade unions. The strategy document produced by the National Agency for School Improvement and the Working Group for a New National ICT Strategy for Schools should constitute one point of departure for this work, as should the Government bill "An open university", and the ambition should be that ICT and learning will also be a tool to develop the competitiveness of trade and industry and to regenerate working life.

4   Confidence

Increasing confidence in ICT is one of the three cornerstones – developing competencies and promoting widespread access are the others - that the ICT policy rests on. Based on the contents of the ICT bill under the heading of confidence - it has, in principle, three aspects:

- Functionality: that the user has confidence that the physical equipment will work

- Data security: that the user can protect his traffic, identify himself and others, and be certain that the right message is received by the right recipient

- Integrity issues: that citizens are protected against "big brother".

4.1   Formal requirements

The measures taken up in the ICT bill are, in the opinion of ITPS/Metamatrix well chosen and prioritised. These measures have either been implemented or are in the process of being implemented. More or less without exception, the measures that have been taken fall under the heading of data security.

Above all the ICT bill emphasises confidence from the e-Trade perspective and, in particular, the aspect of e-Trade that concerns trade between businesses and consumers, and it attached considerable importance to formal requirements, for example in respect of electronic signatures. Formal requirements in respect of paper communication, for example that a document shall be signed personally, or the physical presence of persons, have been experienced as an obstacle on the way to the information society. It is important to analyse this from three perspectives:

- Formal requirements and e-Trade

- Formal requirements and e-Administration

- Formal requirements and personal integrity, and rule of law for the citizens

4.1.1   Formal requirements and e-trade

Where formal requirements and e-Trade are concerned, it can be said that Swedish and Nordic business legislation is extremely open where recommending validity of business agreements is concerned. In a study of electronic business from a legal perspective, Siepel (2003)[28] says the following, among other things:

"Requirements that documents shall be *in writing* or requirements in respect of *personal signatures* may be seen as exceptions (cf. for example house purchases). The model provided by contract law has the effect, in brief, that the parties are assumed to exchange *"declarations of intent"*. On the Internet this is done by a

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[28] *Seipel.P /2003). Elektroniska affärer ur ett rättsligt perspektiv. Online:*
http://www.juridicum.su.se/iri/seip/ekommers.doc (per 2003-05-20).

communication which is something of a cross between the traditional written and oral agreement." There is an underlying assumption that the trust[29] between the parties in respect of the agreement is regarded as sufficient for the agreement to be valid. The exceptions from this principle are house purchase agreements.

One way of proceeding in the matter of e-Signatures and e-Trade is to evaluate ways in which the formal requirements for distance agreements functioned prior to the introduction of open and real time practicable e-Trade opportunities. A good example could be electronic mail-order, which has existed for a long time in Sweden and the Nordic countries and has been developed both horizontally and vertically.

The formal requirements do not constitute critical problems in respect of contract law issues and the necessity of documents being in writing for electronic trade in general and electronic retail trade in particular. On the other hand, there are complications that are mainly associated with the business models and implementing processes for e-Trade.

Where B2B (business to business) trade is concerned, closed systems and techniques that strengthen reliability have now been developed on the basis of the needs and experience that the e-Trade businesses have encountered as e-Trade has grown. In addition, these transactions are often governed by a special mutual agreement, a so-called Interchange Agreement.

Where the retail trade on Internet is concerned, it would appear to be essential that government directs its attention to process-related issues relating to legislation for the protection of consumers. The government's attention and priorities should be directed towards retail trade issues from the following perspectives:

- the compatibility of the business models for e-Trade with the legislation for the protection of consumers.

- transparency and demands for accuracy in respect of the information provided by the company making the sale prior to purchases and in cases of possible complaints and returned goods.

- safe, simple and generally accessible payment systems.

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[29] *See Cecilia Magnusson Sjöberg, Electronic signatures –new legislation with a need for further measures JT 2000-01, s 864-88 (in Swedish). Online:*
http://www.juridicum.su.se/iri/cems/publikationerfulltext/SignaturlagenJT01webbred.doc

4.1.2   Formal requirements and e-Administration

Present situation

Where formal requirements and e-Administration are concerned, the matter is more complicated since "formal requirements have been experienced as an obstacle to the development of electronic government agency services"[30].

At the beginning of 2002, the Government appointed an inter-ministry working group to coordinate a review of all formal requirements in laws and ordinances, to make general fundamental assessments and to submit proposals for further work. The working group submitted a report on April 15, 2003, *Formal requirements and electronic communication*[31], which forms the basis of the standpoints adopted by the Government for its future work.

The report presents results and conclusions which refer to a total of some 2 000 instances in laws and ordinances in which there are formal requirements of one type of another. "In 1 200 of these cases the working group would make the assessment that the provisions do not constitute an obstacle to electronic communication. In the opinion of the working group some 190 provisions impede electronic communication and should therefore be adapted. In some 650 cases further analyses need to be made before a position can be reached as to whether the provisions need to be amended."[32]

A practical case

How then does the legislation function in practice? One interesting case was when the Stockholm Chamber of Commerce submitted its annual report via e-mail with electronic signatures to the Swedish Patent and Registration Office in Sundsvall. However, the Office was not permitted to receive the annual report in this way. A representative of the Swedish Patent and Registration Office was asked by a newspaper, NyTeknik, why it was not allowed to receive annual reports with electronic signatures. The answer was "We are not allowed by law to do it today. However, where the Swedish Patent and Registration Office is concerned, there is no resistance to doing something of this type, it is already possible to register firms at the Office with electronic signatures."[33]

In the opinion of ITPS/Metamatrix, there are no objective reasons for stricter formal requirements for annual reports than company formation. According to ITPS/Metamatrix, the problem lies in the division of responsibilities between ministries for the government agencies subordinate to them. Forming companies is a question for the Ministry of Industry, while annual reports come under the Companies Act,

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[30] *Cf. Ministry of Finance, Summary of the review of formal requirements in laws and ordinances. Online: http://www.finans.regeringen.se/fragor/forvaltningspolitik/pdf/formkrav_sammanfattning.pdf (per 2003-07-11).*

[31] *Cf. Ministry of Finance, Summary of the Review of formal requirements in laws and ordinances Online: http://www.finans.regeringen.se/fragor/forvaltningspolitik/pdf/formkrav_sammanfattning.pdf (per 2003-07-11).*

[32] *Cf Newsletter from Ministry of Finance No. 3, Sept. 2003. Online: http://www.finans.regeringen.se/fragor/forvaltningspolitik/pdf/nyhetsbrev_3_2003.pdf (per 2003-10-01).*

[33] *NyTeknik. " Five questions for Roland Höglund – Paper an absolute necessity for the Patent and Registration Office." (In Swedish.) Published 030612. Online: http://www.nyteknik.se/art/29071 (per 2003-06-14).*

which is handled by the Ministry of Justice. Regulations of this type have come into being to help agencies rather than to make life difficult for them in their work. In this case it is obvious that the regulation lives a life of its own and, where the Government Offices are concerned, there is no holistic perspective for the agencies' work.

An important issue for assessing the system's efficiency is to see what progress the Ministry of Justice has made in the review of the rule. When this was checked by ITPS, it emerged that a revision of the entire Companies Act will be made, hopefully by 2005, and that changes to all formal requirements will first be made in that context. However, an amendment to the law can be made earlier, which would facilitate the submission of documents to agencies. This will be presented in a ministry memorandum. A Government bill containing proposals for amendments can be tabled in 2004 and the amendment can enter into force at the end of 2004.

Given the Swedish system, the process is moving forwards. One possible way of dealing with formal issues in the short term could be for the Government to appoint a special coordinator to act as a driving force for necessary changes, but from the example of the Companies Act it is doubtful whether the process could be speeded up at all with the aid of a coordinator of this type.

The future

From the study of formal requirements and electronic communication mentioned above, it can be seen that no less than 840 instances in the statutes need to be changed or are the subject of further analysis in order to eliminate obstacles to an electronic administration. Some of these instances can be amended with relatively small means. Some of the regulations are waiting to be processed in reviews of policy areas. Accordingly, the issue of electronic signatures will be included in the planned review of the Companies Act. It should be possible to solve some problems with the aid of cooperation between the agencies concerned which, in a process analysis, could assess the degree of validation that is needed in the case in question. In this respect, it has previously proved to be the case that agencies have been able to solve problems without making amendments to laws.

At the point in time of the production of this report, the period during which the report on the study of formal requirements and electronic communication was circulated for comment came to an end.

The holistic view

The reason why ITPS has dwelt on the issue of annual reports of companies is that it reflects a problem that can be serious in the work of an electronically coordinated administration if it is not rectified.

It would seem to be the case that amendments to laws and other adjustments to the work of agencies are easiest to implement when only one ministry is responsible for the legislation that concerns the agency in question. The National Tax Board's administration of income tax returns is an example of a rapid and appropriate adjustment of the rules. The issue of annual reports could have been solved if the Ministry for Industry and Ministry of Justice had had a common approach to the

work of the agency concerned. One impression gained is that it is difficult to give priority to the cross-sector character of ICT in individual policy areas. The "dual control" of agencies slows down developments. Therefore, in further work on the electronically coordinated administration it will be important not only to eliminate formal requirements but also to review the degree of coordination or fragmentation the Government Offices have towards the different agencies. In the next stage of the process this issue will have consequences on, for example, the position of the agencies vis-à-vis the municipalities and the problems that this creates for the municipalities to establish horizontal forms of cooperation between the administrations.

4.1.3 Formal requirements, personal integrity, and the rule of law for citizens

Where formal requirements in respect of personal integrity and the rule of law for citizens are concerned, they should mainly be dealt with within the framework of formal requirements and the public administration. Further discussions and reviews of existing knowledge are needed in this issue, which goes beyond the borders of the ICT policy.

4.2 Confidence as a central ICT policy concept

Increasing confidence in ICT constitutes, together with promoting widespread access and developing competencies, the pillars on which the IT policy rests. Despite this, ITPS/Metamatrix have established that there is no definition of confidence in this context in the IT bill. This will be a problem in the future when the Government does not take any specific measures under the heading of "confidence" unless they can be referred computer security and integrity.

One problem with increasing confidence in ICT as a policy area is that the measures taken by central government only constitute a small proportion of the things that create confidence in the technology among the people. If the Government takes on the task of creating "confidence", it should also have an idea of ways in which the measures taken by central government relate to the efforts made by the parties on the market to create confidence.

One major problem with "confidence" as a policy area is that it is by no means an end in itself or not even desirable to create "confidence" as such. A lack of confidence in technologies and systems can be both justified and unjustified, in exactly the same way that strong confidence can be both justified and unjustified. Methods to overcome unjustified confidence are information, training and demonstrations of the excellence of the system. The reverse, in which there is a lack of confidence, means that the technology or system must be changed.

In the ICT bill there is a general ambition to stimulate e-Trade and even that part of e-Trade that concerns consumers (B2C). It is true that "confidence" is important but it is also important in times of viruses, spam and hijacked modems that the citizens learn sound precautionary principles in order not to end up in difficulties, i.e. that they have "an optimal degree of confidence" in the system. The dimension of the confidence concept leads to the vision that the technology should be so safe

that the citizens do not need to pay attention to the problems. The achievement of this goal would take a very long time and the possibilities available to the Swedish Government to exert an influence on the situation are limited. There must also be an attitude that should be conveyed to the general public before the technology has reached the totally safe stage.

In the ICT Commission's communication to the Government "Basic security in computers and software" (2001-04-03), some actions are proposed to make the technology safe.

What is naturally important is the substance of the measures taken by the Government and not the heading under which they are presented. However, from the evaluation perspective it is a problem to have a concept that does not have any actual meaning apart from computer security/integrity.

The concept of confidence appears to have been included in the ICT policy as a "third leg", after access and skills had been laid down as cornerstones of the policy. Without any doubt, confidence and reliability are important in order to eliminate obstacles to the achievement of "an information society for all". However, it is also a question of what one wishes to give prominence to. Katz et al[34] emphasises the *cultural aspect*. Certain individuals or groups find that ICT gives the both an opportunity for personal development and to improve professionally while others consider that IT cannot contribute to anything positive at all. There is a Swedish report entitled "Life form – Live cycle – Life style: On the driving forces behind use of the Internet"[35]. There is also other empirical evidence from research, for example, on ways in which innovations are spread which it would have been possible to link up to conceptually[36]. The lack of discussion and analysis on why certain concepts are included and others are not taken up at all contributes to making the policy difficult to penetrate.

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[34] *See footnote 6.*
[35] *Selg, H. (2002) (in Swedish).*
[36] *Rogers, E.M. (1962). The Diffusion of Innovation.*

4.3   Metamatrix on confidence and reliability

According to Metamatrix, confidence is an *attitude* held by an individual or a group of individuals that can be directed towards different types of agents or objects. In the ICT policy it is possible to identify the following relevant objects where confidence is concerned:

- Organisations (government agencies, enterprises and other service or information organisations)

- Processes (defined service processes such as the annual income tax return)[37]

- Arenas which in this context refer to virtual arenas that facilitate the access of individuals to mechanical processes. In this connection mention can be made of portals and special web-based points of entry.

- Equipment

In other words confidence is to be regarded as a relationship between subjective phenomena, and qualities in organisations, services and processes in society. In this section confidence will be treated as a relationship between the willingness of natural or legal persons to take risks (or pay prices) in order to use a service or participate in a process and the ability of the organisations to produce qualitative services and safe processes. Confidence in IT based services and products will be regarded as a multi-dimensional phenomenon in which the relationship between, on the one hand, the risk and total cost for the person consuming the services and, on the other hand, the probability of obtaining the expected result is conditional.

The figure below represents confidence as a relationship between the person consuming the service and several quality dimensions that are properties of ICT-based services and products.

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[37] *It could be reasonable to argue that confidence in a process such as the annual income tax return is really part of the category Trust in organisations (tax authorities), since there is an agency that is specifically responsible for the process. However, we have chosen to have a separate confidence category for processes that are so legitimate that the individual does not care what organisation is responsible. This has an interesting bearing on the definition of information strategies that have the aim of increasing and/or strengthening the confidence of the individual in new forms or channels for the implementation of legitimate, fundamental social processes. We would point out that within the framework of the 24/7 agency, the vision of "one item of business, one agency contact" is of central importance and it focuses the attention of citizens on the process instead of on the agency.*

Figure 4 Confidence and reliability
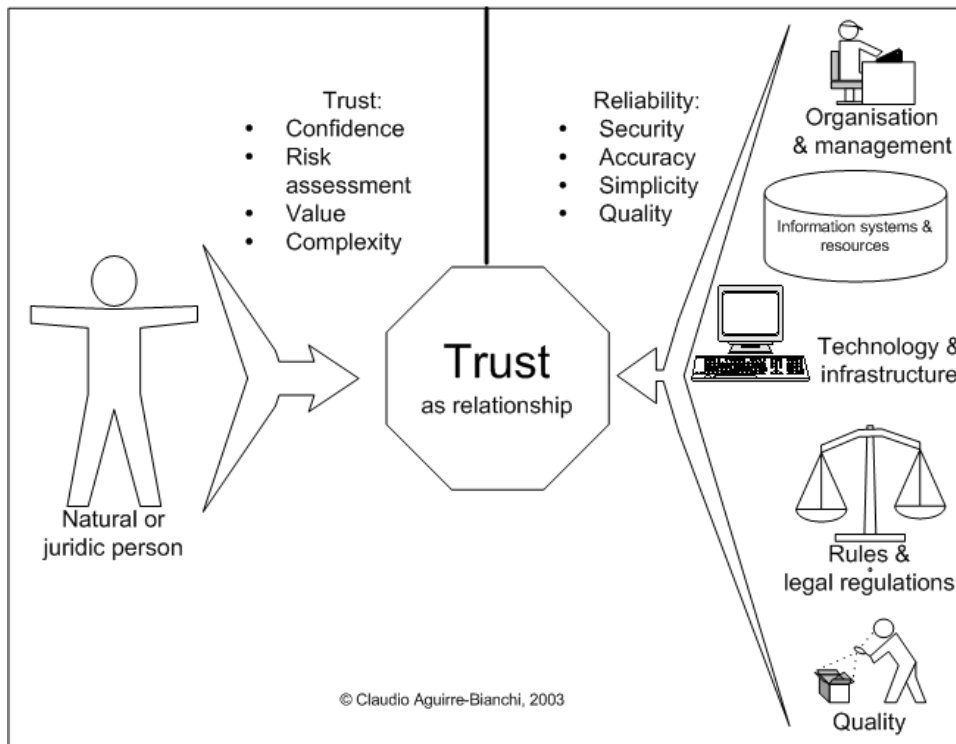
Accordingly confidence is something that cannot be made operational in policies if the policy shall be pursued within the framework of democratic processes and with respect to the freedom of opinion and choice of individuals and in interaction with the institutional and organisational foundations of society.

With the aid of confidence, society is closely knit in a constant communication process, which is based on a situation in which the informal (real) society is formed through communication in common.[38]

The political scope for confidence -related issues will, in accordance with Metamatrix' reconstruction of concepts, concentrate on reliability, i.e. a quality dimension consisting of properties belonging to systems and services that guarantees

- Security
- Accuracy
- Simplicity
- Quality

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[38] *This is a fundamental idea on the democratic and human-oriented society developed by John Dewey in his book Democracy and Education: "There is more that a verbal tie between the words common, community, and communication. Men live in a community in virtue of the things which they have in common; and communication is the way in which they come to possess things in common. What they must have in common in order to form a community or society are aims, beliefs, aspirations – a common understanding – like-mindedness…"wrote Dewey in 1916.Cf. John Dewey, Democracy and Education, Macmillan Company, 1916. Quoted from Colliers first Free Press Paperback Edition, 1966. Macmillan Canada, Ltd., p 4. (ISBN not available).*

The *reliability concept* has been defined as a quality dimension in Swedish and international standards. These standard-oriented definitions and the methods of putting them into operation should be revised with the aim of including ICT-based services and systems in a minimalist standardisation perspective which is based on absolutely essential requirements that must be fulfilled but which are, at the same time, sufficiently flexible that they can be adapted to changes in society.

4.4   Recommendations:

- The Delegation for the Development of Public Sector e-Services should assess the issue of ways in which the government administration itself, and in relation to the municipalities and county councils, can eliminate the obstacles to the implementation of the vision of a coordinated public electronic network administration.

- The confidence concept as one of the pillars of the IT policy has not been defined and is therefore difficult to interpret and difficult to link to evaluations and follow-ups. ITPS therefore recommends that if the concept should continue to have this central position in the ICT policy, it should be clearly defined. In the opinion of ITPS, the reliability concept would appear to be better suited as an object for political programmes.

5   Access

The IT bill emphasises that by "access" the Government means both hardware and the information services that can be supplied by the network. ITPS is of the opinion that access also has a *financial* dimension.

Within the framework of the evaluation of access, ITPS has published a part-study of its own - an evaluation of the broadband policy - and the analysis of the competition policy made by ECON. The PC reform, which has also been evaluated by ECON, could also have been included under access, but in the ICT bill it has been included under *competencies* since this reform ultimately has the aim of human resource development.

In this section on access, ITPS initially takes up different aspects of the so-called broadband policy. In the opinion of ITPS, the investments made within the framework of the broadband policy fall under the framework for decisions of the type that have "long-term consequences in which the decision-making process must be based to a great extent on strategic assessments and forecasts for the future". In this context the short decision-making process on 3G expansion is also touched upon.

The broadband policy that was launched in the ICT bill is now being implemented and developed. In principle none of the important measures have been finalised. This evaluation comes in the middle of the process and this is the reason why there is no conclusions to evaluate the results against. What ITPS has done in this situation is to establish a base in the broadband report as the point of departure of a number of assessments. In this report issues are taken up that concern, for example, choice of strategy, transparency of the policy, possibility of evaluating the policy, processes and dissemination of knowledge. In order to compare the outcome against a norm, the concept of operator neutrality is also discussed.

5.1   The infrastructure study

The present broadband policy has its roots in the ICT infrastructure study[39] and the ICT Commission's vision report[40]. The assignment for the ICT infrastructure study included providing proposals for the role central government should adopt partly in order to promote industry policy goals and partly to promote the regional and social goals in respect of access for everyone.

The approach proposed by the ICT infrastructure study was that the Government would assume a special responsibility for access to broadband in the sparsely populated parts of the country. The proposals had the effect, among other things, that a national infrastructure programme would be drawn up and that government would enter into discussions with the Swedish Association of Local Authorities and the Swedish Federation of County Councils on voluntary measures for the supply of broadband within their borders.

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[39] *Government Official Report 1999:85 Broadband for growth throughout the country (in Swedish).*
[40] *Government Official Report 1999:134 Secure IT infrastructure for Sweden in the future (in Swedish)*

An open network that linked up all the municipalities in Sweden was the foundation of a network that would create appropriate conditions for growth throughout the entire country. The goal was not merely to provide access to high-speed communications, it was also that the price should be reasonable. Therefore, it was not enough to build networks in the sparsely populated areas of Sweden, there also had to be a network that also permitted nation-wide and international communications.

It was proposed that a government-owned company, Swenet AB, should be established which would be permitted to make use of the facilities of the government-owned network companies. Furthermore, the study emphasised that government should stimulate a horizontal market structure which would have the effect that there would be competition in most of the different stages in the process. This should be seen as a counterweight to the strong influence possessed by the vertically integrated operators. It was proposed that a national government agency function should be established with technical, legal, financial and industrial policy expertise, preferably in the National Post and Telecom Agency.

5.2   The ICT bill

The proposals of the ICT infrastructure study are included in the ICT bill under the broadband section. There the Government writes that: "households and companies in all parts of Sweden should have access in the next few years to ICT infrastructure with a high transmission capacity." This would take place under the auspices of the private sector but central government would have the overall responsibility for ensuring that the infrastructure was available throughout the country. Furthermore the Government writes: "Competition, low prices and rapid development will be promoted by making it possible for a large number of operators and ICT enterprises to use of the network. Neutrality in respect of competition and diversity on the network shall be promoted through government interventions and rules".

The proposed measures that were associated with financial undertakings included:

- support for regional and local telecommunications networks in areas that were not supplied with ICT infrastructure through the market,

- tax allowances for natural and legal persons for broadband connections, and

- a basic network with high levels of access for all municipalities in the country.

After Parliament had made its decision, a national ICT infrastructure programme was drawn up within the framework of the Broadband study[41] and the first ordinance[42] entered into force on July 1, 2001. In this and subsequent ordinances[43], it is laid down, among other things, that the conditions for receiving support for networks that link different places together and for area networks are that the municipality in question has an approved IT infrastructure programme and that the mu-

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[41] *Government Official Reports 2000:68 och 2000:111*
[42] *Swedish Code of Statutes 2000:1469*
[43] *Swedish Code of Statutes 2001:349 and 2001:350*

nicipality co-finances a certain percentage (which during the period was reduced from approximately thirty per cent to five per cent) of the components entitled to support. Where support to the municipalities for the installation of telecommunication networks is concerned, it was first intended to cover the period up to the end of 2004. The period has since been extended to the end of 2005.

In addition to the national IT infrastructure programme, there are other forms of support for development purposes, such as funds from the EU's structural funds, via the Government's programme for IT in schools, through grants from the Knowledge Foundation, regional development grants etc.

In August 2000, the Swedish National Grid was commissioned by the Government to construct a basic optoelectronic network with high transmission capacity between all municipalities. The goal was to connect all main centres in each municipality no later than December 2002. Early in 2002 it was clear that the National Grid was unable to meet its commitments and the organisation was given an extension of the time it needed to complete its assignment. At that time the National Grid was also given permission to sell capacity and black fibre, the implementation period was extended, and the requirement that the fibre should go to the main centre in the municipality was changed to the "closest centre".

5.3   The process

Much of the thinking of the ICT infrastructure study is to be found in the Government bill. Swenet AB and the central broadband agency are not included. The idea for a national programme led to the initiation of the Broadband study, which was approved prior to the presentation of the bill. The proposed SEK 12 billion broken down over five years turned out to be a little more than SEK 8 billion, of which SEK 5 billion consisted of government support. No appointment was made of a national co-planner to coordinate the regional and municipal plans with central government ambitions. Where the idea of a national plan for an open national basic network to the main centres in all municipalities is concerned, the assignment was given to the Swedish National Grid. The expansion was undertaken in the commercial interest of the Swedish National Grid, i.e. it was done on businesslike grounds and was not governed by a "national plan". It would appear that this solution was adopted since the Ministry of Industry felt that Parliament would probably not approve the amount stated in the ICT infrastructure study. Among the parties that could have contributed to expansion in a cost-efficient way, it proved to be the case that the Swedish National Grid was the partner that, given the limitations of time and financial resources, was perceived by the Ministry of Industry as the organisation that could best combine the assignment with its own business interests.

Concerning the support given to municipalities to install networks to combine main centres and area networks, at the time the ICT bill was in the process of being drafted, there were differences in opinion on the type of focus the government engagement should have. Some debaters were of the opinion that it was extremely urgent to install a nation-wide network that all buildings in Sweden could reach and be connected to. The cost of this was assessed by the ICT infrastructure study to amount to between SEK 55 and 60 million.

The Government adopted the policy that central government could contribute to extending the network in those parts of Sweden that would not be covered by the market. In order to determine the boundaries of the market's interest, the municipalities needed to be involved in the process. They were also given the assignment of subjecting the establishment of a "competition-neutral" network to competition on the basis of the ordinances described above. The municipalities that drew up infrastructure programmes that were approved by the county administrative boards were entitled to receive support in accordance with the ordinances that had been produced.

All municipalities, regardless of whether they were entitled to support or not, received this grant for their infrastructure programmes. The county administrative boards received support for their work on coordination and control. The county administrative boards established a cooperation organisation, Länssamverkan Broadband, as a common support function for the counties, principally since the Delegation for ICT Infrastructure proposed in the Broadband study was not established. The Government commissioned the Swedish Association of Local Authorities to support the municipalities in the work of subjecting networks to competition and the National Post and Telecom Agency was given the assignment of assisting county administrative boards and municipalities in the application of laws and ordinances. In other words the Government planned to establish a body of expertise to support the municipalities prior to their work of developing networks and subjecting them to competition. On the other hand there was, to a certain extent, no corresponding function for the county administrative boards. Subsequently a large number of stakeholders around the country have become engaged, for example the universities, the IT Commission, urban network associations, property companies, tenant associations, owner-occupier cooperatives etc. This engagement has been expressed in different ways and has had its point of departure in providing support, shaping a role in the process, criticism etc. Regardless of the type of stakeholder and the engagement, in the opinion of ITPS the support from what is known as civil society has been impressive in the work of establishing broadband in the country, despite the rapid deterioration in the market situation. The criticism that the process was slow and that the Government's goals had not been achieved does not seem to have given consideration to this nationwide activity which took place all the time.

5.4   The present situation

What is the situation at the moment?

A brief recapitulation of the situation as it seems to be at the end of October and the beginning of November 2003 is as follows:

5.4.1   Swedish National Grid

In March 2003, 215 of 300 municipalities were connected to the basic optoelectronic network provided by the National Grid or a partner company. As much as 92 per cent of the population live in the main centres of the municipalities that are connected. A connected municipality has access to a so-called black fibre network no more than five kilometres from the main centre in the municipality.

5.4.2   Support for municipalities and property owners

According to responses to the broadband questionnaire which is distributed by the cooperation organisation of the county administrative boards, Länssamverkan Broadband, once a quarter[44], only 62 municipalities of 270 that are entitled to receive support had one type of network or another installed on October 1, 2003. However, the number of signed agreements is larger: 171 municipalities have concluded agreements for networks that link together main centres in municipalities, and 128 municipalities have concluded agreements for area networks.

Hitherto, SEK 246 million (of a total of SEK 1 200 million) has been disbursed for area networks and SEK 476 million (of a total of SEK 1 900 million) disbursed for networks that link main centres in municipalities. This means that only 23 per cent of the total support for these two types of networks had been disbursed as at October 1, 2003. However, 38 per cent of the support had been granted for projects that have not yet been completed (50 per cent of the support is not disbursed until the installation is complete and the municipality has submitted its final report on the project to the county administrative board) and the applications received cover 41 per cent of the total support available. It can also be seen from the statistics that many municipalities have not yet completed the procurement phase and therefore there is a strong likelihood that the funds will be used within the foreseeable future. It has not been possible to use the tax allowance for property owners. The minimum amount of support is too high for property support in blocks of flats and, despite the support, the total threshold is too high for house-owners.

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[44] *Made by Ipsos-Eureka*

5.4.3　Results of municipalities' competitive activities

The results of the municipalities' competitive activities and the county administrative boards' approval of infrastructure plans have been regularly reported by Länssamverkan Broadband. The first influx of finalised procurements showed that, to a large extent, the assignments had been given to municipal companies. After the summer of 2003, this dominance appears to have been ended since many assignments have been given to a telecommunications company, TeliaSonera, with different variations of the programmes IP-City and IP-Country, in which ADSL solutions play an important role.

In 38 per cent of the municipalities entitled to receive support, municipal co-financing has been limited to the compulsory five per cent. In other words, in all the other cases the municipalities have contributed a higher proportion (see broadband report), which can also be interpreted as a reluctance to invest on the part of the market.

According to the initial rules it was not possible to provide support for ADSL solutions. This was changed with the amendment to the ordinance[45] approved by the Government in June 2002. Under the new ordinance, ADSL is entitled to government grants "should special reasons exist". This was later reinforced by the expression "in exceptional cases". According to the lawyers with whom Länssamverkan Broadband has been in contact with, this should be interpreted as a formulation that falls between "special reasons" and "particular reasons", i.e. the formulation is particularly restrictive.

As far as ITPS can judge, the county administrative boards and Länssamverkan Broadband have applied a restrictive attitude in respect of whether ADSL inputs are entitled to government support. To the extent that public funds have contributed to this development, they would appear to have come in the first place from the municipalities.

5.4.4　From technology to community planning

From the very outset, the development of infrastructure was a matter for central government and the active participation of the municipalities first came with the discussion of procurements. Since aspects of competition were then placed under the auspices of the municipalities, and almost all the municipalities took over the responsibility for drawing up municipal ICT infrastructure programmes, broadband development definitely ended up in the hands of the municipalities. One tendency now is that the municipalities are increasingly beginning to see ICT and broadband issues as an integral component in community planning and community development, rather than duties or matters for the public works departments. If this tendency and understanding should continue, it will be one of the most important foundations of successful ICT development in Sweden.

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[45] *Swedish Code of Statutes 2000:1469*

5.5   Business models

In the ICT infrastructure study, horizontal competition was recommended, the ICT bill talks about neutrality in respect of competition without going into detail, and the funds made available under the ordinance were made conditional on the networks being supplied on non-discriminating conditions. Since the use of the expression "neutrality in respect of competition" was used in the ICT bill, the concept has started to drift increasingly towards what is now called neutrality between operators and there is therefore good reason to pay attention to the model based on neutrality between operators. This is a concept that has its origins in the idea of horizontal competition and, from being little known, it has become the recognised concept in a short space of time.

What then are the effects of neutrality in respect of competition on the networks whose "provision" is now being subjected to competition? What are the problems on the networks that are now being established and what are the advantages and disadvantages of operator-neutral networks?

5.5.1   What does operator-neutrality mean?

The interpretations of operator-neutral networks vary. There is no single clear-cut definition. However, a number of attempts have been made to analyse, survey and define operator-neutral networks. In a report published in 2001, the ICT Commission described a number of case studies in order to increase understanding of these networks at urban and district level[46]. A number of student projects in the *Communication Systems Design* course at the Royal College of Technology have worked with the question from different perspectives and, in 2002, several projects were implemented in which operator-neutrality was taken up from different perspectives, for example for the perspective of the communication operator[47]. In the autumn of 2002, a degree project at the Royal College of Technology further developed the projects' conclusions in a study of operator-neutral networks in Stockholm[48]. The latest contribution to the analysis is a report from the ICT Commission, written by Fredrik Orava, a senior lecturer at the Royal College of Technology, who describes the difficulties associated with the development of urban networks[49].

In a vertically integrated network, all levels in the value chain are controlled by one supplier who owns the network, is responsible for operations and supplies services to the final customer. This "traditional" model has been used, for example, by cable TV companies, which historically have signed long exclusiveness agreements with property owners. The consequence for the final customer is that he has no freedom of choice. It is in principle impossible for him to choose another supplier of the same service. There is a tendency for exclusiveness agreements of this type to be

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[46] *Operator-neutral networks – a study of networks at local and municipal level, report 41/2001, ICT Commission (in Swedish)*

[47] *Ownership, operation and maintenance of operator neutral networks, Frankenberg et.al, 2002-05-30, http://2g1319.ssvl.kth.se/~csd2002-kistaopennet/Documents/Final_Report_27.pdf*

[48] *Operator Neutral Networks in Stockholm – possibilities and problems for a broadband expansion, 2003-03 ,Marcus Lind, Royal College of Technology, Stockholm*

[49] *Operator-neutral urban networks. Report 66/2003 ICT Commission (in Swedish)*

short since property owners no longer wish to be tied by agreement periods that they consider are far too long. The opposite of the vertically integrated structure is the operator-neutral network where the different levels in the value chain are kept separate from each other and are owned by different stakeholders.

Orava has identified the following roles in an operator-neutral network[50]: final customer, service supplier (ISP or a supplier of telephony, TV etc), communication operator who acts as a agent for services and the development of the network, the operating operator who looks after the operation of the network on behalf of the communications operator, and the network owner who supplies the passive infrastructure on which the communications operator builds his network. Through this separation, an individual stakeholder cannot exercise control over the entire chain from infrastructure to the final customer. There is competition at the service level, which shifts the power from the operator to the final customer. In the optimal situation there is freedom of choice and pressure on prices, which benefits the consumer. Figure 5 shows, in a simplified way, the difference between vertical integration and operator-neutrality[51].

Where the operator-neutral network is concerned, the different suppliers link up at a point which constitutes a common connection point for properties connected to the network. The communications operator is responsible for operations and/or looks after the contracts with the suppliers of services. The service suppliers do not own any part of the "lower" infrastructure. Instead of each operator building his own infrastructure for the properties, a common infrastructure is built at the "bottom" of the system. The communications operator is given a key role and it is important that this operator is replaceable and made subject to competition in order to avoid misuse or abuse of the monopoly situation. In this respect it is also important how the contract with the communications operator is formulated.

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[50] *ibid*

[51] *ISP stands for Internet Service Provider who is a supplier of Internet access. Naturally other types of services such as telephony and TV may also be provided.*

Figure 5 Vertical integration versus operator-neutrality

Vertical integration   **Operator Neutral Network**
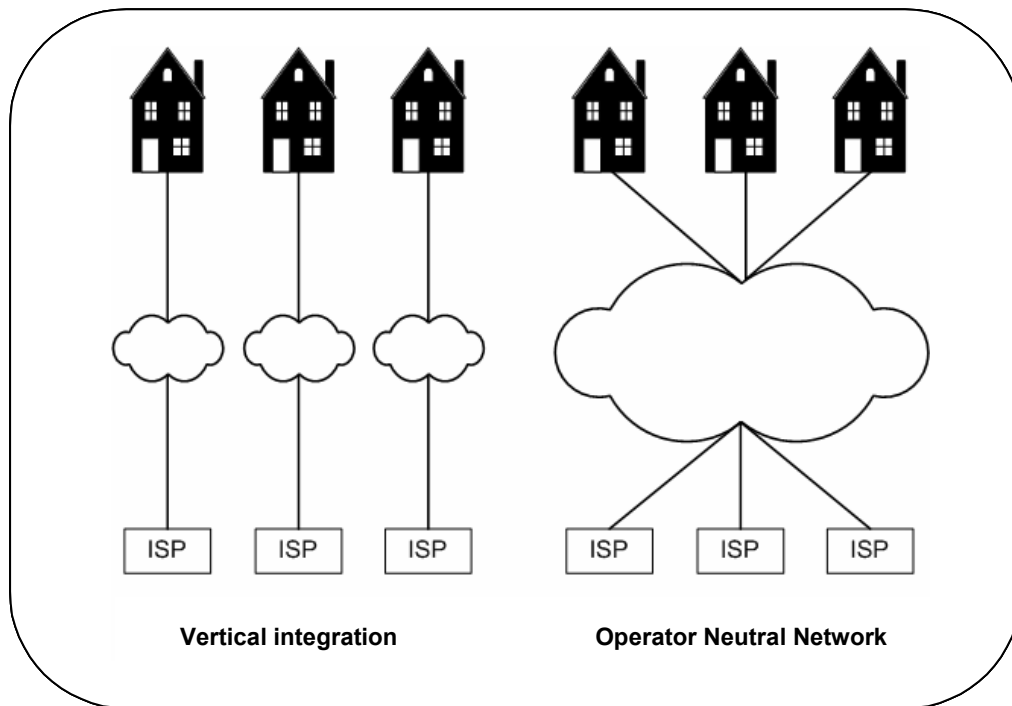
Where operator-neutral networks are concerned, *openness* and *neutrality* are concepts that are not used consistently and are interpreted in different ways. Orava has defined these concepts and is of the opinion that openness shall prevail where the final customer is concerned and that the network shall be neutral vis-à-vis the suppliers of services:

Openness:
- The network shall be open to everyone who wishes to connect to it as a user. Owner-occupier cooperatives, tenants' associations and others shall be fully entitled to connect to the urban network
- The network shall be open in the sense that all final customers shall be free to choose among the suppliers of services that are connected to the network.
- The network shall be open for all suppliers of services to connect to it, provided that they follow the rules laid down for the network.
- The network shall be open for everyone to extend, provided that the extension follows the rules laid down for the network.

Neutrality

- Neutrality shall apply vis-à-vis the providers of services. These suppliers shall be invited to supply services at all levels that are financially defensible. The main principle is that the communications operator should not limit the possibilities available to the providers of services to supply services over the network by only offering network services at a certain level.

- There shall be no disloyal competition on the part of the communications operator. This means that the communications operators may not sell services directly to the final customer.

- All suppliers of services in one and the same category shall be offered the same conditions for the supply of services.

5.5.2   What types of networks have been established?

In the majority of the urban networks that are being constructed, it is the municipality that has invested in the infrastructure. The reason for this is that the construction of networks has often been done in order to satisfy the municipalities' own needs of communications. In the construction of their networks, some municipalities have included other existing networks in the municipalities, for example those installed by property companies, house-owner associations and owner-occupier cooperatives, industrial estate networks etc. Often it is a municipal company that is responsible for ownership. This company can then offer different types of services both actively and passively.

The strategy selected by some urban networks is merely to offer a passive service (black fibre, wavelengths or transmission capacity). A well-known example of this is Stokab, a municipal company in Stockholm, whose basic business philosophy has been merely to supply black fibre and has consistently refused to go higher in the value chain to ensure that it is not suspected of having plans to compete with its customers.[52]

Other urban networks have also chosen to offer active services and are themselves communications operators and service suppliers. In this respect there is a risk that conflicts of business interests may arise and if the network is to be really operator-neutral, the communications operators should not compete with the service providers. In principle it is possible to draw up two models for networks: the strictly operator-neutral model and the strictly vertically integrated model. The vertically integrated networks can, in turn, be divided into two categories: vertically integrated networks controlled by private interests and by municipalities. We thus have a triangle with composed of three absolute models: the strictly operator-neutral model with competition at all levels (ON), the privately owned vertically integrated networks (VIP) and the municipality-owned vertical integrated networks (VIK) (see figure 5.2). In other words the last two are networks of the type where a

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[52] *An interesting issue which ITPS has not been able to shed light on in this evaluation is why this model which has received attention internationally has not been adopted at other places in the country.*

private company or a municipality acts, in different forms, as the network owner, operator and service supplier.

Where the municipally integrated networks are concerned, there are two groups. The first group includes those that consider that the integrated solution is a temporary solution and a consequence of the inability to find interested commercial parties. The ambition of this group is to develop the networks, as quickly as possible, so that they become what can be said to be operator-neutral. In the other category of networks there is no reason to change positions. Neither of the two categories can be said to be more firmly in place than the other. When assessing the likelihood of a change in position, it is probable that different solutions will tend to be cemented the longer they are allowed to remain in operation.

Figure 6 Network structures
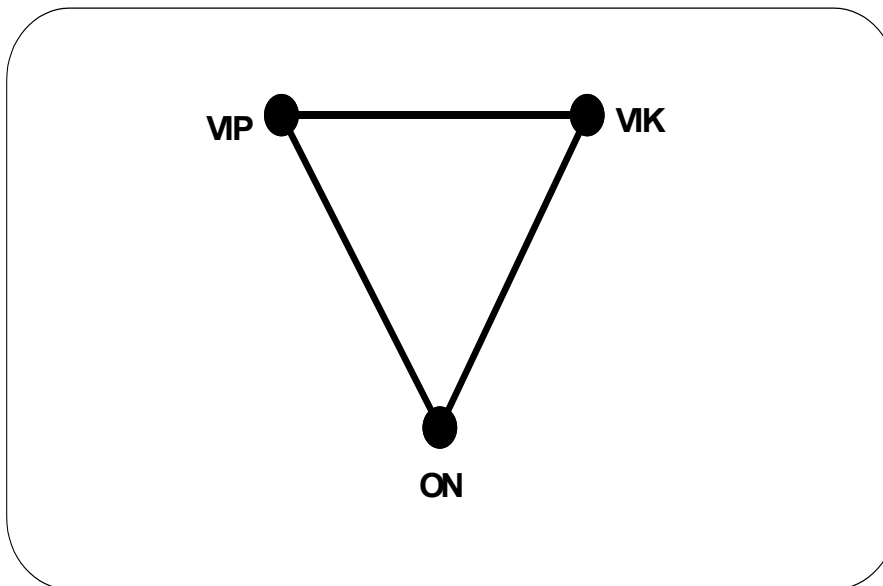
There are three extreme models that can be said to characterise the urban networks: the vertically integrated private networks (VIP), the vertically integrated municipal networks (VIK) and the pure operator-neutral networks (ON). The existing networks can be placed in different positions inside the triangle depending on the model of the network in question.

How then can the existing networks be placed in this triangle? There are considerable difficulties in obtaining this picture. In principle, ITPS can state that all the existing networks are, in different ways, a *blend* of the three absolute models. Only a few networks can be regarded as being "in principle" operator-neutral.

To this should be added another perspective, which has arisen during the last few years. For decades, the telecommunications market was dominated by a strong, governmental vertically integrated monopoly and, even after the deregulation of the market, the vertical thinking has still remained. The networks of persons in management positions that exist in ministries, regulatory authorities, municipalities and research councils have naturally been largely characterised by this historical background. Knowledge and experience of the new open structures that are starting

to develop as a consequence of the convergence between data communications and telecommunications have not yet reached the system. In the light of this, it can still be said that what has happened is that, despite everything, the new infrastructure, even if incomplete and slow, has moved towards open solutions that are neutral from the competition perspective. A further factor to note is that government grants have only influenced the projects supported by the grants to adopt an open approach. Since the grants have been tied to the production of municipal infrastructure programmes, other projects than those entitled to government grants were also reviewed in one and the same context. In the design of any support systems in the future, it is important that good use is made of this multiplier discussed here.

5.5.3   Problems in the urban networks

As the urban networks continue to be installed, problems associated with installation are becoming increasingly evident. These are problems of both a business and technical nature.

Examples of problems that have to be overcome by the urban networks are:

- Low levels of efficiency due to the fact that the network is small and there are no advantages of scale. This generates costs that must be paid by someone. Operator activities are high volume activities with low margins in which coordination and efficiency are essential for competing on an open market.

- Lack of cutting-edge skills can be a problem. Demands made by companies can differ considerably from demands made, for example by private persons, in respect of the functionality of the network and there is a difference between installing a fibre network and hiring an activated network in an efficient way.

- Each network is unique which has the effect that service providers must adapt their products to the network in question and to administer a large number of business relationships, which makes the administration of services more difficult and more expensive.

- A lack of clarity in respect of roles. When an urban network operator does not act in a neutral way, this can affect the confidence of the service providers in the urban network.

- Prices that are dependent on distance make it difficult to hire black fibre.

The interest shown on the part of operators and service providers in connecting to the networks is low, and the use made of them is also still relatively low. It is true that diversity is desired in the ICT bill, but this probably referred to diversity in the services offered and not the type of diversity referred to here.

In order to remedy these problems, the joint production of generally accepted standards in respect of technologies and business models is necessary, as well as the coordination of operations, customer support and monitoring. Several coordination initiatives have been taken, for example by urban network associations etc. It is important that the urban networks not only collaborate among themselves, but also

with other stakeholders. There is also reason to coordinate the different initiatives taken at a higher level. The prevailing situation is often characterised as the "Wild West", and the general conception is that the situation is untenable in the long run.

The degree of seriousness with which the present situation is viewed also depends on the perspective selected. From the participating stakeholders' perspective, the situation is problematical. If a higher level is selected and studies are made of developments from an infrastructure perspective, similarities can be seen with other historical developments, and it can also be thought that three and a half years, which is the period of time that has passed since the ICT bill was passed, is a short period of time in the infrastructure context.

5.5.4   Division of roles between the market and municipalities

The assessment made by ITPS is that there is some concern among operators and service providers today, even a strong concern, in respect of the municipal vertically integrated models which are considered to constitute an obstacle to engagement by private ISP and service providers in urban networks. The question is thus how should the engagement of the municipalities be viewed.

The actions and functions of municipalities in ICT and broadband issues are widely diverse. They have subjected the provision of networks to competition, they have planned the development of the networks by drawing up IT infrastructure programmes, they are landowners, often network owners, they issue permits, they place orders, and they are sometimes operators and sometimes service providers. Therefore it is important that the municipalities can handle these roles in a professional manner and in a way that inspires confidence. The more roles that they take on, the more difficult it naturally is for them to find a balance between their different duties.

The municipalities' role is mainly to channel government support to the market. In many municipalities this has functioned well, in others not. A number of municipal companies are vertically integrated throughout the entire value chain and even sell services to the final customers.

In the IT infrastructure study, Jan Grönlund wrote as follows:

"In my opinion the local responsibility should be borne by the municipalities. This does not necessarily mean that the municipalities must build or own a network of this type, but that the municipalities shall feel that they have the responsibility for ensuring that a network is achieved in the best possible way. In my opinion it is also unsuitable that the municipalities extend their responsibilities to such an extent that they also offer services on the network /.../. The responsibility of central government and local government should above all focus on that part of the infrastructure that includes physical infrastructure, and central and local government should not enter the market for services."

In the final report of the Broadband study, it can be seen that the Swedish Association of Local Authorities had another interpretation, or a supplementary interpretation, of municipal expertise:

"Where municipal expertise is concerned, it is, in the opinion of the study in accordance with municipal skills to install and run networks, while this is not so obvious when the municipalities provide more advanced services and are active as communications operators in respect of connections with the Internet./---/

The Swedish Association of Local Authorities of the opinion that it is part of the municipal expertise to construct networks, to handle junctions, to provide black fibre and capacity and to act as communications operators. It would state that the provision of Internet connections should normally not be part of the municipal expertise but, for example, the lack of private initiatives can change this."[53]

The active interest shown by municipalities in establishing solutions at different levels in cases where there has been no interest on the part of the market has, as ITPS has understood, been met with appreciation by both trade and industry and other stakeholders. However, what will happen when a business potential is developed and the market starts to show an interest? What tasks should the municipalities continue to have and how should the municipalities transfer responsibilities to the market?

Both governmental and private market actors have expressed the desire that municipal actors should not act at a higher level in the value chain. The ICT companies' trade association considers that one condition for the provision of infrastructure support to the municipalities should be that they do not act, in the short or long term, higher up in the value chain and thereby compete with actors on the market[54]. If a municipality is nonetheless forced to do this for market reasons, it should have a strategy for ways in which it should withdraw when appropriate market conditions have been established, in the opinion of the IT companies' trade association. Market solutions in combination with self-regulation and discussions on the future division of responsibilities (see section 5.7) can offer one way of solving these problems.

According to studies made of municipal expertise in this issue, it is compatible with local government legislation for municipalities to be at all levels in the value chain, i.e. all the way up to service provider level, depending on the situation in question and the interpretation of the legislation. However, there is no established practice relating to ICT infrastructure and services related to it. A court can determine the rights a municipality has in this question if the market considers this to be necessary. At the same time, actors on the market have indicated that they do not wish to be involved in disputes of this type since they are apprehensive that this will have a negative effect on their possibilities of establishing business relations with other municipalities.

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[53] *Certain supplementary studies in connection with the support to ICT infrastructure, Report from Broadband study (in Swedish), 2001-05-31*

[54] *Broadband for growth, utility, pleasure and welfare, IT companies, 2003-03-19 (in Swedish).*

5.6 Alternative lines of action

There are few issues in the ICT policy that are as controversial as the so-called broadband policy. Opinions on what should be done were widely diverse before the policy was approved, and opinions and assessments of the outcome vary to just as great an extent. There were a wide range of opinions prior to the approval of the broadband policy: from the perception that broadband was not a government matter at all but was the concern of the market, to the opinion that rapid development of broadband was urgent and essential in order to avoid a situation in which Sweden fell behind.

In the light of the many opinions that have been presented on the broadband policy, it can therefore be appropriate to discuss to some extent the issue of possible alternative choices.

In principle the following alternatives should have been present:

1. A national network for central social functions
The idea behind this proposal is that society needs to develop a national network for various important social functions. The Swedish Armed Forces would be an important stakeholder in a network of this type; the medical services could have an interest of this type as well as universities and university colleges, and culture. In this respect, the different ministries could establish a demand side while other government network owners could establish a supply side. An overall social function network could have been planned on the basis of a review of the above factors.

2. Government procurement of a coordinated network at national and municipal level
Many debaters demanded that the development of a fibre network up to 100 metres from every building was a matter for central government and should be paid for by government funds. If this was the case, Parliament could have allocated an amount that would have constituted the ceiling for a government procurement.

3. Doing nothing
Handing over everything to the market would also naturally have been an alternative. After developments had started on their own accord, large parts of the country would have been reached and eventually a combination of technical and institutional innovations would also have made broadband available in the most sparsely populated areas.

4. Programmes in regions where the market would not develop networks
This was, in principle, the line that was then adopted: with the basic network solution being provided on a commercial basis and with government grants to areas in which the market was not expected to develop networks within the foreseeable future.

The issue that must be taken up in this context refers to the *restrictions* on the solutions. It is obvious that a project of this type encounters two types of restrictions: financial and legal.

The willingness (or reluctance) of Parliament to allocate funds for the development of broadband is naturally one restriction that is of decisive importance. In light of the strict budget reorganisation that took place during the years immediately before the implementation of broadband, the fact that Parliament and the Government would not allocate an amount in the magnitude of over SEK 50 billion is not particularly surprising. It is possible perhaps to wish for another scheme of things, but for Parliament and the Government, which have to weigh social interventions in different fields against each other, it can be thought that there would have to be convincing arguments that the investments would be defensible from the perspective of the national finances, before they were prepared to allocate considerable resources for developments of this type. And it is quite clear that there were no possibilities of convincing Parliament about a programme of this type. At the same time, as pointed out above, the ICT boom was at its zenith and market stakeholders had a strong voice which also made it easier for Parliament and the Government to reduce its level of ambition for the planned financing.

At the point in time of the ICT bill, were there any legal obstacles in EC law to a major government procurement for developments in an area in which there were market alternatives, for example in order that the networks could be established rapidly and have a uniform structure?

The question has not been examined but an indication of the EU Commission's standpoint in the matter can be found in the guidelines that the Commission has issued in respect of the use of structural funds in the telecommunications sector[55]. Here it has stated that if public support to the telecommunications sector is deemed necessary, it must be given on the basis of foreseeable rules that have the aim of preventing the distortion of competition at the same time as public funds are allocated to fields in which investments would not be made on market terms.

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[55] *Published in the Official Journal of the European Communities C267/2, September 22, 1999*

The EU's standpoint is clear to say the least, but it applies to structural funds and therefore it can be theoretically possible that the assessment of ways in which national funds may be used is milder. However, it is not only reasonable but also probable to assume that the structural fund directive has not been produced by chance but is derived from general EC law. Articles 86 and 87 in the Treaty of Rome pose the fundamental question on competition on the inner market, describe the conditions for publicly-owned companies in relation to the inner market, and describe the conditions for government support[56]. Article 87 reads as follows:

> *"Save otherwise provided in this treaty, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, insofar as it affects trade between Member States, be incompatible with the common market."*

In other words it would appear that the directives for the use of structural funds correspond fairly well with the basic principles of the Treaty of Rome.

Apart from the general competition policy, there was also a special policy in the telecommunications sector. The telecommunications sector was deregulated in the 1990s.

One fundamental element of the EU's policy was also that competition should not only apply to services, but also to *infrastructure*[57]. In official communications, speeches and instructions, use was made during this period of the expression *"full competition"*, which underlines the importance the EU also attached, and still attaches, to aspects of competition in the telecommunications sector.

Nor does the idea that central government could make procurements and then, in one form of another, own an infrastructure as long as the procurement was conducted in a correct way, seem to be tenable. The whole idea is to avoid trade monopolies and that central government should leave, rather than establish, new areas for ownership.

There are therefore very strong reasons to assume that, where government subsidies were concerned, no other way was possible than having a regional perspective in which support could be given to places where the market could not be expected to construct the network in the foreseeable future.

The idea of a "community network" is an interesting alternative and could have been realised if there had been political interest in it. However, it was not politically possible. The idea that a community network should first be constructed and then made public would probably have entailed problems in relation to the EU.

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[56] *Consolidated version of the treaty for the establishment of the European Communities. Articles 86 and 87.*

[57] *Status Report on European Union Electronic Communications Policy. Update: December 1999. European Commission. Brussels, 22 December 1999.INFSO/A/1.*

The actual developments that took place in connection with subjecting networks to competition in those parts of the municipalities where the market was not expected to solve the problems has shown that the interest of the market in constructing networks in these parts of Sweden has been limited. A parliamentary majority has made the assessment that it is the responsibility of central government to facilitate the provision of networks in these places in Sweden. This means, as ITPS interprets it, that it is difficult to find any other fundamental objective than the selected "regional" policy, given the financial, legal and political restrictions.

5.7 Cooperation and a long-term perspective for the financing of infrastructure

In the discussion on the financing of infrastructure, it has been maintained that the broadband network was to be regarded as a form of infrastructure that was a collective good, i.e. a product whose value to a person using its services was not affected by the fact that others also use the resource in question. On the contrary, in network economics it can be the case that the value for a user increases with the number of persons connected to the network. The parallel has also been drawn with "natural monopolies" in which there are high entrance barriers and low marginal costs of producing the services when the infrastructure is already in place. Collective goods, natural monopolies and external effects, i.e. the traditional reasons why market solutions do not lead to economic efficiency have been given in the debate as reasons why the central government should enter the picture and finance broadband development with tax funds.

But neither history nor economic research provides any support for the idea that total financing by central government is the optimal solution. The reasons why certain investments are "collective" are not at the technical level but in the costs - transaction costs - that are associated with finding suitable contractual solutions between those parties that have an interest in having the infrastructure in place[58]. This approach has more or less revolutionised modern economic research and has shifted the focus from establishing whether there are any "market failures" towards seeing what can be done to the contracts and how different negotiation solutions can be established. One attempt to use this approach on the Swedish broadband market was also presented in a report made by the ICT Commission in connection with the broadband debate[59].

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[58] *The pioneer in this field of research is the American economist Ronald H. Coase who, in two epoch-making and Nobel prizewinning articles laid the foundation for an approach to "market failures" that attract attention primarily to the possibility of minimizing the economy's transaction costs, i.e. the costs of negotiating and monitoring the observance of different contracts between the parties rather than seeing the cause of the market failures as a consequence of, for example, technical factors such as the advantages of large scale operations or external technical effects. See Coase. R.H. "The Nature of the Firm (1937)" Economica 1937:4 and "Problems of Social Cost" Journal of Law and Economics 3(1960) 1-44.).*

[59] *See Odhnoff, Hamngren, Lundgren Making space for broadband, ICT Commission, Feb 2000 (in Swedish)*

Nor is the character of "a collective good" unambiguous in a case of infrastructure of this type. To some extent the high investments costs, together with dividing up the "total utility" among individual parties, give broadband infrastructure this character. But there are also specific elements of a private character since companies, municipalities, housing companies, operators etc. are establishing services of a private character by making supplementary investments.

Seen in this light, the problem of developing the infrastructure can be regarded as the establishment of a negotiating process: a process which, in different stages, the public sector and private sector parties that could be thought to have an interest in establishing the infrastructure at the level in question are identified and then, together with other parties, are also given a role in the financing. Solutions of this type can be favoured since the individual parties know that other stakeholders are also doing their share. Thus the insecurity which investments of this type are always associated with can be reduced.

This type of cooperation and co-financing solutions for infrastructure investments also fit in well with the concept of Public-Private-Partnership, PPP, which is currently being increasingly used by the EU Commission[60]. The Commission defines PPP in the following way:

> "A PPP is a partnership between the public sector and the private sector for the purpose of delivering a project or a service traditionally provided by the public sector. PPPs recognise that both parties have certain advantages relative to the other in the performance of specific tasks. By allowing each sector to do what it does best, public services and infrastructure can be provided in the most economically efficient manner. The overall aim of PPPs is therefore to structure the relationship between the parties, so that risks are borne by those best able to control them and increased value is achieved through the exploitation of private sector skills and competencies."[61]

Among the comments that are interesting in this connection, the following can be mentioned:

- *"Of particular importance is the role of the public sector which may transform itself from a service provider to an overseer of service contracts."* (page 8)

- *"A key requirement of Commission financing is that PPPs should not impact negatively on the operation of open markets nor the clear and transparent rules of these markets."* (pages 8-9)

- *"While regard must be taken to ensuring that private parties are able to realise financial returns by guaranteeing control mechanisms is foremost in guaranteeing a sufficient opportunity to generate revenues, this must be matched with a concern to avoid the creation of non competitive or closed markets"* (page 8)

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[60] *Laan, G. Van der et. al. (2002):"Optimal provision of infrastructure using public-private partnership contracts". Tilburg University, Centre for Economic Research.*
[61] *Guidelines for Successful Public-Private Partnerships. European Commission, 2003*

- *"The European Commission's objective in developing control mechanisms is foremost to protect the public's interest."* (page 9)

The cooperation between central government, municipalities, operators, property companies and service providers that has been established during the work on the municipal infrastructure plans has constituted an example of budding cooperation in respect of the PPP concept in Sweden. Cooperation between parties on the operator-neutral networks can be seen as a further step towards permanent partnership. The PPP concept offers cooperation, but with the specification of the roles and responsibilities of the different parties involved. The concept shows the potential benefits of cooperation of this type, given that the parties identify and jointly specify their roles in the system. Furthermore, cooperation based on the concept create a long-term perspective in, for example, the production of rules and institutional conditions for urban networks and can counterbalance the short-term perspective which often characterises both municipal and commercial activities. However, this short-term perspective is not suitable for the work of establishing an infrastructure whose useful life is calculated over much longer periods of time than quarterly reports or terms of office. The fact that so many parties in both the public and private sectors criticise the difficulties in establishing long-term solutions with the aid of the procurement regulations, is a further indication of the need for creating meeting places for discussions of long-term solutions to the IT infrastructure problems.

5.8   The municipalities as stakeholders

Let us return to the section (5.6) where we established that an active government interest that focused on programmes in areas where the market was not expected to develop the infrastructure was a reasonable line of action. However, even in this situation, it was possible to proceed in two ways:

- That central government makes a uniform procurement within the framework of an amount that is laid down by Parliament for the development of the network of this type, which is compatible with EU rules in respect of competition.

- That central government constructs a system of rules and commissions the municipalities to make these procurements.

With the first alternative central government could have made a procurement of a network with an open structure. The positive aspect of the proposal would have been the establishment of uniform technical standards throughout the entire network. However, the implementation of this strategy would have encountered a large number of difficulties:

- How would central government have obtained access to all the information on existing networks that, reasonably, only the municipalities could have produced? Who, for example, would determine the borderlines in respect of the interests of the market, central government, the contractors and the municipalities?

- How would it have been possible to have a planning process that was linked to the real local needs if parties at the local level had not been engaged as owners or part-owners of the project?

- What incentives would the municipalities have had to plan properly if they already knew that the project would be financed by central government? Instead of planning with the aim of using resources efficiently, there would have been a risk of a scramble between the municipalities themselves and between central and local government.

- Last but not least: central government would have lost the opportunity to get all parties with an interest in developing the networks to join forces and to share the investment costs.

It is also possible to imagine that the winner of a procurement of this type would probably have been one of the established network owners in the country, which could have caused a large number of other problems relating to, for example, the situation in respect of competition. This solution would also have assumed that Parliament would have been prepared to approve financing in an amount corresponding to that proposed by the Infrastructure Study.

Accordingly, the solution that in principle was chosen had many advantages. Not least the policy had the effect that approval was not given to a gigantic solution that would then be implemented without taking into consideration the new knowledge and skills that had been developed during the course of the process. The strategy also had the effect that the basis for establishing active interest and acquisition of knowledge was broadened by handing over the responsibility for subjecting the networks to competition to the municipalities and thus that advantage could be taken of their knowledge of local conditions.

However, one weakness in the implementation is of necessity the skills issue. What incentives did the municipalities have to construct open networks that were neutral in respect of competition? How could the networks be constructed so that they did not become isolated islands without the ability to communicate and collaborate with each other from the outset?

5.9   The knowledge issue

The Infrastructure Study proposed the establishment of a "national, government agency function, preferably within the National Post and Telecom Agency, with technical, legal, financial and industrial policy expertise in broadband infrastructure".

This function was also intended to constitute a centre of knowledge for the development of the infrastructure. In its decision the Government distributed the tasks that this function would have had to three organisations: the National Post and Telecom Agency, the Swedish Association of Local Authorities and the county administrative boards. It was the function given to the county administrative boards that was later developed into their cooperation organisation, Länssamverkan Broadband.

The idea that a regulatory authority should also have an interactive role and a role to disseminate knowledge can be discussed. The fact that the Swedish Association of Local Authorities should have a function in this respect appears given, particularly in light of the role that was distributed to the municipalities for subjecting the provision of networks to competition. The assignment given to the county administrative boards of checking observance of the ordinances also appears to be correct since checking almost 300 municipalities could hardly have been done by the central level.

In the opinion of ITPS, there was a great deal of work in establishing these structures. However, local government officers in all the municipalities in the country nonetheless faced the task of administering the establishment of a totally new infrastructure that was also being constructed with a totally different philosophy than that which characterised the traditional telecommunications structure of which the municipalities had a great deal of experience[62].

The Government dealt with the skills issue through the three assignments but, after the event, these appear to have been far too weak. Both the Swedish Association of Local Authorities and Länssamverkan Broadband have made superb efforts. Neither has mandatory powers and can "only" advise the municipalities and county administrative boards. These, in turn, had (at least) just as serious skills problems as the municipalities and, in some places, also had a double role - as a controller and interpreter of the use of government grants and as a stakeholder in their capacity of having the responsibility for coordinating regional development.

One question that should also be posed is whether the problems could have been avoided if the ordinances or the bill had been worded more strictly.

It is possible that clearer linkages could have been made in the ICT bill to the requirements laid down in the Infrastructure Study of horizontal competition at most levels, and that it could have been possible to find more precise requirements in respect of separation between different levels in the ordinances. The ordinances

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[62] *Support for this work was provided by the ICT Commission's report "General specifications of Internet services" (in Swedish) which was widely disseminated.*

could also have been more forceful in their requirements for municipal coordination and synchronisation of the networks.

However, in view of the shortcomings in experience and expertise in the municipalities, how would it have been possible to follow up how these requirements had been observed? One alternative could have been that a group of the Länssamverkan Broadband type had been involved from the outset in the formulation of the ordinances and had acquired links to the Government Offices and thereby the legitimacy to act more powerfully in relation to both county administrative boards and municipalities.

However, the question is the extent to which better regulation and stronger support in the form of expertise would have resulted in a qualitatively different outcome. A completely different approach that gave even greater attention to collecting knowledge and experience on a step-by-step basis could have been an alternative line of action.

In the natural sciences a lack of knowledge of the solutions that function best is remedied by first making mistakes on a small scale in experiments and then scaling up the experiments that prove to function in practice. Was it necessary for the entire country to move forwards at the same time? The fact that infrastructure issues are strongly dependent on steps, i.e. that freedom of action is greatly limited by decisions made earlier, has the effect that it is most often better to do things correctly than to do everything immediately. In most cases the concept "first mover advantage" is an illusion and it is most often better to be "a fast second" and to base one's actions on the mistakes of others.

In a course of events of this type there should have been time to engage persons with experience of developing the new infrastructure, and it would have been possible to work first in certain regions or in a small number of municipalities as test cases, allowed them, together with a group attached to the ministry, to make procurements or to subject the process to competition, evaluated the procurements or competitive situation, drawn up ordinances based on experience gained, and organised proper training for those who would be responsible for matters relating to competition and the infrastructure plans in the municipalities.

5.10 The future

Where does the development of infrastructure stand from the political point of view?

The 3G networks are being developed and, if nothing "unexpected" happens in this process - that can require new interventions to make the operators cooperate with each other, environmental problems etc, it would appear that this part of the development of infrastructure will be increasingly phased out from the political agenda.

Where the development of broadband is concerned, the development process is taking place and the period during which financial support is available expires in 2005. In October 2003, 23 per cent of the total financial support for area networks

and networks for linking centres in municipalities had been used. At the same point in time, 250 municipal infrastructure programmes had been approved. The municipalities have shown considerable interest and issues relating to broadband have been handed over to the local politicians, but it is difficult to determine the extent to which this also means that the preparedness exists to use the networks as a tool for local and regional economic, social and cultural development processes. The ICT infrastructure study proposed the establishment of demand programmes that would systematise and report on the demand for broadband services of organisations in the public administration. However, the municipal infrastructure programmes have been given a technical focus.

In the opinion of ITPS, one problem is the heterogeneity demonstrated by the urban networks in respect of business models and choice of technology. The Infrastructure Study's vision of an infrastructure with horizontal competition at almost all levels has not been realised and the requirements for neutrality in respect of competition made in the ICT bill and the ordinances have been interpreted in different ways.

On the basis of the above, it is difficult to maintain that the phase in broadband development characterised by the construction of infrastructure is now a thing of the past. On the other hand, it is important that further development phases are seen from a users' perspective. In this situation, the tasks faced by the public administration are not, in the first place, to "create services" but to stimulate the development of a structure on the networks that give them uniform and standardised business models, to ensure that the various parties involved find their roles, and to ensure that a structure is created that provides freedom of choice for the consumers, competition where services are concerned, and the possibility for service providers to have access to and to compete on the networks they wish to enter. In this way the requisite conditions will also be created for the networks to communicate and for the service providers to gain access to larger groups of customers. More services will stimulate more customers to be connected to the networks and a positive spiral between networks and services can be created.

This means that structures and business models on the networks will be an important issue in the foreseeable future.

5.10.1 Operator-neutrality - a matter for central government?

How will the networks be given a rational structure? There are many stakeholders that are regarded by everyone to have legitimate interests in the networks. Housing companies want to have freedom of choice and competition. Today they are more often owners of the property networks and are not prepared to give one single operator a monopoly in access to these networks. The municipalities have interests that can be traced back to their responsibility for a large part of the undertakings that the public sector has vis-à-vis the citizens, but they act in many roles, as land owners, owners of property companies, network owners, service providers etc. Operators and service providers have an interest in being able to reach their potential customers. Local trade and industry - that are not part of the IT industry itself - can have an interest in reaching the local population in order to provide

information and special offers to customers. Central government can have a certain interest in using these networks to test, develop and provide services linked to the "24/7 government agency" and naturally to ensure that basic civic information is guaranteed access to the networks. There are also other parties that could have an interest in participating on the urban networks, for example local societies, churches, sports clubs, adult education associations, and so on. If all these parties are to be able to make use of the networks, it is obvious that the interests must be balanced against each other.

The operator-neutrality principle has many interesting aspects where the IT policy is concerned. The principle means among other things:

- freedom of choice for the customer

- competition and dynamism on the services side

- possibilities for several stakeholders to share investment costs

- local control over the lower part of the infrastructure that can be linked to user influence

- possibilities to develop local commercial and public content on local intra-networks

- "organic development", i.e. the possibility for those who build their own networks in properties/areas on non-discriminatory terms to connect their networks to established networks and all the services that they can offer.

From the perspective of aspects of competition, aspects of democracy, culture policy ambitions etc, there are links to important government policy areas.

Does this mean that it is a matter for central government to encourage this type of solution in various ways?

The question cannot be answered in a clear-cut manner. In cases where government support could be arise in one form or another in order to develop access networks, it is natural that this support would be made conditional on the networks containing competition at most horizontal levels. The interpretation of this concept should then follow developments that are taking place on the market. Should, for example, an assessment of the meaning of "limitation of competition" in the new legislation on electronic communication be seen from a national or local perspective? Hitherto these issues have been regarded from a national perspective. However, how should the issue be assessed if the urban networks and the activities developed on these networks increasingly affect important functions for individuals and society? Under the new legislation on electronic communication, the so-called SMP (Significant Market Power) assessment can be tested more extensively in this context and also include local levels.

5.10.2 Loose threads

As ITPS sees the situation today, there are a number of loose threads that need to be tied up.

- A number of new organisations are working on standardising technologies and business models on urban networks (see above). What is not least important is that residents and different "civic agents" such as property owners of different types formulate their demands on the functionality that they want in the network.

- The relevance of copper networks in the new legislation on electronic communication has not yet been put to the test.

- In general, the right of ownership to the infrastructure in properties should, according to the code of land laws[63], belong to the property owner, and ways in which this legislation can be applied to those parts of the copper network that are within the boundaries of the area that legally constitutes the property have not been studied or tested judicially.

- Nor has the role of the municipalities been put to the test in relation to the new legislation, for example in respect of local SMP assessments. Nor has the issue of the way in which local government legislation should be interpreted in relation to the levels at which the municipalities are active been put to the test, as well as the extent to which local competition should influence this judgement.

- The present period for the provision of financial support expires in 2005 and today it is difficult to obtain an overview of the degree and focus of possible further government support for broadband development.

- Developments in the field of digital TV are proceeding rapidly and Parliament has decided that analogue TV transmissions shall come to an end in February 2008. This will have consequences for the broadband policy but it is not yet been possible to see the reactions to this of parties on the market.

- Will the explicit determination of the property owners to build their own property networks be realised or will other models take over or be developed in parallel?

- How will the municipalities now assume responsibility for giving the urban networks substance and using them as a tool for comprehensive social development?

- Are the principles in the TV medium for the "must carry" policy, i.e. the requirements to provide information of an overall social character, also applicable to transmission over broadband?

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[63] *Code of Land Laws, Swedish Code of Statutes 1970:994. See in particular Chapter 2.*
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Without doubt there are also a number of other questions that can be mentioned in this context, but the issues listed above will have to illustrate the complexity and rapidity associated with broadband development.

5.10.3 Dialogue and self-regulation

ITPS is of the opinion that, in the present situation, it is necessary to apply a historical perspective to broadband development. Only slightly more than three years have passed since the ICT bill was tabled and Sweden has recently been given new legislation in the field that has not been interpreted or tested in any way. In every new rapidly changing and dynamic situation there are many wishes and opinions that want to be expressed. Therefore, in this complex of problems, it is not appropriate to extract individual issues and make rapid and thereby, in all probability, premature decisions.

The most important aspect in this respect is not the different technical solutions associated with the different urban networks, but rather their differing business models and structures. The large, important pieces must fall into place and the remaining pieces can adjust to the pattern that emerges.

In the opinion of ITPS, many initiatives hitherto have been taken by the parties themselves in order to find solutions to the division of roles in the networks. A large number of questions need to fall into place or be analysed in more detail. In a situation of this type, apart from encouraging such initiatives central government should not take any active measures.

The development of urban networks should naturally be followed by the Strategy Group as well as the National Post and Telecom Agency, the Swedish Competition Authority and the Swedish Consumer Agency. It is also imperative that important developments on the urban networks are made the subject of a comprehensive, multi-disciplinary academic process of acquisition of knowledge.

Operator-neutrality should be one point of departure for the discussion on ways in which the different interests should be balanced. The principle of operator neutrality is supported by a large number of important stakeholders and there are many models that function well in operation. There is also a large degree of consensus in respect of concepts and fundamental solutions. It is possible for local and central government to have their interests met, for the citizens and residents to have freedom of choice and influence over access networks, and for operators and service providers to have access to different networks, but not in the role of vertically integrated monopolists.

Above all it is now three "levels" that are particularly important. *The residents, citizens and property owners* have a key role in further developments.

The property owners, both public and private, as well as the representatives of the tenants, have expressed support for giving priority to solutions that give freedom of choice for residents and for competition where services are concerned. Many of the largest property companies have also expressed the ambition to build their own property networks and this has been done in a number of places around the country.

On the other hand, it would appear as if this trend, after a certain boom some years ago, has now lost its impetus. There are many reasons for this. In many places there have not been any networks to connect to. However, in most cases the main reason seems to be purely financial. The ambition has been that the property owners, with the aid of rationalisation in their administration of properties, could be able to finance the property networks, but this has proved to difficult to do in the short-term perspective. Pending efficient financing models and in view of uncertainties in relation to urban networks and service providers, many property owners have either permitted their tenants to find their own solutions, i.e. in most cases ADSL, or have allowed a private company to build the property network and then to use the network with exclusive rights during a transitional period.

Now a tendency is beginning to emerge that investments in property networks are regarded in the same way as other investments, for example in roofing, modernisation of cable TV networks, balconies, renovations etc, i.e. that they constitute a basis for negotiations on rents. The position adopted by the major property companies in the new situation that is starting to arise on the market is of vital importance for further broadband development. Many operator-neutral networks have been able to offer residents access to the Internet with higher capacity and at lower prices than ADSL is able to offer today and there are a number of networks with operational - but different - business models. A first step is therefore that the property owners establish their positions and formulate their demands in respect of the networks they shall connect to. If the major property owners in the densely populated regions assume responsibility and take the first step, this would be of extremely great significance for finding solutions to the present situation.

Financial support for property networks has only been utilised to a small extent. On the basis of the principle that all parties shall be responsible for paying for at least part of the infrastructure, it would appear reasonable that, in principle, the residents and property owners are responsible for the property networks. The aspect that is currently difficult to solve in many places is the link between the property and the urban network (or other networks) - "access networks close to properties". It is also this part that the operator is often responsible for in an exclusivity agreement: the property owner finances the property network but since the access network to the urban network is owned by the operator, it is possible nevertheless to restrict the customer's freedom of choice. If financial support for this part of the network were to be made available, there would also be possibilities to make demands for openness on this network, as well as on the networks at higher levels to which it is connected.

The urban networks, or the other networks that the property networks can be connected to, also have problems in relation to the residents and service providers. One issue that should be taken up in the discussions that the parties should hold is the status of the urban networks. In most places the municipalities have integrated aspects relating to the municipalities, operators and private network owners in the infrastructure plan. However, in some places there is inbuilt tension between the private parties and the municipalities, or rather the municipal companies. In other places the network that links the property networks with the higher levels does not

necessarily have to be a municipally-dominated urban network, but can be built for example by a strong property owner or a coalition of owners. *Once again, where control of the urban networks is concerned, we can see the need of balanced solutions.* A great deal would be gained if the residents/property owners, municipalities and service providers could agree on structures that give the urban networks a base that facilitates stability, a long-term perspective and coordination, and that give all stakeholders involved the incentive to contribute to the long-term development of the urban networks. ITPS knows just as little as any other interested party of what this solution should be, but two concepts should provide a point of departure in this discussion, the operator-neutrality concept and *private-public partnership*. The traditional *operators and service providers* are also in a new situation.

Many, but not all, of the operators would preferably see vertically integrated business models. The problem is that their competitors want the same things, but with themselves as the monopolists. When the property owners build property networks, they naturally have no interest in handing them over to a vertically integrated monopolist. This understanding also has the effect that the period of time a private party is given exclusivity in respect of the network in exchange for building a property network is tending to become increasingly shorter, which in turn makes it less attractive to build. This also means that the major operators are also starting to act on the operator-neutral networks. For example, a national telecommunications operator (Telia) has accepted for the first time the role as a communication operator on a network that it does not own itself (a network owned by a housing company, Svenska Bostäder, in Vällingby, a suburb of Stockholm). Many service providers have also started to realise that they are in a difficult position in relation to the urban networks when the municipalities or companies owned by the municipalities provide services themselves, and are hesitant to enter these networks.

The issues are complex and there are many interested parties who have legitimate interests to safeguard. The municipalities have their interests, private companies want to come in with their services, the property companies consider it obvious that they should have full control over the networks in their properties, and the tenants and their representatives want to have freedom of choice and competition. The property companies and the tenants are of the opinion that vertically integrated networks do not provide dynamism and competition in respect of services and are concerned about a new cable TV monopoly situation. Therefore solutions should be sought that are of they type that create a balance between the different stakeholders so that everyone's legitimate interests can be satisfied without encroaching too much on the interests of others. In the opinion of ITPS, the best solution in the present situation would be to solve any problems on the division of roles through a discussions and agreements. Different constellations and alliances are working to formulate rules for the urban networks. Operator-neutrality could create a platform for balanced development in which the municipality has its share, the tenants and the property owners have control over the basic infrastructure, diversity and freedom of choice would be established, and operators would have access to the

networks but not in the role of monopolists. On the other hand, they would also have access to networks to which they would otherwise never had access.

Even if there are considerable differences in the approaches of, for example the property companies, the tenants, the Swedish Association of Local Authorities, Länssamverkan Broadband and so on, there is a lowest common denominator in the interest in finding operator-neutral solutions and in the need of developing effective models of cooperation for these solutions. Hitherto developments have also, as can be seen from the case with Telia and Vällingby described above, or the fact that, in connection with the infrastructure plans private networks have opened up at different levels, show that that developments in the operator-neutral networks have also led to greater openness in the vertically integrated networks. In the foreseeable future, this effect will be the most important from the purely qualitative point of view since, for the foreseeable future, we will live with (at least) two network structures. This competition and the possibilities of interpreting the concept of SMP from a local perspective create interesting possibilities for both competition and for cooperation between the different structures.

5.11   Recommendations

- The Government should not yet introduce different types of interventions on the market, but make it possible and, in suitable forms, provide support for market tendencies to engage in self-regulation.

- It is desirable that discussions between stakeholders lead to balanced solutions and it is particularly important that the interests of the citizens/final users have an impact on the solutions that are implemented. The discussions should be held at a certain distance from the Government, but the Government should follow developments, primarily through the Strategy Group.

- The National Post and Telecom Agency should be given the assignment of extending its examination of broadband development from presenting purely quantitative results to presenting qualitative variables also. The most interesting aspect is the degree of heterogeneity shown by the different municipal/regional solutions in respect of business models and choices of technology etc, which can constitute obvious obstacles when the networks, in the next stage, are connected to the national level, and guarantee an infrastructure which makes horizontal competition possible at all levels.

- In the light of the new legislation on electronic communication, the National Post and Telecom Agency, the Swedish Competition Authority and the Swedish Consumer Agency should monitor ways in which competition and openness in the networks are affected by vertical integration in different respects. A follow-up should be made of the municipalities' IT infrastructure plans by the municipalities themselves making a market analysis of different aspects of the competitive situation, including their own roles and their intentions in respect of the future division of roles at different levels. This material can form the basis of a possible future assessment of the extent to which, under the new legislation on electronic communication, SMP (*Significant Market Power*) can be assessed on the basis of a local perspective.

- The Government should consider stimulating the formulation of municipal IT policy plans with a focus on activities and content.

- The Government should consider whether an ordinance would make it possible that funds for property networks that are not utilised can be transformed into financial support for "access networks for properties", given that the network fulfils the requirements in respect of operator-neutrality that discussed above in this report.

- The Government should consider ways in which to make it possible in the regular support systems to strengthen the incentive for interested parties to physically connect networks in the vicinity of each other in order to increase the potential number of customers and to speed up the development of services, as well as to improve the quality of the networks by increasing redundancy and security. One adroit way of doing this would be for the Government to allocate the "new" SEK 500 million to the counties and then, in its annual directives and letters of appropriations, give instructions to the counties on how these funds should be used. Conditions could then include that the funds should lead to the networks being physically connected to each other, that the structure should come closer to municipal boundaries, or that different types of quality improvements should be made to the networks.

- The Government should commission, possibly through the Strategy Group, an analysis made by researchers and important stakeholders of the situation on the broadband market in a medium-term perspective (preferably up to 2010) in which, among other things, light is shed on the consequences of developments in respect of digital TV.

- All the issues described above should be implemented with an eye to 2005. However, this means that *preparatory work* prior to new decisions in respect of the broadband policy should be started and be given high priority.

5.12   The mobile networks and the broadband policy - a comparison

The infrastructure for mobile communication is also an important element in the ICT policy. Providing as many people as possible with access to the new services of the information society, both companies and individuals, in urban and rural areas, is an important social concern. This also applies to mobile communications which can thus be listed under the general goal of an information society for everyone.

The National Post and Telecom Agency distributed a number of licences for the new UMTS networks, the so-called 3G licences, on the basis of the current legislation and rules that referred to the field in question. In May 2000, the National Post and Telecom Agency invited telecommunications companies to apply for permits in a so-called "beauty contest" for 3G. The permits were distributed in December 2000. The operators had been invited to submit undertakings in respect of coverage, numbers of base stations, speed of development of new networks etc. On the basis of these tenders, four operators were selected and there was a certain amount of surprise when a national telecommunications operator, Telia, which considered it could build a network with the same range but with far fewer base stations than the competing tenderers, was not awarded a licence. The tenders were converted into conditions for 3G activities. According to the licence conditions, it is possible for the holders to reduce their network costs by cooperating in the construction of the network for up to 70 per cent of the population covered. After the licences were distributed, network companies have been established by Telia and Tele2 and by Vodafone, Hi3G (now also operating under trademark 3) and Orange. Orange has subsequently announced that it does not intend to continue building the 3G network, but it has not returned its licence.

The National Post and Telecom Agency had to formulate the criteria for the "beauty contest" on the basis of the overriding goal of the telecommunications policy, i.e. to offer citizens, trade and industry and the public administration in different parts of the country satisfactory access to telecommunications at the lowest possible cost to the economy. Guaranteeing good coverage geographically and demographically formed the basis of the National Post and Telecom Agency's regulations and constitute the very core of the policy. At the same time it was important that the Agency did not make demands for coverage in its permits that the operators could not live up to them. It therefore chose not to define the coverage that should be achieved, but left it up to the operators to define the degree of coverage and the speed of construction of the network that they considered they could offer.

Important and costly elements where accessibility is concerned are the construction of infrastructure, both fixed and mobile. Investments in infrastructure are long term and, in this context, are relevant for periods of time that are calculated in decades rather than in years. It can therefore be interesting to see how the Government, consciously or subconsciously, handled the decisions in respect of investments in infrastructure that are taken up in the ICT bill.

Prior to reaching decisions on major infrastructure investments, it is important that an assessment is made of the costs and revenues of different alternatives. There is a degree of uncertainty at several levels. Are the costs predictable and how are large unplanned cost increases prevented? Will the technology on which the infrastructure is based be competitive in the long term? New technology is competing with updated old technology as well as with even newer technical solutions. How is it possible to identify the future applications that can be linked to the technology and - above all - how can these applications be expected to be requested by customers? The decision-making process should be linked to the best possible information on the value of future use, control stations should be built into the process, and the construction of the network should be adapted on the basis of new experience and new information. The approach used by ITPS to evaluate the ICT policy is the concept of "a learning ICT policy", which means that objectives should be broken down into sub-goals that are possible to monitor and follow up, and that results are measured and evaluated and then constitute the basis for the preparation of decisions on the next phase in the policy area. It is not always possible, but is none the less desirable, to break down major and complex investment decisions into sub-processes of this type.

In this respect we see two different approaches in the ICT policy. Where the new mobile infrastructure was concerned, i.e. the 3G licences, the National Post and Telecom Agency chose to have a beauty contest - as did half of the EU's member states[64]. In Sweden it was not possible at that point in time to arrange an auction without first making an amendment to existing legislation, which was not considered at that time. At that point in time, criticism of the Government from some quarters was fairly harsh for making a choice without having foreseen the advantages of an auction procedure and thus making amendments to the law. Auctions were considered by some economists to be the most effective instrument for making choices since the responsibility for assessing good business practice in the calculations rests with the party that is responsible for ensuring that future business will be successful. In addition, government would receive, without raising taxes and any negative side-effects this is associated with, billions of Swedish kronor for the public treasury.

What happened was that the high licence fees in Europe, combined with the costs of building the networks, almost broke the backbone of the operators who had been granted the licences, particularly since the market was not as mature as it had been thought. In this situation, there was greater understanding for a beauty contest. The Swedish government did not have the policy of creating, through high licence fees,

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[64] *Economic research into these issues has not made much progress. Research into auctions to deal with natural monopolies has a long tradition ansd has alo been applied in the telecommunications sector (See Klemperer,P.D. (2002) "What really Matter is in Auction Design." Journal of Economic Perspective 16.) The idea is that an auction can generate, to a large extent, a process that is linked to a solution based on perfect competition. A more critical view of actions has been developed by Oliver Williamson (Williamson, O.E. (1976) "Franchise Bidding for Natural Monopolies – In general and with respect to CATV". Bell Journal of Economics 7: 73-104). For a general review of the Swedish 3G auction see Bjuggren, P.O. (2002). "The Swedish 3G beauty contest: A beauty or a beast". Jönköping International Business School Working Paper No. 2002-4.*

financial obstacles to entry to the market, in addition to the costs that were to be ploughed into the future network. Nor did the Government consider it improbable that this additional cost would be passed on to the consumers, even if this was not emphasised as a main reason why Sweden used a beauty contest. On the other hand, the operators were forced to stand for their undertakings and could not use their permits flexibly vis-à-vis market demand. After it proved to be the case that demand had not grown at the rate that the operators had hoped, they tried to renegotiate the conditions of their permits. Since this refers to the exercise of public authority, the Government has limited, if not to say non-existent, powers to exert an influence on the course of events that relates to conditions for permits. The government agency, the National Post and Telecom Agency, is responsible for ensuring that conditions are followed and, if they are not, of examining judicially each and every case. On the other hand, the Government has expressed the view, for example in the press, that it is not reasonable to give the operators concessions in respect of the undertakings they have made and which were of decisive importance for the granting of permits to the very four operators in question.

The government did not receive any income from auctions but received, instead, undertakings for a mobile network with nation-wide coverage. It will be a question for future evaluations to make an economic analysis of this choice when more knowledge is available on ways in which the value of this infrastructure should be assessed. All in all it can be said of the decision-making method used that flexibility was limited should an unexpected course of events arise. If demand grows more slowly than expected, it could be considered theoretically possible to renegotiate conditions at a control station after a certain period of time. The disadvantage of this procedure is that a renegotiation of this type that had not been announced in advance of the process could lead to a loss of trust in government in future negotiations.

It is important to emphasise that neither the Government nor the National Post and Telecom Agency had made any advance demands in respect of coverage. The undertakings made by the operators form the basis of the conditions for the permits. The undertakings made in the applications were of decisive importance and must be assumed to have been made on the basis of market assessments. The Government assumes that the operators will live up to the undertakings they have made.

If an evaluation is made of the handling of the 3G process and the development of its infrastructure as a part of "a learning ICT policy", it is reasonable to draw a parallel with the procedure for the introduction of GSM. One of the reasons why the development of more advanced services took such a long time for the GSM operators was that, in the first few years, they worked and competed almost exclusively on creating a better coverage and did this, in principle, with three parallel infrastructures. How much this delayed the development of more advanced services in addition to regular standardised telephony is difficult to judge.

In the case of 3G, the opportunity was now given to share infrastructure up to a maximum of 70 per cent coverage. The remaining 30 per cent was to be covered with the operator's own infrastructure. Despite the improvement in comparison with GSM, the construction of infrastructure has also been one of the most serious stumbling blocks for 3G. The construction of 3G has not yet been completed and therefore a further evaluation of this process must be deferred.

On the basis of a review of experience gained, it can be of value to give consideration to three aspects:

- In terms of "a learning ICT policy", we have seen that the process to 3G has not offered particularly great opportunities for correction, adaptation and learning during the course of the process. This can be compared with the step-by-step development of the broadband policy and the attempts to link its construction to needs.

- If the GSM policy had also been subjected to successive follow-ups and evaluations, it is at least hypothetically possible that the conditions for the development of UMTS would have focused more on stimulating cooperation in respect of the infrastructure.

- If there had been a learning process between the different sectors in the economy that work with infrastructure and services (see main report), this would possibly have paved the way for the development of vertically separated 3G networks with cooperation at network level and horizontal competition at the higher levels. What has been done cannot naturally be undone, but one lesson learned for the future can be that different agencies working with infrastructure should exchange knowledge and ideas systematically with each other in order to make it possible to spread new ideas in the structures.

6 Democracy

In its ICT bill, the Government stated that our practical knowledge of what is known as digital democracy, cyber democracy or teledemocracy was modest and that knowledge could only be acquired through practical experiments. These experiments were to be established on a relatively large scale (municipal districts or large housing estates), extend over a period of four to five years, have a wide spectrum of possibilities, and have a bottom-up perspective.

In March 2002, the Ministry of Justice appointed a Working Group on ICT and Democracy with the mission of "following and promoting the development of democratic processes with the aid of ICT".

The Working Group's mission is to follow and promote the development of democratic processes with the support of ICT but hitherto to its operations have been limited. The Working Group has produced an anthology on electronic voting.[65]

6.1 Actions taken by ITPS

In the pre-study to this evaluation (A learning IT policy), ITPS wrote:

"Measures in this field have barely had the time to have had any effects at local level. The Government Commission on Democracy took up issues relating to citizens' panels and practical support, for example in the form of IT, for elected representatives. A situation report and analysis of experience gained hitherto in the form of a review of knowledge should be completed in 2003.

The concept of "electronic voting" is often heard in the public debate and it is probably the case that other aspects of the effects of IT on democracy and the possibilities available to citizens for participation are at least equally interesting. A compilation could be made of government agency reports on their measures on the web or of visits by citizens, participation in dialogues, statements of opinion etc in this respect.

The possibilities available to citizens to organise themselves and establish contacts with like-minded citizens is also an important consequence of IT development, but these possibilities are also being used by criminal forces. We note that the Government has formed a working group whose task is to monitor and promote the development of democratic process with the aid of IT."

Accordingly, in the opinion of ITPS, what was to be made was an analysis and review of knowledge rather than a traditional evaluation in this field.

ITPS commissioned Åke Grönlund (Örebro University), Agneta Ranerup (Gothenburg School of Economics) and Peter Gustavsson (Örebro University) to perform this assignment.

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[65] *See www.demokratitorget.gov.se.*

6.2   Focus of the work

ICT affects democracy in a number of different ways. Among others, Manuel Castells, in his famous trilogy on the "Information Age"[66], has linked the collapse of the Soviet empire with the inability of the command economy to develop "informationalism", i.e. the integration between production and management of information and knowledge demanded by modern society. In an analysis of the Japanese economic problems since the 1990s, Castells also takes up Japan's inability to adjust to the rapid developments that occurred in the financial markets, and the lack of transparency and openness in the Japanese systems. With Castells' analyses as the point of departure, it is possible to draw the conclusion that closed systems have difficulties, both in adjusting their actions rapidly to the demands imposed by modern times, and in living up to the openness that the citizens are starting to regard as natural, as a result of, for example, technical developments. Naturally arguments of this type can also be reversed by referring to the possibilities offered by the technology of exercising controls over the citizens.

In its work with ICT and democracy, ITPS has chosen not to develop a total approach to the fields of ICT and democracy but has selected to limit the subject area to discussing issues that concern different forms of electronic dialogues between politicians and citizens and between the public administration and the citizens. In particular, the issue has been studied from a local, municipal perspective.

If an active interest in the municipality can be established via an electronic service dialogue in which the citizens feel that that have closer contacts with their municipality in respect of concrete events, this can in the long term create a greater interest for more people to try to exert an influence in local democratic forums in which a citizen may have a personal interest at that time. The fact that the different ways of obtaining a footing of this type can be achieved via childcare, care of the elderly or the sports and recreation department or whatever, is perhaps not so important. A new, interactive, easily accessible channel has been discovered that gives a new dimension and the discussion on services can be the first step in an active interest, at least at the local level. What seems to happen in this first step is that the discussion both on policies and services is individualised since the political system is ignored. Common concerns and mutual standpoints are in danger of disappearing in a system of this type. However, one important issue is ways in which the political parties are capable of meeting this challenge.

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[66] *Castells, M. (1998). The Information Age: Economy, Society and Culture: Volume III: End of Millennium. Blackwell Publishers.*

6.3   Summary

A summary of the report produced by the research group reads as follows[67].

Experiments in e-Democracy, in the narrow sense of participating in political deliberations, have had a strong influence on practical democracy at the local level. The number of experiments is small and the results are not clear-cut and it is therefore not possible to see a statistically measurable trend. If the meaning of the concept is extended to include more aspects of a democratic society, the picture is entirely different. In the services field and that part of municipal activities referred to as community networks, there are clear development tendencies with implications for democracy. Experiments in e-Democracy are in general local, both in Sweden and internationally. One exception is Great Britain, where electronic consultations have even been given a place on the national agenda.

Where possible changes in respect of democratic theory are concerned, it is possible to see at the local level important changes in the organisation of decision-making processes and in the influence exerted by the citizens, but this is not a clear-cut trend. Electronic democracy is formed by, and dependent on, the parties that participate. It is the strong parties who form it in accordance with their visions.

In electronic democracy as it is in Sweden today, the parties barely have a place. Instead it is "strong leaders", politicians or local government officers, who are the centre of attraction. This means that the political part of government, debates and differences of opinion, are mainly replaced by a service approach - the municipality's "strong man" (usually) discusses the quality of services with the inhabitants. And he does this increasingly directly, via e-mail or electronic conferences, while the parties sit in the gallery.

This is reinforced by developments in the service field. These developments, in many ways, inspire and set trends for further developments in the field of democracy. An electronic service model has emerged, with active customers and electronic tools. In the public sector a similar pattern can be seen with new roles for citizens and new behavioural patterns. Adaptation to the electronic service model is on the way in practically all organisations. Its pace varies in different organisations and local democracy brings up the rear. The private sector is in the leading position. A number of central government agencies with service on their agendas, for example the National Labour Market Agency, have made some progress. In the field of democracy many voluntary organisations have come a long way. The political parties and Parliament have started developments in this direction. Hardly any traces at all can be seen in municipal democracy.

Where democracy is concerned, e-Services have led to the strengthening of individual aspects of democracy while collective aspects have been weakened. The focus is on the access of the individual to services and the right to correct treatment in matters concerning the citizen.

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[67] *The text is taken from the report on ICT and Democracy – Experience gained and future options (in Swedish)*

Since government bills with a bearing on democracy do not discuss developments in the service field, and vice versa, this means that, in practice, government hands over democratic development to the public electronic service field, "e-Government". This field is governed at present by financial incentives at agency level. This means that democracy in connection with contacts between government agencies and the citizens is made dependent on the profitability of democracy at agency level. This is problematical.

Apart from these points, the report draws the conclusion that in the future policies in this area should use knowledge acquired in recent research. This means not least that attention should be given, and remedies made, to the lack of initiatives directed towards the structural effects of ICT on democracy that prevail today. The report identifies four areas where this has not yet taken place and, where to a large extent, this shortcoming lies behind part of the problems identified in the conclusions:

1. *Develop a more specific approach to the role of technology in the development of society.* In the bills that form the basis of the ICT policy, "cyber democracy" is presented as being something separate from "normal" democracy. The former is assumed to be entirely "government by technology", while the latter is not government by technology at all but rather stands above the development of society in technical respects. This is a wrong approach; technology and society develop in collaboration with each other. It is therefore important that the future policy is guided by studies of the use of technology in order that the desired changes can be designed in harmony with the practice that is now emerging in a wider context.

2. In the bills that this report has analysed, there is an *unclear theoretical and fundamental division between "service" and "democracy".* They are treated as completely separate activities. This can seem to be strange since the expressions "democracy" and "dialogue" appear frequently in texts on electronic services. But there is no discussion of ways in which the "service dialogues", which are described in the section on service, contribute (or not!) to the development of democracy in a wider sense of the term. If these dialogues, for example, strengthen the individual as a participant in the democratic system (as opposed to collectives such as parties and interest organisations), this means a change in the view of democracy compared to the strong party-based view that forms the basis of the political system in Sweden today. *This report links together developments in the service field with direct political processes. We show that an important part of the organisation of the work of the institutions is governed by customer/user interactions in service processes and that it is these processes that are currently mostly in focus in the movement towards an electronic administration, a development that is also international and the subject of regulation and control in the EU area.*

3. Develop a *model of the future* in the e-Service society. At the same time as assumptions are made in respect of changes in behavioural patterns and in attitudes in individuals and companies, earlier government bills assume, without further refection, traditional political institutions and processes in the future also. "Political interest and participation" should be stimulated. It is the individual that should be changed, not the organisation. *This report presents an e-Service model and new assumptions for the roles of the citizens as a point of departure for the discussion not only of service processes but also of the role of the citizens in democratic decision-making processes. The service processes are the forerunners; the political processes must be adapted to the new living conditions of people, by analogy with the ways in which politics were built up around the living and working conditions of industrialism one century ago.*

4. Analyse technological advances as a driving force for a new society, not as a threat to an old society. Often *erroneous analyses of technological advances* are made.

Our analysis shows that the spread of technology in Swedish society is extensive enough not to represent an obstacle to the development of e-Democratic methods. Research into the use of technology shows that access to the ICT medium does not, in itself, lead to a situation in which people participate in democratic processes. On the other hand, the organisation of the democratic processes can do it. Nor is it the medium that stands in the way of participation in collective forms of e-Democracy - access to ICT is far more widespread among the population than participation in democratic processes. The individual forms, networking, lobbying etc have already made use of the new medium. Hitherto, e-Democracy has not fostered to any great extent the collective forms of democracy as long as we refer to formal democracy. Where voluntary organisations of different types are concerned, the situation is entirely different.

6.4   Recommendations

- The aspects on the relationship between democracy and electronic service presented in this report should be the subject of a seminar organised by the Delegation for Public e-Services, preferably together with the Strategy Group.

- The Strategy Group should ensure that the content of this report is discussed with the stakeholders concerned, since the content of broadband is an issue that is growing in importance.

- The Delegation and the Strategy Group should work together to find ways that guarantee future consultations that can also be the subject of scientific analysis and evaluation.

- The consultative model should be developed in municipalities with the aid of practical experiments and the participation of experts.

7 ICT and sustainable development

There are several conceivable mechanisms through which ICT can be thought to support the political vision of a sustainable society. In the ICT bill, the use of ICT is emphasised for promoting ecological sustainable development and for contributing to reducing the negative effects of transport on the environment and health. However, it is doubtful whether travel or transport will diminish as a result of the development of ICT. On the other hand, the pressure on the environment from travel and transport can decrease in relative terms.

However, there is also an indirect effect on sustainability through the restructuring of the industrial society with the aid of ever increasing elements of service and knowledge acquisition that ICT has contributed to and which can even contribute to reducing the wear and tear on natural resources.

The ICT bill also proposed that a special delegation should be established to survey ways in which ICT applications can be used to reduce effects on the environment and to promote sustainable development. A group for this purpose, the "Forum for IT and the Environment", was subsequently formed at the Ministry of the Environment. Its mandate extends to December 2003. Its work has been performed in a working group chaired by the Minister of the Environment, Lena Sommestad, with representatives of industry, research, the Swedish Environment Protection Agency, ministries, and environmental organisations.

7.1 Actions taken by ITPS

In other words, the political measures that have been taken are not so extensive. ITPS realised that the steps that should now be taken should above all focus on analyses and knowledge acquisition. What are the mechanisms through which ICT influences ecological sustainable development, and what role does the ICT policy have in this?

In order to establish a relationship between the ICT policy and the environmental policy, ITPS has chosen to cooperate with the Swedish Environment Protection Agency in respect of the workshops on ICT and the environment that the Agency planned. In this connection, ITPS was also given the opportunity to follow the work done in the Forum by Dennis Pamlin and Ewa Thorslund with the aim of "making a general survey and presenting strategically important questions for, and links between ICT and sustainable development."[68]

In this work, ITPS has given priority to aspects of sustainable development that are aimed in the first place at the environment, while aspects that are related to health-care or culture are taken up in special sub-studies and, in this report, under the heading concerned.

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[68] *See Pamlin and Thorslund, "ICT and sustainable development" Forum ICT and the Environment 2003 and http://miljo.regeringen.se/Projekt/forum-it-miljo/index.htm*

7.2 Summary

In the discussion that is taking place in relation to Forum IT and the Environment, and which is presented in the report written by Pamlin and Thorslund, the perspective is that the transition from an industrial society to a knowledge society provides opportunities to go beyond marginal improvements and break the trend of increasing environmental degradation and widening social divides. From having been driven by technology, ICT developments are starting to focus on traditional economic aspects and the central and long-term social issues have ended up in the background.

Pamlin and Thorslund are of the opinion that there are a number of challenges that must exert an influence on the discussion on the ways in which ICT affects sustainability:

- reducing the consumption of resources

- eliminating absolute and relative poverty

- dealing with demographic changes

- dealing with forthcoming and new technical breakthroughs (for example breakthroughs in biomaterials and biotechnology).

Four principles should serve as the starting point for integrating ICT with the discussion of sustainability:

- The focus should be shifted from products to services

- Inclusion of the issues of environmental benefits in all important ICT investments

- Reduction in rebound effects and calculation of total gains from ICT investments on the environment

- Parallel time horizons for long-term planning

For all four areas the report proposes analyses and proposals for *institutional changes* (new services, institutions, changes in current e-Government), *strategic fields for research* (in relation to international research and in relation to Swedish experience), *changes to strategic directives and strategic investments/contributions* (public or public/private partnerships that supplement and support the efforts made by the companies and civil society to find sustainable solutions).

The report proposes that a document, an integrated framework, should be drawn up that describes how an integrated national programme for ICT development should contribute to sustainable development.

In order to create this framework, it is necessary, *in the first place*, to have a vision that is provocative and specific. "Without a specific vision it is difficult to know why the Government is interested in the issue and it is difficult to collect widely dispersed initiatives so that they pull in the same direction." For this purpose, a *long-term perspective* is also required in the policy. *Secondly*, resources are required where the Government should provide support, but should also encourage

other parties to clarify their interests. *Thirdly*, there must be a clearly defined political responsibility for ICT and sustainable development. *Fourthly*, focus and structure are required.

7.3   ITPS' comments and recommendation

ITPS has a positive attitude towards the work that is now being pursued in the Forum for ICT and the Environment. This work is completely in line with ITPS' ambition that, on the basis of their objectives, the different policy areas should produce programmes and strategies for ways in which ICT can assist them in the achievement of their operational goals. ITPS also notes that the Minister of Infrastructure, Ulrika Messing, and the Minister of the Environment, Lena Sommestad, were the joint authors of an article on ICT and the environment. Collaboration of this type can lead to a bridge possibly being established between the Ministry of Industry and its specific sectors, which largely concern issues relating to transport, i.e. cars, trains, boats, aircraft etc, and the goals of the Ministry of the Environment for a reduction of pressure on the environment through lower emissions from different modes of transport. ICT in the transport industry is a vital field with, for example, advanced traffic informatics, development of a national road database, advanced modular transport systems etc. All these are projects that lie within the jurisdiction of the Ministry of Industry but which have considerable importance for influencing effects on the environment.

Recommendation
- ITPS proposes that the Strategy Group, together the ministries and government agencies concerned, contributes to finding forms for financing the work that has now been started in the Forum for IT and the Environment, in order that the work in this field does not come to a standstill when the mandate of the Forum expires in the near future.

8   ICT and culture

Culture has traditionally been an important field for the Swedish ICT policy. The ICT Commission that presented its report in 1994[69] formulated the vision that ICT should provide support for the culture policy which had the aim of "making it possible for everyone in Sweden to participate in the cultural experience and the Swedish cultural heritage".

On the other hand, in a review of the ICT bill of 1999/2000, ITPS found that the land-based digital TV network was the only special aspect of the culture policy that was really taken up. On the other hand, the general objective of creating an ICT society for all naturally also contains a bearing on the goals of the culture policy. However, in other respects the ICT policy in culture is presented, in principle, with the wording "to make use of the possibilities available to ICT to preserve and de-velop culture, the cultural heritage and language in Sweden". The digital TV network can also be seen as a question of access and it is noticeable that the Government had two infrastructure programmes in progress in two ministries: the broadband policy and the digital TV network. The lack of substantial content in the fields of ICT and culture in the ICT bill raises the question of ways in which hori-zontal work in the Government has functioned. The meeting between the ICT policy and the culture policy had clearly not functioned well, in any case not before ICT bill was drawn up, despite the considerable importance that ICT clearly has for the cultural interests of young people, for example where film and music are con-cerned, and also in respect of the possibilities of ICT of making culture widely available and of being an instrument for the creation of culture.

In the light of the above, ITPS invited tenders for a status report and review of knowledge in the field. Among other things, the status report was to describe the fields in the culture policy that were linked to ICT and measures taken since 2000. The assignment was awarded to Metamatrix and was performed by Claudio Aguirre-Bianchi.

In the text below, ITPS follows, in principle, the presentation made by Metamatrix and presents in particular those aspects that concern the formulation of goals and strategies for the policy.

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[69] *Government Official Report 1994:118*

8.1   The ICT-culture policy documents

The strategy that can be found in the Ministry of Culture's approach to ICT and culture is described primarily in the following documents:

- The culture policy bill[70]

- A ministry memorandum entitled: Culturenet Sweden for greater access to culture on the Internet.[71]

- The budget bill 1999/2000[72].

8.1.1   The culture policy bill

A revision or reformulation of the fundamental features of the culture policy has not been made since 1996[73]. The national cultural policy that Parliament has adopted lays down seven national goals:

- to safeguard freedom of speech and create real conditions for everyone to use this freedom,

- to work to ensure that it is possible for everyone to participate in cultural life and in cultural experiences as well as to be creative themselves,

- to promote cultural diversity, artistic renewal and quality and thereby counteract the negative effects of commercialism,

- to make it possible for culture to be a dynamic, provocative and independent force in society,

- to preserve and use the cultural heritage,

- to promote cultural ambitions,

- to promote international cultural exchanges and meetings between different cultures in the country.[74]

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[70] *Government bill 1996/97:3 Culture policy*

[71] *Ministry memorandum 1999/2000 Ministry of Culture*

[72] *Government bill 1999/2000:1. Proposed government budget for 2001. Expenditure area 17: culture, media, religious communities and leisure.*

[73] *Cf. Government bill 1996/97:3 Culture policy.*

[74] *Cf. National Council for Cultural Affairs, Plan of Operations for 2003, p 7 Online: http://www.kur.se/uploaded/document/2003/4/4/VP_vers_final.pdfhttp://www.kur.se/uploaded/document/2003/4/4/VP_vers_final.pdf (Per 2003-04-10).*

8.1.2   Culturenet Sweden

In 1995 a government committee on "Culturenet Sweden - IT study" was established. It submitted its final report in 1997[75]. The study drew up an integrated strategy for the use of information technology at government agencies and institutions in the cultural field. The evaluator gave considerable attention to "rapid developments in information technology" and to "the new technical solutions that are leading to a situation in which telecommunications and data communications can be integrated and linked together over geographical borders." The evaluator lays down that the Culturenet "should be based on Internet technology for several reasons".

The point of departure of the study was the need expressed by the earlier government committee on culture[76] of securing new networks and information systems for the free exchange of ideas and of creating databases in the cultural field which would make information available to the public. The point of departure of the government committee on culture was that "every cultural institution should make use of ICT in order to make its information available to other institutions and stakeholders in the cultural field, to researchers and to the general public".

This therefore included a vision of creating, with the aid of ICT, easily accessible information which would be available to everyone in a transparent way. At the same time Culturenet Sweden is seen "as a foundation of an integrated ICT strategy for the cultural institutions". The point of departure is that every cultural institution should use ICT in order to increase access to its activities, information and knowledge. Since the material would be digitised, considerable amounts of information can be made accessible, even to those who are physically a long distance away. Via a common cultural network on the Internet, the material can then be sought in an integrated context. In the vision presented by the committee, ICT has different supporting roles in the cultural institutions' activities. The two central roles are

- digitisation in order to preserve, and
- the Internet in order to make available.

As a fundamental element in the strategy, it was laid down that the digitisation work had to be strengthened in the cultural institutions and that this work should follow the standards and format of each cultural sector.

The outline of an integrated strategy for the cultural sector is based on the growing digital communications network, the Internet, and its point of departure is that every institution should acquire a fixed Internet connection and a website of its own, and should use e-mail and news groups.

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[75] *Government Official Report 1997:14*
[76] *Government Official Report 1995:84*

A proposal was presented in the Ministry of Culture in 1999 on the future focus of activities.[77] In the ministry memorandum Culturenet Sweden is made permanent in the following way:

"...a future Culturenet Sweden (would) constitute the foundation of an overall ICT strategy since the institutions' activities and resources would then be made available in one context."

8.1.3 Budget bill 1999/2000

In the budget bill for the year 2000, the Government makes the assessment that:

"One of the operational goals of the National Council for Cultural Affairs is ... to have an overview and to spread information on ICT use in the cultural sector. In the light of this, the Government would make the assessment that the Council already has the assignment that some other stakeholders feel that Culturenet should be given, apart from its basic activities and website."[78]

With this decision, the task of Culturenet Sweden included, in principle, the development of a cultural portal with a small number of employees. Culturenet Sweden collects information that is relevant for the culture sector and those interested in culture, regardless of the ministry responsible for the policy area concerned. However, Culturenet Sweden was not given an "ICT policy" role.

However, as ITPS has interpreted the situation, this means that the only really important and relevant strategy document for the ICT policy is the culture policy bill. The seven national goals that are formulated in this document are, within reasonable time intervals, timeless and do not need to be revised regularly. On the other hand, there are issues that concern coordination between culture, media, technology and the development of society, whose conditions vary in shorter cycles. Therefore, the culture policy could be structured and formulated in a more dynamic way in order to make it possible to define shorter cycles that can be harmonised with, for example, the life cycle of the ICT policy.

In the general culture policy this long-term policy is supplemented by short-term action plans. In the latest document published, ICT is not taken up[79].

This is not necessarily something negative from the ICT policy point of view. It can also be interpreted in such a way that ICT, as an instrument to enable the culture policy to reach everyone, is taken for granted and it is unnecessary to constantly emphasise the importance of ICT for the achievement of the goals of the culture policy.

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[77] *Cf. Ministry of Culture memorandum on "Culturenet Sweden for increasing access to culture on the Internet. 1999 (in Swedish). The memorandum was circulated for comment, the responses received are available at the Ministry of Culture*

[78] *Cf. Government bill 1999/2000:1, Expenditure area 17: culture, media, religious communities and leisure.*

[79] *"Agenda for Culture 2003-2006" published by Ministry of Culture, 2003-01-24 (in Swedish).*

However, in view of the role that ICT plays in cultural life and for culture institutions today, an ICT strategy document of one type of another should be available. The lack of a strategy in the field of ICT and culture is not merely an expression of a lack of interest on the part of the Ministry of Culture. It can also be the case that the extremely general formulation of the ICT policy on "an information society for all" does not offer the interfaces with culture that ensure that the ICT policy and culture meet. The lack of linkages between the ICT policy and the culture policy is not unique but illustrates the lack of horizontal coordination which, in the opinion of ITPS, characterises the entire ICT policy.

8.2   Practices in respect of ICT and culture

The interesting aspect in the field of ICT and culture is that, despite the lack of a well-thought out policy in the field, there are nevertheless broad and advanced activities in the field. The cultural sector also appears to be special in the sense that so many "cultural activities" are being pursued under the areas of responsibility of other ministries. If the ministries or policy areas in which decisions are made on aspects that concern culture are listed, the number of ministries is fairly long:

- Ministry of Culture
- Ministry of Education
- Ministry of Industry
- Ministry for Foreign Affairs
- Ministry of Justice
- Ministry of Finance
- Ministry of Health and Social Affairs

Under several of these ministries, extremely advanced ICT activities are being pursued in different agencies such as the Royal Library, the National Archive of Recorded Sound and Moving Images, Music Library of Sweden, the Swedish Broadcasting Corporation, Sveriges Television, the National Archives, the National Heritage Board and so on.

On the basis of assignments given in the Government's annual directives and letters of appropriations, several of these agencies work with soft infrastructure but, to a large extent, the agencies are free - within the framework of their basic instructions - to develop their activities.

ITPS has not studied this issue, but many stakeholders have drawn its attention to two problems with ICT-related activities in the cultural sector. One is the duplication of work by different agencies. The other problem is that an agency's financial, administrative or professional resources cannot be used by others.

8.3 Recommendations

- An inventory should be made of way in which ICT is part of the culture sector, regardless of the ministry that is responsible for the policy area concerned. This inventory should be drawn up by the Strategy Group and the Delegation.

- A working group with members drawn from the Ministry of Culture, the Strategy Group and the Delegation should initiate a project for the design of a common vision of ICT in culture policy and design different goals and strategies for the field of ICT and culture.

- Broadband development and the closing down of analogue TV broadcasts will raise many issues concerning copyright, standards etc, that should be analysed in the work on a vision for the broadband policy in the medium term (for example up to 2010). This aspect was also discussed in the section on broadband policy above.

- The links between ICT, culture and education should be strengthened. Culture and the work of digitising the cultural heritage and the 24/7 government agency have clear linkages with each other.

- A joint project on culture and industrial development should be established by the Ministry of Culture and the Ministry of Industry.

9 ICT and economic growth

In the ICT bill the Government estimates that ICT can contribute to the achievement of a number of general political goals linked to the economy and growth, for example

- sound finances and stable prices

- growth, more job opportunities and lower levels of unemployment

Furthermore, growth would be promoted since the Swedish ICT sector's international competitiveness would increase, ICT would contribute to creating new markets, more jobs, improvements in productivity, and growth in electronic trade. How realistic are these hopes and how well grounded was the Government's emphasis on the importance of a strong ICT sector in Sweden?

9.1 Research into ICT and growth

In the pre-study to this evaluation, ITPS emphasises the difficulties involved in tracing the effects that the ICT policy can have on growth[80]. In this respect, the mechanisms are in two steps. Firstly there is a relationship that is difficult to identify, namely that between the measures taken by the Government within the framework of the ICT policy and ICT use by companies. Secondly the links between companies' ICT use and productivity growth are not entirely self-evident.

Regarding the question of ways in which ICT influences productivity, this is an issue that has been the subject of intensive discussion in economic research.[81] Ever since the end of the 1980s, different explanations have been proposed as to why ICT is "everywhere except in productivity statistics". One explanation is that ICT certainly provides actual results but that these results are not measured in current statistics. Another point of view is that proportion of the economy that relates to ICT is far too small to reasonably have an obvious effect on the economy. A third point of view is that the effects will come but that history shows that it will take time for them to have an impact. A fourth point of view is that the effects can certainly be measured but that ICT investments must be combined with other measures such as organisational changes or human resource development in order to lead to results. In addition to this there is a fifth standpoint, principally interpreted by Robert Gordon, an American economist, who says that ICT is far too complex a technology to lead to higher rates of growth in the long term.[82]

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[80] "A learning ICT-policy – proposal for the evaluation of the ICT policy". ITPS 2002.e
www.itps.se./rapporter
[81] See the discussion on the Solow paradox in the pre-study above or in Lundgren, K., A.Wiberg (2000), "The Solow paradox or the new economy". Ekonomisk Debatt 4. 2000 or the ICT Commission's report 34/2001.
[82] Gordon, R.J., (2000). "Does the "New Economy" Measure up to the Great Innovations in the Past?" Journal of Economic Perspectives, 14(4) pp. 49-75.

During the epoch of "the new economy", i.e. the latter part of the 1990s, many believed that the question of the importance of ICT for growth had been solved once and for all. Theories were launched that the economy had entered a long period of growth and that the era of economic recessions was a thing of the past. We now know that this was not the case. Statistics are now becoming available on what happened during the period of the new economy but revisions are still being made to the data from the agencies that produce statistics, and the perspectives and interpretations of researchers range over a wide spectrum. There are no data and reliable analyses on what happened in the period after 2002/01 and all conclusions must therefore be preliminary.

9.2 Total factor productivity and labour productivity

There are, in principle, two indicators that are used to measure productivity. *Labour productivity* measures value added per employee, per working hour, per month and per year etc. *Total factor productivity* (or multi-factor productivity) TFP, is an indicator that also attempts to eliminate the effects on productivity that arise as a result of more capital being used per employee. Therefore, the change in TFP is often regarded as the indicator that best measures actual improvements in efficiency in the economy. What happened during the period of the "new economy"?

Robert Gordon has maintained that the tendencies towards accelerated increases in productivity that could be seen in the American economy in the 1990s, and particularly in the latter part of the decade, were dependent, in principle, on extremely rapid increases in productivity in the computer and telecommunications industries, while the productivity increases in other sectors remained at the same level as previously. The fact that the ICT industry experienced such a strong increase in productivity that it had an impact of the aggregated economy is undisputed. However, many researchers have claimed that Gordon underestimated the productivity increases in the sectors that used ICT.

The research findings that are available in the autumn of 2003 show that, at least in the USA, the increase in labour productivity was faster during the latter part of the 1990s than in earlier years.[83] This was not merely the case in the ICT sector, even if it was in this sector that the largest increases took place, and naturally not in all industries, but in most.

Trends in respect of TFP were more uncertain. In principle, results confirm that the rate of increase in the ICT sector was high. On the other hand, relatively small changes would appear to have taken place in the rate of increase in TFP in the industries using ICT compared with earlier years.

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[83] *See, for example, Nordhaus, W.D. (2002). "Productivity Growth and the New Economy". Brooking Papers on Economic Activity 2: 2002. Nordhaus tries to take a new grasp on the productivity paradox by studying sectors that can be considered to be relatively easy to assess from the productivity point of view. Furthermore he defines sectors in a somewhat different way to Gordon.*

The American economist and economic historian, P.A. David, makes two comments on the research situation.[84] Firstly, he is of the opinion that productivity growth in the first half of the 1990s was not so great that it was able to improve the average rate of growth during the period 1988-1996, and it was nowhere near the rate of growth during the golden period when productivity lagged behind, which was between 1972 and 1988.

Secondly, David is also of the opinion that the higher rate of growth in TFP took place, above all, in the ICT sectors. This productivity growth created an enormous fall in prices for ICT-related products which, in turn, led to very large investments in trade and industry leading to greater capital intensity, i.e. every employee could use an increasingly larger amount of real capital in production. This effect is impressive even in current prices and, if we were to conceive the ratio between capital and labour based on the fixed prices for ICT equipment that prevailed just a few years ago, the mind would boggle at the thought.

Schreyer[85] and Daveri[86] have included other countries than the USA in their studies. Schreyer's study covers all the G-7 countries. The factors he analyses are labour, ICT, "non-ICT capital", and TFP. Schreyer also finds that ICT has contributed to growth mainly through increasing capital intensity. On the other hand, he did not find any convincing evidence of a relationship between TFP trends in sectors using ICT and investments in ICT.

Daveri's study included an additional eleven OECD countries, and he methodologically uses the concept of including software in ICT investments. Even if there are problems between the studies with their different approaches to the definition of ICT capital, Daveri also produces the same holistic picture. ICT is growing faster than labour inputs and therefore capital is intensifying and labour productivity is increasing. The studies are also consistent with the results of the studies that have merely concentrated on the USA. ICT contributes to increasing capital intensity while the effects on TFP in the sectors using ICT appears to be difficult to identify on a large scale. However, the difficulties of measuring these effects must be borne in mind and therefore all conclusions must be interpreted with a great deal of caution and with the understanding that new versions of deflators over different periods of time can lead to different results.

It is true that more studies will be published and the data are being revised continuously. Therefore the conclusions are still unreliable.

Moreover, an economic recession has now taken place during the first few years of this decade. This also appears to have reduced the changes in productivity growth, particularly in the ICT industries.

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[84] David, P.A., (2001). "Productivity Growth Prospects and the New Economy in Historical Perspective". EIB Papers. Vol. 6 .No 1
[85] Schreyer, P. (1999). "The Contribution of Information and Communication Technology to Output Growth", Statistical Working Party (99)4, OECD. Paris, November.
[86] Daveri, F. (2000). "Is Growth and Information Technology Story in Europe Too?". Working Paper. Universita di Parma and IGIER, September 12.

The fact that, during part of the 1990s, certain sectors in the ICT and telecommunications industries had annual increases in productivity of between twenty and thirty per cent naturally has an effect on the average increase in productivity, even if the share of these sectors in the economy only correspond to five per cent of employment or value added. However, the question here is the extent to which these figures of productivity increases were the result of a number of factors that cannot be reproduced. Nor did the large increases in productivity prove to provide a guarantee against the telecommunications industry entering one of the deepest industrial crises in modern time a few years later.

9.3   The ICT policy and growth

How can the ICT policy be considered to influence economic growth?

Even if many of the effects of ICT on productivity and growth are disputed there is, however, a great degree of consensus that the increase in capital intensity that has taken place as a result of constantly falling prices for ICT products and ICT services has been an important factor behind the increase in labour productivity that also has taken place in the sectors of the economy that use ICT. Moreover, there is evidence that shows that mere investments in ICT do not lead to anything except increases in costs unless the investments are combined with organisational changes and human resource development. In other words, access and skills are important and they are also factors that can be influenced to a large extent by the policy within the framework of *the general dimension* of the ICT policy.

The access policy and also access in the economic sense, for example access to high transmission capacity at low prices for companies in the entire country, is something that the Government can influence through, for example, the broadband policy and the competition policy.

The policy that government *shall be a forerunner in ICT use* can affect the economy in several ways. Firstly, government is responsible for important functions in society. Secondly, the Swedish ICT policy has always had the ambition that good use of ICT in the public sector will also have dissemination effects throughout trade and industry. If government, in turn, can collaborate with municipalities and county councils so that the entire public sector is a forerunner in ICT use, a considerable part of the entire economy will be represented.

Skills is also a general ICT policy area that, not least research into the Solow paradox shows, must be supplemented with investments in access and organisational or institutional changes to enable ICT to result in growth.

In addition to these general policy areas, the ICT bill also takes up a number of specific areas that have a bearing on growth. Where these areas are concerned, discussions were held last year on suitable measures in view of the decline in the computer and telecommunications industries. In principle it is the following areas that have been the subject of measures or proposed programmes:

- the competitiveness of the ICT industry

- ICT use in small and medium-size companies

- ICT and regional development

- electronic trade

- measures that should be taken in light of the problems in the telecommunications sector.

9.3.1 The competitiveness of the ICT industry

The ICT bill calls attention to the importance of Sweden having an internationally competitive ICT sector. No arguments are given why it is more important to have a strong ICT industry than, for example, a strong biotechnology sector, a strong financial sector or a strong forestry sector. In the ICT policy some objectives for exports from the ICT industry are also formulated which, in themselves, appear to be reasonable, but the question is *why the ICT sector is the only industry for which goals of this type are formulated*. Nor is an indication provided of the types of measures the Government intends to take if the goals are not achieved.

The links between the ICT industry and the ICT policy could be understood if it had been laid down that a strong ICT industry was clearly linked to a "good and broad" use of ICT in society. The fact that Sweden has a good and broad use of this type is beyond dispute, but the question is how this is linked to the existence of a strong ICT industry. The fact that a few decades ago Sweden did not invest in developing "national champions" among computer manufacturers but chose the policy of maintaining an open market with strong competition is a factor that is often given as a reason for the rapid diffusion of computers in Sweden.

The size of the ICT sector's proportion of value added and employment is dependent on the way in which the sector is defined. One common conception is that, in total, the sector accounts for five per cent of value added and approximately the same proportion of employment. *However, this also means that the sectors in the economy that use ICT account for 95 per cent of value added and employment. The effects of ICT on productivity and growth are therefore determined in essentials by the ways in which ICT is spread to, absorbed by, used and developed by companies in the sectors using ICT.* The fact that Sweden, through various interventions not least on the part of government, creates skilled and demanding users and a population and a labour force that is well informed where ICT is concerned, is probably the best form of support that active ICT producers in Sweden could have. A consistent policy that did not involve support for special companies or technologies would also force the companies to adapt their products to the needs and preferences

of the users, *which should also, in general, make them more competitive in an international perspective.*

To have consistently upheld the user perspective would, in this connection, have been more correct and would also have contributed to creating a more congruent and integrated ICT policy.

9.3.2   ICT use in small and medium-size companies

The ICT bill emphasised the importance of developing ICT skills in small companies. In general it is considered important that Swedish trade and industry reduces its dependence on a few large companies. At the same time there are clear indications that it is the large companies that have the resources to use ICT to develop their businesses.

The Government allocated SEK 29 million to the National Board for Industrial and Technical Development (NUTEK) for the implementation, in cooperation with the Federation of Private Enterprises, of a programme for ICT use in small and medium-size enterprises (IT.SME) and for a network project for companies in the inland region of Norrland, a province in the northern part of Sweden, (IT.REG) which is managed by the National Board for Industrial and Technical Development.

The policy that the Government has had in relation to small and medium-size enterprises, IT.SME, is still current and has not yet been evaluated by the National Board for Industrial and Technical Development and the Federation of Private Enterprises. However, a preliminary follow-up has been presented by the National Board for Industrial and Technical Development. ITPS has therefore chosen not to make a special evaluation of this programme in the present situation.

The project has not been directed towards small and medium-size enterprises in general but towards the very smallest companies, companies with up to ten employees. The amount of support has been limited to SEK 29 million. The funds have mainly been used for know-how support for companies or groups of companies around the country. The project has not been restricted to special industries or regions.

However, ITPS considers that idea of implementing a programme of this type in cooperation with the interest organisation concerned was positive. ITPS would refrain from making a judgement of the programme but nonetheless considers that future programmes should give priority to ICT use in companies of the type that are judged to have the potential of influencing *other* companies to make good use of ICT.[87] The "for all" aspect is, in the opinion of ITPS, essential from the perspective of the citizens, but the parallel cannot be drawn automatically with companies.

If new programmes directed towards small and medium-size enterprises are initiated, it is also important that the projects are organised in such a way that future evaluations are facilitated.

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[87] *Arguments for a focus of this type can be found in Frankenberg, E. (2003), SME Use of ICT, Royal College of Technology.*

The fact that industrial estates of small and medium-size enterprises are given priority in the municipalities' broadband work can have an effect in the long term. The large companies can deal with their access problems themselves and the very smallest can be regarded from the access policy perspective as "normal" citizens. On the other hand, the municipalities should give attention to the intermediate group.

9.3.3   ICT and regional development

The ICT bill makes linkages between the ICT policy and regional development. The importance of ICT in overcoming distance makes ICT a useful instrument in the regional policy.[88] In the opinion of ITPS, it is too early to comment on what is reasonable to expect in this respect. It is true that, in a certain sense, ICT reduces dependence on distance. However, on the other hand ICT works best when the technology is supplemented with other interventions. However, these can be more sluggish geographically and therefore the overall effect can be the creation of new clusters rather than the creation of appropriate conditions for growth, regardless of geographical location.

It is far too optimistic to expect that the decisions that were made in connection with the ICT bill in 2000 would have had demonstrable effects that were visible in 2003. The perspective is far too short. Even if the period is extended by a further three years, it would still seem to be doubtful whether effects could be seen. One possibility that could be used now is to investigate how the price and capacity of the companies' Internet connections affect allocation decisions.

A more important aspect of the issue of ICT and regional policy development is that the regional growth programmes make it possible to break down abstract national growth goals into concrete goals in a regional context. An assignment of this type given to the regions could constitute the starting point at the regional level of the introduction of a learning ICT policy. It could be linked to the work on the local infrastructure plans which, at the time of writing, are being finalised in municipalities and regions, and not least to the actual development of the urban networks that are now being established around the country.

9.3.4   Electronic trade

Electronic trade was regarded by the Government as an important instrument for increasing growth. However, the Government emphasised that the development of electronic trade should primarily be pursued by stakeholders on the market and that regulation would only be resorted to if industry standards and agreements were inadequate. In a process of international collaboration and in interaction with trade and industry and the stakeholders concerned, government would act for the establishment of an effective set of rules, coordination of public sector activities, and for an accessible and safe infrastructure. The Government also linked the increasing confidence in ICT concept to electronic trade in that it assumed that a lack of confi-

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[88] *Cairncross F. (1997), The Death of Distance: How the Communications Revolution Will Change Our Lives, Harvard Business School Press.*

dence would be one of the major obstacles to acceptance by consumers of electronic trade and, for example, to consumers daring to disclose the number of their credit cards for payments over the Internet.

Events have shown that the form of electronic trade that has really grown is that between companies (B2B), while consumer trade is still insignificant, even if it is growing rapidly, particularly in respect of travel, CDs, and computers. Electronic trade between companies in Europe is, in principle, doubling each year and turnover last year amounted to USD 200 billion.[89]

It is naturally important that the parties concerned go back and examine what was wrong with the assessments they made of rapid expansion in electronic trade for consumers. The reason for the slow expansion is probably not only to be found in the last phase of financial transactions (electronic signatures) but rather in shortcomings in the total utility that the proposed service can give to consumers. In cases where it is obvious that electronic transactions have an overall utility, for example for bank business, safety routines have been established which have clearly gained the confidence of customers. This does not mean that the work on electronic signatures is less important. It can be the case that, at this point in time, not only the Government but also certain parts of the market have an ungrounded idea that if only this problem was solved, different types of electronic trade would be rapidly developed. Instead of making a *holistic analysis* of requisite conditions for increasing electronic trade, one aspect has been emphasised. An electronic invoice is merely the fruit of an order and it is important that the entire chain – from the customer's decision to make a purchase up to the point where he or she makes the payment – is seen as a process.[90]

Even where trade between companies (B2B) is concerned, it is obvious that developments have taken a different course than that which was expected some years ago. Business processes and purchasing systems that are linked to a market place or directly to suppliers seem to be the driving force behind developments. This means that electronic trade is being integrated with other systems in the companies and with the systems of customers and suppliers. It also means that electronic trade has now brought about new ways of working within and between companies, which also makes it necessary for companies to develop and improve their operations.[91]

There is a great deal that would indicate that the development of B2B trade, particularly in large companies in the Nordic countries, is proceeding very rapidly and that there are signs that electronic trade is being integrated in all operations of companies. This can mean that developments are taking a somewhat different course compared, for example, to the USA. However, much of what has happened seems to be taking place in large companies. Small and medium-size enterprises hesitate when faced with the necessary investments, which are relatively large for them.

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[89] *"Purchases drive e-Trade". (article in Swedish) Computer Sweden 77 2003*

[90] *See for example: "e-Trade's time has come". (Article in Swedish) Computer Sweden 92 2003*

[91] *Development of operations is taken up in Chapter 11 on ICT use in central government*

9.3.5 Measures resulting from the crisis in the telecommunications sector

In the autumn of 2002, four county governors in counties that hade been severely affected by the crisis in the telecommunications sector took an initiative to establish joint projects between central government and the regions concerned, partly with the aim of giving impulses to the industry in light of the large number of employees who had been given notice, and partly in order to stimulate development by establishing testing environments. The Government commissioned the Swedish Agency for Innovation Systems to develop the idea, and a proposal was presented in November 2002.[92]

Apart from the regions' proposals for co-financing by the Government for developing testing environments in order to develop new services and applications, the Swedish Agency for Innovation Systems' proposal also included long-term consolidation of the appropriations for research into ICT and telecommunications amounting to SEK 3.15 billion. All in all, the proposal amounted to SEK 3.5 billion. In the budget bill for 2004 the Government proposed an increased appropriation of SEK 100 million for the Swedish Agency for Innovation Systems for "applied ICT".

ITPS considers it of great importance that the development of services is initiated. However, in the opinion of ITPS, it is also important to define the role of government in this process. It is also important that measures are designed in a manner that is neutral in respect of competition and non-discriminatory. Government can contribute to creating access and also, in different ways, to providing support and encouragement so that the infrastructure is given a design of the type that makes it open and neutral, and so that competition, diversity and dynamism are created in the networks. Furthermore, government and the public sector in its entirety are extremely important suppliers of their own services. The development of these services should take place in close cooperation with private trade and industry so that standards can be adapted and discussions can be held on ways that would make it possible to avoid creating too many obstacles to individual users. If government and the public sector can develop their own services vis-à-vis the citizens, habits and confidence can be created that private service companies can then build further on.

On the other hand, publicly financed bodies, in their work of developing their services, should ensure that free competition is not disturbed and that service companies are treated in a non-discriminating manner in order to avoid new fixed positions and "downpipes" being established with public funds.

Regarding the industry policy aspects of the difficulties faced by computer and telecommunications companies, ITPS considers that – apart from the consequence of circumstances that lead to regulation via the National Post and Telecom Agency - there are no reasons to consider these industries any differently from other industries in difficulties.

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[92] *See www.vinnova.se/vinnitel.*

The best support the industry can be given is that government contributes vigorously to creating competent and demanding customers who, with their knowledge and experience, can help the industry to develop products and solutions for the Swedish market that can then be sold on other markets.

Where funds for research purposes are concerned, it is important to emphasise what the Swedish Agency for Innovation Systems expressed in its proposal to the Government, namely that the proposal was long term. The effect of research on growth and employment is a long-term process and it is not certain that decisions on a long-term orientation of research should be made under stress. In its formulation of the long-term research policy, the Government should naturally consider the consequences of the reduction in research activities made by several parties, not merely by Ericsson but also by Telia, the Swedish Armed Forces etc. Fairly large reductions in research programmes are being made on the Swedish market. However, it is also important that government-financed research does not only take over the projects abandoned by the market. The question why no other private party has taken up this research should also be posed. Furthermore, it is important to analyse experience gained from the crisis and the consequences this may have for the direction of the future ICT research policy. Likewise it can be important for the universities to analyse the consequences the crisis may have on the content of training programmes for ICT specialists. The difficulties experienced in recent years by large parts of the industry, and the knowledge that it is only in interaction with institutional change and the development of knowledge that ICT can lead to long term growth and increases in productivity, also create the need of systematic multi-disciplinary acquisition of knowledge in these issues.

Regarding the funds for "applied ICT" that the Government has allocated, in the opinion of ITPS it is important that they are linked to the tradition in the Swedish Agency for Innovation Systems that has been developed in respect of ICT use. User and consumer perspectives must be give greater prominence so that ICT is not merely developed from the perspective of the producers.

The programme proposed by the Swedish Agency for Innovation Systems also included elements of labour market policy programmes. ITPS regrets that no great efforts have been made to deal with the situation in an innovative way. If the county labour boards ands county administrative boards had been actively engaged, it should have been possible to achieve cooperation between university colleges and universities with the aid of various education and development programmes. Persons with considerable practical experience who had lost, or were in danger of losing, their positions could have come into contact with environments that had considerable theoretical knowledge but a lack of practical experience. With a little foresight and energy, it would have been possible to have integrated "mature" skills in telecommunications with the new skills in data communication. As far as ITPS has seen, the formal rules and horizontal barriers between the organisations concerned effectively prevented solutions of this type - with the exception of regions, for example the Gothenburg region, where the parties have developed a tradition of pragmatic solutions over a long period of time in cooperation between trade and industry and the public sector.

9.4   The future growth policy

It is important to understand that an ICT-based growth policy is realised to a large extent through the general ICT policy measures, i.e. that government has an effective policy for access and skills.

The ICT policy should be directed towards the users, not the producers. There is a danger that government recommendations - that certain services should be supplied in a certain way with a certain technology - may lead to developments on the users' terms being given unnecessary and dubious restrictions. There is no reason at all – apart from the reasons that have led to special regulation via the National Post and Telecom Agency – to give the ICT industry special treatment through the industry policy.

The future ICT-related growth policy must, in the opinion of ITPS, be related to the challenges arising from demographic trends and the aging population that Sweden will face in coming decades (see Chapter 15). This means that issues relating to ICT-supported operational development, problems with non-communicating systems etc – in brief the ways in which ICT is to be an instrument to enable *fewer people to do more, and to do it better, for more people* - will be the predominant issue for the ICT policy for the foreseeable future.

9.5   Recommendations

- That a user perspective consistently permeates the ICT policy and that all features that indicate that the ICT policy may be an industry policy in disguise should be consistently eliminated.

- That the starting point of the future ICT policy should be that the decisive factor for ICT-related growth and for the future of the ICT industry is the way in which the 95 per cent of the economy that is part of the ICT user sector is capable of absorbing, using and developing the technology as a tool to achieve its operational goals.

- That the ICT policy is directed towards the users and is neutral in respect of technology.

- That, where the industry policy perspective is concerned, ICT industries are treated in the same way as all other industries.

- That any government measures taken in the area should be of a general character and focus on promoting access, developing skills and increasing confidence.

- That the issues of education, development and research in the ICT field, and the ways in which interventions in these issues correspond to the needs of the market and society, are taken up in the production of a possible new research policy bill.

- That ICT-supported operational development is made a task for various public sector organisations, that the Strategy Group and the Delegation examine ways in which different agencies can contribute to developments in this respect and design proposals for the management and control of agencies' actions, for example in the form of annual directives from the Government.

- That the public sector seeks ways in which it should cooperate with, strengthen and establish mutual learning processes with the private sector on ICT-support development of operations, and the development of electronic trade and electronic services.

10   ICT in healthcare

In the ICT bill the Government stated that greater efforts would be made to develop and regenerate the health and medical care services with the aid of ICT. Closer coordination of different care levels and care providers would be sought in order to make an effective exchange of information possible. A national action plan for the development and renewal of the medical services was to be created in which the use of ICT in healthcare would be taken up.

10.1   Healthcare in the ICT era

The national plan for development and regeneration resulted in the report "Healthcare in the ICT era"[93]. The assignment given to the working group mostly focused on telemedicine. It included making an analysis of the current situation in telemedicine, proposing strategies for extended use, and describing their benefits from the patient's perspective.

In order that telemedicine should not merely refer to the care provided by medically trained personnel but should also include care aspects of the service, the committee used the concept telemedicine/telecare.

The working group structured its proposals for strategies and actions in five areas:

1.   Strategies to establish technical and other requisite conditions for telemedicine/telecare.

2.   Strategies for telemedicine/telecare in hospitals, and in primary and district medical centres

3.   Strategies for telemedicine/telecare in the health and medical services provided by municipalities.

4.   Strategies to strengthen the positions of patients/recipients of care services and persons close to them.

5.   Strategies to create a better market for ICT and medical technologies.

After the event it is interesting, from an evaluation perspective, to note that the working group also drew the conclusion that the traditional method of introducing a new technology into an activity - through trials, evaluations and decisions - did not function where telemedicine/telecare applications were concerned. A care unit cannot introduce applications of this type alone. The great advantages of systems of this type arise in applications in which a number of different care providers and support functions collaborate.

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[93] *"Healthcare in the ICT era– Strategies and measures to extend the use of telemedicine and distance care" Ministry of Health and Social Affairs.*

The working group stated:

"Not even a normal size county council can introduce telemedicine/telecare on a large scale and with good finances. It is namely the fact that many applications require collaboration with care services in the municipalities and with university hospitals where highly specialised medical services are concerned. In order to achieve major effects, regional and national collaboration is required."[94]

10.2   Summary of the analyses made by PLS RAMBØLL

ITPS' consultant in this field, PLS RAMBØLL, has identified, in the course of the study, a number of major obstacles and driving forces that have characterised development and use of ICT in the health and medical care services. The most important barrier to the extensive use of ICT in healthcare is the lack of a common ICT infrastructure and information structure for healthcare. An infrastructure of this type is a basic prerequisite for ICT coordination between the different organisations responsible for the services. The reasons for these problems lie primarily in shortcomings in general collaboration between the different organisations. This has been caused by a pronounced focus on technology and the operational perspective has had to take second place. Nor has the interaction between ICT suppliers functioned optimally, largely due to cultural clashes. Investments in ICT for the health and medical care services often have a high initial cost and this has had a negative effect on the willingness to make investments, both in county councils and municipalities, not least during difficult economic times.

Among the driving forces, the establishment of a network for the medical services, SJUNET, can be noted. In SJUNET, the framework of an infrastructure for the health and medical care services has been established which has created appropriate conditions for improving services in collaboration. In SJUNET, the organisations responsible for the health and medical services see a way out of the sub-optimisation created by developments hitherto. The general development of ICT in society is also reflected in the health and medical care services. Today ICT is increasingly regarded as a tool in the healthcare process that has become more widely accepted by healthcare personnel. During recent years it has also become increasingly common that healthcare personnel are involved in the acquisition of different forms of ICT support. Today there is more participation by healthcare personnel in investment decisions. The prevailing economic and demographic situation has contributed to putting ICT on a higher level. ICT is regarded by many as an absolute necessity to meet future demands for healthcare services. Today, ICT issues are pursued actively by a healthcare cooperation organisation, Carelink, which includes all county councils, some 20 municipalities and some other stakeholders. In Carelink attention has also been given to some of the most central obstacles that must be overcome in order to achieve broader ICT use.

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[94] *Ibid p.15.*

In the primary care services, electronic patient journals are used, in principle, by all parties involved but, despite this broad ICT support, the advantages of ICT cannot be realised, according to ITPS/PLS RAMBØLL. The different systems cannot communicate with each other since they are based on different concepts and security methods. During its work on this evaluation, the attention of PLS RAMBØLL was often drawn to the fact that, in certain cases, the emergence of different systems has counteracted collaboration between the different parties involved, which is so important for the development of the healthcare services.

When information cannot be transferred between different infrastructures, the information cannot follow the patient. When a patient comes to a new care provider, it is often problematical to transfer information from previous care providers. The information on a patient is held in different systems and no overall picture is available. Today therefore the systems cannot support an unbroken care chain between different care providers and over the borderlines of the different organisations responsible for healthcare services.

The study also takes up the ICT issue from a future perspective. The evaluators discuss different areas in which interventions can be made in future work on increasing ICT collaboration between the different organisations responsible for care services and other stakeholders, as well as the division of responsibilities, financing and control. In the opinion of PLS RAMBØLL, there are a number of key issues that must be solved at central level, for example the production of a national vision for ICT in the healthcare services and a common infrastructure and information structure based on common and recognised communications standards. Furthermore, PLS RAMBØLL is of the opinion that there are a number of tasks that the regional and local organisations responsible for healthcare services should be responsible for, with central back-up and support. Tasks of this type include measuring effects, making follow-ups, and using tools for work process analyses and implementation processes. Finally PLS RAMBØLL recommends that a study should be made of the possibility of providing financing through different development agreements between central government and the county councils and municipalities.

10.3   The present situation

PLS RAMBØLL arrives at the same conclusion as a large number of earlier studies, namely that there are considerable shortcomings in coordination between the infrastructure and systems architecture of the county councils and municipalities. According to Carelink[95], there can be between 400 and 800 different and overlapping forms of ICT support in one county council alone. The possibility of transferring information between the county councils and municipalities is made difficult, major security problems are created, and the activities tie up important resources that could be used for other urgent purposes. The chairperson of the Swedish Association of Health Professionals, currently also the chairperson of the

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[95] *Carelink, Strategies for effective and interactive ICT support in the healthcare services. Report 1/200. p. 8*

Government's Delegation for the Development of Public e-Services, Eva Fernvall, maintains, for example, in a letter to the National Board of Health and Welfare that the problems with ICT communication are growing and that "shortcomings in the systems that are in use are so great that the healthcare services and security of patients is being threatened".[96]

The county councils of Blekinge, Sörmland and Västerbotten, Karolinska hospital, and part of the county council of Stockholm have created a strategic form of collaboration for ICT support in the health and medical care services. In the final report on this strategic collaboration, the situation is summarised as follows. "Current ICT systems show great limitations in their interaction with each other. They are seldom so flexible that they can be adapted to different needs within a reasonable period of time and at a reasonable cost."[97] The solution is to take gradual steps in clearly defined areas in order to achieve long-term solutions.

The report of the Royal Academy of Engineering Sciences on healthcare describes experience gained from implementing successful local projects on a large scale. The potential gains in reduced lead times should be considerable but in order to succeed with the recommended strategy, active financial control of development is required. Establishing a new architecture always entails an initial cost, which should be paid back in the long term. However, the problem is often that when an individual new function is discussed, an addition to the existing system appears to be least expensive in the short term. This means that it is easy not to incur the initial cost required to create freedom of action and thus better finances in the long term. Many pieces of the puzzle are in position but naturally new routines are required, certain investments should be made etc. But the study made by the Royal Academy of Engineering Sciences states that it is impossible to take advantage of the potential of ICT on a large scale with the existing system.[98]

The healthcare services in Sweden are decentralised to over 300 organisations which, for the most part, have their own, very special solutions. Those who gain most from the present situation are, in the opinion of the Royal Academy of Engineering Sciences, the producers. There are no incentives to work together in an infrastructure with a common interface for applications. The market is fragmented and there is little potential for creating large production volumes.

In the book "The Sick Healthcare Services"[99], the authors express the opinion that Sweden has invested a great deal in ICT support in the health and medical care services. Despite this, they make the assessment that Sweden has fallen behind in comparison with many other countries. The reason for this is the large number of organisations responsible for health and medical care services. Also, in every county council there are a number of systems that are isolated islands, which

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[96] *Computer Sweden 2002-12-17.*

[97] *Final report on the project (in Swedish) 2001-06-18.*

[98] *"IT could be put to much greater use in the healthcare – A report about the Royal Academy of Engineering Sciences' project "IT in Healthcare"*

[99] *Fölster, S., O. Hallström, A. Morin och M. Renstig (2003). The Sick Healthcare Services –A study of the use of healthcare resources. Ekerlids förlag. Falun.*

cannot communicate with each other. There are some exceptions, for example in Norrbotten, a county in the north of Sweden, the primary care units are linked up to other healthcare units and support functions. The authors are also of the opinion that Denmark has made much more progress and that most general practitioners use ICT for communications in respect of referrals, responses from laboratories, making appointments, X-ray pictures etc. Strong ICT support is a cornerstone of the American Kaiser system that was created to facilitate administration and tracing journals.

On behalf of the Foundation for Strategic Research, two independent consultants in ICT and management issues have taken up the issue of ICT in the healthcare services on the basis of "the present fairly widespread conviction that it is now time to release care capacity by radically reducing the time required for administration in the health and medical care services."[100]

Among the conclusions of this report, the following can be noted:

- Greater coordination of ICT support in the healthcare services has considerable potential to release capacity from administrative duties.

- Coordination must made dependent on the needs of the patients and the care processes and not on the needs of individual care providers, clinics or the like.

- Many people would like to have more government coordination and want to see initiatives in this matter from the Government Offices and the Ministry of Health and Social Affairs.

- In many places there are effective local solutions that, with a planned and coordinated development effort, could play important roles for the healthcare services throughout Sweden. Several of the projects run by Carelink are good examples that show that this is possible.

- The coordination process is made difficult by the fact that in many places there is express opposition to external solutions.

- The major ICT suppliers are sceptical about investing in the healthcare services due to the complicated and fragmented procurements and the large number of unsuccessful investments made earlier.

- In a corresponding way, many leading decision-makers and ICT experts in the healthcare services are sceptical about the ICT suppliers who are often considered to have promised far too much without being able to meet their promises.

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[100] Dahlin, Jan och Göran Larsson. "An increase in the use of ICT can release healthcare capacity. Final report . August 2003. Memorandum not yet published.

10.4   At what stage are the healthcare services in the ICT evolution?

Figure 7 The coordination ladder
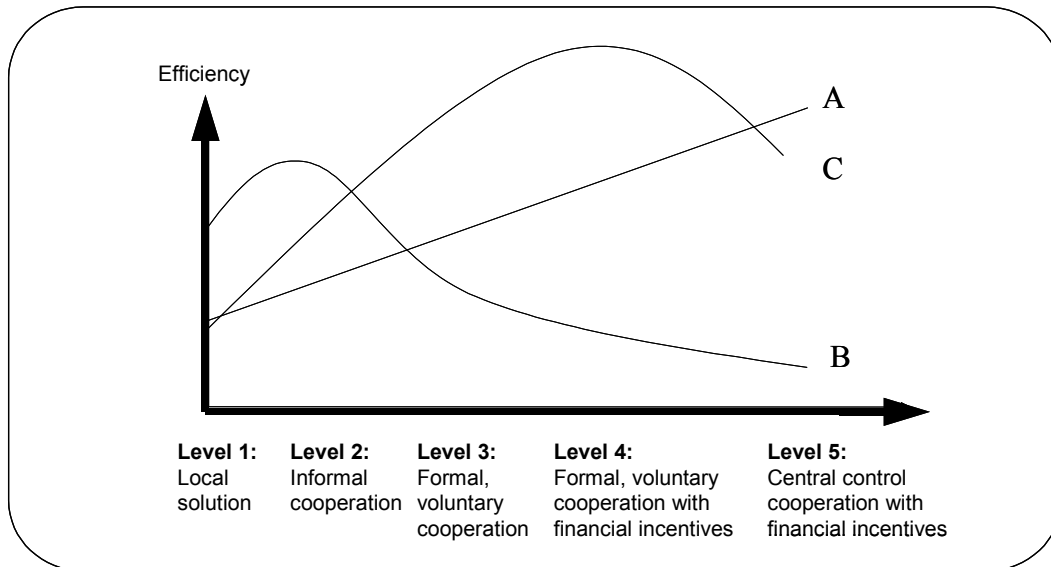
In order to understand the problem from a management and control perspective, Figure 7 can be of assistance[101]. The figure shows the relationship between ICT investments with varying degrees of central control and coordination and the financial efficiency of the selected level of coordination. The easiest level to implement is merely to give consideration to the needs of one's own activities or departments (Level 1). The disadvantage of this type of investment is that it gives limited returns in the form of increases in productivity and cost reductions, and can also be entirely counter-productive for the organisation in general. Often the care services come no further than Level 1 since no success is achieved in establishing common infrastructures for communication between different systems at different levels. The other extreme is central control (Level 5) which can provide considerable gains through coordination since the systems of all units can communicate with each other, at the same time as a few people can be responsible for operations for all the units connected.

It is easy to intuitively imagine that the relationship between degrees of coordination and efficiency is as shown by A in the diagram, i.e. that efficiency gradually increases with an increasing degree of central control.

However, there are in principle two factors that modify this relationship in all cases. The first factor is the issue of the relevance of a general solution. All systems do not need to communicate with each other, the problem is local and there are, at most, reasons for informal cooperation (Case B above). The second factor that has the result that total central control is not always optimal is the need of innovation

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[101] *This diagram is a development of the efficiency/level diagram that is used in Metagroup's analyses and which, in principle, covers case A in the diagram above, i.e. where utility increases constantly with the degree of central control.*

and change. Development takes place to a large extent through experimentation, i.e. by someone deviating from current solutions, finding a new solution that works better than the previous solution, and thereafter others follow. At the same time as there is a need for coordination, it is also desirable that everyone has the possibility to think differently in order to lay the foundation of new developments. This would mean that neither the entirely local solution nor the entirely central solution is the optimal solution, but that a mixture of the solutions is most appropriate (Case C in the figure).

The Swedish healthcare services are often at Level 1, at the lower left-hand corner of the figure. Through regional programmes there is a tendency to move towards Level 2 and the formation of Carelink is an initiative for moving towards Level 3.

In the judgement of ITPS, there is considerable and, in principle, completely unanimous documentation that shows that in general the healthcare services are at levels of integration that are far too low. PLS RAMBØLL's analysis can now also be added to the earlier documentation. It is quite simply not possible to defend the number of mail systems and patients' journals at each hospital. The fact that the situation these reports describe is correct is also confirmed by a large number of newspaper articles and interviews. In this report ITPS has chosen to refer to just a few. In addition to the independent work done by PLS RAMBØLL on its report, ITPS itself has conducted a large number of interviews which, without exception, confirm the picture that is depicted here.

The Internet technology and the IP-based standard for computer communications constitute important cornerstones for the further work of producing common applications that are based on *open standards* that permit networking organisational solutions. However, the underlying problem remains: why the healthcare services do not have a greater amount of coordination.

The question is whether voluntary coordination provides a sufficiently high rate of modernisation that also corresponds to the financial resources and the needs of care in society? The county councils were created to coordinate the social services that were too expensive for the municipalities to provide. Does this solution work in the ICT field in a perfectly satisfactory way?

ITPS considers that a change must be made. The costs of the present system are too high and the healthcare services must already be made to use ICT more efficiently if the future problems with an aging population are to be solved. The question concerns the method that should be adopted.

10.5   Four alternatives

What method should then be used in order to establish the desired cooperation? Can cooperation be forced on the parties concerned? Since the county councils are responsible, central government has no legal rights in this respect. Even if it were possible, there is a great deal of experience, for example from England, which shows that these solutions rarely function, if ever. The reason for this is probably that much of the information necessary to solve the problems lies in the hands of parties at the local level in the form of "silent knowledge", and the bearers of this knowledge must want to cooperate if the solutions are to work.

There is also a historical explanation of the problems. The ICT solutions were initially constructed to meet local needs. When requirements increase in respect of communication to other levels, the simplest and least expensive solutions are selected. At the county councils today, processes are taking place for collaboration in respect of common platforms. Blekinge and several other county councils have developed the concept of "the unbroken chain of care" and the county council in Västerbotten is also pursuing active work on standardisation.

Carelink was established in order, among other things, to solve these problems and has made major efforts, but Carelink's resources are a drop in the sea and new "downpipes" and patchwork solutions are constantly re-emerging.

ITPS is of the opinion that well coordinated and integrated solutions must be developed in the healthcare services. In principle there would appear to be four fundamentally different solutions that can be discussed:

1.   The National Board of Health and Welfare is given the responsibility for providing a common information system for the healthcare services. It should be possible to finance the system by reducing the Government's general grant to the county councils by an amount corresponding to the central government programmes, possibly in combination with user fees. This would be subject to negotiations between the Government and the Federation of County Councils.

2.   All county councils would conclude a binding agreement to establish an infrastructural service for the healthcare services based on the "unbroken chain of care", which would purchase and manage common systems and produce the standards that may be needed.

3.   To do nothing, but await the results of the government committee that is examining issues of responsibility in respect of the county councils.

4.   To seek a solution based on joint efforts by county councils and central government.

The first proposal would suffer from the fact that the participation of the county councils in the system would be reduced and that the solution would fall outside the ongoing discussion in the county councils. The solution would be based on the healthcare services following line A in the coordination stepladder.

The second proposal would mean, in principle, that external pressure would be put on the county councils to collaborate and to give Carelink a stronger position in the system. The disadvantage of the system could be that incentives for cooperation - over and above what is the case today - would be weak.

The third proposal, to await the proposals of the government committee, would entail a long period of passivity and the opportunity to get to grips with the problems in the work on the unbroken chain of care would be missed.

The fourth proposal would involve a contract between the county councils, Carelink and central government (National Board of Health and Welfare). The county councils would undertake to contribute a certain amount and to equip Carelink with a more powerful mandate than it has at present. In return government would contribute an amount that would be proportional to the contributions of the county councils.

A solution should be based on positive aspects and these are the local initiatives that are in place and can be identified. These include Carelink and, for example, existing tendencies towards greater cooperation between the chief finance officers at the county councils. If government lacks the legal possibilities to make cooperation compulsory, and since, even if it were possible, it would probably not lead to desirable results, there is only one way left – to supply the county councils with incentives to cooperate, i.e. to go up to Level 4 in the diagram above.

We must live with a large number of local solutions. Some of them do not need to be coordinated with other systems and others will die out naturally. *However, to meet the new developments that are in progress, it is necessary to ensure that a common approach and collaboration are established, that this collaboration is used as a lever to get other systems to cooperate and, last but not least, to establish a base for creating common platforms in the future.*

Then the question refers to the grounds that conditional support of this type from central government should rest on.

10.6   Financing the introduction of telemedicine/telecare

"Healthcare in the IT era" provides a line of reasoning for financing the expansion of the use of telemedicine/telecare.[102] The basic principle for this financing is that the organisations responsible for the healthcare services have the full responsibility for making priorities, for developments and for funding where their activities are concerned. If government proposes measures that involve an increase in the undertakings for these organisations, the effects should be regulated through adjustments to government grants. Government has also given targeted grants to stimulate the development of the healthcare services in the desired direction. The working group is of the opinion that, since it has been given the assignment of "proposing strategies to extend the use of telemedicine on an overall national basis", the question of government contributions can arise partly in the form of commissions to government agencies, and partly in the form of targeted grants.

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[102] *"Healthcare in the ICT era" chapter 18.*

The working group makes the assessment that telemedicine/telecare will be introduced rapidly in the world around us since the operational advantages are obvious and the thresholds for the introduction of the systems are being successively lowered. The problem for Sweden is now that partly uncontrolled developments of this type will take too long, with the effect that it will not be possible to realise gains from coordination and collaboration. The working group gives four reasons why central government should have the responsibility to act as a driving force for development:

- The use of telemedicine/telecare requires a technical infrastructure that is common throughout the country in order to fully realise the benefits and hold down the costs.

- The healthcare services are considerably decentralised, the subject of reappraisal, and have a lack of funds.

- Telemedicine/telecare have elements of applications for faster and more efficient dissemination of knowledge.

- Many applications in telemedicine/telecare require a larger market than the Swedish market and in order for the markets to be sufficiently interesting, there must be collaboration in Sweden.

10.7   Current initiatives at the county councils

At present Carelink and the county councils are working in cooperation on an extensive development of a national infrastructure for the healthcare services. The overall vision is to make it *possible for authorised care providers, regardless of their location and organisational affiliation, to locate and produce all the information that exists and is needed for the care of patients, whenever necessary, and with the patients' consent.*

Requirements for this *infrastructure* are that it should be developed in a *long-term perspective* and it should be *stable.* It should be robust, extendable and replaceable. The idea is that the national component in the infrastructure should supplement the local components, and that it should gradually increase in importance. At the same time it is important to start the development of a national ICT infrastructure at an early stage in order to reduce adaptations and avoid overlapping with local ICT infrastructures.

10.8   ITPS' proposals

A proposal for the focus of a joint project between the organisations responsible for the healthcare services and the government should be based on what is working well today and can be extended.

This means, in the first place, that Carelink should have a central role in the work. Carelink has, in the opinion of ITPS, done an excellent job and has a great degree of legitimacy among the organisations, but Carelink's resources are merely a drop in the ocean and the system is based on voluntary participation. The healthcare services must have the aim of climbing the coordination stepladder as soon as possible.

Secondly the work that has been started on developing information support for patients for all care providers, accessible wherever the patient may be in the chain of care, should continue. A project has been started that can be linked to this work, and it is extremely relevant to determine its focus in the light of the problems created by demographic trends. A contribution of this type can also be the link for coordination with other systems. The development of this structure also puts the issue of cooperation between county councils, municipalities and the central government agencies involved on the agenda.

In the ICT bill the Government stated that an extended effort should be made to develop and regenerate the healthcare services with the aid of ICT support and that consolidated collaboration between different levels of care and care providers should be sought in order to make an efficient exchange of information possible. It should therefore be possible for government to make special efforts to help the organisations responsible for the healthcare services to implement this policy, given that the latter also finance their parts of the project and fulfil certain require- ments. The funds can be administered by a steering group consisting of Carelink and the National Board of Health and Welfare.

Support for planning should be given to the county councils that, in cooperation with other organisations and with the approval of the cooperation group, have a plan for ways in which their own infrastructure can be linked to the national infra- structure. The information architecture in the new infrastructure should focus on operations and constitute a form of support for the organisations working with patients throughout the chain of care. Most of the extension of the national infra- structure and the adaptation of local solutions that exist today should be paid for the organisations responsible for the healthcare services.

The proposal should be based on the fact that there is a great need to create common standards for cooperation processes, concepts and information models to make collaboration possible between and within the healthcare organisations. These must be described on the basis of an operational perspective and their point of departure should be the needs of patients and not an organisational or technical perspective. There is a need to make it possible to plan care, to perform care, and follow up the care provided on the basis of a philosophy that is independent of the organisation. Today there is a lack of a common approach and a common platform from which, for example, municipalities and private care providers can participate in the common healthcare processes. Care providers should be able to communi- cate with care providers, care providers with patients, and patients shall be able to have access to the documentation on their care, the "journal".

This requires a process of enhancement in the development of operations in which focus should also be placed on gaining acceptance and support for new working methods that ICT makes possible in operations.

The solutions should be independent of the organisations. Thus, if an organisation changes, it should be possible to adapt the model without making changes to the basic structure. Adaptability creates opportunities for collaboration.

One recurrent theme in all operational development supported by ICT is the difficulties of integrating the technical skills with the knowledge, experience and needs of the users. One condition for possible government participation should therefore be that user participation is built into the process.

Furthermore, activities should support the development of purchasing skills for building ICT support from a patient perspective that is independent of the organisation. These skills should be strengthened and coordinated in order that the persons concerned can create a strong position vis-à-vis the suppliers, so that the suppliers are also drawn into common learning processes. The healthcare services must improve their purchasing skills in order to do this. Greater coordination of ICT in the care services has considerable potential to release care resources from administrative duties and faulty working methods.

The roles of the National Board of Health and Welfare and the Medical Products Agency for the comprehensive development of ICT in the healthcare services are also of great interest. In this respect it is possible for the Government to give the agencies, directly through agency ordinances or annual directives, concrete assignments that actively support this work.

The following example is taken from the annual directives and letter of appropriations to the National Board of Health and Welfare for 2003:

The National Board of Health and Welfare shall submit a report on its existing and planned programmes to develop the information resources for which the agency is responsible and to provide points of view of the agency's future role and duties in a increasingly digitised healthcare system. A report on this assignment shall be submitted no later than April3, 2003.

The date for the submission of the report was changed in a later decision to June 6, 2003.

This assignment can be seen as a first step in a process in which the agencies submit reports on their own ongoing and planned activities. (The National Board of Health and Welfare presented a ten-point programme together with activities.[103]) With this as a base, carefully planned assignments can be given which harmonise with the activities of the organisations responsible for the health care services.

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[103] *Government assignment – the future role and responsibilities of the National Board of Health and Welfare in a digitised healthcare system, 2003*

10.9   Recommendations

- ITPS considers that measures must be taken as soon as possible to enable the healthcare services to ascend the so-called coordination ladder.

- ITPS proposes that the newly formed Delegation for Public e-Services is given the assignment of drawing up, as soon as possible, a proposal on ways in which collaboration between the organisations responsible for the healthcare services and central government should take place on the basis of the initiatives that have been taken hitherto to establish one information system for all care providers based on the unbroken chain of care.

- In its work the Delegation should take into consideration the points of view on user participation, development of purchasing skills and process orientation that ITPS has emphasised above. The system should also be designed in such a way that it paves the way for future collaboration between county councils, municipalities and the central government administration.

- The Delegation and the National Board of Health and Welfare should ascertain, in discussions with the organisations responsible for the healthcare services, their interest in 1) co-financing a joint programme, and 2) extending Carelink's mandate with a binding agreement to develop an infrastructure and an information structure of the type outlined. If interest of this type exists it should be supported and encouraged by government co-financing. If no resources are available, financing via general support to local government should be considered.

- Proposals for the use and administration of this support should have clear goals and should be formulated in terms that make evaluation possible.

- If the work outlined above fails to achieve a solution, the National Board of Health and Welfare should be given the responsibility for providing a common information system for the healthcare services.

11 Central government as a forerunner in ICT use

According to the ICT bill, central government should set "a good example as an active user of information technology in its activities and in its cooperation with companies and citizens".[104] It is therefore considered essential to establish as soon as possible security devices that include systems for handling electronic signatures for the government administration. Furthermore, the development of the 24/7 government agency should be stimulated.

There are two reasons for central government to establish advanced ICT use: firstly the measures taken to do it should naturally lead to a more efficient government administration and better services for citizens. Secondly, government's own use can also be seen as an important instrument for realising the ambitions of the ICT policy to increase confidence, develop skills and promote access. In these respects the Government can set a good example by developing skills or creating standards that can then be used extensively in society.

11.1 ICT use by the public sector in an international comparison

In this section ITPS presents a summary of the report submitted by ITPS' consultant in this field, Booz Allen Hamilton, (section 11.1.1), and makes some other international comparisons (11.1.2).

11.1.1 Booz Allen Hamilton

Booz Allen Hamilton was commissioned by ITPS to study ICT use in the Swedish public sector on the basis of an international comparative perspective. The study includes an index that Booz Allen Hamilton has constructed for public sector ICT use in the G7 countries, Australia and Sweden.[105] This index has been developed in fields such as basic conditions, preparedness, use and utility (see Booz Allen Hamilton's report).

The countries' relative position in the different areas forms a so-called *fingerprint* for all countries (See figure 11.1). In an international comparison, Sweden shows a strong position in "Use" and "Utility", but appears to have considerable scope for improvement in "Basic conditions" and "Preparedness". On the whole Sweden's position is very strong.

When a closer study is made of the Swedish picture, three measured values stand out in particular:

Firstly, Sweden appears to have – from the international perspective – a low degree of *political control* where the ICT economy is concerned.

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[104] *ICT bill1999/2000:86.*
[105] *This index was devised in connection with the study made by Booz Allen 2002 for the British government and which is described in the report "The World´s most effective policies for the e-Economy". The index for each area is a weighted combination of a number of factors in which the best country is give 1 point and the worst 0 points.*

Secondly, the levels of *preparedness* for the ICT economy in the public sector appear to be low.

Thirdly, Sweden shows the highest measured values where *use* of ICT is concerned and the degree of *utility* measured in the public sector. This would undeniably appear to be full of contradictions.

Figure 8 Sweden's relative position in the ICT economy according to Booz Allen Hamilton
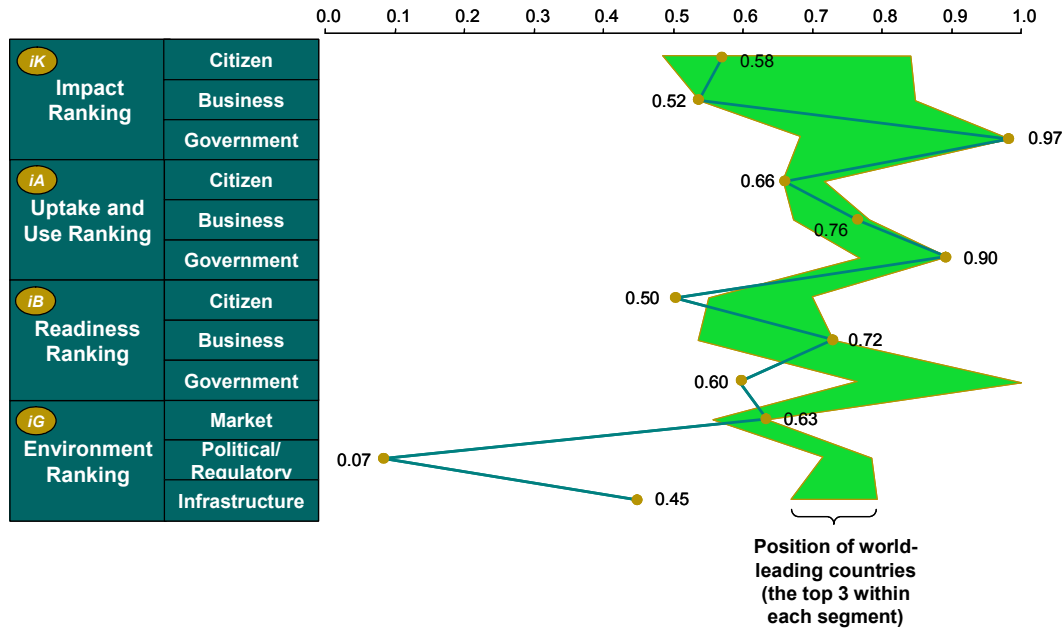
In order to understand this, we must study the conditions for the English study. England and the other countries in the study share something that Sweden does not have, namely a model for management and control of the public sector in which the political and executive powers are linked together. Sweden, on the other hand, is the only country that is organised on the basis of an administrative model where we make a clear distinction between the exercise of political and executive powers. The result is – in a study of this type – that an initiative taken at the public administration level in Sweden is not regarded as impressive as it would have been if it had been taken at Government level. One example to illustrate this could be an initiative to offer citizens the possibility to submit their income tax returns over the Internet. In Sweden an initiative of this type can be made by the National Tax Board and in Italy by the Italian Government. The result can be equally successful in both cases, but the Italian initiative fits in better in the comparison model and would, in this case "lift Italy in respect of the sub-index "Policies/Rules". We have to accept this and adapt our conclusions accordingly.

Another reason why Sweden, in an international comparison of this type, ends up at a low point on the scale in an assessment of the area "Policies/Rules" is that the Swedish municipalities are responsible for areas that, in many other countries, are the responsibility of central government.

The second observation – that Sweden has a relatively low degree of preparedness for the ICT economy – is associated with the fact that many of the initiatives taken for the production of Internet-based applications have been relatively simple and basically have not required a great deal of understanding of the ways in which ICT and operational development can and should interact. The first services to which the public administration exposed itself to on the Internet were relatively trivial – they were often a case of information services and the publication of forms. Another factor that has affected the assessment is the lack of collaboration between agencies, as well as the lack of technical standards for collaboration of this type.

Even if many services have been trivial, they have nonetheless been perceived as meaningful. We also have many good examples of advanced applications in the public sector which we describe below in this report. Simple or advanced services – "value" has clearly been created, which the third observation shows. Sweden is given the individually highest value of all countries in the English study where assessments of the value of ICT in the public sector are concerned.

The fact that this is the case is not so strange. The public sector definitely did not start its ICT programmes yesterday. One characteristic of the Swedish public sector is that it has methodically built up an administration over a very long period of time, in which concepts such as EDP, and now ICT, have constituted key factors. Probably the establishment of the Swedish social security number system was one of the most fundamental success factors for the structured administration and, in recent years, the ongoing digitalisation of the system.

It has often been a strength that the Swedish public administration has been kept separate from the political sphere. In this way the government agencies, regardless of the political agenda, have been able to build up their operations with a long-term perspective.

Much of this is also naturally practicable and desirable today and tomorrow. At the same time there is a strong ambition in Sweden to reform the public sector, not least as a result of the potential created by ICT, the Internet and other "electronic" aids.

The administration organisation in the public sector largely came into being before the potential of the ICT economy became known. The great challenge for Sweden and other countries must reasonably be to make the best possible use of the new potential without needing to take into consideration the obstacles that existing rules can constitute. One example of this is legislation that was not written for the opportunities provided by an information society. However, for the same reason existing borderlines between agencies can also be experienced as an obstacle. Many critics are convinced today that structural changes will be needed to create greater efficiency in services and government agencies. The customer perspective is also gradually being introduced into the public sector and this often turns ingrained concepts upside down.

Booz Allen Hamilton summarises what it considers to be the core issues for the future as follows:

- Who is the driving force?

- Will the Swedish model function in the future?

- Can the public sector continue to show "first class results" where use and utility in the ICT economy is concerned while political controls appear to be very low?

11.1.2 Other international comparisons

Booz Allen Hamilton has given ICT use in the Swedish public sector a very high value, 0.90. This is based among other things on the strong focus on increased ICT use, the high proportion of public sector employees connected to the Internet, and government agencies with their own website etc. Where the "utility" of ICT use in the public sector is concerned, Sweden has a very high value, 0.97. This is explained by the strong focus on changes to working methods, access and openness. Since 0.97 is a combination of several factors, this means that Sweden was best in almost all respects in the study made by Booz Allen Hamilton and that Sweden is also ranked above the USA.

However, in the report on ICT development and ICT policy compiled by ITPS' office in Los Angeles, for which Martin Ahlgren was responsible, a different picture is presented:

"In the overall position of the ICT policy, we would state that the ICT policy in the USA is more service-oriented, more needs-motivated and more user-oriented than in Sweden. We can also express this in that the ICT policy in the USA in general lies higher up on the value chain. In the USA the federal administration has consistently worked with strategies that apply to all agencies in areas such as e-government and cyber security. The concept of ICT policy as a separate area is only found very sporadically in the discussion on ICT use in the USA. In the ICT policy area it is e-government that is at the top of the agenda at both federal and state level. E-government is a priority area, which is one of five points on the President's Management Agenda. In the area of control, coordination and efficiency for e-government, the USA is approximately two years or so ahead of Sweden. In the USA priority is given to both the economic effects and utility for the citizens which can be obtained through investments in e-government."[106]

Other studies also provide a positive picture where the development of services in the Swedish government agencies is concerned. In a report to the Government, the Agency for Administrative Development quotes e-Europe's procurement of a measurement and analysis of e-Services in 18 countries that was made by Cap Gemini Ernst & Young. This study shows that, from the autumn of 2001 to the autumn of 2002, the pace of service development in Swedish government agencies was twice that of the average in the countries studied. The Agency for Administrative Development makes the assessment that "where the content of the public

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[106] *See the report on ITPS' website.*

administration is concerned, Sweden is not in first place in all areas but in some, for example employment offices and customs clearance, we are world leaders and on the whole we are in the forefront. However, developments are proceeding very rapidly and in order to retain this position the Swedish public administration must continue to develop at a rapid pace."

The Agency for Administrative Development has commissioned two studies on the use and perception of the agencies' websites (for a summary see the above-mentioned report). According to the Agency, an increasing number of private persons and companies choose to use the Internet in their contacts with the public administration. One survey reported an increase in the number of visitors of over ten per cent.

During a three-month period in 2002, 3.3 million different individuals visited the public administration's websites. This corresponds to two-third of all the active Internet users. In one survey, 36 per cent of the visitors stated that they had done some business on the website. This is a high figure and is partly explained by the fact that the period during which measurements were made coincided with the submission of income tax returns. Approximately half a million people chose to submit their returns electronically. According to the studies as many as 90 per cent of the e-Services functioned "fairly well" or "well". The users agreed with the statement that the service saved time but not with the statement that the Internet was a poor alternative to a personal visit or telephone call. There was some uncertainty in the Agency for Administrative Development's report concerning responses to the question of whether the services offered were too limited.

11.2   Visions, goals and strategy

In the study made by Booz Allen Hamilton for the British Government, Sweden was given a low value, 0.60, in the area of "Preparedness". Sweden was assessed to have a low level of visions in its strategies and plans for ICT in operations. Where the ways in which countries describe the goals of operations is concerned, Booz Allen Hamilton found that Sweden is an exception in that totally lacked precise objectives.[107]

The lack of visions, goals that can be followed up and evaluated, and well-considered strategies to achieve the goals is, in the opinion of ITPS, a common feature of the entire Swedish ICT policy, and here the e-Governance policy is no exception.

It is only very recently that government work on electronic services has been linked to demographic trends. Central government, municipalities and county councils will face ever-increasing pressures. Major adjustments must be made to public sector activities in order to solve these problems. In this respect, in the Agency for Administrative Development, there is growing support for an electronically

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[107] *Booz Allen Hamilton's report for ITPS "ICT use by the public sector in an international perspective" p. 23 (in Swedish).*

coordinated public administration that could constitute the foundation of further work on the vision.[108] Here the Agency writes:

> *"In order to achieve the ambition of increasing utility for both citizens and companies, at the same time as government agencies reap the rewards of internal improvements in efficiency, it is necessary to find partly new ways of organising different activities. This is a case of both internal organisation development and organised development based on collaboration between several organisations."*

What happens when the agencies start to develop a common information structure? If a citizen merely wants to get into contact with one agency in order to transact business, what will this lead to in the long term in respect of divisions of responsibilities between agencies, the number and size of agencies, or the "contract" between citizens and agencies? Where are the political visions? In the municipalities, coordinated platforms have the effect that citizens in one municipality can use services produced in other municipalities. This avoids duplication of effort and makes it possible to use the strong features of the municipalities concerned.

In its work on visions and strategies, the Government should also define its intentions for the development of public electronic services. Is there an aim to have one and the same concept for the entire public sector or is there an intention to make collaboration between different sectors possible?

What is the Government's view on the "depth" of the work on the 24/7 agency? Does the 24/7 agency primarily have the aim of improving access, which was the aspect that was emphasised in the assignment given to the Agency for Administrative Development in 2001? Does the concept represent a symbol for all ICT-related work in the government administration, or is the concept the lever the Government is planning to use to cope with welfare issues and services for the citizens in the situation that will arise when the public sector, for demographic reasons, is faced with considerable problems in respect of its labour force and resources?

Is the vision for society that "fewer people must do more, and do it better, for more people" and that central government and the public sector shall be the forerunners and *benchmarks* for the entire economy in this respect?

11.3 Development of services and development of operations with ICT support

Every organisation, regardless of whether it is a private company or a government agency, has to balance different interests. These can include taking care of customer relations and offering the customers the services and products they want, taking responsibility for acting in a financially rational way, and naturally also looking after relations with employees.

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[108] *"Interactive 24/7 government agencies – Coordinated electronic administration," Agency for Administrative Development, 2003:18 (in Swedish)*

At different points in time management chooses to emphasise one or another of these interests. It has sometimes been the case that companies have developed services but have lacked knowledge/experience or methods to run the organisation in a rational way. But there are also examples of organisations which, in their ambition to rationalise, have pursued this so single-mindedly that customer relations have been neglected and customers have been lost. In this respect banks have both succeeded in creating new services and profits for their owners. The income tax return service provided by the National Tax Board also has the quality of having created considerable value for a large number of people who use the service and at the same time it has also created internal gains from rationalisation.

New services can give people a better life, save time, and replace the demand for other services that are produced less efficiently. Cooperation between those who produce and supply electronic services can rationalise operations in the linkages between them and rationalisation gains can be realised at *back office* level. The current trend is to release resources for new activities. What do we know today in respect of whether or not it is realistic to link expectations of this type to the work on e-Governance?

As the result of a study on e-Government in 23 countries, a consultant's report draws the following conclusion:

> *"Expectations that e-Government would fully reduce the cost of service delivery have not been realized due to the immature nature of most online government, and critically, the lack of back office integration. Publishing services online has little impact on cost— in most cases this is just a duplicate channel. Real cost savings are only realized when there is a true integration between the web front-end and the back office system. Achieving this end-to-end integration requires changes to administrative structures, development of new skills, and redesign of processes. Implementing the changes necessary to truly capture the benefits of e-Government is far more complex than simply creating an Internet presence."*[109]

There is a great deal of international experience. The experience gained in Finland can be summarised in the following way:

- *"The starting point for developing services must be process re-engineering rather than simply transferring current processes to the Internet."*

- *"The development of cross-governmental services and their integration with back-office services is a difficult task."*[110]

What lines then has the discussion taken in Sweden? The ICT bill mentions both services and "use in government activities". The concept of "efficiency" is not mentioned and the text only takes up the 24/7 government agency.

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[109] *"e-Government Leadership – Realizing the Vision". The Government Executive Series. Accenture. 2002.*

[110] *"Benchmarking Electronic Service Delivery". Office of the e-Envoy 2001.*

In the assignment given by the Government to the Agency for Administrative Development of developing the 24/7 agency, the aim is described as being "to stimulate agencies to pursue active development work to improve their accessibility and services with the aid of information technology…" The Government describes nine measures that should contribute to increasing accessibility for citizens and companies. Strengthening openness, democracy and the influence of citizens are important goals of the activity.[111]

Efficiency is taken up in two lines: "Open systems for information and self-service can lead to considerable gains in efficiency. These can be used to reduce costs or to improve services in areas that require personnel-intensive inputs." The efficiency of the agencies is not a goal in itself but rather something that can occur as a side effect of the development of new services.

In the report submitted by the Agency for Administrative Development two years later[112], efficiency issues are taken up in greater detail than previously. The Agency now emphasises that, in order to achieve cost efficiency, it is not sufficient to give attention to ways in which services are supplied but also to ways in which they are produced, The Agency emphasises[113] that it is also necessary to focus on the underlying operational processes – not least in order to be able to make good use of the potential for efficiency that lies in development.

Above all, the Agency for Administrative Development emphasises the importance of breaking up traditional boundaries through operational processes that are common to several organisations. The Agency also stresses the importance of developing standardised profitability calculations in connection with ICT-based operational development.

At a meeting of the Government on June 18, 2003, it was decided to establish a Delegation for the Development of Public e-Services.[114]

The Government summarises its assignment in the following way:

Information technology (IT) is a powerful tool to improve public sector operations and to make them efficient, to improve access to important social services, to facilitate the insight and participation of the citizens in decision-making processes and to stimulate the competitiveness of trade and industry. Information technology can thus promote sustainable economic growth, high levels of welfare for all citizens throughout the entire country, and vigorous democracy.

In the foreword to the document produced by the Ministry of Finance, "The 24/7 government agency – for the benefit of citizens and companies", Gunnar Lund, the acting Minister of Finance, wrote that from the technical perspective the Swedish public administration had made good progress. "Now it is time to take the next major step – to regenerate our way of working."

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[111] *"Assignment to promote the development of the 24/7 government agency". 2001-06-07*
[112] *"Interactive 24/7 government agencies – Coordinated electronic administration," Agency for Administrative Development, 2003:18 (in Swedish)*
[113] *Ibid*
[114] *Ministry of Finance*

In an address given in the spring of 2003, Gunnar Lund stated[115]: "The challenge is to continue to provide a good level of service and to make it more efficient. This is not least important in view of demographic trends. In order to guarantee good social services to everyone throughout the entire country, we must rationalise and regenerate our way of working."

In other words it is clear that a shift has taken place in the Government's perspective - from merely emphasising services and access to using ICT in order to provide good services and to make them efficient.

In the opinion of ITPS, it is great importance that the question is posed in this way. We do not know yet how it is possible to achieve, with the aid of ICT, a situation in which "fewer people do more, and do it better, for more people", but one condition for making progress is that the goals are formulated with care and that the issues are the subject of a broad and open discussion.

11.4   Major ICT projects

Even if the Government's work on the 24/7 government agency looks good, in principle, in an international perspective, the area that is to be evaluated is "central government as a forerunner in ICT use", and not merely that part that concerns the 24/7 agency. What then is the general picture of government agencies' ICT use and their capacity to handle major ICT projects? Posing this question is naturally of interest in light of the major programme that is being implemented in one form or another in respect of the 24/7 agency. What legacy in the form of experience from earlier governmental ICT projects can the 24/7 agency make use of?

Unfortunately there are several examples of splendid governmental ICT projects that have broken down. The ICT projects in the Swedish Armed Forces, Orion and Sirius, are two examples of this type. However, there is a great deal of experience that can be drawn from "normal" government activities.

11.4.1   The views of the Swedish National Audit Office on government agencies' ICT projects

The Swedish National Audit Office has worked on several occasions with evaluations of various ICT projects in government agencies. One of the evaluations that can be interesting in this context is the study made by the National Audit Office of five agencies: the National Labour Market Agency, the National Land Survey, Statistics Sweden, the Swedish Meteorological and Hydrological Institute and the National Road Administration.[116] The examination of the five agencies by the National Audit Office was made when the agencies were faced with the task of living up to the visions for the 24/7 agency, and the evaluation appears to have been made with the aim of providing that project with relevant experience.

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[115] *"Continuity and change in the public administration policy" Address at the Public administration policy seminar, April 3, 2003.*
[116] *ICT in operational development Better control of the agencies' investments in ICT-based operational development". Performance audit, National Audit Office, 2002.*

The National Audit Office emphasises in its report that the agencies it examined are highly advanced ICT users but that, despite this, there are apparent shortcomings in their work on ICT projects. The National Audit Office emphasises that, since the latter part of the 1990s, it has made ICT-oriented examinations of the Swedish Armed Forces, the prison and probation services, the police, and the national rescue services and, in all cases, including the five specific agencies mentioned above, the Office had found "a need for explicit quality requirements and basic requirements formulated by the Government".

In its study, the National Audit Office found, among other things that the agencies are now totally dependent on ICT for discharging their responsibilities and that they have difficulties in establishing an effective dialogue between their professional functions and the ICT functions. The agencies' development strategies lack a focus on the strategic main issues for the enhancement of their operations.

The National Audit Office's report also states that the agencies' quality enhancement functions, their internal audit functions, and other similar functions provide knowledge and experience that should give impulses in the work of improving their ICT-supported development processes. The feedback of knowledge between different agencies is, at best, spontaneous and unorganised, and the acquisition of knowledge in respect of processes of this type is also poor, since these activities have not been given the position of priority operational areas.

In the opinion of the National Audit Office, the agencies have a need for deeper ICT-related knowledge in order to be able to develop and make use of ICT-based operational processes. In this respect, the National Audit Office proposes among other things that the agencies should try to have a relationship of long-term cooperation with the universities in order to use their skills in their development of operations, and thereby acquire knowledge of new skills and new technologies.

To sum up the National Audit Office is of the opinion that investments in operational development should be managed and controlled in a way that is adapted to the importance of the investments for operations, finances and the type of investment concerned. The level of risk in individual investments should be defined on the basis of the difficulties that, from experience, can arise in projects in respect to focus, size and contract situation etc. In the opinion of the National Audit Office, the material required for this risk assessment should be "collected – from the agency itself and through external monitoring activities – and compiled systematically."

11.4.2 What can be done to solve the problems?

In a situation where it can be expected that many agencies will make major ICT investments in connection with the 24/7 agency, it is important, in the opinion of ITPS, that previous experience is put to good use, is evaluated and forms the basis of decisions.

The National Audit Office recommends a method that it calls "INVIT" for the management and control of operations. The Agency for Administrative Development has followed a number of costly ICT development projects, has made regular assessments of ways in which the Government should strengthen its controls of the agencies concerned, and has approached the question in a somewhat different way than the National Audit Office.

In the opinion of ITPS, there is no need to restrict the controls of agencies' ICT projects to a certain method. However, both the National Audit Office and the Agency for Administrative Development emphasise the importance of the Government making specific demands on the documentation used by the agencies to propose funding from the Government. Government directions for this purpose should contain requirements of assessed utility, risks, implementation strategies, control stations etc.

The National Audit Office had the opinion that the documentation for a risk assessment of this type should be "collected – from the agency itself and through external monitoring activities – and compiled systematically." One idea is that the analysis and risk assessment made by the agency in question should be the subject of an compulsory "referee" procedure by external parties from trade and industry and other government agencies, and that this assessment should be attached to the documentation submitted to the Government.

In view of the anticipated increase in ICT-related activities and the need of strengthening coordination and control in ICT-related activities, it is important that demands of this type are drawn up fairly soon, for example in the form of annual directives.

There is also another aspect of ICT-related investments made by agencies that the Agency for Administrative Development often draws attention to.

As the Agency has frequently emphasised, balancing the developing of a new service and recovering its costs is different for a government agency in comparison with a private company. For every new service or product that is planned, a private company must, in principle show that the return on the investment is sufficiently high and is also received quickly enough. If we look at the banks, this has not led to valuable services for customers not being developed.

However, where government agencies are concerned, it can be the case that the development of a service benefits other agencies, companies or individual citizens, while the agency that developed the service cannot recover the costs of its development work through rationalisation.

In such cases the Agency for Administrative Development has proposed that the investment shall be assessed on the basis of three criteria: its consequences for the finances of the agency concerned, its effects on overall government finances, and the gain to the economy.

ITPS has no objection to these criteria but would nonetheless advocate caution in respect of confidence in the capacity and objectivity of the parties concerned where making assessments of something as complex as economic utility is concerned. An

important test of the utility other parties gain from the development of a certain service is whether the parties concerned show any desire to participate in the financing of the project in question.

In this respect, a possible frame of reference for working together with other parties can be the concept of *public-private partnership*, which was discussed in Chapter 5. On the whole, in the opinion of ITPS it is important that the work is done in close cooperation with trade and industry.

However, one important aspect is that the work is continuously followed up and evaluated. The driving force must not be to have a large number of web-based services "noted", but that the quality of the services is assessed above all from a user perspective, and also with the aid of basic financial criteria such as the number of users, ways in which the costs have been calculated, through rationalisation or through co-financing, etc. Not least *benchlearning* vis-à-vis good models can be an interesting method in this respect for evaluation and development.

11.5 Stakeholders and government coordination

In this section, firstly a description is provided of the situation that has prevailed hitherto in respect of the degree of coordination in the central government sector. This is followed by a description and discussion of the measures taken recently to remedy the shortcomings (11.5.2).

11.5.1 The position of the agencies in the coordination diagram

Is it possible to place government ICT activities in the diagram in Chapter 10 that showed the relationship between efficiency and the degree of coordination and centralisation? (See Figure 7 in Chapter 10.)

Let us first recapitulate on the situation as it has been.

The Government has stated for several years that the decentralised Swedish public administration model means that, in the final analysis, the responsibility for the 24/7 agency rests with the agencies. The adoption by the Government of a more active role does not mean that the responsibility has been taken away from the agencies.

The Government's own coordination and rationalisation agency in ICT issues, the Agency for Administrative Development, has also been critical of the lack of coordination. In its report to the Government on measures to create a coherent electronic administration, the Agency states[117]:

> "In order to provide a better service, simplify administrative routines and shorten the period of time needed to reach a decision, every agency must ensure that it obtains the information needed for its purposes that is already stored by other organisations. There are several examples of collaboration that both simplifies the contacts of citizens with the agencies and makes the agencies' administration more efficient. Even if there are good examples of cooperation in respect of services, it must be stated that this is not the result of systematic and structured development for the public administration in general. The potential for automatic exchange of information is still almost non-existent."

The Agency for Administrative Development is of the opinion that the desired collaboration in the administration of official business cannot be achieved in a rational way for each individual agency and for each individual purpose, but must be based on common technical solutions, standards, and agreements on what, how and under what conditions information shall be transferred between different sources. The Agency for Administrative Development therefore considers that it is necessary to abandon the existing loose and fragmented structure for cooperation and adopt more permanent and more specific forms of collaboration.

Coherent development work needs to be handled by an organisation that is competent, and is capable of making necessary decisions, producing necessary regulations and instructions, and purchasing and providing basic functions independent of the agency.

Apart from the Agency for Administrative Development, there are many examples of ways in which initiated stakeholders have demanded more coordination on the part of the Government. The issue was taken up for example in an official communication from the ICT Commission to the Government.[118]

At a conference on the 24/7 agency arranged by the Agency for Administrative Development, the director general at that time of the Swedish Competition Authority, Ann-Christin Nykvist, stated:

> "The Government makes things easy for itself when it says that the responsibility rests with each agency. Without coordination there is an immediate risk that the agencies will develop their own systems that are not sufficiently user-friendly. Then we will fail to make full use of all the advantages offered by the new technology and waste tax-payers' money."

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[117] "Presentation and proposals for measures to be taken for a coordinated electronic administration" Agency for Administrative Development, 2001.
[118] On the need of interventions for the development of information infrastructure in society", 2001

Nykvist demanded that the Government should produce common guidelines, minimum requirements and good examples. She also wanted the agencies to be given advice and support, for example when making procurements of consulting services. "*Initiatives of this type from the Government are conspicuous by their absence.*"

The agencies were, in principle, at Levels 1-2 in the diagram. Operations were, in principle, local with elements of voluntary, if not yet formalised, cooperation. The need to move up and to the right in the diagram is well documented.

At a meeting of the Government on June 18, 2003, the Government made, in principle, three decisions that are relevant in this context:

- It decided to establish a Delegation for the Development of Public e-Services.

- In order to establish a common standard for electronic communication between agencies and between agencies and individuals, and to facilitate the introduction of common standards, the Government decided to establish a "special coordination body consisting of representatives of government agencies that are of particular importance for the development of the electronic administration." This body will be "an agency within an agency" with the Agency for Administrative Development as the host agency.

- The Government gave the Agency for Administrative Development, the National Labour Market Board, the National Board of Student Aid, the National Social Insurance Board, the National Tax Board and the Swedish Customs the assignment of "jointly developing and testing new forms of collaboration in respect of local services".[119]

11.5.2 The stakeholders

The newly formed delegation was not called the "ICT Delegation", as many had expected, but was called the Delegation for the Development of Public e-Services. Together with the nomination of Eva Fernvall, chairperson of the Swedish Association of Health Professionals, as the chairperson of the Delegation, this indicated an intention on the part of the Government to develop an instrument for cooperation between central government, municipalities and county councils. In addition the Delegation will work with private trade and industry and the research community.

The assignment given to the Agency for Administrative Development and the five major agencies indicates that they are free to proceed and to prepare the ground for the 24/7 agency.

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[119] *Ministry of Finance 2003.*

In the final work on this report, it was also announced that a "Board for Electronic Administration" had been established. The Board will establish common standards for government agencies' electronic communication. The aim is to *"create a safe and effective exchange of electronic information between agencies and citizens .... The Board shall consist of representatives of agencies that are of particular importance for the development of the electronic administration."*[120]

However, here the Government could have acted more proactively instead of taking a reactive measure at a relatively late stage after a lengthy process which started when different agencies drew attention to this problem around the year 2000. It is also a national concern, since consensus on standards is essential before major investments are made in municipalities and government agencies around the country.

ITPS has understood that this has aroused criticism in certain quarters since there is a conception that the Agency for Administrative Development already has the duties given to the new agency. However, in the opinion of ITPS, it is important that the new agency does not merely include the Agency for Administrative Development with the mandate to decide on standards etc. It is also a great advantage that the directors general of the largest agencies are represented in the "agency". This gives it the legitimacy and capacity to implement and check observance of decisions that would not otherwise have existed. Given the decentralised agency structure in Sweden, this construction is an interesting attempt to introduce centralised features into a decentralised administration structure. The core of the new construction is a new ordinance that makes it possible for the Board to design compulsory standards and norms. Decisions made by the Board are thus compulsory for agencies. This means that, on the coordination stepladder, the agencies are in a position between Level 2 and Level 3 and that now there is a tool which can be used by the agencies to move closer to Level 4.

Since it is one of the most important stakeholders in this perspective, a comment needs to be made on the Agency for Administrative Development. With the formation of the "Delegation" and the "Board for Electronic Administration", the Agency for Administrative Development, given that everything functions as intended, will be relieved of a number of duties, even if it is to function as the host for the e-agency. The Agency for Administrative Development has given an important role as a catalyst, *think tank*, and social engineer for central government. Cooperation vis-à-vis the municipalities on the part of central government has also been channelled hitherto to a certain extent via the Agency for Administrative Development. However, it is naturally necessary to give this task to the "Delegation". Requirements in respect of evaluation skills and for the formulation of goals will be high for the Agency for Administrative Development.

However, this is a future problem. Now a number of pieces in the puzzle are in place and it is naturally important that they find their roles in relation to each other. Measures have been taken with the aim of remedying the shortcomings in the Swedish political system that have been the subject of criticism. Some observers will certainly consider the measures inadequate while others will regard them as

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[120] *Press release, Ministry of Finance, 2003.*

being interesting attempts to introduce necessary elements of coordination while preserving the advantages of the traditional decentralised administrative system.

In the opinion of ITPS, the Board has been formed at a late stage, but the decision has now been made.

Sweden is not alone in having problems with non-synchronised systems. If Sweden had not taken measures on the central government side and if nothing is done in relation to the county councils, the weaknesses in the Swedish system would, in all likelihood, have fairly severe repercussions. But no one knows how the centralised models for management and control of e-society function. Here, in the opinion of ITPS, it is important that the Swedish system is followed up continuously, at the same time as comparative studies and analyses and made of the ways in which control systems in other countries function.

11.6 Five government agencies, all government agencies or the entire public sector?

Like the earlier ICT policy, the ICT bill emphasised the importance of central government being a forerunner in ICT use. The choice of name of the Swedish variant of *e-Governance* – the 24/7 government agency – has also had the effect that the debate has focused to a large extent on government agencies. However, the problem is that most of the production of social services is done by the 290 munici-palities and the county councils in Sweden. They are responsible for activities that are extremely ICT-intensive, that have direct links to the future development of welfare, and it is primarily the municipalities and county councils that will be negatively affected by the imminent shortage of labour in the next ten years.

Therefore it is reasonable to expect that the policy would be worded in a way that includes the entire public sector, i.e. the public sector as a forerunner in ICT use.

This also seems to be the idea behind the recently established Delegation for the Development of Public e-Services. This delegation is to identify areas in the public sector where it is possible to create utility or to improve efficiency. The Delegation is also to examine new methods of increasing collaboration between central government, municipalities and county councils.

The Government has also given the Agency for Administrative Development, the National Labour Market Board, the National Board of Student Aid, the National Social Insurance Board, the National Tax Board and the Swedish Customs the assignment of "jointly developing and testing new forms for collaboration in respect of local services".

On the other hand, the 24/7 agency seems largely to be making progress through collaboration between the five agencies that, together with the Agency for Administrative Development, were given the assignment of jointly developing and testing new forms for collaboration in respect of local services. However, there are approximately 200 government agencies and a large number of them, particularly the smaller agencies, have difficulties in developing advanced e-Services of their own.

Here the Government is faced with two alternatives. Should it continue to focus on the five agencies or should it include all agencies and develop forms that would have a broad impact on the entire central government administration?

In this respect the role and perception of the municipalities is a key issue.

11.6.1   The e-Policy of the Swedish Association of Local Authorities

Relations between the municipalities and the citizens have many dimensions and forms of expression. The municipalities have a physical proximity to the citizens. Requirements in respect of ways for interaction with the citizens in fields such as education or home-help services are different than those for a government agency which, for example, handles permits for vehicular traffic.

Therefore, it is not surprising that the Swedish Association of Local Authorities has had problems in finding links between its own activities and the work on the 24/7 government agency.

Moreover, the municipalities speak more in terms of a digitised administration than the exercise of public authority, and the county councils rightly maintain that their activities, for example in the healthcare services, have been a 24/7 activity from time immemorial.

It is interesting to note differences and similarities between central and local government strategies where e-Services are concerned. The Swedish Association of Local Authorities presented its strategy in the document. "Electronic services – new approaches at all levels."[121]

The Swedish Association of Local Authorities focuses in the first lines on its activities with demographic factors and requirements for rationalisation:

> *"The expected shortage of labour in the future, requirements for improved efficiency, and the determination to improve services for the citizens and for trade and industry are some reasons for the increasing interest in and discussions on public electronic services or e-Services. There is a great deal of uncertainty about the ways in which the public administration shall implement these services, since they can lead to considerable changes, both for activities and for the choice of technology and organisation. Basically e-Services are a case of continuing the long-term work of making the administration more efficient."*

The Swedish Association of Local Authorities continues:

> *"Today the number of services available on the Internet is often used as a factor to measure success. It is important to make surveys of developments but there is a risk that these measurements create a feeling of competition that shall pressurise the municipalities into introducing further electronic services. The risk is then that these services will not meet real needs."*

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[121] *This report is available at www.svekom.se*

"The way to a more efficient administration – with a greater degree of accessibility, faster decisions and greater transparency for the general public – starts in a discussion on what is being done and how it is being done, and that processes and working methods are reviewed. Then skills will be created for adapting applications, intranets, operational systems and communications – an information infrastructure – that will support operations flexibly and efficiently."

The picture that emerges of the views on e-Governance of central and local government respectively is that their approaches tend to converge. Central government has often emphasised aspects of access as such, but it has also in both programmes and actions taken a firm approach to develop activities and to solve back-office problems. The central government sector often refers in its documents to positions on international ranking lists and appears to deliberately develop services that raise the level of ambition and oblige government agencies to cooperate with each other, even if the services have a limited number of users. The approach of the Swedish Association of Local Authorities is more process-oriented and emphasises needs and a long-term perspective. In both sectors a mental state of preparedness is starting to emerge on the necessity of using ICT activities as an instrument to meet the demographic challenges.

However, ITPS must state that the policy in both sectors is extremely rudimentary and there is a long way to go before the SMART criteria are fulfilled.

Both sectors work – in the same way as the county councils – to try to eliminate "downpipes", fixed positions and inefficient overlapping systems. In this respect, the central government sector has certain powers in the form of agency ordinances and annual directives from the Government. The Swedish Association of Local Authorities does not possess such powers. The municipalities also have negative experience of the creation of strong central functions that apply to all municipalities.

In the light of this it is gratifying to state that, in the spring of 2002, the Swedish Association of Local Authorities' congress decided among things that the Association shall "look after the interests of the municipalities and work to ensure that there is a common approach where cooperating electronic social services are concerned".

In Sweden a number of municipalities (encouraged by the Agency for Administrative Development) have taken the initiative to create a common base for the development of e-Services, a so-called "common-use platform". This platform includes collaboration on a selection of priority e-Services and on soft and technical components for the development and operation of services. A core group of 12 municipalities have run the project hitherto, but it is estimated that the interest group will include around 50 of the country's 290 municipalities at the beginning of 2004, i.e. more than 17 per cent of the municipalities will participate in this programme of cooperation.

In the work done by the Swedish Association of Local Authorities, the contours of a well-thought out e-Policy can be discerned. The municipalities should:

- plan (develop procurement strategies, analyse operational needs, develop specifications with open standards etc.),

- place orders and make purchases through coordinated procurements, and

- stimulate competition on the market in order to break fixed vertical arrangements.

The market shall provide e-Services, applications and ICT solutions. In order to avoid a situation in which customers have no freedom of choice and in which competitors are excluded, discussions are taking place on the need to develop new business models by going from vertical to horizontal competition (see Chapter 5). In this respect it can be noted that the horizontal systems also give parties on the market the responsibility for developing system platforms, while the customer is responsible for the coordination of the systems in the vertically integrated models.

11.6.2 Where does the future start?

In the study quoted above on e-Governance in 23 countries[122], the conclusion was drawn that the most successful examples were to be found in the countries that had adopted the approach: "*Think Big, Start Small, Scale Fast*". Even if developments have picked up pace and breakthroughs have been achieved on important points, new challenges are arising in areas where there is extremely little empirical evidence to build on and where we must revert to relying on general experience when making decisions under conditions of uncertainty, i.e. mistakes should be made on a small scale and successes on a large scale, or – as ITPS has expressed it –a learning ICT policy should be developed.

Even if there are differences in opinions between central government and the municipalities, there is a growing convergence of opinion and mental preparedness to face the challenges posed by demographic trends. This is probably a very important point of departure for the future work of the Delegation. The possibilities of collaboration between central government and local government are good but, without any experience to use as a point of departure, there is no reason to stipulate that future cooperation should be in forms that have not yet been tested. In the long term it is important that the entire public sector develops a common approach and common platforms in order not to build "downpipes" vis-à-vis the citizens. However, at the same time it is important that cooperation is developed step by step and on the basis of practical needs. The question that the Delegation, central government, county councils and municipalities should now start working together on is "one patient – one journal", the systems that are discussed in Chapter 9. This is also an issue that cuts across all sectors: central government, county councils and municipalities.

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[122] *"eGovernment Leadership – Realizing the Vision". The Government Executive Series. Accenture 2002.*

Where the 24/7 agency is concerned, one question that arises is the relationship between the five large agencies and the vast majority of agencies. In light of the fact that it must be considered extremely important to acquire experience of how far in institutional and organisational regeneration the vision of "one item of business − one agency" and the idea of the electronically coordinated network administration can lead to, it can be a good idea to allow the five large agencies to proceed rather like snow ploughs, to test and develop methods, forms of cooperation and standards that can then be used by other agencies and parts of the public sector.

The Agency for Administrative Development is of the opinion that it is services of this type, i.e. that require the exchange of information over agency borders, which proceed most slowly when the agencies lack the incentive to make investments in projects in which the benefits will be reaped by other agencies, municipalities or private companies. Here, in the opinion of ITPS, there is good reason to develop experience of systems of this type in relation to the five large agencies.

One important task for the Delegation is to see how incentives for collaboration between municipalities, county councils and central government agencies can be created.

11.6.3 Fixed vertical solutions in central government and municipalities

Fixed positions, "downpipes" and non-synchronised systems constitute considerable problems in municipalities, county councils and central government agencies. These fixed positions lead to duplication of effort and a great deal of inconvenience for the personnel concerned, and they also constitute major obstacles to the achievement of dynamic efficiency in the systems. For example, vertical "downpipes" stand in the way of the development of cooperation at horizontal level in a municipality, which in turn makes horizontal cooperation difficult in various areas with adjacent municipalities.

There are many causes that interact to create these fixed vertical positions. One important factor is the way in which central government exerts an influence on the municipalities. The municipal systems are built up vertically in order that they can be coordinated with the central government level rather than for horizontal development. The existence of this causal relationship exists and the fact that it is strong has been confirmed by independent researchers.[123] Against this it can be said that one form or another of "sectorisation" is in any case inevitable and that it is justifiable to make a review of ways in which the negative effects on the municipalities can be reduced. A task of this type should also take up issues pertaining to ways in which the municipalities coordinate their own ICT-based operational systems in their own areas of responsibility. A further dimension in this complex of problems is how the Government Offices also create "downpipes" in relation to the government agencies (see, for example, Chapter 4 on Confidence). In a task of this type it is naturally important that the different parties do not place the entire responsibility

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[123] See, for example, Wallenberg, J. "The role of an employer in tomorrow's municipalities" which is included in vo Otter, C. (ed) "Inside and outside in Swedish working life" National institute for Working Life, 2003

on each other but that they all openly try to see their role for avoiding a situation in which unnecessary fixed positions are reproduced both "upwards" and "downwards" in the systems. The Delegation could well constitute a suitable forum for a discussion of this type.

At the same time ITPS would emphasise that the work of eliminating "downpipes" and fixed positions is a long-term and complex process that must be implemented in a number of different ways. One important aspect that has been emphasised in ITPS' work with municipalities and county councils is the issue of strengthening purchasing expertise in a long-term perspective. ICT activities are complex and range over many fields. Activities, technologies, finances, working conditions, uses and developments proceed very rapidly. In this respect, training programmes can be necessary in many fields and the question has been raised whether long-term collaboration should be initiated with universities and university colleges.

11.7 Conclusions and recommendations

- It is necessary that the visions relating to the electronically coordinated network administration and the 24/7 government agency are developed and defined. The Government's ambition must be specific. It cannot be limited to the development of a certain number of electronic services, but must extend to such an extent that central government (or the entire public sector) is a forerunner in ICT use that makes it possible for "fewer people to do more, and do it better, for more people", with a clear focus on the demographic challenges and with a view to testing the possibilities of extensive organisational and institutional changes and with a balanced view of the relationship between the development of services and operations.

- The Government should take a firm grasp on all the pieces of the puzzle that exist today as fragments of an e-Policy that combines services with operational development and efficiency through a coordinated strategy that is communicated in a clear and coherent manner.

- The work must also focus on formulating goals that are possible to follow up and evaluate. It is necessary to have action plans with clearly defined points in time for the implementation of different phases. It is not necessary to limit the goals to stating when individual web services should be in place. They should rather be measured with different financial indicators, lead times for the administration of agency business, quality goals, customer satisfaction etc.[124]

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[124] *In a statement made by the Agency of Administrative Development on this report, there is a discussion of the wording that, for citizens and companies it shall be possible no later than the end of 2006 I) to send in documents to agencies and to make applications electronically, ii) to be able to obtain a decision via the Internet in individual items of business, and to follow the status of item of business that the citizen or company is directly involved in, iii) to need to approach only one agency for each item of business and iv) to provide in a simple way via the Internet points of view and proposals on agency activities and operations*

- International comparisons should not only be made in the form of analyses of studies built up on indices but also in the form of studies of best practice and benchlearning in important areas for the Swedish public sector.

- ITPS welcomes the tendency of giving greater priority to efficiency and operational development and assumes that the Delegation for the Development of Public e-Services will work, as planned, with this specific focus.

- ITPS welcomes the fact that the e-agency has now been established and that it has been given the possibility to exert considerably stronger controls over the agencies' standards and norms than has been the case hitherto.

- ITPS consider that it is reasonable that the five agencies that were given the assignment with the Agency for Administrative Development of "jointly developing and testing new forms for collaboration in respect of local services" may function as pioneers with the task of "spreading their wings", trying to find new organisational forms etc, as well as for developing standards and working methods that other parts of the public sector can benefit from.

- ITPS considers that the ICT standard and ICT maturity of the Government Offices are not completely negligible symbolic issues in this context, and therefore proposes that considerably more resources are allocated for this purpose.

- It is also important, not least for the credibility of the digital administration, that matters relating to archives are not neglected.

- The inclusion of the entire public sector in the work should be based on a common approach to the potential for coordinating the entire administration, and be developed step by step.

- Central government should find forms for giving municipalities and county councils incentives and support to enable the entire public sector to find forms for

    i) ways in which ICT-supported operational development can lead to both new institutional forms, rationalisation, and the development of new services that create utility for citizens and companies.

    ii) ways in which fixed positions, "downpipes" and non-synchronised systems can be avoided, different islands can communicate with each other, horizontal cooperation can developed at all levels, and the public sector can develop common platforms in relation to the citizens.

- A suitable start for cooperation between central government, county councils and municipalities is, in the opinion of ITPS, to develop a common form of information support based on the patient, regardless of where in the care chain he or she may be (see Chapter 9).

- The Delegation should work for the development of a common approach to counteract ways in which different tendencies for fixed positions are reproduced and spread in the systems can be avoided.

- In this work, aspects of democracy should be given attention to permit full use to be really made of the potential that lies in the concept of e-Service to strengthen democracy (see section on democracy in this report, or the report by Grönlund et al on ICT and Democracy).

- The Swedish public sector should not merely be a forerunner of good and broad ICT use, it should also develop close cooperation and mutual learning activities with the private sector in respect of ICT-supported operational development.

- The thinking related to Public Private Partnership should be developed in connection with the work on the 24/7 government agency and the electronically coordinated administration. This is important not least in relation to the healthcare services.

- Knowledge processes related to ICT-supported operational development should be organised through improved learning processes between the different sectors as well as through the establishment of long-term cooperation with universities and university colleges.

- Regarding the so-called Svegfors study, a special study on the role of ICT in the public administration should be implemented in connection with, or as an immediate consequence of, this study.

12 The ICT policy's vision, goals and strategies

What experience can we draw from the ways in which the ICT bill has worked – has it been a platform for interpretation and guidance for the actions of interested parties and stakeholders? In this section, ITPS analyses and assesses the question of the justification of the overall ICT policy, how the vision of "an information society for all" functions as a platform for the policy, and how goals and strategies have been formulated.

12.1 Is an ICT policy needed?

As many other countries, Sweden has mainly formulated an ICT policy that is linked to the vision of "an information society for all". This also the "official EU policy" that was formulated in e-Europe. Are there other alternatives? One possibility is not to have an overall ICT policy at all. It is possible, as is the case in England, to have one policy for ICT in the home, one for ICT in education, one for ICT in the public sector, and so on. The different policy areas can be treated and presented in principle independently of each other. The coordinating force in the policy would the be *the Office of the e-Envoy*" which the British Government has established centrally in the Government Offices, and through which all important public ICT investments must pass before they are implemented. Another alternative is a policy that is built up from the bottom and is based on shared visions, which Holland has tried to implement. This experience and its relevance for the Swedish ICT policy has been summarised in the report by English and Dutch researchers which is attached to this main report.[125]

Alternatively, the Government should allow each line ministry to draw up an ICT strategy for its own policy area. There would then be an ICT policy for each of the policy areas but the Government would not have an overall ICT policy.

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[125] "A contribution to ITPS evaluation "A learning ICT policy: A review of ICT policy in the Netherlands and the UK*".*

Figure 9 ICT-policy and "sector policies"
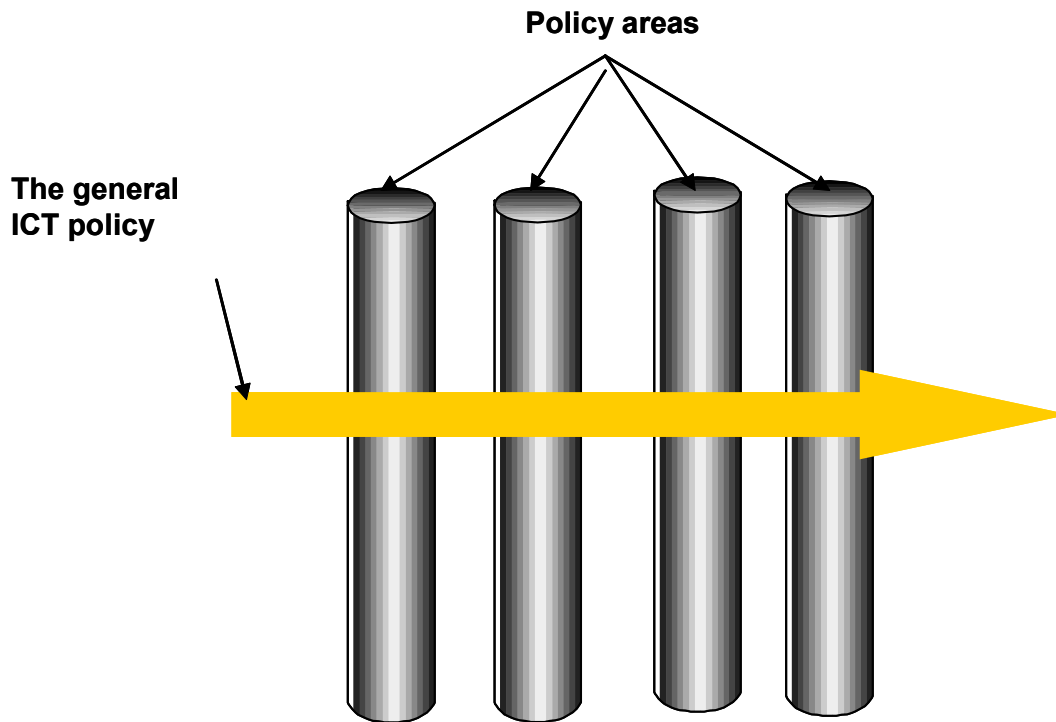
Is there a need for the "crossbar" or "coordination linkages" between the different policy areas that the ICT policy constitutes? (See Figure 12.1) ITPS' answer to this question is based primarily on an assessment of how the present policy has worked.

ITPS is of the opinion that, for the foreseeable future, there will be a need for a special "horizontal" ICT policy and there are two main reasons for this.

Firstly, there are synergy effects between the different policy areas. For example, it is clear that students use their computers at home more than they use the computers at school. The employers have seen positive effects of the PCs in the computer skills of the employees at work. The access policy for broadband affects the companies' access costs and thus their choice of location. A well-considered and long-term ICT policy in areas such as healthcare, culture, sustainable development, public electronic administration and the 24/7 agency has the potential to give important impulses to trade and industry.

If the policy pursued has had effects in different policy areas and areas of use, it would also appear that these effects can be traced, in the first place, to the general policy. This is clearly the case with ICT's role for growth, where research shows that the falling prices of ICT products and the access of companies to inexpensive ICT services has had the effect that every employee works more with capital goods than before, which has led to an increase in the productivity of the labour force.

The general structural rationalisation that has taken place in trade and industry and in which ICT has played an important role has contributed to a drastic reduction in emissions from large-scale industries. Moreover, a more efficient use of natural resources has been achieved, and the possibilities of making the controls of processes

more efficient, and of improving logistics in different respects, have made a strong contribution to our taking at least a small step towards a sustainable society. This has not been a consequence of measures taken in the area of ICT and the environment, since this programme has just begun, but is a result of the general ICT development in society to which ICT has naturally contributed but is not the only explanation. Another example can be based on the advanced use of traffic information (Ministry of Industry), that can reduce the pressure on the environment (Ministry of the Environment) and also contribute to reducing road accidents and sick leave (Ministry of Health and Social Affairs), i.e. it influences the outcome over ministry borderlines.

Even other policy areas can provide similar examples of synergy effects. Without the Government having taken any special measures in the area of ICT and culture, the widespread access to the Internet has opened up new information channels, and for many people, not least young people, the possibility to enjoy and participate in creating culture. With the aid of ICT societies have become more transparent and the citizens have thus become much better informed.

There are strong effects from the general aspects of the ICT policy in a number of important policy areas. ITPS' consultant in the healthcare services found in interviews that the general improvement in ICT skills has reduced the lack of confidence in the use of ICT in the healthcare services.

ITPS' consultant on ICT in the universities also comments on ways in which the use of ICT in education programmes in universities and university colleges is dependent for the most part on the possession of computers by the students themselves.

This list could be continued. ITPS is of the opinion that there is convincing empirical evidence for the conclusion that the general aspect of the ICT policy shall be retained, since there is a strong risk of sub-optimisation without a "general" ICT policy.

The other argument that we can see today for retaining an ICT policy in the future is that the different policy areas have scarcely started their planned work of identifying the ways in which ICT can be used in their own operations. There are exceptions, but they are few and even in such cases not much progress has been made.

12.2　Has "an information society for all " succeeded as a strategic objective?

The concept of "an information society for all" as the main strategic objective of the ICT policy, as well as the wording that this goal shall be achieved before other countries is, as commented on by ITPS in section 2.2.4, difficult to follow up due to its lack of precision.

However, in the opinion of ITPS, the formulation "an information society for all" functions well in political terms. Despite the difficulties in interpreting the concept, it indicates that the ICT policy should be seen from the perspective of the citizens

and individuals and that the ultimate goal of the ICT policy is the well-being of the citizens. The vision is also that all people shall be able to make good use of the potential of the information society in order to achieve their aims in life. With a certain degree of justification the wording can be regarded as rhetoric, but rhetoric creates, if nothing else, expectations among the citizens which, if they are not fulfilled, can be directed against the political system. Despite the vagueness of the concept, after a large number of interviews ITPS is of the opinion that the focus of the policy as in Figure 9 indicates that "for all" has considerable amount of acceptance and support in society, among the representatives of trade and industry, and among stakeholders in civil society such as trade unions, tenants' associations, sports organisations etc.

In the large number of measures, goals and guidelines for the ICT policy which are presented in a somewhat disorganised way in the ICT policy, the expression "information society for all" nonetheless functions as a type of compass that puts the utility of individuals in focus and which obliges stakeholders in the ICT policy to find solutions that include "all".

12.3   Is there an ICT policy strategy?

The Ministry of Industry is the ministry that is responsible for the coordination of the ICT policy. The Ministry itself is responsible for the access policy which includes the development of broadband and primarily those parts of the industry policy that are affected by ICT. The responsibility for ICT in schools rests with the Ministry of Education, the responsibility for ICT in culture rests with the Ministry of Culture, and so on. The ways in which ICT is used to develop policies and activities in these fields is something that the Ministry of Industry has very little influence over. This also has the effect that the responsibility for the ICT policy in these policy areas rests with the line ministries, the "downpipes", but is nonetheless included in the ICT bill in the inventory of measures that the ICT bill actually makes in a fairly meritorious way. The problem is that, when the measures laid down in the ICT policy are to be implemented, they are totally dependent on whether the line ministry that "owns the problem" has a mission that includes ICT, whether it considers itself to be the "owner of the problem", and the extent to which it has the expertise to deal with the problem. This is a major explanation why ICT issues often fall between two stools and that no one takes responsibility for the policy. *It is quite clear that the policy cannot be developed and that instruments for its implementation will be lacking if the ministries that "own" the problem do not assume responsibility for the development and implementation of the policy.*

Accordingly, the Ministry of Industry has no powers over the issues that concern other ministries and, since municipalities and county councils are the bodies that have most ICT-related contacts with the citizens, it is difficult to understand how the Government will be able to implement the ICT policy.

The *strategy* that the Government has in this respect to realise the vision of "an information society for all" is, in principle, conspicuous by its absence. In the Swedish ICT policy the void between "an information society for all" and the

various measures is filled by the three ICT policy instruments. These are rather *requisite conditions* for the implementation of the policy in different areas of use than a strategy for the Government to achieve its ICT policy goals. What is lacking is a description of the measures or programmes that link the vision on "an information society for all" to the various policy areas.

ITPS' international consultant also arrives at the same conclusion in his report.[126] The main conclusion in this report can be summarised by the sentence: "*Despite its ambitious goal to make the rapid transition towards an information society, Sweden lacks an overall strategy to coordinate and implement its various ICT policies.*"

12.4 Definitions of the goal of "an information society for all before all others"

If an objective of this type is to be perceived as anything else than rhetoric, it must be combined with a clear definition of the respects in which the Swedish Government consider it to be of special importance that Sweden should be first of all countries. Unless Sweden is first in all respects, this assessment is dependent on the weight given to different aspects and thus the claim that Sweden should be first in all respects falls on account of its own absurdity. If we are not first – what should we do and at what cost? A priority of this type must primarily be based on an analysis of the country's own needs and not on constant, anxious glances at positions on international ranking lists. We have nothing against being "first" but the policy must be given content.

12.5 Goals that are possible to evaluate and monitor?

In its report "A learning IT policy", ITPS emphasised the importance of the policy being formulated in terms that are possible to monitor and evaluate, and set up the so-called SMART criteria for this ambition. It is not possible, within the framework of this report, to compare these criteria with all the decisions that are formulated in the ICT bill. Interested readers can do this exercise themselves. In the opinion of ITPS, what is important in the respect is that those who formulate the future ICT policy, regardless of whether it refers to the 24/7 government agency, democracy or culture, contribute to creating requisite conditions for the policy to be a learning policy by using these requirements as far as possible in their work.

ITPS would make the judgement that it is only to a very small extent that the ICT policy has been formulated on the basis of these requirements.

Nor does ITPS find that, in its formulation of new ICT policy requirements, the Government has done this in such a way that they can be formulated in accordance with the SMART criteria. These criteria can, for example, be applied to the presentation of the 24/7 agency which is presented on the Ministry of Finance's website and which is the only document that has been presented on the 24/7 agency.

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[126] "*A contribution to ITPS evaluation* A learning ICT policy: *A review of ICT policy in the Netherlands and the UK*"

12.6 Has the policy been transparent?

However, ITPS would also emphasise other aspects of "a learning ICT policy". In order to make it possible to evaluate the policy, it must be transparent and the underlying reasons for the different decisions must be presented in such a way that actions taken can be assessed in relation to the reasons.

It is not possible to formulate all goals immediately within the framework of the SMART criteria. To make it possible for stakeholders to ascertain the basic goals for an operational area, a vision can be presented for the area. This vision should not contain abstract formulations of a vague policy. It should be based on experience, be possible to revise on the basis of new experience, and possible to break down into sub-goals that can be monitored and evaluated. If the parties concerned are to make a collective effort to achieve results that the citizens consider desirable, they must see the whole picture, understand their role, and know that the focus of their work is sustainable in the long term. As can be seen in the international comparative study, the concept of shared visions is not sufficiently efficient as a control instrument for an ICT policy. However, together with other features of the policy, *shared visions* can make a common approach, coordination and collaboration possible.

12.7 Further evaluation

In an earlier assignment of planning an evaluation of the Swedish ICT policy, which was given to ITPS in its annual directives from the Government, ITPS proposed that the evaluation should be divided into two time perspectives: a short-term ICT evaluation with the aim of summarising experience gained prior to imminent ICT policy decisions, and a long-term evaluation that would study causal relationships in depth and which would also take up the long term social aspects of ICT development. In order to implement the first phase of the assignment, ITPS has mainly cooperated with consultants, and to a lesser extent with researchers and persons responsible for activities and representatives of important user groups. When this report is submitted to the Government, ITPS' assignment will have come to an end. What then does ITPS think about further evaluations?

ITPS assumes that it will be some time before a new assignment of this type will be performed. The task now is to make it possible to pursue what ITPS has called "a learning IT policy". For this purpose analyses and evaluations of different fields are needed, as well as long-term acquisition of knowledge in some of the core areas of the new ICT policy, for example the issue on the role of urban networks and broadband in local or regional economic, social and cultural development, ways in which the development of services and ICT-supported development of operations relate to each other in different types of activities, the role of the users in the development of the technology and society, etc. One research field is the ICT policy itself. In its evaluations ITPS has encountered a need to establish long-term relations between universities and different public sector activities from the aspects of both education and development. Experience gained from this evaluation also shows that the academic world has long lead times before it can become engaged in this type of project. Therefore there can be great value in bringing together the research groups

that have the possibility to study the ICT policy, or are interested in the ICT policy, in a network. There are a number of groups around the country that could be interested in "a learning ICT policy". In this evaluation, ITPS has worked closely with researchers attached to the ICT university in Kista and proposes that the centre established there to study issues relating to ICT in the development of society is given the assignment of planning how universities can participate in creating the learning ICT policy. If a network of research groups of this type is firmly established it should also be possible to mobilise research interventions a short notice to meet acute needs.

ITPS has also noted that the 24/7 government agency is on the Swedish National Audit Office's list of forthcoming evaluations.

In the section on "an information society for all" ITPS states that there is a need for continuous monitoring of progress in the development of the information society at two levels. At the international level, relevant statistics need to be compiled regularly. There is also a need for an in-depth project of a *benchlearning* character in which a study would be made of good models for the Swedish ICT policy in important policy areas. In this respect ITPS' technical attachés can be an important resource. However, ITPS would also make the judgement that it will be increasingly important to monitor ICT developments in Sweden on the basis of local perspectives. It should be possible for Statistics Sweden, the National Post and Telecom Agency, the Swedish Institute for Transport and Communications Analysis and the Swedish Association of Local Authorities to work together in a project of this type and develop indicators in consultations with the Strategy Group.

12.8   Recommendations

- ITPS considers that there are strong reasons for retaining a general "horizontal" ICT policy in order to avoid sub-optimisation, to create synergy effects and to make it easy for the political system and for the citizens to obtain a complete picture of ICT and its effects on society.

- The concept of "an information society for all" should also be the guiding concept for the Swedish ICT policy in the future.

- Every policy area must be given – and take – a clear and formal responsibility for the achievement of the overall goals in the policy area. As a suggestion, this can be done by the Government taking an initiative to give the ministries concerned the assignment of devising a strategy on ways in which activities in each policy area should be developed in order to take full advantage of the possibilities offered by modern information technology, and to monitor and revise these strategies, for example every second year. These strategies can also form the basis of the continuous controls of government agencies by ministries and the Government.

- The future ICT policy must be worded in terms that are possible to monitor and evaluate.

- If the goal that Sweden should be the country that creates "an information society for all before all other countries" is to be retained as the strategic objective of the ICT policy, it must be more clearly defined.

- In order to discuss how the research world can participate in the work on "a learning ICT policy", ITPS proposes that the Strategy Group and the Delegation take up the matter with the ICT university in Kista. ITPS' technical attachés can be an important resource for monitoring international ICT development. It is possible for Statistics Sweden, the National post and Telecom Agency, the Swedish Institute for Transport and Communications Analysis and the Swedish Association of Local Authorities to cooperate in a project for developing indicators that reflect, not least, internal ICT development in Sweden, in consultation with the Strategy Group.

13 A new phase in ICT development and the ICT policy

When ITPS hands over this report, three and a half years will have passed since the ICT bill was passed by Parliament. This means that, in principle, the ICT bill has been in force for a complete political cycle. The views on ICT that existed at the time the ICT bill was presented were characterised to a large extent by developments at the end of the 1990s, i.e. during the era of "the new economy", with extremely large and somewhat simplified and exaggerated expectations of what it would be possible to do with the aid of ICT. However, at approximately the same time as the ICT bill was made public, the market started to discover that many of the dot.com companies did not have operational ICT plans, finished products or customers. Then the stock market collapsed and the entire industry ended up in difficulties. It also soon proved to be the case that the telecommunications industry had considerable over-capacity. In other words there were a large number of facilities for production and research that demand had been too small to exploit.

13.1 A new phase in ICT development?

There are many people who claimed that what happened was "merely" a stock exchange bubble and that the underlying operations could continue as before. However, there are strong reasons to believe that the difficulties that affected the industry were not merely due to the state of the economy. It is striking that the decline in ICT, at least during the initial period, was not linked to a general economic decline. The reasons for the crisis therefore probably lie in factors associated with the industry. Over-capacity and over-optimistic conceptions of the rapidity and capacity of different consumer groups to absorb new technologies are aspects that often characterise new industries in processes of rapid change and whose driving force primarily relates more to *technology push* than to *demand pull*. Developments driven by technology can function successfully when a general technology can easily find new applications in different areas. However, as the technology finds these new applications, it is reasonable to assume that they also become more sophisticated in their interaction with human skills than what was previously the case. Early users absorb new products since, to them, a new technology often has a value in itself. The customer groups that absorb new technology at a relatively late stage demand value and products that are easy to use.

If ICT is to become an important tool in different activities or if it is to realise the goals of individuals, groups or organisations, two fields of knowledge must meet and be integrated. On the one hand we have the general technical knowledge that is often possessed by technicians and, on the other hand, the user-specific knowledge that is to be found in companies and organisations and which is based on the goals of activities, customers, competition, skills and working methods. The latter type of knowledge is specific to companies, tied to the situation, and therefore also difficult to move. All research and all experience show that integration between fields of knowledge is not always easy to achieve. One example is the American innova-

tion researcher, Eric von Hippel, who has described the use-specific knowledge as *sticky* – viscous and difficult to communicate to the bearers of the technical knowledge.[127]

Sometimes this transfer of knowledge is successful, but most often there are considerable difficulties which, for example, is demonstrated by research into the Solow paradox or the long lists if ICT projects that have broken down in companies and the public administration. One possible conclusion of von Hippel's analysis, which he also presents, is that in certain situations it can be necessary to supply the *users* with technical expertise to a greater extent than has been the case hitherto, since most people possessing technical expertise work for suppliers or are external consultants. This can improve the users' absorption of new technologies and can also strengthen the users in their role of making demands on and procurements in the industry.

There is a great deal that indicates that the new era in ICT development, and even in the ICT policy, will be characterised by the development of user skills and by strengthening the position of the users in the ICT-related innovation processes. It is roughly in this way that ITPS would characterise the new phase in ICT development. ICT development needs to proceed from a technology and producer-driven phase to a user-driven phase.

The concept of *user-driven development* does not mean that technicians, producers or researchers are no longer needed. The concept rather emphasises the importance of *integrating the users' knowledge, experience and preferences in the innovation process*.

The ICT bill was drafted during the period that was known as "the new economy". Then came the decline for ICT, including telecommunications. Hopefully the industry is on the way to recovery and the markets will pick up once again. The challenge faced by the industry is to assimilate the experience and knowledge of the users and to learn to understand the needs of different types of user groups. The challenge faced by the rest of society, including government agencies, municipalities and county councils is to extend their knowledge of ways in which ICT should be used in activities and be made subordinate to operational goals. Moreover, the ICT policy has another goal in respect of integration, namely to integrate the general ICT policy into the individual policy areas and areas of use.

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[127] *von Hippel,E. (1998).''Economics of Product Development by Users: The Impact of ´Sticky` Local Information''. Management Science Vol. 44. Issue 5. May 1998*

13.2   A new phase in the ICT policy?

Are we in a new phase in the ICT policy compared to that that was presented four years ago?

Let us briefly consider the different policy areas:

Where do we stand today?

Many of the measures and programmes have ended or are approaching their end. The broadband policy is in an implementation phase and the municipalities are in, or have completed, the process of subjecting the provision of networks to competition. This does not mean that the networks have been constructed, and even less that they have been given real substance. The period in which financial support may be received does not expire until 2005. Many threads are loose and should be tied up but it is necessary to collect more experience before new steps are taken. On the other hand it is clear that two problems will soon have to be faced: synchronisation of the networks and their content.

Where skills are concerned, the broad skills mentioned in the ICT policy have hitherto focused on "general" use. No action has been taken to encourage the use ICT for the development of activities and operations, as an instrument in the regeneration of working life, or to achieve a breakthrough for ICT as an instrument for pedagogical or didactic regeneration. The IT in Schools programme has ended and the PC reform that attracted a great deal of attention will gradually lose its importance as an instrument for speeding up ICT development by increasing the number of PCs in homes. Teacher training, further education of teachers, wording of goals, evaluations in which assessments are made of ICT maturity of schools, are the instruments now available to central government.

At the same time the 24/7 government agency and ICT-supported operational development have been placed on the political agenda.

Where "increasing confidence" is concerned, this concept should be made operational. According to the Metamatrix, this would pave the way for the creation of a specific policy that would be possible to monitor. An important component in this is the systems of rules that are undergoing gradual revision. However, this is often made difficult by the "dual control" of the Government in relation to the agencies.

The ICT bill established the goal that ICT should be an effective tool in a number of policy areas two years after the bill had been passed. This has been achieved, not as a consequence of the measures in the ICT policy but, to the extent that the policy has had an effect, as a result of the policies pursued by the line ministries.

In the field of ICT and sustainable development, analyses and evaluations have just started. The field of ICT and democracy is also mainly in an analysis and project stage. As ITPS' consultant from Örebro University states, the trials that have been made in the field of democracy are few in number and not very well conceived. Of must greater importance is the service dialogue that has been established with users in many fields. This is a democratic resource that is underestimated by the political system and which can lead to both a strengthening and a weakening of traditional

democracy. In the field of ICT and culture, efforts have already been made to develop programmes, but the development of the policy areas has not resulted in any programmes or strategy documents and thus not in any intentional controls. The list can be continued. The only programme document that has been presented on ICT use in activities is "Care in Time". The work on the horizontal "crossbars" through which the ICT policy should be integrated with the vertical "downpipes" has therefore hardly started in most policy areas. This does not necessarily mean that no measures have been taken in the areas in question, but these have often had the character of interventions that have not been very well conceived, or more or less temporary projects rather than the result of a systematic analysis of the policy area in question.

At the same time it has been shown in one area after another that the hitherto successful developments in Sweden have also left a number of unsolved problems for the future. The National Audit Office has stated that, with the 24/7 agency programme about to start, the public sector has not yet learnt to handle major ICT projects. "Downpipes", fixed positions and special local solutions can be found everywhere. ITPS' consultants have warned that the decentralised Swedish public administration system has problems in handling these matters with its 200 relatively independent government agencies, 290 municipalities, 300 healthcare organisations and 21 county councils – all this with a population of nine million inhabitants, i.e. a population that corresponds to approximately half the population of Greater Los Angeles. We can also make comparisons, for example, with England where all the hospitals report to the National Health Service which is the organisation responsible for the health of 56 million inhabitants. No country has yet solved the problems of non-synchronised systems but many analysts, including ITPS' consultant Booz Allen Hamilton, consider that Sweden is not as well equipped as other countries to do it. The comparison made with Denmark, among others, by PLS RAMBØLL in the field of healthcare shows that where synchronisation is concerned, Sweden has fallen behind. We must be aware of this legacy from the past before we take the plunge into new, exciting ICT adventures.

A service phase?

In the discussion on the new phase in the ICT policy, it has often been maintained that the infrastructure phase is a thing of the past and that the ICT policy must now focus on ensuring that "services" enter the networks. The ICT Commission[128], for example, uses the concept "the digital services society" to describe the new phase in the development of the information society.

The development of services on the networks is, in the opinion of ITPS, a very important matter. Services are one aspect of ICT development, but it is not possible to extract one aspect and to use it as a guiding principle for the development of the ICT policy. It is also important to define the role of the government agencies and the municipalities in the development of services in relation to parties on the market. The public sector should concentrate on access, develop its own informa-

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[128] *"Digital services – how? An ICT policy for results and benefits" Final report of the ICT Commission. Government OfficialReport 2003:55.*

tion structure and create the requisite conditions for the acquisition of knowledge of services development. There is also a danger that *technology push* will be replaced by *service push* and that an ill-considered focus on services could once again be a way of excluding the users/citizens from developments.

However, there is an important reminder in the ICT Commission's report, namely that the work on the information structure takes considerably more time than the work on infrastructure. Moreover, in this respect the work is mainly done with representatives of the activities concerned and with users, and not with technicians.

The new phase in the ICT policy

ITPS would describe the new phase faced by the ICT policy in roughly the following way:

Hitherto, in order to achieve "an information society for all", the ICT policy has mainly been interpreted in the sense that individuals/citizens should be able, with the aid of access, confidence and skills, to use ICT in different contexts (see Figure 10 below). When ICT has spread to all groups in society, the goal of "an information society for all" will have been achieved.

Figure 10 The new phase of the ICT policy
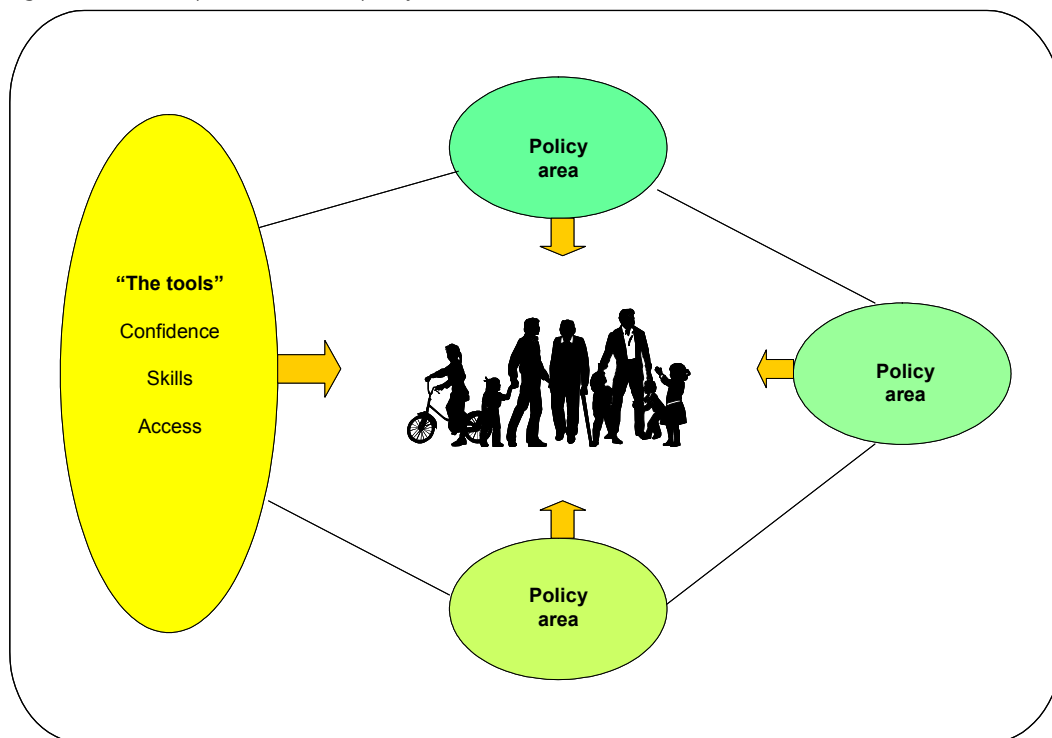
However, ICT also has another, indirect effect on individuals. Since ICT can be an effective tool for developing activities in practically all important policy areas, the citizens of Sweden will be able to participate in and harvest the fruits of the development of the information society inasmuch as society will be better in different respects: productivity will increase, health and medical services can be more effective, ICT can contribute to a better environment, and so on. These advantages of ICT development can be enjoyed, even if individuals themselves do not use ICT. The description of the development of the ICT policy made by ITPS in this evaluation, which has been summarised above, also shows how tentative steps are now being taken towards the formulation of ICT strategies for different policy areas. This tendency has naturally been facilitated, has even been made possible, by the general ICT policy.

In Chapter 12 ITPS presented the reasons why the general ICT policy (increasing confidence, promoting access and developing skills) is still topical. However, active measures must now be directed against the development of *ICT in policies*, i.e. that the *line ministries concerned and the policy areas* develop *goals and strategies for ways to make ICT an effective tool in the development of their own operations*. In the opinion of ITPS this is the new phase in the ICT policy.

Requirements in respect of "the new ICT policy"

On the basis of what was presented in Chapter 12 and in the section above, ITPS would make the following requirements of the new ICT policy:

- The ICT policy should focus on users not on producers

- The ICT policy should be durable and consistent, i.e. learning.

- The ICT policy should focus on strategically important problems and policy areas.

A user-oriented, not a producer-oriented, ICT policy

In the opinion of ITPS, the ICT policy should focus on good and broad use of ICT. Industry aspects should, if there are any reasons for giving the ICT industry special treatment, be taken up within the framework of the general industry policy. Competent and demanding users are the best stimulus that the ICT companies active in Sweden can reasonably request. The ICT policy should be neutral where the selection of technology is concerned and should not prescribe the technology with which different services shall be developed, thereby creating obstacles for users to have access to and participate in the development of the services that best meet their needs.

Modern political science research also shows how the development of the policy is affected by the nature of the networks in which the policy is discussed and formulated. ITPS considers that strengthening the influence of users over the policy should be achieved in the different reference groups and meetings in which the policy is designed. This can lead to a reduction in fixed positions in favour of open standards, the strengthening of consumer interests and competition, and not least the possibility for producers to learn to integrate the knowledge and experience of

customers in the development of their products. On the basis of the above, the research councils should review the networks that design their ICT activities.

The ICT policy should take up ICT use. It should not merely be an additional industry policy. Elements of the industry policy should be eliminated from the ICT policy. The best contribution to economic growth is via access and skills and by the provision of different programmes to develop competent users. Furthermore, policy areas that have goals that the public sector can only influence to a small extent should be given lower priority or removed entirely from the ICT policy.

Durability and consistency – a learning ICT policy

The ICT policy, as proposed in the ICT bill of 1999/2000, presents the whole field of activities and actions that concern ICT and which can be related to central goals in a large number of policy areas. In order to create a structure for the, to say the least, heterogeneous activities and to give a direction fro the policy, "an information society for all" should be the uniting force and Sweden should achieve this goal before all other countries. What then, in the opinion of ITPS, are the challenges faced by "the new ICT policy"?

Many stakeholders and debaters have the expectation that "the new ICT policy" will soon lead to new outgoing measures such as a new PC reform, which can once again put the ICT policy on the political map. In the opinion of ITPS most of the possible ICT policy initiatives are already to be found in the arena. The challenges do not lie in finding new, spectacular measures but rather in making a long-term and systematic review of the different dimensions of the Swedish ICT policy, in ensuring that the ICT policy and the line policies meet, that the different ingredients in a "learning ICT policy" function properly, that shortcomings in the ICT activities in the public sector come to the surface, are discussed and remedied, in brief that the ICT policy's motor is reviewed and "defragmentised" to meet future challenges.

It also means that the work must concentrate more on giving "an information society for all before all other countries" real substance and that the superficial fixation on non-standardised key positions on different international ranking lists should be broken. On the other hand international *benchlearning* is a good instrument. In this respect relevant indicators would be needed in order to identify where interesting examples could possibly be found. Sweden should thus become actively engaged in the work of international bodies in both these aspects. The study of international experience must be placed in a *learning perspective*. Most of those people in Sweden and abroad who are interested in the matter know that Sweden is one of the most highly developed and mature ICT nations. Most also understand that it is not reasonable to expect that Sweden can be best in all respects. A humble attitude, in which international monitoring focuses more on learning from good examples than on constantly trying to find confirmation of excellence, is necessary so that Sweden will be able to hold its own in these ranking lists in the long term.
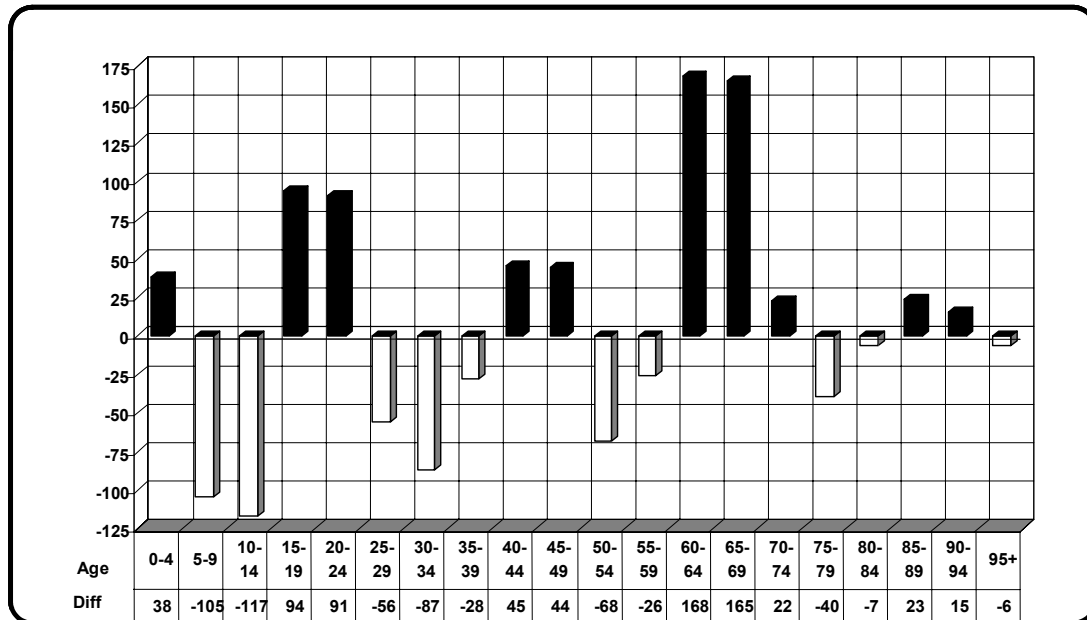
Focus on strategic problems and policy areas

The ICT bill of 1999/2000 placed most ICT issues relating to the public sector on the agenda. Now the ambition must be that many of these issues should be passed on to the policy areas that "own" the problems.

The ICT policy should

- Focus on the strategically important questions

- Assist representatives of the various policy areas in their work of analysing ways in which ICT can be used to improve goal fulfilment. The latter is essential in order to make it possible for the ICT policy to give attention to the strategic problems related to ICT in policies.

14   ICT for growth and prosperity

Figure 11 Net change in population growth, 2000-2010

Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95+
Diff	38	-105	-117	94	91	-56	-87	-28	45	44	-68	-26	168	165	22	-40	-7	23	15	-6

14.1   The decisive issue

What is the most important social issue that ICT can be linked to?

One increasingly overriding task for ICT is that it should assist in the modernisation process that Sweden, like other European countries, must undergo in order to continue to grow and prosper, despite the challenge presented by demographic change.

No task can be more important and this perspective must, in the opinion of ITPS, be put in focus in the ICT discussion.

Statistics Sweden's population statistics are very specific on this issue: Figure 14.1 above shows the net changes for different age categories between 2000 and 2010. We can see from the figure that:

- The number of persons in the age group 60-69 years is growing rapidly

- The number of persons in the group that has the highest level of employment, i.e. that between 25 and 60 years, is rapidly decreasing.

With these statistics as its point of departure, the Swedish Association of Local Authorities draws the following conclusion:

The municipalities face great challenges in the future. During the next ten-year period the municipalities will need to employ some 600 000 new employees. This corresponds approximately to the total surplus on the entire Swedish labour market during the period."[129]

The problems arising from the aging population will affect the public sector in several ways. The first, that is indicated above, is that the loss of labour due to retirement will have a very severe effect and that, quite simply there is not enough employable labour to make up for this loss. The age breakdown among public sector employees is, in this respect, extremely distorted. The public sector employs a large number of people who were born in the 1940s and 1950s, i.e. the ages that will soon leave the labour market.

The fact that also the number of persons in the age groups with the highest levels of employment will decrease in absolute terms also means that the tax base will diminish, i.e. there will be difficulties in financing the public sector.

Finally, if the perspective is moved forwards a further ten-year period, the number of very old people will increase dramatically and the associated needs for health and medical care will put entirely new demands on both county councils and municipalities.

In view of the fact that care of the elderly accounts for a large proportion of municipal expenditure, increases in productivity will be essential, even if the entire surplus of new labour on the labour market goes to the municipal sector. Who then is going to work in the private sector and for central government? The municipalities do not merely face a shortage of labour, they also face a large shortage of resources.

These problems cannot be solved by the ICT policy. Other policy areas such as the finance policy, the social insurance policy, the industry policy, the social policy, the education policy, the public administration policy, the immigration policy etc. will also, with great probability, focus on meeting this scenario.

However, without the support of ICT it will not be possible to implement the process of rationalisation and regeneration of trade and industry and social life that is needed to preserve welfare, and preferably also to enhance it. It is in the light of this that ITPS taken up issues relating to the development of activities and operations, rationalisation, efficiency and ICT as a tool in the regeneration process in this evaluation.

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[129] *Introduction to municipal e-Services, Swedish Association of Local Authorities, 2002.*

14.2 Policy areas

ITPS' recommendations

On the basis of the experience gained in making this evaluation and the analysis that was made of the challenges for the foreseeable future, ITPS proposes that during the next few years the ICT policy should focus on the following three themes:

- ICT for prosperity and growth

- From broadband to a network society

- ICT-supported learning for work and personal development

The development of activities with the aid of ICT for prosperity and growth

If ICT is to be an effective tool in the promotion of welfare and growth during the next few decades, a purposeful process of development must be started now.

ICT is a technology which is scaleable and makes things possible, and which is still in its infancy. With the aid of historical parallels we can see that ICT is a technology that, like electricity or the steam engine, contributes to the development and modernisation of society. ICT can also be compared with other innovations that have changed conditions for learning and acquisition of knowledge, such as the printing press or the quill. History also teaches us that a new technology develops in an evolutionary way, not a revolutionary way, and that it requires the development of new infrastructure, new knowledge, new organisational forms and new institutional solutions in order to be fully used.[130] ICT also stands out as the most important technology for the achievement of increases in productivity and economic growth.

However, at the same time research also shows that the way in which ICT interacts with people is often sophisticated and that the difficulties are systematically underestimated. This is partly due underestimations of the importance of organisational and institutional changes, and that the differences between knowledge and data or between codified knowledge and knowledge gained through experience, "silent" knowledge, are not taken into consideration.[131]

The factor which is of critical importance for long-term economic growth is growth in productivity. ICT developments have now reached the point where the technology increasingly meets the needs of activities in companies and organisations, which means that organisational forms must be changed, new knowledge developed and, above all, that technical knowledge is integrated with the skills in the activities which are often specific to the organisations and based on experience (see Chapter 13).

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[130] *David, P.A, [1990], "The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox", American Economic Review vol 80, nr 2.*

[131] *Polanyi, M, [1962], Personal Knowledge: Towards A post-Critical Philosophy, Harper Torchbooks New York.*

It is always tempting to use the analogy of the advent of electricity. The major effects on productivity did not arrive when the steam engines were discarded and were replaced by electric motors. They came gradually, partly since electricity provided electric light in the factories which led to improvements in production times and conditions for production, but above all when the scaleable part of electricity started to have an impact, i.e. when every machine was given its own electric motor and could be disconnected from the large belt transmission systems. This made it possible to work with an entirely new factory layout, often on one floor, with a completely new production layout, and completely new possibilities for organising production activities. It was here that the requisite conditions emerged for the new industrial society.

Swedish society is now faced with the task of regenerating organisational forms and institutional solutions that enable ICT to be an effective instrument to achieve the regeneration of trade and industry, as well as of the public sector, which must be achieved in order that *fewer people can do more, and do it better, for more people*. The banks have shown that the development of new services that save time and money for their customers can be combined with the development of their own operations and with increases in productivity. The income tax returns of the National Tax Board are another example. New services can create greater utility for customers and replace less efficient and expensive products, thereby releasing new resources into the economy. With the aid of rationalisation, resources can be released that enable society to provide important welfare functions. With the aid of collaboration and new organisational solutions, government agencies, companies and administrations can use ICT to take advantage of each other's resources and thereby increase efficiency totally. Administrative functions, for example in the healthcare services, can be rationalised and resources can be released for core activities.

A process of mutual learning between the different sectors needs to be established. The balance between customer relations and internal development work is one important aspect. The work on the 24/7 government agency can be an important ingredient in the process of necessary institutional regeneration, provided that the work is pursued with a focus on development and institutional regeneration that is supported by ICT and aims at achieving an efficient electronic network administration. *Trade and industry should be invited to follow and contribute to the development of services so that central government, municipalities and trade and industry can reach the citizens from simple and standardised platforms*. If the 24/7 services can create habits on the part of the users, important synergy effects can be created in relation to the services offered by trade and industry.

One condition for success in this work is that user skills are reinforced in different ways and that technical skills are allocated to important user environments. One important ingredient in the public sector is to strengthen purchasing and procurement skills with the aid of training, development and research.

The natural "owner" of this policy area is the Delegation for the Development of Public e-Services. In aspects that concern relations between the public sector and trade and industry, collaboration should be established between the Delegation and the Strategy Group. Universities and university colleges should be drawn into this process. The long-term acquisition of knowledge is necessary and close cooperation between researchers and practitioners should be stimulated. The agencies concerned should be instructed to support this work in their annual directives.

From broadband to a network society

One important feature of the ICT policy has been the development of broadband. Basic networks have been constructed at the overall level, and networks that link together areas and districts have been planned and built at the local level. In the municipalities' infrastructure plans different network resources have been reviewed and further developments have been placed in a holistic perspective. In many places property networks are now being built that can be connected to the urban networks from which they can then be connected further to the higher network hierarchy.

Here the local communities have a very unique resource in their hands. We do not know what will happen on these networks in the future. However, the networks could be used *as a tool for comprehensive economic, social and cultural development at the local level*. The question is whether the municipalities, citizens, civil society and local trade and industry are capable of providing a vision of this type with substance. The task should be described as *giving the development of the Internet a local dimension for the first time*.

In this respect, the so-called operator-neutral networks have an interesting role to play. This structure can create competition and dynamism in the services offered and it is possible for municipalities and central government to contribute by giving the networks a social content. One aspect that is interesting for the ICT policy in this type of construction is that, since the property owners have built the property networks, the access networks are under the control of local stakeholders. This can influence the activities and the content of the service in a way that is adapted to the needs of the users. However, it is also possible to develop suitable forms that enable the users and citizens to have a direct influence over the development of the conditions that communications operators and service providers shall follow.

In Svenska Bostäder's Vällingby project, the metaphor "network society" is used to draw attention to the multidimensional social aspects that could be built into the local, operator-neutral access network[132]. How can the local companies reach the residents over an Intranet? Is there another way than using computers and mobile telephones to reach the citizens? Can IP-TV be a way of realising the vision of an information society for all? Is it possible, from the property network, to realise the vision of integrated services, i.e. to have access from one and the same IP-based infrastructure to a diversity of communications services (Internet, local intranet, IP

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[132] *The idea behind the metaphor has been developed by, among others Claes Engerstam of Svenska Bostäder and Lars Forsström, Centrumutveckling.*

telephony, video on demand, as well as property services, for example energy control, ventilation, security etc)?[133] One possible tendency is that the home can become an increasingly important arena not only for recreation and entertainment but also for health care, education, distance working and cultural activities.

These questions are of vital importance for the process of regeneration that is on the way in Sweden. Should broadband play a role in the economic, cultural and social development of the local communities or will its effects have the same influence as, for example, cable television? We do not know today but the responsibility rests with the political system for formulating goals and strategies for desired developments.

In other words, the theme "from broadband to a network society" has links to the industry policy, culture, democracy and the environment. ITPS proposes that this theme should be a central task for the Strategy Group which could then include the Property Unit at the Ministry of Finance, environmental work, the Democracy Group at the Ministry of Justice, the Ministry of Culture and the Ministry of the Environment and so on in a vision and strategy project based on this theme.

This policy area should be given to the Strategy Group since it integrates a number of other policy areas and therefore it should lie in the ministry that is responsible for coordinating the ICT policy.

The information society as a learning society

The vision is that the Swedish information society should also be a learning society. The organisational forms in working life, with decentralised information management, flat organisations and project-based organisations make it possible to have more interesting, if more demanding, jobs.

In the tendency towards a network society that can be discerned, there is a loosening up of the traditional borderlines between companies and agencies and between different educational institutions. The Government committee studying distance education is of the opinion that the development of networking with complex interactive processes will lead to a society that must be permeated by learning.[134] In a static society learning is concentrated to children and young ages. In the industrial society the need arose to upgrade obsolete knowledge and the solution to this problem was recurrent training. In the society being developed today, the need for learning is acute and constantly present.

However, the new technology does not merely provide new possibilities for the production of goods and services, it can also be seen as a tool for influencing the learning process itself, both the learning that takes place in working life and the learning that can be regarded as in-service training or further education.

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[133] *See report from a student project" Integrated Services" together with Svenska Bostäder and NCC: http://2g1319 (Projects 2002. Integrated Services.)*
[134] *"Cost-effective education" in Government Official Report SOU 1998:83*

ICT offers the potential to produce educational programmes that are flexible in terms of time and space and are therefore well adapted to the requirements for perpetual change made by working life, an education programme that is *just in time* rather than *just in case*.

The skills aspect in the ICT policy needs to shift its focus from general knowledge of computers and the Internet to knowledge of ICT in order to achieve the aims in life of individuals and the operational goals of organisations.

User skills in industry and working life need to be strengthened and people in their role as "citizens" also need new skills in order to absorb the "semi-finished" services that are being produced and which require an increasing degree of participation on the part of the customer.[135]

ITPS therefore proposes that a third theme for the policy should take up ICT and learning.

ICT and learning must be included as a theme in order to make possible the process of transition to a "knowledge society", which is essential for the solution of growth problems, as well as for issues relating to life quality and sustainable development.

This theme should not merely include schools and universities, it should also include working life and be linked up to existing political ambitions that are expressed, for example, in the Government bill on "The open university".[136]

The policy area is a necessary ingredient in the strategy that could be described as development of the competitiveness of trade and industry and the regeneration of working life. The policy area should be "owned" by the Delegation for IT and Learning that the ITPS proposes should be formed with representatives of the education system and working life. The new delegation should work together with both the Strategy Group and the Delegation for the Development of Public e-Services.

14.3   Concluding remarks

In an international perspective, Sweden is on the way towards developing broad participation in the information society. However, on the basis of the objectives formulated by the Government, there is a long way to go before the goal of an information society for all is achieved. With the forthcoming problems associated with an aging society, new solutions must be found for the elderly, and the stagnation in ICT use that seems to exist among immigrants is a matter of concern.

Where the use of ICT to increase the degree of goal fulfilment in various policy areas is concerned, this has been started to a certain extent. But it is taking place rather as a result of general ICT developments than as a result of a deliberate ICT policy in these respects.

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[135] *See for example, Sannes, R. (2001). "Self-Service Banking: Value Creation Models and Information Exchange". Information Science. Volume 4. No 4.*
[136] *Government bill 2001/02:15*

It is a matter of concern that ITPS' international consultants are obliged to state that, despite Sweden's high level of ambitions and its many ICT related activities, the Government seems to have lacked a strategy for success in achieving its ICT policy goals. Booz Allen Hamilton also considers that, among the G7 countries and Australia, Sweden is an exception in that it totally lacks precise objectives.

These shortcomings are not merely at programme level but also in the practical policy which has more or less totally lacked horizontal coordination. This conclusion is also confirmed by the evaluations made by ITPS in the various policy areas. It is only very recently that the Government has taken the initiative to develop the horizontal work, for example through the e-Agency, the Strategy Group and the Delegation.

There are also shortcomings in vertical coordination. The decentralised Swedish public administration system has proved to have many merits where achieving rapid development at local level is concerned, but has difficulties in getting the different local islands to communicate with each other.

Necessary supplementary and balanced solutions have not been developed for the decentralised public administration system.

One decisive task is to develop incentives so that the various parties concerned in the public sector can coordinate their programmes and get away from "downpipes", fixed positions and non-communicating islands.

In a system with decentralised implementation, it is necessary that goals are formulated that can be evaluated and monitored, that the parties concerned have the incentive to act in accordance with the objectives and that the implementation of these objectives if followed up and evaluated, i.e. that "a learning policy" is developed. In this report the vision of an information society for all has been broken down by ITPS into three components:

- The enhancement of activities and operations with the support of ICT for growth and welfare

- From broadband to a network society

- The information society as a learning society.

This focus can provide impulses for further work on visions, goals and strategies.

ICT alone cannot solve the growth and welfare problems. Nor can the ICT policy. The other policy areas must take over and "meet" the ICT policy in order that its visions may be realised. At the same time the difficulties should not be underestimated, investments in ICT must always be accompanied by organisational and institutional regeneration, with the development of new skills, attitudes and even new infrastructure and information structure as the base.

A vision of both a *network economy* and a *network society* needs to be developed. In the network economy, companies, government agencies and municipalities would not merely take advantage of each other's databases but also of each other's comparative advantages and special expertise. In the vision of the network society,

ICT is a tool for comprehensive economic, social and cultural development and for combining local and global knowledge and perspectives for individuals and companies. In the vision of the *information society as a learning society* ICT is an instrument that enables the individual to achieve the goals of his personal development, to acquire knowledge of value in working life, and to be able to participate in the modernisation of society and trade and industry.

Hitherto Sweden has been successful on the international ranking lists. But our satisfaction with these rankings must not lead to self-conceit and prevent the understanding that the ICT policy now has serious deficiencies, with an extremely weak implementation and evaluation superstructure. If the ICT policy is to be an effective instrument for achieving the general policy goals, measures must be taken to remedy these deficiencies. In this report ITPS has provided its contribution on ways in which the ICT policy could be developed in the light of the development of society.

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