

MAKING THE GLOBAL VILLAGE LOCAL?

The Agenda of National Policy

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Is the development of new information and communication technologies (ICT) part of a global trend standardising nation specific styles and cultures of policy-making? The authors summarise how Denmark, Norway and Switzerland respond to the challenge of new ICT. Traditions seem to adapt to the demands as well as trying to survive shaping the making of the information society by national styles. Will the "electronometric" revolution be accelerated by the Internet more socially and humanly patterned than the former evolutions, i. e. the "planimetric" reshaping of space by traffic and the "chronometric" revolution of time use? The social sciences are facing an excellent task, that is to evaluate ICT impacts and applications in order to avoid abuse as well as testing the opportunity for ICT in private and public life.

1 Introduction

The idea of the information society or, as it was originally called, the post-industrial society, was launched in 1973 by Daniel Bell in his book *The Coming of Post-Industrial Society*. Bell attempted to describe the transition between the two forms of society and placed his emphasis on information or "intellectual technology". However, one

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of the things he just mentions is Information and Communication Technology (ICT). In other words his description is not based on any form of technological determinism, but is rather a sociological description of important changes in modern society. If we read the visionary documents of today, we find that to an increasing extent ICT has moved into the driver's seat. The Bangemann Report and contemporary national policy documents are part of a global trend in this connection.⁴

We shall take as our starting point the notion of the information society as a post-industrial society. When it comes to different characteristics of the industrial society versus the post-industrial society, there are many observers who have listed fundamental differences that are certainly important. Nevertheless the concepts of the information society or of the post-industrial society are problematic because they create the impression that we are leaving industrial production for the benefit of the production of information. This is of course completely wrong. In many contexts it may therefore be useful to speak of the super-industrial society; to an increasing extent industrial production presupposes advanced knowledge and communication, without respect to time and space. In a more holistic perspective modern society implies an on-going and intensified process of innovation in all sectors of public and private life. The shaping and reshaping of time and space are among the most prominent features in that process. McLuhan developed the notion of the Global Village as an illustration of the ongoing processes of reshaping time and space. However, McLuhan never implied that new ICT would solely open up the world and improve the interactions of those within it. He assumed that the global village was fission, not fusion and that the village was not the place to find ideal peace and harmony (McLuhan and Powers 1989).

Technology may be considered as a form of integration between nature and culture, in other words new „hybrids“ are created. ICT functions integrationally at a superordinate level in time and space, i.e. it makes possible ever larger economic systems. In this connection it may not be out of place to remember the fact that when new technol-

⁴ The relationship between topical sets of problems/policies and what subsequently happens has been described by many writers. A classical work is I. de Sola Pool's *The Social Impact of the Telephone*, Cambridge: The MIT Press, 1981. A description of topical interest today is to be found in Bengt-Arne Vedin, *Resor i rum och tid [journeys in space and time]*, Teldok, Rapport Nr. 105. Stockholm 1996.

ogy matures and completes its break-through, we take it for granted and forget its importance. A good example is the telephone. In spite of this we dare to make the claim that the telephone has meant far more for the development of modern society than a lot of so-called new ICT. Obviously this does not mean that new ICT is of no significance. Important points in this connection are

(1) the fact that digitalisation has meant that more and more communication takes place with or between machines „independently“ or with reduced human presence and

(2) the fact that asynchronous communication is approaching synchronous communication.

These two processes form the foundation for increasing integration and rapid changes in economic and social systems. In this context we may speak of three processes of convergence:

(1) convergence between communication networks,

(2) convergence between different communication services and

(3) convergence in the information and media market.

In this introduction we shall deal with three points in relation to the policy dimension: communication technology viewed in relation to (1) visions, (2) strategies and (3) a challenge. To limit this to some extent we shall concentrate on ICT and its importance for development in the regions.

2 Global visions framing policy

Information and communication technologies are the top issue in all highly developed countries. The question of whether the new wave of innovations will correspond to a hybrid of Prometheus, on the one hand, or will only lead to a new generation of hybrid systems, on the other, has not yet been answered. Let us first take a closer look at the global visions of the new information society. The first wave of visionary documents on the European scene was introduced by Nora

and Minc from 1978 (*L'Informatisation de la société*). For Denmark, Norway and Switzerland this period may be characterised by large investments in infrastructure and at least for the two first countries several "social experiments" to identify how to utilise the infrastructure.

In connection with new ICT and possible applications it is often said that "the only limit to the possibilities is the imagination". It may therefore seem surprising that the imagination very often functions in a trivial direction. If we look more closely at the applications that are suggested for new ICT, it is as a rule well known operations and activities that are now to be replaced or made simpler: distance teaching, teleconferencing, tele-medicine, telemetry, remote work etc. The prefix "tele-" or the epithet "remote" can in other words be placed in front of most things.

Internationally, one starting point of the information superhighway was set in July 1993, when the US Congress adopted the National Information Infrastructure (NII) Act. The main policy documents in the NII issue were "The National Information Infrastructure – Agenda for Action". Similar documents were drawn up in Singapore and Japan. „Indeed most countries followed close in line, after the NII and "Agenda for Action" had been presented. Within a year, half of the OECD countries and the European Union had issued reports presenting ICT visions for development of information infrastructures. (Starting in April 1994: Canada, the EU (the Bangemann report), Japan, Sweden, France, Denmark, the United Kingdom, Australia, The Netherlands, Finland, Norway, Germany.) (Johansson 1997:174). Many European policy documents gathered their inspiration from the Bangemann Report (European Commission 1994) or from its abbreviated version, the Bangemann List. Here ten areas of application are mentioned (see list on the following page):

These are all well known areas of application and they have been discussed, tried out and investigated during the last 20 years. The most important reason that people have invested in well known solutions, which at times have spread considerably more slowly than countless prognoses have laid down, is to be found in the very "diffusion of innovation"-philosophy of the Bangemann Report. Practically all applications can or must be spread with the help of the private sector and/or market forces. In the public sector costs must be offset by corresponding savings with the aid of the same technology. Public authorities are only to play the role of a catalyst in this process.

1	TELEWORKING More jobs, new jobs, for a mobile society
2	DISTANCE LEARNING Life long learning for a changing society
3	ANETWORKFOR UNIVERSITIESAND RESEARCH CENTRES Networking Europe's brain power
4	TELEMATIC SERVICES FOR SMES Relaunching a main engine for growth and employment in Europe
5	ROAD TRAFFIC MANAGEMENT Electronic roads for better quality of life
6	AIR TRAFFIC CONTROL An electronic airway for Europe
7	HEALTHCARE NETWORKS Less costly and more effective healthcare systems for Europe's citizens
8	ELECTRONIC TENDERING More effective administration at lower cost
9	TRANS-EUROPEAN PUBLIC ADMINISTRATION NETWORK Better government, cheaper government
10	CITY INFORMATION HIGHWAYS Bringing the information society into the home

In the national policy documents the applications are organised somewhat differently from the way in which they are presented in the Bangemann Report; a somewhat different order has been emphasised in order to stress national values and special features. This applies not least to the regional aspects. However, the role of the public sector, the role of the catalyst, does not deviate from the Bangemann Report. The emphasis on the role of the catalyst and market forces does however limit the imagination, one counts on what is well known and on what one reckons will happen anyway. There may be several reasons for this emphasis. Here we shall mention only one: there is a notion that new ICT has passed "take off" on the diffusion curve, i.e. the demand

for new technology is now so great that developments will take their course without any strong involvement from the public sector. The public sector should therefore concentrate on its own activity, on the rules of the game and on being an innovative customer.

The fact that the new wave of national policy documents has toned down the technology optimism on behalf of the regions does not mean that this optimism has disappeared from national politics. For example, according to an investigation conducted by Scan Fact 70% of the members of the Norwegian Parliament believe that investment in ICT and the Internet will strengthen rural parts of Norway in relation to urban areas (Aftenposten 10/9-96). This notion is linked to one of the most stubborn myths about the information society, the myth that new ICT can put an end to or even reverse the meaning of geography. When we say “reverse”, we are thinking of the notion that through new ICT the regions will be able to have the best of both worlds, i.e. the best aspects of modern society and the best aspects of the happy life in the rural community. In keeping with this the development of ICT for regional development has been pushed forward not only by inner driving forces in technological development but also with the help of political dreams and visions of how ICT ought to be able to revolutionise the regions. Such dreams and visions have formed important frames of reference and been used to mobilise support for a desired development. These frames of reference have also had an influence on the historical interpretation of the entry of ICT into the regions, which has often resulted in technological determinism and a lack of understanding of why political goals were not achieved. In this connection it may be useful to take a closer look at the concept of communication. The term is used in at least three ways:

- (1) Physical movement with the help of various means of transport,
- (2) Telecommunication, by which one communicates interactively over distance,
- (3) Communication in the sense of conveying a message in a more qualitative meaning, making oneself understood.

Built into the notion of strengthening rural communities by means of new ICT there lies an idea that geography means less and less; if necessary one can tele-commute in various ways (be it distance teaching, tele-medicine or remote work). Of course one can. However this

leads into a problematising of the way in which new ICT is understood. Telecommunications have throughout history been understood in two competing paradigms. The first, which is found both in popular writings and science fiction, but more importantly also in research and policy papers – we will call the modernisation paradigm.⁵ In this paradigm, old ways of communication are substituted by the new technology. When we reach for the telephone we are at the same moment transferring a major effort into a minor one. This very strong delegation of activity to a non-human, a telephone, is perceived as the most promising element of modern industrial society. This view is also found in both old and modern advertisements for telephones and other services (Cherry 1981). The main idea is that the new technologies substitute travel, post and other ways of communication and thereby extend modernity to even the most remote places. Imbedded in this modernisation paradigm one finds the diffusion of innovation model.

In the diffusion of innovation model the focus is on the process by which an innovation is communicated through certain channels over time among the members of a social system. More generally, as Rogers has described, there are a variety of factors that seem to promote the adoption of innovations: relative advantage over previous methods; compatibility with the adopters' values; the complexity of understanding and using the innovation; the possibility of testing the innovation on a limited basis; and the visibility or demonstrability of the results to others (Rogers 1995). This epidemic approach imagines diffusion as a shift of the demand curves caused by the spread of information from early adopters to late adopters who are made aware of the innovation by the use of early adopters.

The competing paradigm, we will call it the hybridisation paradigm, claims that although some ways of communication may be substituted, the most important quality of new communication technologies is the fact that they create more communication. New communication technologies may be a substitute for travel of the most trivial sort. However, the sheer fact of introducing new ICT will also stimu-

⁵ As one of the strongest promoters of the modernisation paradigm Rostow describes in his theory of the stages of economic growth the S-shaped growth pattern of take-off, rapid growth with the "drive to maturity" and slower growth with the "age of high mass-consumption" and standardisation. Rostow's thinking is therefore quite similar to what one finds in diffusion theory. See Rostow, "The Stages of Economic Growth".

late travel. The “hybrid” has added a “sixth-and-a-half sense” (Boettinger 1981) and thereby extends the capacity for communication and action. By these extensions the new “hybrids” blend their communication activities so that they all in all communicate more, and thereby also old forms of communication activities may increase. One may therefore speak of a synergy effect, resulting in both more travel etc. and more use of telecommunications. Latour suggests that “modern knowledge and power are different not in that they would escape at last the tyranny of the social, but in that they add many more hybrids in order to recompose the social link and extend its scale” (Latour 1993:109).

Technical change is therefore neither additive nor subtractive or substitutive – it is ecological. Ecological in the same sense as in the ecology of biological systems. If one adds, subtracts or substitutes one significant factor, then the whole system undergoes a change that affects many other factors. This paradigm is more commonly found (more or less implicitly) in the social sciences, and explanations deriving from this paradigm may explain why dramatic forecasts of declining business travel etc. never become reality even if a wide range of artefacts has been added to our repertoire.⁶

Looking to Denmark, Norway and Switzerland the hopes as well as the fears are signalling that the new ICT developments will be radical innovations. In January 1998 the three countries will join the free information market of Europe. The new wave of innovations of ICT such as the Internet, WWW and multimedia or different hybrid forms more popularly merged into the concept of Cyberspace could not be stopped at the borders of the three countries. A new generation of technology-push ideologies has been launched. Sardar claims that Cyberspace represents the darker side of Western society – a parallel to colonisation which paved the way for modernity (Sardar 1996). Before we go any further we should like to underline the banal fact that the discussion about how we are to understand Cyberspace is first and foremost a discussion that concerns the privileged groups in privileged nations. Now there is no sensible statistical basis for dividing the world into different forms of society. Available UN statistics however provide a basis for estimating that roughly half the world’s popu-

⁶ For a deeper treatment see Bengt-Arne Vedin: *Myter om ICT [myths about ICT]*, Teldok, Rapport nr. 94, Stockholm 1995.

lation derives a livelihood from the primary industries, largely based on pre-industrial production technology in rural communities. Another relevant illustration in this connection was provided by Bill Clinton in his annual speech to the American nation this year (1997), in which he formulated the aim that “all 8-year-olds shall be able to read, and that all 12-year-olds shall have access to the Internet”. The fact that access to the Internet was mentioned right after the ability to read of course illustrates Bill Clinton’s understanding of the problem, but when it comes to literacy it is important to remember that the process has by no means been completed. It is still reckoned that roughly 1/3 of the world’s population cannot read or write, and when Clinton finds it worth repeating as a political goal in a country like the USA, this illustrates the fact that a number of highly industrialised countries have problems with increasing illiteracy. Precisely this growth of more and more “hybrids” can be used as the transition to a presentation of different development strategies.

3 Hybris or hybrid?

In the spring of 1997 an initiative to join the Swiss schools to the Internet was announced. Only two of the 26 Cantons of Switzerland resisted the project arguing that the use of the Internet could be postponed to the period after primary education in schools. Indeed, the EU will start new Telematic programs in several domains intending to compete with the other international regions, i. e. Japan and the Asiatic tigers, which are building up the global paradise of an information society crossing every border. How will Denmark, Norway and Switzerland cope with this new challenge? Reading the documents of the last five years the decision-makers have a stressing job confronted with:

- the forming of an information society shaped by ICT;
- the fast transformation perceived as fate;
- the diffusion of innovation imposed from outside;
- the fact that decisions are severely delayed in relation to the fast developments;
- a gap between the states’ self image of an actor coping with ICT and the loss of real control;

- becoming like other small nations a “region” at the margin of global society;
- a strong fear in people⁷ of the loss of more work-places connected to ICT.

There are signals that Danish, Norwegian and Swiss political culture is intensively concerned by ICT innovations and their effects. It seems that the technology policy in the three countries can be characterised by one important trend and some dilemmas.

3.1 From simple to complex strategies

In an increasing number of contexts the information society is perceived as a phenomenon linked to the regional cohesion areas in an economic sense.⁸ The fact that the regions are not effective participants in the development of the information society is therefore first and foremost due to various barriers to effective participation of this kind. From this point of view the regions may adopt three different relationships to the growth of the information society:

- (1) active integration in the information society;
- (2) adaptation or subordination to the information society;
- (3) exclusion or protection from the information society.

We shall not go into what forms of society the different relationships may lead to, but for points 2 and 3 the associations with the two-thirds society are not far away. Not only social groups but also regions may fall within this concept. One often hears it claimed that better “telecommunications lead to economic development”. Making such

⁷ The population in Switzerland estimates high-tech rather negatively, expecting the further loss of work-places; see: Meier-Dallach et al. 1997.

⁸ We have in this connection made use of Qvortrup et al., *Barriers and Strategies to effective Participation in the Information Society in Cohesion Regions*, Vol. 3, Nexus Europe, Dublin 1996.

statements people forget that telecommunications lead to the regions being more strongly integrated in larger economic systems. Improved communications and better trading connections with fewer barriers often provide better competition conditions for strong economies rather than weak ones. To the extent that the regions are economically weak greater openness will simply make these weaknesses more visible. One may argue for the view that sharper competition conditions will also strengthen the regions in the long run, but in the short term the local production may nevertheless experience considerable problems on account of increased competition. New ICT makes it possible, for instance, for large production systems to make decisions with far-reaching consequences at short notice.⁹ This emphasising of ICT and the economic system as a closely knit web leads, however, to a problematising of political strategies that takes in both the development of the information society and regional development. Over the last 25 years several strategies have been tried out:

(1) The growth centre strategy. Selected rural municipalities attempted to attract central industry by creating a suitable infrastructure and other prerequisite conditions. Naturally enough this was often industry that had no great problems in moving on. In this way one often ended up with a game with no winner.

(2) Strengthening of the public sector and the building of infrastructure have been tried in the three countries with considerable energy. The same is true of the EU, where for example the STAR programme had 760 million ECU at its disposal; the idea was to build an advanced electronic infrastructure in the poorest regions of Europe. There is a great deal to suggest that this strategy brought with it a limited amount of new economic activity. Improvements in infrastructure can yield the following advantages for individual enterprises:

- (a) direct reductions of costs
- (b) indirect reductions of costs
- (c) new and better services

⁹ See inter alia Hepworth 1986: "The geography of technological change in the information economy" *Reg. Stud.* 20:407-424, in which he says that "with the growing importance of information in all sectors, regional development will be increasingly affected by how multilocational organisations use computer networking to allocate their use of capital and labour".

- (d) better decisions
- (e) increased flexibility in relation to localisation
- (f) larger markets and increased ability to compete

In a study that CSP¹⁰ carried out an attempt was made to quantify the advantages within points a to d in relation to the investments made in telecommunications. It was found that the advantages from direct reductions of costs were small but the advantages from indirect cost reductions, increased efficiency and better decisions were considerable. All in all the proportion between achieved cost reductions and investments in telecommunications was 6.5 to 1. However these improvements do not give the regions any competitive advantages over central areas.

(3) The active diffusion of technology has been tried out in a number of countries. Numerous experiments have been started with new ICT. One of the early programmes in the EU was “Effects of New Information Technology on the Less Favoured Regions of the European Community”, which in 1983 presented the results of studies in France, Greece, Ireland, Italy and England. These reports showed that outlying areas were slow to start using new ICT and that the potential was large. The policy recommendations in the programme were fragmentary and concentrated on “technology-push” proposals, or in other words the supply side and the raising of skills.

In Denmark the discussion about the hybrid network led to the granting of money for a “Research and Development Programme with the application of new information technology”, and in addition to the funds granted for the programme large sums were also made available by the EU, among others, for the same projects. The EU has established a number of programmes in connection with new ICT. Most of these programmes have focused on advanced and competence-intensive technology. The proportion of policy-relevant programmes related to regional policy has therefore been small. To improve this situation

¹⁰ CSP International 1982: Telecommunications and the Economy Report supplied to Long Range and Strategic Studies Division of British Telecom, London.

programmes like ORA (Opportunities for Applications of Information Technology and Telecommunications in Rural Areas) and projects like BIRD (Better Infrastructure for Rural Development) were established. Applications and infrastructure measures were central in these programmes.

Norway has also had its programmes for the diffusion of technology, but probably with a limited degree of success. It has often been the case that “Nothing succeeds like success”, which means that smart players received public funding for things they would have done anyway. Earlier it was shown to be the case that in those technology-diffusion programmes that were in progress, the proportion of enterprise-oriented spreading of ICT was relatively small. Several programmes touched upon new ICT. However, only to a modest degree were these programmes directed towards stimulating enterprises to establish external links or strategic networks. Much of the effort invested in regional policy was directed at comprehensive “technology-push” programmes, or in other words the supply side without any full realisation of the fact that this was a cost-intensive, risky and long-term strategy. If one chooses such strategies, the will to invest effort over a long period of time must be present; small programmes over three to five years both are and also were probably an unsatisfactory use of limited resources.

In Switzerland policy-makers are trying to react pragmatically observing and/or adopting the OECD-, G7- or EU-recommendations or -decisions (Dönni 1997). A nation wide think tank group was founded aiming to reflect the transformations into global information society. The Swiss Council of Science obliged its Technology Assessment branch to evaluate the impacts of the new revolution. The question is whether and how the peculiarities of Swiss political culture will function as before and/or whether and how international pressures of technology developments will disturb the Helvetic pace on the road to globalisation (Lepori 1996, Colom and van Bolhuis 1996, Maggi 1996).

(4) The competence centre strategy signals good associations, not least because of the association with Silicon Valley. It has been tried out in several countries, and the Norwegian FUNN programme is an example in this connection. From 1988/89 14 centres of expertise

in information technology (also called FUNN centres) were established.¹¹ The results were out of all proportion to the expectations. Silicon Valley signals good associations but is difficult to copy.

The four strategies that are mentioned here have in common the fact that an attempt was made to pick out a strategically important factor which, if it were influenced, ought to lead to more comprehensive economic and social development. However it appears to be difficult to identify "trigger" factors of this kind. Since ICT is first and foremost an integration technology, strategies that are more integrated are sailing with the wind.

(5) Flexible specialisation integrates economic and social factors to a greater extent. Furthermore it has important geographical implications. This strategy claims to be able to stimulate the growth of geographical "clusters" of productive activity in remote regions, where one can find historically based productive skills and the capacity for production. This strategy involves active use of electronic networks, not as triggering factors that are intended to generate growth, but as an integrated activity that makes flexible specialisation possible by supporting, among other things, division of labour, activities like education and further education, access to public services etc. Flexible specialisation has been chosen as the focus for more detailed studies in a major project funded by the EU. One of the ideas here is that ICT must be part of the total development strategy in a region. In this context ICT is simply a necessary but not sufficient condition for the generation of economic development. This „complexification“ of policy highlights some dilemmas.

3.2 The dilemmas of national policy

State: active or passive?

In Denmark the debate about ICT was from the very beginning linked to media and culture. A media commission, analysing the importance and the consequences for the media was established in the 1980s. It pointed out clearly that ICT would mark most sectors. Again the discussion about consequences for the media especially TV was

¹¹ FUNN = The Norwegian Research and Development Network.

central. In a report from the tele-companies, the television coverage and the cabling were an important way to increase the commercial base of the companies, through an increase in the amount of traffic, and a specific plan for the cabling was presented.¹² Through the cabling of the most populated areas one killed three birds with one stone. The financing, the control over channels, and last but not least – one would get Denmark cabled with fibre optic cables – a Danish ICT Highway. A political agreement was reached. A plan for a net – a Hybridnet – consisting of cabling and radio signals, digital as well as analog transmission – was decided. Part of this agreement was 16 social experiments to be carried out in local communities (Cronberg et al. 1991). The experiment stopped – without any visible effects. And a standstill could be observed. 1994 saw a radical change in Denmark's technology policy. A fast-working two-man committee had presented a report: *The Info-society in the year 2000*, with appendices¹³, in which the authors put the information society back on the agenda. They proposed active government involvement with a view to promoting and moulding the use of the new technology and stressed the importance of the fact that no one should be excluded from access to the new technology in order to avoid ending up with a two-thirds society. They also stressed that use of the new technology should be based on Danish values – and that these values could be ensured through deliberate choices. They suggested a Danish model in which market forces were not allowed to stand alone. There were three serious risks that had to be avoided:

- the risk of the state and private companies not managing to change their work procedures sufficiently effectively and develop new ICT-based products
- the risk of increased social polarisation
- the risk of the information society developing in the direction of a “Big Brother is watching you” society.

¹²De Danske teleadministrationer (1983): Rapport om tilvejebringelse af hybridnettet. København.

¹³Dybkjær L. and Christensen: *Info Samfundet år 2000* (The Info-society in the year 2000).

The authors stressed that public sector action in particular should be directed towards ensuring some special values:

- ICT must support free access to information and exchange of information
- ICT must support democracy and the individual's right of co-determination
- ICT must contribute to personal development, partly by supporting the individual in his or her work situation and leisure hours
- ICT must open up the public sector and make it more transparent
- ICT must be used to support the weak members of society.

In each of the following three years – 1995, 1996 and 1997 – action plans and follow-up plans were prepared for the public measures. As a result of these initiatives, public institutions and the public sector have drawn on and are now implementing plans for using ICT to improve products and processes.

The Norwegian parallel to the Danish report, “Bit for bit”, has many similarities. However, in Switzerland the federal, i. e. central state is rather more passive than active in technology policy issues (Rossel 1995). It is difficult to imagine a Swiss minister proclaiming a nation wide slogan like “all Swiss children to the WWW”. But the recent mobilisation by the new push campaigns in the international context are leading to fears that Switzerland will lose its international position, i. e. work-places and productive capacities. So the central state is under pressure to decide between the traditional passive orientation, on the one hand, and a new active policy to push the new information technologies, on the other. Or is “waiting between” the better strategy because the push could become a flop?

Policy: central or focused on regions?

In Denmark the regional dimension plays only a minor, direct role in new policy plans. A number of spearhead municipalities have been designated to try out different strategies and ICT applications. However, the regional effect is mainly indirect since it is at the local level that the plans are to be realised. Through the various activities, different solutions are being developed and tested in direct interaction with the users. Among other things, this means that both suppliers and pur-

chasers of ICT solutions are developing a high level of readiness and that both electronic and social networks are being established that can react adequately to future possibilities. It also means that the regional and local public decision-makers have got ICT on the agenda and are beginning to see how they can actually use ICT to improve the conditions for development in their areas.

If we compare the visions for the regions in Norwegian policy we can see that the Telematics report of 1983 balances between uncertainty and optimism, while the policy document "Bit for Bit" of 1996 is in fact more cautious. In 1983 it was said that "the ability of telematics to reduce the significance of geographical distances will be of advantage to the regions". In 1996 the slogan is "som utkant må vi være i forkant", which in English means something like "though remote, we shall never miss the boat", in other words it is Norway itself that has been placed in the position of a region 13 years later. True enough, great emphasis had been placed on the regional dimension in 1996 too, but first and foremost in the form of securing for all citizens public benefits of good quality in terms of information, communications, education, health etc. The idea that the more remote areas are to get more than central areas has been toned down. This impression is reinforced when one reads Proposition No. 70 to the Norwegian Parliament (1995-1996) "On the discontinuance of remaining sole rights in the telematics sector".

The culture of policy in Switzerland is federalist. Mainly the policy of development and technology is focused on regions. While a nationwide coherent policy is lacking, each of the 26 cantons and of the different small regions has its own policy instruments, for instance, the cantonal offices for economic promotion, elements of new technologies within the regional concepts for development (IHG)¹⁴ and regional networks like the CIM-Centres. It is evident that this federalist pattern of policies strongly resists a nation wide push strategy of new technologies. It is typical that the last experiment to do this, the KMG-project of the PTT (the previous state enterprise for Mail and Telephones) failed (Rotach et al. 1993). It is difficult to mobilise Swiss regional resources and private initiatives by central state campaigns or strategies.

¹⁴ In Switzerland an "Act for investment to support peripheral regions" (IHG) was passed.

Pragmatic or programmatic?

In Denmark, interestingly enough, especially the plan about the Hybridnet brought the regional and local dimension into the picture. The plan excluded the least lucrative areas, that meant the periphery and the sparsely populated areas. The Ministry of the Environment reacted with a report (Planstyrelsen 1983) about the local consequences of such a policy. And it was pointed out that the suggested plan would cement the position of the periphery. Public debate and social experiments were suggested to throw light upon whether the negative effects could be avoided. When finally political compromises arrived at the establishment of a net, named the Hybridnet, means for full scale ICT experiments in local communities were set aside (Cronberg et al 1991) and 16 experiments was carried out. They never became the springboard to the information society, which more or less implicitly had been hoped for. Great expectations lay in the air. Expectation of better access to the coming infrastructure, to avoid being excluded from the coming future of ICT. Expectation of creating attention on the area. And not least expectations about stimulating industry through developing and testing new technical equipment. The attention from the period of starting up the experiments was quite different from the indifference found when they stopped. In spite of the fact that important experience was gained (Cronberg et al 1991), it was obvious that the expectations were not fulfilled. Similar experience was harvested in Norway, where the experimentation with telematic centres, or as they were later called „telecottages“, was partly implemented as a result of the Green Paper presented by the Tele Commission in 1983.¹⁵ However, this experimental strategy, was primarily followed up by more experiments, and not an easily identified strategy. Arbo (1989) discusses the growing interest in social experiments as a central method in the “ad hoc-crazy” and proposes that, as such, they are an important tool in a refeudalisation of society.

In Swiss technology policy pragmatic elements and actions are predominant in programmatic concepts and strategies. This characteristic is a further precondition for the fact that Swiss technology policy is neither systematic nor programmatic. An important source of resistance to state programmes is the enterprises of Swiss industry. The industrial culture of Switzerland is – compared with the neighbours, like

¹⁵Norges Offentlige Utredninger, “Telematikk”.

Germany, France and Austria – opposed to big state programs, for instance to promote R&D. Swiss enterprises accentuate self reliance, individual competition and rather mutual networks than participation within state-initiated programmes and networks. Therefore the Swiss federal policy risks resistance within the private leading sector of the economy, if it intends to profile technology promotion as a national programmatic issue. Pragmatic improvement of state conditions for private initiatives in technology is preferred. – This orientation is rooted in the relatively decentralised pattern of industrialisation and simultaneously in the fact that the Swiss industrial culture was not based on big complexes and heavy industries. In countries, where these types of industries were or are important, a state programme for promotion and/or pushing a technological policy is more feasible.

Protection or de-regulation?

When it comes to new information and communication technology Denmark and Norway have moved from protection to de-regulation during the 1980s and 1990s. This move has also resulted in a move from technology push strategies to market pull strategies. There is one contradiction unfavourable to a strongly profiled push policy of new technologies on the Swiss federal level: the federal state is, on the one hand, forced to protect and regulate the small business sector in the regions and agriculture against the tendency towards an open market. These protective interests are very important for the central state because they can influence nearly all policy issues in parliament and in referenda issues. One factor is quite unique, i. e. the so called ‘majority rule of cantons’. Relevant issues in referenda are only accepted if the majority of cantons vote by a majority. The small business fraction and the farmers are concentrated in the small cantons of the Alpine periphery, which decide as states independent of the population’s size. On the other hand, the Swiss central state was and is relatively “low regulated” as far as social policy is concerned. The industrial part of Swiss society, the conditions of working people in terms of social security, as well as the top sectors of industry are less regulated, than for instance in Germany, Sweden and other Scandinavian states comparable to Switzerland. Therefore, a nation-wide strategy for new technologies appears in the protective part of society, in peripheries and in lower strata, as a threat to the existential base. This is obvious since people mainly in peripheral contexts prefer core technologies

(Meier-Dallach et al 1996), which guarantee work-places instead of high tech perceived as job killers. A strong national push policy for new technologies would lead to dissent between the two parts of Swiss society, i. e. the centres and the peripheries.

Economic globalist and/or political self orientation?

Denmark and Norway adapt to the policy regime of the European Union when it comes to the innovation and diffusion of new ICT. Until now, Switzerland prefers the role of an observer mainly of the G-7 and WTO plans and strategies. A globalist orientation seems to be the most adequate for Switzerland. In contrast for instance to Austria the Swiss economy is not only horizontally connected with neighbours (according to the proximity principle) but it is more vertically and globally oriented. The market outlook is world wide and the Swiss multinationals profit from this economic universalism. The less regulated horizontal relations and connections – as on a European scale in the case of the EU – the more freedom of choice is possible on a world wide scale. The globalist option is simultaneously a private individual choice. This orientation is a challenge to innovations in technology, mainly for new communication technologies. A state programme pushing exports to global markets and mobilising for global orientation is not necessary. On the other hand, the autonomy of decision in politics remains a strong focus of orientation in most Swiss regions. The economic universalism contrasts with this political self-orientation. The federal state is again under pressure, it remains to be seen whether it will promote a push toward economic integration, which is seen as a threat to political autonomy by a majority. And why is economic integration into an international macro region like the EU necessary, if the individual economic universalism is successful on a global scale?

Straightforward or going-between?

The changes in Danish ICT policy – major attention, concrete initiatives, user involvement, passivity, renewed attention and hectic activity – must be seen in the light of the structural changes that have taken place in the eighties and nineties. The situation when experiments were carried out at the end of the eighties was very different from the situation in the middle of the nineties. That applies both to the technology and to the extent of its use in everyday life. In the experiments of the eighties, there were problems with the technology.

The user interfaces were very restricted and the communication side was limited by a lack of subscribers. In the latter period the technology has developed, so there are fewer technical problems, convertibility has increased and user interfaces have become much better.

In the understanding of the new and changed conditions a certain degree of readiness seem to be important (Storgaard 1997). Readiness develops mainly through learning by doing. Without some degree of readiness, one does not react, no matter what is said. Without readiness, one is deaf to the message. The code has to go in first. The Internet is incredibly important in this connection. It acts as a kind of catalyst for the development of readiness – and perhaps also for the development of the ability to see new potentials. Especially the growth of the Internet here in the middle of the nineties has created entirely new conditions – technological (in the form of a common network), economic, and with respect to readiness and competence.

Thus, after a break, the Danish model has begun to focus on a development that is intentionally based on user involvement and on preservation of values and standards. It is recognised that the technology can be moulded simply by developing specific methods of using it, and that this development must not be determined only by market forces. An important effect of this development process is the development of competence and readiness among the regional and local actors and decision-makers.

Denmark and Norway have both moved from a technology-push strategy to a more market-pull strategy during the last 20 years. We may therefore conclude that the two nations have moved from a more straightforward policy situation to a “go-between” situation between these contradictory positions. A review of the literature reveals that apart from some important contributions, there is no deep understanding of how information and communication technologies contribute to economic development (Snow 1988, Strover 1989). Against this background the providers of communication technology and especially the development organisations apparently find it difficult to tackle problems linked to new communication technologies in an economic development context. Looking into the Norwegian situation we may observe that development organisations like the Norwegian Directorate for Development Cooperation have the same problems that organisations working with rural development inside Norway are facing. Both the Norwegian Ministry of Local Government and several rural development agencies find it difficult to implement more overall develop-

ment strategies. Norwegian policy papers have their own rhetoric of telematics, networks and rural development. However, there are indications that this rhetoric first and foremost is a reminiscence from the strong technology push tradition that now has few supporters.

The Swiss federal state was/is in a “go-between” situation between these contradictory positions. It is evident that a strongly profiled, active national policy or a push strategy for new technologies is hardly to be found in this situation. The Swiss federal state is rather observing than acting and prefers to participate in economically and globally oriented organisations like WTO, OECD, G7. Pragmatic promotion of favourable conditions is more attractive than a top down strategy.

Against this background we shall content ourselves with stressing a challenge for further work.

4 A challenge

In regional policy we find a paradoxical situation when it comes to technology policy: the faster new technological solutions have spread, the less they have been the object of an active technology policy. Correspondingly, much of the active technology policy has concentrated on technological solutions that it has often been difficult to get the users to accept. The Internet is in fact an exception in this connection.

At the same time as it can be difficult to achieve political goals, new ICT has practically flooded the market. This schism between map and terrain points towards two central strategies for spreading technology: technology-push and market-pull. An important theoretical tradition within technology studies takes as its point of departure that those decisions that have already been taken strongly influence the room for action in the future. In this theory these are called “path-dependencies”. To put it briefly: both the possibility of participating in the decision-making process and future possibilities for alternative options are „path-dependent“. The task of enabling competition for all telecommunications services is to be completed by 1.1.1998. What are called universal services, or “Universal Service Obligation”, are to ensure basic services for all users as well as ensuring special services for some groups. Ensuring that special services are included in the general technological development may however easily become a responsibility that lies outside the operating companies. There is a clear possibility that free competition in the case of more and more telecom-

munications services will result in new localisation conditions in a few years' time in spite of the fact that policymakers are optimistic about the ability of the market to ensure equal opportunities. There are of course differences between Denmark, Norway and Switzerland when it comes to the rhetoric of policy papers, however, there is a strong convergence when it comes to actual policy more and more influenced by international "trends" and commitments. On this point irreversible situations can easily be produced. The problem of irreversible technological solutions thus illustrates the need for an active policy in relation to technological development.

We can put all this in another way: rapid technological development, which has often brought about irreversible technological solutions, has in many ways made apparent the need for constructive technology assessment and likewise the task of safeguarding social and societal criteria in the process of designing and introducing new technological solutions. Important aspects of constructive technology assessment are revealed by the way in which we answer the following three questions (Callon 1995):

(a) How are we to ensure that all the players who are involved, including non-specialists and the most deprived, are heard when it comes to the various technological choices that are made – also when it comes to the moment of the final decisions?

(b) How can we keep open important technological options so that in the future as well we have an acceptable amount of room for action when it comes to different designs of technology?

(c) How can we avoid the creation of irreversible situations that exclude technological options in the future simply because they received support at a given point in time?

Evaluations could learn from the past revolutions reshaping space and time. The most visible was the "planimetric" revolution. Step by step natural and populated landscapes became crossed, "sub-wayed", overflowed, surrounded. The substantial elements of space are no longer its substance, the landscapes, but the roads, connections, mobility schedules.¹⁶ Terms like modal split, inter-operability of traffic systems are the crucial concepts. The landscape became "une quantité négligeable" of space. Substantial space has been transformed into a metric space. The traffic system de-evaluated the landscapes to coordinates instead of basic frames for the life of natural and human existence.

The “chronometric” revolution was a more silent and long-term process. The society transformed natural time step by step into a metric time. The life became a set of years, the spring a set of numbered weeks, the day a succession of agenda obligations dictated by the digital swatch. The time became an abstraction of life patterns instead of a frame for shaping the understanding and sense of activities. Substantial time has been fragmented into metric time.¹⁷

The recent revolution we call “electronometric”. The first evaluations are available, starting or planned. But it is evident that the evaluators are predominantly users of ICT and fascinated by the informational and global society. Although the fact that compared with previous revolutions a lot of money is being invested in evaluations and technology assessment, not the end but the repetition of the story will be more probable. This should make evaluation more sensitive, critical and controversial at the beginning of the implementation. Including non-users, non-loyal users, rebels and delayed people in evaluations could provide more substantial knowledge about the informational society. The negative consequences and irreversible situations of chronometric and of planimetric evolutions are obvious today to many groups suffering from stress.

Some critical writers like Neil Postman and others more or less choose to reject modern ICT and promote “back to basics”. Technological progress has been made responsible for all the evils in modern society. In the field of policy this is hardly a fruitful analysis, either in the urban or rural areas. However, it is necessary to draw attention to a trend which is becoming more and more pronounced in the system of behaviour, namely the trend towards individualism. Not only the mass media, but also ICT, are part of a transition from one type of society to another, which underlies and comprehends all the individual changes in behaviour patterns. When these patterns evolve quite differently among different user-groups, enormous information and communication gaps also develop. These information and communication gaps

¹⁶ The most profiled interpretation of this revolution is found in: Virilio 1993.

¹⁷ The chronometric revolution correlating with the planimetric changes is described in several contributions in: Zoll 1988.

are therefore not only a reflection of different access to important resources, but also an important indicator of a different social involvement. Social science has therefore an important role in understanding these processes. Three areas of research should be given priority:

Design and application of new ICT This area can provide greater insight into the user situation, and it will be possible to influence and design better programmes through interdisciplinary competence. In addition this will make it possible to achieve the effect of creating new activity based on the results of such work. The active contribution of the users is important, both factually and normatively. For instance, studies may be made of how users apply new technology in other ways than the original developers had imagined.

The role of communication technology in public space The development of communication technology raises a number of ethical, legal and political questions about the manner in which this technology should be managed and used in "public space". These changes may also be studied in a historical light. This area takes up the possibilities of, the limitations on and the desirability of political control of the development of new ICT.

Changes in patterns of symbols and collaborative behaviour The integration of text, sound and image, and interactivity in global networks is changing our systems of communication and symbols and influencing patterns of collaborative behaviour. This applies to all forms of communication in which new ICT is being used. This all gives rise to a number of problem complexes within the fields of the humanities, the social sciences, education and law.

These three areas of research are of course not limited to specific regional or rural problems. However, we choose to underline these three more general areas of concern as ICT is a global technology with no intrinsic possibilities for rural or the urban parts of the world. Different kinds of information-gaps are primarily the result of deliberate actions and not technological development as such.

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