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Information Policy in Europe: The (Research) Political View

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The Information Society

There is no doubt that Europe is heading now very quickly towards the "information society". A decade ago, the term was certainly already phrased, but it didn't have the meaning and obvious closeness to everybody that it has today. The past few years have seen quite a number of developments giving realistic visions as to what the rapidly evolving technologies can do for society. In the US, Vice-president Al Gore has made "information superhighways" a political theme broadly discussed. Already in 1991, when he was still a senator, he pushed strongly for action concerning what was then called the NREN - the National Research and Educational Network. This was very much based on earlier initiatives in the States, where public money - e.g. from the National Science Foundation - had been put into an electronic network for the universities and research laboratories, and many tests and trials carried out. Since then, the vision has become that of a National Information Infrastructure (the NII). This has called many press comments, describing the vision of a society where homes, offices, schools, hospitals and research workers are all in easy communication through electronic super-highways. But at the same describing the realism of a programme leaving it to competitive private enterprise to find the funds to undertake the operational work.

The US is already well on its way, then - with the universities and research laboratories and libraries on the Internet, and many new initiatives on the private sector, e.g. as illustrated by the new California service called Main Street, which features news and entertainment, education, financial information and shopping, allowing also the interactive television browsing of electronic encyclopedias by 6-year old Max in California, one of the examples described recently in American newspapers.

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The White Paper

So, where does Europe stand? Last year in December, the EU published a report, the "Delors White Paper". The official title of the paper is "Growth, Competitiveness, Employment - The Challenges and Ways Forward into the 21st Century". Being mainly concerned with the present high rate of unemployment in Europe, its points to the potential of information society to improve on this. Also, follow-up actions are described, to which I shall later return.

In the White Paper, the information society is described with the following "key words": multimedia will revolutionize society in a way comparable to the first industrical revolution. It's already here, but the growth is impressive. TV channels flourish and multiply, teleworking is becoming a realistic alternative to transporting people to a workplace, big companies improve their competitiveness by efficient, paperless communication, health care is expected to take a major leap with videocommunication, scientists of course already interwork via the networks, e.g. by accessing databases all over the world.

The Single Market in Europe aims at achieving economies of scale and set free the dynamics and creativity of competition. This also entails decentralization. The move towards decentralization, supported by the new technologies, is the first serious step on the road to the veritable information society. The corollary to decentralization is information sharing and communication. Numerous decisions can be decentralized, when sufficient information is at hand at all levels - this is important for companies as well as educational institutions when they need to be dynamic - changing with an ever changing world.

To distribute information, highways are needed. Society already has motorways for transporting people and goods, and libraries to carry knowledge (or how?). The information society too will have highways, i.e. broadband networks through which a large variety of information will circulate rapidly, carriers, i.e. services facilitating access to information (databases), information transmission (electronic mail) and the exchange of information (e.g. interactive video), and goods, i.e. new applications for work, health-care, teaching and leisure.

Europe's telephone networks are already international, but the digital networks for carrying information in the form of text, data or images are mainly being developed on a purely national basis. Hence it is actually important to interconnect the various networks in different countries and to make the various services interoperable.

The White Paper presents the following views on what are the necessary services, to ensure diversification on a given infrastructure network:

- electronic images: interactive video services will revolutionize working methods, training and leisure activities. The objective is to

ensure Europe-wide interoperability of these new "a la carte" services by 1997

- electronic access to information: this will entail bringing together information (administrative, scientific, cultural or other) in databases to which all users in the Community should have access
- electronic mail: the various commercial electronic document transmission services must be developed and made interoperabale.

Note here the stressing of the importance of not dividing society into the haves and the have-nots. This is one place where I should think libraries will have a possibly very important role. Finally, electronic mail is, not surprisingly, seen as important and development of EDI services with it.

Hence, the White Paper sees four priority applications:

- Teleworking, where projects are already under way in the Member States and the Community should support pilot programmes in the establishment of a trans-frontier network for the management of human resources
- Teletraining, with the objective of establishing a network linking over 100 universites and colleges by 1996 and giving them all access to common training modules
- Telemedicine, where multimedia links should be established by the year 2000 between the main cancer research centres, bone marrow banks and social security centres (among others, one may think!)
- Links between administrations: to improve the operation of the internal market (taxation, customs, statistics) it is essential to facilitate the interchange of data between administrations and to provide companies and the public with easier access to this information.

The White Paper suggests an investment scheme summing up to 67 billion ecus. I am not quite sure where the money is supposed to come from, but there is no doubt that a large investment from the private sector is expected, exactly in the same spirit as in the Gore vision.

Information superhighways

You will have noted by now that the terms "highway" and "networks" come up ever so often. Out of these emerge the new term "information superhighway". I don't think anyone has really defined what is meant exactly by this term, but

already examples and illustrations have been mentioned. Obviously, the term itself is appealing - it gives you an immediate glimpse of possibilities where information flows as easily as traffic, and then most of us here probably have in the back of our heads that it is something like the Internet. No doubt, politicians have been keen to find a word that would be suggestive to everybody - and perhaps it's not by chance that Al Gore is the son of the US Senator who was a driving force behind the US Interstate Motorway system ...

Anyway, we have the term, and we may foresee that it develops. It is probably highly speculative to think of how this is going to happen, but here is a bid that was given in April at the HPCN (High Performance Computing and Networking) conference in Munich by David Williams from CERN, to whom I owe quite a few quotations:

> **Terminology - From highway to I-way**
>
> Compression is all. Allan Metcalf, executive secretary of the American Dialect Society, reports the group's choice for the phrase that best typified 1993 was information superhighway.
>
> This expression is, of course, a mouthful, taking a full second to get out. In a few months, it is sure to be called the info-highway, since both rmation and super are expendable.
>
> Then, in a few years, as we all look back fondly at antiquated fibre optics, it will be the I-way (or the "Infobahn").
>
> *From William Safire (IHT - 21 February 1994)*

I think it is obviously true that information superhighway is far too long an expression, and I guess we have already from the beginning seen the term without the "super" - just information highways. Well, who knows, maybe it will actually end with the I-way or Infobahn? There could easily be several national versions of this. Most probably, all languages will also shortly be spoken on the network, but again there is hardly any doubt that many non-English speaking countries will experience that more information will flow in English than in their own languages.

The Internet

I think I am right in assuming that most of us here will actually think of the Internet as a prototype information highway. I believe the research libraries in Europe are well connected to their national research networks, which in turn are part of the global Internet.

At any rate, I can state without the slightest flicker of doubt that the research

community as such in Europe certainly associates Internet with Information Highways. So: what is the Internet? Just to be sure, let me repeat to you some of the basic facts about the network, as described by the Internet Society in 1993. From a historic background in the Military and Research Sectors, the Internet has expanded rapidly to all sectors of society, and a 1993-cartoon from the *New Yorker* with the text "On the Internet, nobody knows you're a dog" illustrated that the Internet is now a popular and well-known utility - and at the same time, this cartoon will also soon be a historic relict, as certainly multimedia will come to the Internet and send pictures and sound along.

"On the Internet, nobody knows you're a dog."

You are probably all aware that the Internet has experienced an astounding growth during the past few years. Every year, there has been a doubling of the number of users on the network.

The exponential growth is literally universal, the Internet connecting today 127 countries and 20 million users. If it goes on, the entire population of the world will be on the Internet by the year 2001. Now, as we all know, predictions are hard to make, and maybe this one seems too unrealisctic. But I have no doubt that the entire research community of Europe will be on the net in a few years time - I even think that most of them are there already. And other large communities if you can believe the Danish newspapers, which have been full of items involving the Internet. Back home at UNI.C - the Danish Computing Centre for Research and Education - we are now offering an Internet Service package with enables people with little computer-experience to use the network, and this is a huge success. Lots of people have read about it, and the interest in discussion groups, electronic mail service, database searches etc. is overwhelming.

So what are the barriers for creating the universal info-highway? Regulations, to put it short. In Europe, the national telecommunications operators still have monopolies in most countries, and on top of that there are other regulatory issues that pose hard questions, e.g. the questions concerning Intellectual Property Rights (IPR). The technology is not the problem.

The Bangemann Report - a market driven approach

The US seems to be tackling these problems at a faster rate than Europe - but a recent report from the High Level Group on the Information Society formed in December 1993 - the so called Bangemann group - suggests that Europe should do as the States, and do it fast. The main problem is probably "to get the European act together", as the Americans would put it. Here Europe does not have a proven record at all comparable to that of the States. Let us hope that we have many other strong points that the Americans don't have ... such as basically well-functioning educational systems, ensuring that only very few young people are real losers at an early age. Europe depends, no doubt, on the overall quality of its work-force, and the basis for this is good basic training and then, of course, continuing education.

The Bangemann Group has just recently published its report, "Europe and the Global Information Society". In summary, the report has the following suggestions: action should be taken on

- Evolving the regulatory domain: accelerating the liberalisation
- Interconnection of networks and interoperability of services and applications should be primary Union objectives. The European

standardisation process should be reviewed

- Long distance and leased line tariffs should come down
- Public awareness should be promoted
- Worldwide dimension, opening up Europe marketwise
- Intellectual property rights should be protected
- Privacy should be ensured through a Directive
- Security work and electronic and legal protection work should be accelerated
- Europe must avoid divergent national legislation on media ownership
- Competition is a key element (we are getting "Americanized")
- Networks: priority should be given to the extension of the availability of EURO-ISDN and reduction of tariffs

The Council should support the implementation of the European Broadband Infrastructure and secure its interconnectivity with the whole of European Telecom, cable television and satellite networks.

- Basic services: the provision and use of basic services, including electronic mail, file transfer, video services should be promoted by urgent and coherent action at both the European and the Member state level

The Commission should **initiate the creation of a "European Basic Services Forum"** to accelerate the availability of unified standards for basic services.

- Applications: 10 initiatives are suggested in the areas of

  Teleworking

  Distance learning

  University and research networks

  Telematic services fo SMEs

  Road traffic management

  Air traffic control

  Health care networks

  Electronic tendering

  Trans-European public administration network

  City information highways

As for economy, the report states the following

- Financing: this should be entrusted to the private sector and the market forces
- Follow-up: the formation of a (sub-) Council of Ministers dedicated to the information society is suggested, and a similar action from the Commission.

  A board should be formed to work on the framework for implementing the information society and promote public awareness of its opportunities and challenges. This Board should report regularly to the institutions of the Union on progress made on the implementation of the recommendations of the Bangemann report.

Here, I will focus on the recommendation concerning Application 3, the development of a trans-European advanced network with high bandwidth carrying multimedia-services, linking universities and research centres across Europe, with open access to their libraries.

The description of this application focuses on the importance of linking the public and the private research institutions and companies, and envisages also a trans-European public library network.

It sets a goal of linking 30% of the European universities and research centres through advanced communications networks by 1997. By advanced, I assume the report means at least 34 Mbps connections, and with lots of multimedia on, too. It also seems implicit that not only the physical links and possibilities should be there, but also links in research programmes content and possibly even in educational programmes.

The Report explicitly states that provided the Telecom operators lower their prices as a natural consequence to the other steps taken, universities, research centres and libraries should be able to pay for the network. I do believe this does imply that more funding must be found for the public institutions here in their respective ministries of their home countries - even though cost-effective prices for high speed networking will indeed be a major step on the road. If it happens as quickly as supposed here ...

European Research Networks

All the European Union countries - and some more - have national research networks. So why does the Bangemann report suggest the formation of a network? I believe it has to do with the following major extra requirements:

The need for a European initiative for research networks both nationally and across the European borders, with higher speeds than today's networks:

- 34 Mbps today
- 155 Mbps next year
- Gigabits by the year 2000

and

- the need for research networks to stretch out to all players:
  universities
  national or regional research centres
  R&D sections of private firms
  research libraries
  SMEs needing the R&D-input

These wishes/demands have already been widely discussed for some years both at the national and the European level, and some countries have indeed started operating national networks or at least stretches of the network - at 34 Mbps. This is true e.g. for the Dutch SURFnet, for the UK's Super JANET (JANET: Joint Academic Network), the Norwegian UNINETT and the Finnish FUNET - just to mention a few. There have also been very interesting projects carried out in several other countries. These higher speeds are relevant for numerous applications in the research communities, including as varied needs as those of supercomputer users, physicists wanting to have direct access to large accelerators from remote places, groups of researchers wanting to collaborate through multimedia-usage, etc. In connection with the USD National Research and Education Network it was estimated that applications like multimedia database access and image transfers would give needs for 10-1000 Mbps, and ot should be noted that this is bursty traffic. But PTO rates in Europe have as yet been prohibitive for the upgrade of the majority of lines to this level, and this in turn means that no researches have international access to the facilities at such high speeds yet.

With national research networks typically connecting the universities, some discussions have taken place as to whether other public research institutions, libraries and private R&D departments should also be on the net. This whole discussion of Acceptable Usage Policy (AUP) has been going on for quite a while, with one basic problem being that of who pays for the network. If a network is paid for e.g. by the Ministry of Education, should institutions not belonging to this Ministry be on the net? If the EU should be willing to subsidize a pan-European link, can private firms be on the net? Etc.

In my opinion the Bangemann Report takes the only reasonable approach in this matter. A research network is only interesting if all actors are connected through it, and the financial questions must then be resolved.

The research networks do indeed seem to become increasingly popular, and being linked to the Internet, they do today offer connections to many different actors all over the world. They also offer the Internet services, like

- the basics:
  remote computer use
  transfer of files
  email
- mailing lists and Bulletin Board Services
  automated mailing lists
  news distribution
- interactive information delivery services
  Gopher
  World Wide Web
- Directory services
  WHOIS Netfind
  X.500
- Indexing services
  Archie Veronica
  WAIS
  online library catalogues
- Active agents
  knowbots

So the services are there, but the speeds still need to come up, at least if real collaboration, also at the educational level, is to go on in the future. This may still be a problem at the national level in many countries, but it certainly is an even bigger problem when you think about international connections. Only recently has a 2 Mbps European backbone been established - the EuropaNet - but it is still true that many stretches and applications have to make do with 64 kbps or even less. This is the real weakness of Europe as compared to the US - that links crossing frontiers are still far too expensive, and the collaboration between the national PTOs still lacking in many ways.

At the organizational level, it's fair to say that a lot of progress has been made recently. The "umbrella organisation" of the European national networks RARE (Reseaux Associées pour la Recherche Européenne) has worked quite hard over

the past years to establish operational structures connecting the different networks, and this has lead to the creation of the organisation DANTE (Delivery of Advanced Network Technology to Europe) as a Limited Company. Later this year we can expect to see the merger of RARE with one of the first international networks, EARN, originally an IBM invention, but certainly an important step in the international collaboration in this area. I think there should be an initiative here for collaboration between LIBER and the networking organisations.

The Fourth Framework Programme

In the fourth framework programme, the EU Commission seems to be taking some important steps to improve the situation for research networks. Still, it is crucial that the tariffs come down soon, and that cooperation between the Telecom operators and the research networks flourish. At the moment, a Europe wide collaborative project is being undertaken - divided up into smaller projects - under the umbrella of the socalled ATM-trial. Here the research community tries out a new and fascinating technology for high speed connections, the socalled Asynchronous Transfer Mode (ATM).

But the ATM-trial is, I believe, only supposed to last until mid-1995, and this tis too short for most of the interesting prospects now coming up in the fourth Framework programme. Several action lines (proposed or already adopted) in the Fourth Framework Programme deal with networks. This is true for the HPCN-action line in the IT-programme under DG III, it is true of the ACTS programme under DG XIII, and of the Telematics Applications Programme under DG XIII.

The Telematics Applications Programme is divided into four areas, one of which is Telematics for Knowledge. This comprises 3 different sectors: research (networks), education & training and libraries. I find that this area definition has as lot of good sense to it, since indeed there can be no doubt that the sectors can interact in a positive way. This should, among other things, be taken care of in the fourth area of the programme, which is devoted to horizontal actions between sectors and areas.

Grand challenges for the library sector

I think the library sector is indeed centrally placed in the trio of research, education and library access. Being the most important supplier of information to other sectors, it can become the central actor in a development where new tools will emerge which will allow information of all kinds to be accessed and it is a challenging task for the libraries to create the necessary structure in the global information system which will develop during the coming years.

In the important task of bridging the gap between the "haves" of new

information and communications technology and the potential "have-nots", I see a new and developing role also for the entire library sector. It is natural to envisage the research libraries to be at the leading edge of these technological developments.

With inevitable changes coming up in the traditional information chain

Author -> publisher -> vendor -> librarian -> reader

I believe the libraries stand to gain. There is a lot of information management to be taken care of in the new, electronic chains, and albeit researchers and other interest groups will certainly to some degree be interested in doing some of this work, there are huge challenges waiting. I wish you all good luck with infoservices, multimedia databases, and all the other new and wonderful possibilities that can ensure faster information retrieval regardless of geographical boundaries. I think in this connection libraries and research networks can complement each other very well, and new partnerships should come up as Europe hopefully now takes major initiatives on the road to the information society. I am sure this meeting will promote progress in these new exciting areas, and I think LIBER has an important role to play in this context in the future.