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Distributing Resources Through Network Utilisation

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Abstract

In general, networking is seen as a means to connect people by establishing technical communication links. Documents and other data can thus be sent back and forth among individuals and groups. Modern networking services, however, allow us to distribute resources, services, and products. The indispensable intertwinement of connecting sites and distributing resources and goods creates new challenges and requires new concepts to properly handle the problems at hand. The design and utilisation of networks reflects to a large extent the political culture we live in.

Keywords: Networking, Teleoperation, Distributed Computing, Information Policy, Standardization, Social Control

1. INTRODUCTION

The line of reasoning and the arguments presented here reflect by and large the contributions and viewpoints of an international and interdisciplinary group of practitioners and researchers who come together to discuss the risks and opportunities of networking with special emphasis on the notion of "information policy". However, due to the heterogeneity of the concepts and problems discussed at this workshop it is impossible to provide the reader with a coherent set of

statements that properly reflect individual contributions as well as the discussion as such. Hence, the following should be taken as a personal account of what has inspired me.

2. Networks are a different

A recurring theme of the workshop was the question whether or to what extent the development and use of computer-based networks differs from the development and use of other computer-based artefacts. The answer is largely dependent on what aspects of networking are considered to be of primary importance.

A tentative list of viewpoints highlighting different aspects comprises seeing networking as:

- building technical links to transmit data,
- a means to connect people,
- providing remote access to resources,
- offering special services (electronic mail, etc.),
- establishing an information market,
- teleoperation, or
- televirtuality (meeting in a virtual space).

It turns out that there is no precise and clear-cut definition that comprises all relevant aspects of networks. Sometimes a specific feature such as remote access to a database may be of primary importance whereas under other circumstances networking may be identified with the ability to send electronic mail. It also depends on the specific perspective we adopt, whether we are interested in the hardware infrastructure, or whether we talk about services such as mail boxes and bulletin boards. In addition, some services may only be available on request and for a limited time whereas others may be constantly available.

By establishing networks, the difference between providing services and delivering goods may vanish. Sending a written message (communication service), or accessing software from a remote server (delivery of a product) does not differ with respect to the technical means to accomplish it. That this creates distinct new opportunities becomes even more apparent if we compare networking with the traditional postal services. Sending a letter by snail mail or by electronic mail is still somewhat comparable. Providing remote access, however, cannot be accomplished by any means provided by public post offices.

Finally, the notions of sender and receiver may no longer have their traditional meaning, especially if we consider the potentials inherent to the use of distributed databases, teleoperation, or televirtuality.

To conclude, the combination of technical infrastructure, specific services and the ability to remotely access documents and objects is unique to computer-based networks. It creates a new layer of complexity insofar as the combination of different services may go beyond what can be accomplished by any of the local services. Many networking activities require a combination of means each of which may be provided by different people, companies, or government agencies. This, in turn, creates the need to socially organise the development and utilisation of networks such that cost/benefit trade-offs are maintained as well as the balance of power

among various interest groups and individuals. As a consequence, networking is very closely tied to the political culture of our society.

3. Networking policies

The fact that networks provide an inter-personal, inter-organisational or inter-governmental infrastructure creates new demands for the social (political) shaping of technology. For instance, technical frameworks and standards have to be developed to effectively use networking technology. Standardisation can reduce the cost of utilising network services but require collective actions which may be difficult to establish. In addition, the trade-off between internal and external costs, i.e. what an individual company has to invest as compared to the overall costs of establishing and maintaining the network structure, may be different depending on factors such as the size of a company or institution, market forces, the actual level of technological infrastructure, etc.

The same problem occurs with respect to individual and governmental or organisational interests. Within the health care sector for instance, the individual persons may have a strong interest to keep their patients records as private as possible, i.e. not to store any data in distributed databases or circulate them around between various institutions and companies. On the other side, the health insurance companies and the hospital administrations may be interested in the most effective way of exchanging data. Furthermore, physicists and researchers may be interested in collecting whole sets of patient data to support diagnostics and research. And finally, the government may be interested in collecting large sets of statistical data in order to be able to take preventive measures if needed. These partially conflicting, partially overlapping demands create partially conflicting and partially overlapping requirements. To resolve these difficulties is a tedious social process and can probably only be accomplished to a limited extent.

A crucial question then is how to socially organise these processes, because individuals and organisations which are connected to the network, or whose data are transferred through the network, do not form a coherent group with common interests.

One way to cope with this new challenge could be to look at urban planning processes in order to gain a better understanding of how to organise development processes where private, organisational and public (inter-organisational) interests and demands interfere with each other. However, if a closer look at current practices in urban development projects does not necessarily support an optimistic view, it may reveal a lot of useful experiences that can be of help in the design of computer-based networks.

4. Conclusion

Networks are a specific kind of computer-based artefacts. Usually, a network ties together different persons, agents or organisations whereby none of them may own the network in the same way as one can own or buy a software package or a piece of hardware equipment. There may be, of course, a single person, institution or governmental agency who owns the technical infrastructure, provides different networking services, or controls the exchange of data or whatever else may be

accomplished with the network. Except for some small private local area networks that are not connected to the outside world, a network is not internal to a single owner or institution. In a more general way it can be said that networks are rather a public kind of artefact than a private one.

Networks may serve a variety of purposes. They can be used to send messages around, to perform teleoperation tasks, to allow for remote access to objects and functions, to share resources (distributed computing), or to provide a variety of services such as mailboxes, bulletin boards, etc. As a consequence, networks cannot be implemented and utilised without defining standards (protocols) and conventions regulating who is allowed to do what and how this can be accomplished. In this sense, networks - more than many other computer-based artefacts - are physical embodiments of social norms and values. Conversely, the design of networks requires us to take extra measures to ensure that

- means to secure privacy and data integrity are provided,
- social norms and values are made explicit, and that
- the people affected by the network can participate in the design and control of the network in the most effective manner.

If I were to define the new quality of computer-based networks, it could be said that the distribution of social and technical resources is of primary importance, not the plain idea of connecting people and institutions. The distribution of resources, however, is - no matter by what technical means it is accomplished - an inherently political affair. Thus, to the extent networks embody social policies they must be subject to democratic control and development.