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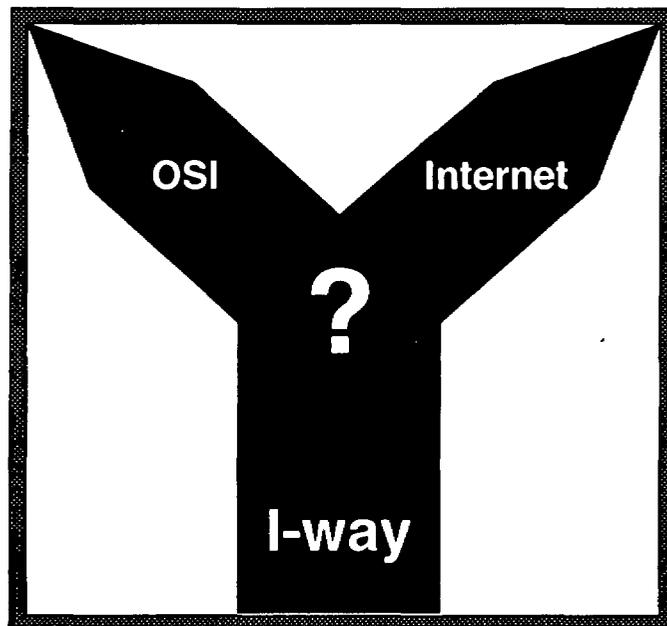


Directorate General for Research

WORKING PAPERS

EUROPEAN INFORMATION HIGHWAYS

WHICH STANDARDS ?



E c o n o m i c S e r i e s

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'For all their newfound enthusiasm for the Infobahn, unless something radical changes in the next few years, European-based companies aren't going to be riding the Information Highway:

*they'll be part of the pavement - run over in their own backyards by companies with American and Japanese license plates. An era of European techno-sclerosis could follow, with serious long-term effects on Europe's economies.'*¹

'Is there really no harm in dwelling on European backwardness when the Old Continent is overflowing with universally acknowledged achievements, projects and expertise? (..)

*By allowing the other side to choose the playing field, the European Union is obliged to leave everything to their initiative, to move forward at the pace they impose, to play on unequal terms and, ultimately, to retreat on other fronts.'*²

¹ in *Newsweek*, 31 October 1994, 'Lost on the Infobahn?'

² in *Le Monde diplomatique*, November 1994, 'Qui tirera profit des autoroutes de l'information?' (Who will profit from the information highways?)

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Preface

One of the central priorities of the European Union is to develop a common European information area which will be embedded in the global information infrastructure. It is in the interest of Europe, as the world's largest trading bloc, with its diversity of cultures and its pluralism, to have an information infrastructure open to the world.

The Commission's vision of such an infrastructure was first presented in the December 1993 White Paper on 'Growth, Competitiveness and Employment'.¹ That vision was later taken up in the Bangemann Report on 'Europe and the Global Information Society',² presented to the European Council of Corfu in June 1994, and in the Action Plan³ issued by the Commission in July 1994.

The role of Information Technology (IT) standards is one of the least understood and least publicized items in the discussion about the information society. Although these standards are of a technical specialist nature, their choice and effects are highly political. They determine how we will communicate electronically in Europe and globally; who will communicate and at what cost (universal access, freedom to communicate); the European and national procurement policies for IT equipment, software and services; and the competitiveness of most sectors of economic activity dealing with information as a strategic resource.

Standards offer the guarantee of global electronic systems interconnection, to the benefit of the media that are used as a powerful means of communication and a tool of international trade.

The present report analyses the political issues surrounding global information network standards, i.e. the strategic choice between standards and protocols developed in the framework of international and European standardization or *de facto* market-tested standards in the Internet.

¹ Available on World-Wide-Web: <http://www.echo.lu/en/wpaper/contents.html>.

² <http://www.earn.net/EC/bangemann.html>.

³ COM (94) 347 final, <http://www.echo.lu/en/com-asc.html>.

This choice is imminent because the progress in technology combined with liberalization of information infrastructures has provided critical mass for the explosion of global multi-media information services.

Since the technologies of data-processing, telecommunications and broadcasting media are converging, IT standardization policies not only determine how information content is transmitted, or how open or interconnected networks are. These policies are also inextricably associated with issues like the suitability of standards for operation in a multilingual environment, and the control and security of information and data privacy.

IT standardization therefore touches upon the very sensitive areas of cultural identity, cultural diversity and national security.

Luxembourg, 24 January 1995

Summary

Since the American Administration dropped its plans to provide exclusive public support for the international standardization process in IT (Information Technologies), in favour of standards used for the Internet, the future of OSI (Open Systems Interconnection) standards has become highly uncertain. The consequences for the rest of the world could be particularly great in view of the size and commercial strength of the American IT market.

Europeans have good reason to believe that this decision has called into question their own standardization procedure, which closely follows that used for OSI.

Imminent international recognition of the IPS (Internet Protocol Suite) is likely to force a new look at European legislation on public procurement. In addition, it will bring out into the open competition between two sets of standards which are not, in theory, on the same level. An assessment of their different objectives and possible (in)compatibilities does not appear to indicate that the Open Systems philosophy should be abandoned in the European Union. However, the commercial reasons underlying the rapid expansion of the IPS and, in particular, the formidable support from which the latter has benefited over many years thanks to the success of the Internet and applications on the World-Wide-Web leave little doubt as to the outcome of this forced co-existence.

From a comparison of the history of the Internet and the progressive development of the OSI, it must be admitted that the European long-term guidelines which have been predominant hitherto seemed to suit the particular political and cultural character of the Old Continent. The proliferation of European 'para-standardization' groups and bodies, the promotion of standards by public procurement, and the moves to overcome the slowness of the international negotiations bear witness to the determination with which European standardization policy has been implemented. The constant concern of the European Commission has been maximum involvement of as many players as possible in an open and consensual process, in accordance with the spirit of OSI.

Is it appropriate now to abandon this approach in response to the impatience shown by the IT and Telecommunications markets? Should the growth of the Internet be watched passively without any concern about the implications of its full commercial use? Is there still time for, or any point in, encouraging alternative international information networks which use standards chosen and developed by the international community?

These issues are not only urgent; they raise fundamental questions concerning Europe's technological and socio-cultural future, especially in the light of the *information highways*. The choice of standards in these sectors will have a major impact on the technology and types of information distributed on the electronic networks.

If US trade policy is conceded advantages in an area as strategic as the information industry, market forces could well become distorted. Furthermore, is the market the only mechanism to be relied on when it comes to responding to the particular needs of Europe with regard to 'contentware' and information infrastructure?

It is evident that standards in the area of information are so important that they warrant a definite decision in favour of:

- a decidedly more affirmative commercial strategy on the part of the European Union, in order to liberate market forces which are the principal motivator of innovation and finance - as the Bangemann report proposes;
- a simultaneous reflection on the most appropriate standards for Europe's specific characteristics: despite the commercial pressures, it is essential to avoid hasty decisions, which may be irreversible, regarding the future implied by Europe's entry into the '*new age of the techno-industrial system*'.¹

¹ in *I&T Magazine*, Spring 1994, 'Transeuropean Information Networks', G. Santucci, DG XIII of the European Commission.

AUTOROUTES EUROPÉENNES DE L'INFORMATION VERS QUELLES NORMES?

Avant-propos

L'une des principales priorités de l'Union européenne est de développer un espace européen commun de l'information, construit à partir d'une infrastructure globale de l'information. C'est dans l'intérêt de l'Europe, première puissance commerciale de la planète, riche d'une grande diversité de cultures et soucieuse de préserver son pluralisme, de disposer d'une infrastructure de l'information mondialement ouverte.

La perception que la Commission européenne a d'un tel ensemble fut présentée pour la première fois en décembre 1993, dans le Livre blanc sur 'la croissance, la compétitivité et l'emploi'.¹ Cette vision fut ensuite reprise dans le rapport sur 'L'Europe et la société de l'information planétaire'² du Groupe de haut niveau sur la société de l'information, placé sous l'égide du commissaire européen M. Bangemann et présenté au Sommet de Corfou en juin 1994, ainsi que dans le Plan d'action³ de la Commission 'Vers la société de l'information en Europe', présenté en juillet.

Le rôle des normes dans les technologies de l'information (TI) figure parmi les aspects les plus méconnus et les moins révélés dans les débats sur la société de l'information.

Bien que ces normes soient de nature technique et relèvent de spécialistes en la matière, leurs choix et leurs effets sont hautement politiques. Elles déterminent en effet la manière dont seront assurées les communications électroniques, en Europe et dans le monde; l'étendue du public en mesure de communiquer, et à quel coût (service universel, liberté de communiquer); les politiques nationales et européennes concernant les marchés publics des équipements, services et logiciels des TI; et la compétitivité de la plupart des secteurs de l'activité économique qui traitent de l'information comme d'une ressource stratégique.

¹ Disponible sur le World-Wide-Web: <http://www.echo.lu/en/wpaper/contents.html>.

² [HTTP://www.earn.net/EC/bangemann.html](http://www.earn.net/EC/bangemann.html).

³ COM (94) 347 final, <http://www.echo.lu/en/com-asc.html>.

Les normes offrent l'assurance d'une connexion des différents systèmes électroniques sur l'ensemble de la planète, au bénéfice des différents média qui sont utilisés comme un instrument puissant de communication et un outil du commerce international.

Le présent rapport analyse les enjeux politiques relatifs aux normes utilisées pour les réseaux d'information de la planète, c'est à dire le choix stratégique à effectuer entre, d'un côté, les normes et protocoles développés dans le cadre institutionnel international et européen et, d'un autre côté, les standards *de facto*, promus par le marché et utilisés pour Internet.

Ce choix doit être imminent, car le progrès technologique combiné aux effets de la libéralisation des infrastructures d'information a déjà permis d'atteindre une masse critique favorable à la floraison de services globaux d'information multimédia.

Etant donnée la convergence des technologies qui assurent le traitement de l'information (informatique), les télécommunications et la radiodiffusion, les politiques de normalisation dans le domaine des TI ne déterminent pas seulement la manière dont l'information est transmise ou les réseaux interconnectés. Ces politiques doivent aussi, inévitablement, s'attacher à des problèmes telles que l'aptitude des normes à opérer dans un environnement multiculturel et multilingue, ou le contrôle, la sécurité de l'information et la protection des données personnelles.

C'est la raison pour laquelle, dans le secteur des TI, les normes sont inextricablement liées aux questions très sensibles de l'identité culturelle, de la diversité culturelle, de la sécurité nationale.

Luxembourg, le 24 janvier 1995

Résumé

Depuis que le gouvernement fédéral américain a envisagé de ne plus apporter un soutien public exclusif au processus international de normalisation dans les TI (technologies de l'information), au profit des standards utilisés par Internet, l'avenir des normes OSI (Open Systems Interconnexion) est devenu particulièrement incertain. Les conséquences pourraient être très importantes pour le reste du monde compte tenu de la taille et du pouvoir d'influence commerciale du marché américain des TI.

Les Européens ont de bonnes raisons de croire qu'une telle décision remet fondamentalement en cause leur propre stratégie normative, qui s'inspire étroitement de celle adoptée pour l'OSI.

La reconnaissance internationale du protocole Internet IPS (Internet Protocol Suite), sur le point d'aboutir, risque de compromettre la politique européenne des marchés publics. Elle va en outre officialiser la mise en concurrence de deux ensembles normatifs qui ne sont, théoriquement, pas sur le même plan. Une évaluation des différents objectifs et (in)compatibilités possibles entre ces deux ensembles ne paraît pas justifier l'abandon de la philosophie des Systèmes Ouverts. Pourtant, la politique commerciale qui sous-tend l'essor de l'IPS et, surtout, le soutien formidable dont celui-ci bénéficie depuis de nombreuses années grâce au développement du réseau Internet et des applications électroniques sur le World-Wide-Web ne laissent pas vraiment place au doute quant à l'issue de cette coexistence forcée.

En considérant parallèlement l'historique d'Internet et l'éclosion progressive de l'OSI, force est de constater que les orientations européennes de long terme, qui ont prévalu jusqu'à récemment, semblaient convenir tout particulièrement aux spécificités politiques et culturelles du Vieux Continent. L'essaimage de groupes et organismes européens de paranormalisation, la promotion des normes par les marchés publics, les initiatives pour surmonter les lenteurs du processus international montrent bien la détermination avec laquelle la politique européenne de normalisation a été menée. La Communauté européenne a toujours eu pour souci d'associer aussi étroitement que possible un maximum d'acteurs dans une démarche transparente et consensuelle, conformément à l'esprit prévalant pour l'OSI.

Convient-il, à présent, d'abandonner cette approche pour mieux répondre aux impatiences identifiées sur les marchés des TI et des Télécommunications? Doit-on être passif devant l'essor du réseau Internet, sans se préoccuper de son usage à des fins commerciales? Est-il encore temps ou utile de promouvoir des réseaux internationaux d'information alternatifs qui utilisent des normes choisies et développées par la communauté internationale?

Ces interrogations non seulement revêtent un caractère d'urgence, mais elles soulèvent des interrogations essentielles sur l'avenir technologique et socio-culturel de l'Europe, notamment dans la perspective des *autoroutes de l'information*. Le choix des normes dans les secteurs en question conditionne en grande partie la technique et le type d'information dispensée sur les réseaux électroniques.

Si la politique commerciale américaine se voit concéder des avantages dans un domaine aussi stratégique que l'information, le jeu du marché pourrait bien être faussé. Par ailleurs, peut-on seulement s'en remettre aux mécanismes du marché pour répondre aux attentes des citoyens européens, lorsqu'on songe aux exigences en matière de contenu de l'information et à la finalité des infrastructures électroniques?

On le voit, les normes dans le domaine de l'information sont à ce point déterminantes qu'elles méritent des choix politiques fermes quant à:

- l'adoption d'une stratégie commerciale nettement plus offensive de la part de l'Union européenne afin de libérer les forces du marché, moteur principal de l'innovation et du financement - comme y invite le 'Rapport Bangemann';
- simultanément, une réflexion approfondie sur les normes les plus appropriées aux spécificités de l'Europe: en dépit des pressions commerciales, il est essentiel d'éviter les décisions hâtives, et peut-être irréversibles, sur l'avenir que nous réserve l'entrée dans un '*nouvel âge du système technico-industriel*'.¹

¹ in *I&T Magazine* du printemps 1994, 'Les réseaux d'information transeuropéens', G. Santucci, DG XIII de la Commission européenne.

INTRODUCTION

Information technologies (IT) cover a very wide field both in terms of issues and players.

It is therefore correct to say that universal and public service considerations are the main factors in:

- coverage of the whole territory under consideration so that all regions can take part in the information society;
- an appropriate response to the citizens' varying requirements;
- high quality services at reasonable prices.

The appropriate physical support for this major development and these characteristics is the infrastructure. It has to be able to evolve to incorporate new technologies and new requirements. Because of the way in which they are promoted by national public procurement, it is **the standards that determine the technology required for the realization of information infrastructures**, as regards both networks and applications.

Even though the standards are complex technical documents, they represent first and foremost the outcome of political choices. So although the standards may be developed in a spirit of voluntary cooperation, there is a likelihood that they will develop into instruments of competitiveness for a country or group of countries and even be used to break down markets such as the IT market into segments. This applies not only to proprietary standards but also to standards in the public domain, particularly those developed within the context of an emergent national industry, national defence or, more generally, a protected sector. Once these standards have been tested they can be exported to, and marketed in, other sectors of the economy.

Recent events would seem to suggest that the US Department of Commerce may have adopted this political line.

When all is said and done, the information field has become extremely strategic: do the media not act as the standard-bearers of the values of the society they represent?

Information is not only the bearer of values, it has also become a commercial factor of the highest importance. During the colonial era, it was accepted that trade followed the national flag; today trade follows the media.

Information should therefore be looked at from two angles, economic and cultural. The present heated debates on the revision of the 'Television without Frontiers' directive is sufficient evidence of this.

In these circumstances, standards in the IT field concern aspects related to the container of the information and the content. They are crucially important for the completion of the European Single Market and also for the *information highways*. These two factors are moreover inseparable: **a European market implies the free movement of information and the creation of an open market for goods and services connected with information techniques.**

The ongoing liberalization of telecommunications in Europe (infrastructure, services, equipment) is overshadowed by the fear in certain European circles that this opening up of the market will lead to the European market being flooded by information from across the Atlantic. Europe could once again find itself in a situation analogous to the prevailing situation in the audiovisual world where financial and organizational capacity have become insufficient to ensure its independence.

To turn more specifically to the standardization sector, how are we to interpret the active support given to the 'Internet Protocol Suite' (IPS) vis-a-vis the OSI international standards which have hitherto been supported by the European Union?



Is there a question mark against international standardization?

On the initiative of those responsible at national level for new technologies, the FIRP (Federal Internetworking Requirements Panel), under the aegis of Diane Fountaine, Director of the Telecommunications Sector of the Department of Defense of the American Government, published a report in April 1994 on the US GOSIP (Government OSI Profile), the federal public market for OSI products.¹

US GOSIP imposes internationally acknowledged specifications on all public calls for tender involving the telecommunications networks. In practice, the American federal agencies issuing calls for tender for telecommunications equipment and services are obliged to purchase OSI products. The purchasing power of these agencies means that they thus influence the whole of the national market.

The European system of public tenders operates according to the same logic, under Decision 87/95/EEC of the Council of Ministers.² The public sector represents 15-20% of the European market in data-processing equipment and software. Conformity with the OSI standards presents four advantages: it reduces public expenditure by preserving investment; it allows the interconnection of different administrative networks; it acts as an incentive to their private partners to conform with the same type of standard; and it creates a market.

It has, however, been ascertained that the American agencies have often bypassed the laws: they have avoided purchasing OSI products or they have discarded them in favour of products considered more suitable - but duplicating the purchase.

¹ In reality GOSIP stands for documents drawn up by several public administrations: UK GOSIP in Great Britain, US GOSIP in the United States; and the American organization responsible for disseminating standards applicable to the federal administration is NIST (National Institute of Standards and Technology). By a linguistic twist, US GOSIP has become the term used to describe the federal public procurement market itself.

² Council Decision of 22 December 1986 on standardization in the field of information technology and telecommunications.

The FIRP¹ report therefore suggests a radical evolution of the US GOSIP policy, in particular by:

- no longer giving mandates to federal agencies issuing calls for tender but only recommendations;
- authorizing the introduction of the IPS (Internet Protocol Suite), on the basis of which the TCP/IP (Transmission Control Protocol/Internet Protocol) standards have been developed in parallel with OSI (Open Systems Interconnection);
- giving the same recognition to IETF (Internet Engineering Task Force), the organization which prepares and draws up the IPS standards,² as to ISO (International Organization for Standardization);
- offering the possibility of using different protocols together in such a way as to be able to use several different types of standards on the same information infrastructure;
- allowing the federal agencies to acquire normative products from other international consortia than ISO,³ and even private proprietary standards.

A four-year old project aimed at solving the problems of interworking between the databases of the different departments of the Administration by using OSI standards has also been called into question.

The American aerospace industry, along with a large number of IT equipment suppliers and national governments throughout the world, reacted very strongly to these proposals, believing that they would ruin the long-term efforts to construct universal interworking via OSI. According to the Boeing information services, '*scrapping the enormous OSI investment in favour of PAS⁴, such as the ancient IPS, demonstrates a naivety in understanding the complexity of our modern world*'.⁵

The Department of Commerce nevertheless decided, in September 1994, to follow the recommendations made by FIRP¹.

¹ For a presentation of the content of this report and the reactions to it, see the OSN review, *Open Systems Networking & Computing*, Technology Appraisals Ltd, February 1994 issue, and Reuters News Agency, 31 March and 26 September 1994.

² With the approval of IESG (Internet Engineering Steering Group) and backing from IAB (Internet Architecture Board), two voluntary organizations like IETF.

³ e.g. X/OPEN, connected with the standardization of AT&T operation systems, and also ATM Forum.

⁴ 'Publicly Available Specificities', standards developed on some regional markets.

⁵ see Agence France Presse, 31 March 1994.

Such a U-turn may seem surprising. **In 1986, the American federal Administration had clearly accepted GOSIP** on the grounds that they could not unilaterally impose TCP/IP standards on other countries: these standards were mainly meant for their domestic market.

But eight years later, account has to be taken of the formidable success of the Internet and above all of the difficulties American firms seem to have had with OSI - it being not complete enough to meet all their requirements and/or not profitable - which have made them prefer other standards.

The mandate in favour of US GOSIP has therefore been challenged on the grounds that OSI standards are not appropriate to users' needs:¹ some commentators in the specialized press make no bones about talking of competition between TCP/IP standards and OSI standards and of the confrontation between two systems driven by fundamentally different mentalities with no hope of reconciliation.

The continuing incompleteness of the OSI standards is also emphasized, meaning that the overall objective of ensuring network interconnection (full-stack) has not been achieved; the few high-performance but isolated OSI standards² would not stand up to comparison with a blueprint for an *information highway* such as the Internet.

¹ 'Currently there are no real advantages to moving to OSI. It is more complex and less mature than IP, and hence doesn't work as efficiently'. Ed Krol, in *The Whole Internet, User's Guide and Catalog*, 1992, 'What Is the Internet?', 'What Does the Future Hold?', p.16.

² Such as the OSI X400 (electronic mail), X500 (directory) and X509 (security) standards (see section on a technical comparison of OSI and IPS, p.37).

In what way are standards essential for information technology?

'Once [technological] products can be easily accessible to consumers, there will be more opportunities for expression of the multiplicity of cultures and languages in which Europe abounds'.¹

The user of electronic infrastructures is looking above all for maximum user friendliness in access to information: he should not be aware of the existence of standards which remain in a way 'transparent'. It is clear that a suitable standardization policy will actively contribute to this accessibility.

Standardization is a determining factor for the interconnection of telecommunications networks and the interworking of services in information technologies. *'Interworking is giving everyone access to information'* according to Pascal Ozanne, head of Netware products with Novell.² Without high-performance standards, there would be no possibility of this.

The European Parliament's resolution on 'Europe and the global information society - Recommendations to the European Council' and on the communication from the Commission entitled 'Europe's way to the information society: an action plan' adopted on 30 November 1994³ rightly insists on the importance of standards for IT.

The text states that: *'the scope of the expected developments can at present only be guessed at [...], which means that this unified regulatory framework must be designed from the outset as an open-ended, predictable and adaptable system'* (§ K). Moreover, if the future information society is to operate on a global scale⁴ *'it is therefore vital to coordinate the efforts being undertaken by all the countries involved in the same process'* (§ L).

¹ *Europe and the Global Information Society*, recommendation to the European Council of 26 May 1994, known as the Bangemann report, p.16.

² in *Le Monde informatique*, 4 November 1994, 'L'intropérabilité, pour quoi faire?'.

³ Parliament resolution on the information society of 30/11/94, based on report A4-0073/94 by Mr Fernand Herman, MEP.

⁴ As suggested in the Bangemann report of May 1994.

Consequently, 'it is incumbent upon the public authorities actively to promote (...) the swift establishment of, initially, European standards and, subsequently, international standards enabling networks and applications to be interconnected (...) without any deterioration in performance or user-friendliness and encouraging the dissemination of multimedia products on a pan-European scale, while taking account of the specific linguistic and cultural characteristics of the peoples of Europe' (§ 19).

The OSI standards¹

*'The OSI is a vast standardization process launched at the end of the 70s to meet a precise requirement, that of giving data-processing systems the means of transferring information and treating it cooperatively without making any assumptions about the specific characteristics of their hardware or software.'*²

In 1977, the International Organization for Standardization (ISO), created 30 years previously, alerted by the difficulties experienced in connecting dataprocessing equipment of different brands and models, decided to launch a vast programme aimed at creating a network architecture, the OSI. *The Open Systems Interconnection (OSI)*, based on experience from achievements with different kinds of networks, proposes standardization of external accessibility of computerized data, whatever the operating systems involved.³

There are two aspects of OSI standardization: *the model*, which is not a standard but a reference framework for the work of the standards setters; and *a series of standards*, defining the services and specifying the protocols as packages of rules governing communication between telecommunications equipment by way of stable interfaces (technical boundaries).

The fundamental principle underlying the definition of OSI standards, which determines their essential characteristics as regards quality, conformity and interworking, is the breakdown of the overall logical structure of the model into functional modules (called layered architecture) for which the detailed specification can be entrusted to autonomous teams. Projects, tests and the finalization of modules can be conducted quite independently with the end result being virtually spontaneous integration - the modules remaining capable of subsequent modification.

¹ Information taken from *Concepts Réseaux - Concepts OSI/DSA, Une introduction aux systèmes ouverts*, Bull SA, Victor Chaptal de Chanteloup, January 1991.

² in *Concepts Réseaux - Concepts OSI/DSA, Une introduction aux systèmes ouverts*, op. cit, p.iii

³ Ideally, a distinction should be made between the area of Information Technologies (IT), i.e. informatics and its socioeconomic ramifications, and Telecommunications. Telecommunications comes under the standardizing activity of the ITU (International Telecommunications Union) and its specialized bodies (CCITT and CCIR) and, at European level, ETSI (European Telecommunications Standards Institute). OSI standardization essentially depends on the international bodies ISO and IEC (International Electronic Commission) and the European bodies CEN and CENELEC.

Nevertheless, the growing convergence of IT and telecommunications justify reference to standardization in the telecommunications sector.

OSI architecture therefore incorporates a fundamental split between *lower layers*, which provide a channel for the transmission of information and thereby have a *transport function*, and *upper layers*, which use this function to transport the content of the communications between the application processes and in their turn provide a *contact function*. The low levels take as their reference the standards of the major networks, and in particular X25 (Transpac in France), which have existed since 1976 thanks to an active promotion policy on the part of the European Community in favour of the interconnection and development of packet switching networks (EuroNet-Diane initiative). These major networks generally use the communication resources offered by the public networks.

OSI standardization uses a worldwide decentralized structure managed by a centralized body, ISO. It is useful at this point to recall that before OSI, international communication between experts of different interests and geographical origins was extremely difficult, with each working session having to be prefaced by a long preamble in order to define a common language.

It was only in 1982 that ISO started the process of endorsing preliminary drafts of OSI standards. And then it was not until the end of 1987 that a draft international standard was agreed. At the time, all networks suppliers were convinced of the necessity of being able to interconnect their systems. They expected the OSI to provide the means of managing on a global scale networks which were becoming more and more heterogeneous.

There are several types of official international standards, not only the OSI standards. But in the domain of information technologies, all of them are currently linked to OSI. Thus, for example, the International Electrotechnical Commission (IEC) and ISO work together in a technical committee, the JTC1; and in 1984 the CCITT (International Telegraph and Telephone Consultative Committee) and ISO agreed on the issuing of ISO standards and recommendations on a common basis.

In the absence of specific binding legislation, conformity with these standards is not compulsory.¹ This is why a distinction has to be made between three types of coexisting standards: proprietary standards (such as those of IBM in the 70s), the PAS (Public Available Specificities) and official standards. The latter may moreover be the result of official recognition of proprietary standards upgraded to PAS: one striking example is that of Windows, the Microsoft software which appeared in 1985 and which has become a universal reference in the world of micro-computers. TCP/IP is an example of a non-officially recognized PAS at international level.

¹ On the other hand, conformity with *specifications* deriving from these standards is compulsory.

A clear distinction does however operate between *de jure* and *de facto* standards. Although this is an artificial distinction, it does faithfully reflect the shortcomings of the official international standardization process which, in the absence of a more resolute product promotion policy, allows different products to develop with the same objective but which some of them are much more simple and more market-oriented.



What is the reason for the success of the Internet (International Network of Computers)?

'Although the Organization for International Standardization (ISO) was spending years designing the ultimate standard for computer networking, people could not wait. Internet developers, responding to market pressures, began to put their IP software on every conceivable type of computer. It became the only practical method for computers from different manufacturers to communicate'.¹

At the beginning of the 70s, in the United States as elsewhere in the industrialized world, the practical problem was that of interconnecting large computers operating on closed systems: how could the different databases be interconnected?

The TCP/IP standards, which appeared at the end of the 60s, were developed in an American environment for American military and then scientific networks as a means of transporting information from one network to another.

The Internet, *the network of networks*, which uses these standards, was developed from Arpanet (Advanced Research Project Agency NETwork), in the Pentagon (Department of National Defense). It was used by an increasingly large body of people made up essentially of scientists, universities and other academic users, usually simply for exchanging mail and data.

The situation now is that the Internet community represents a large population of potential users characterized by the many registered addresses - the result of intensive use of electronic mail and file transfer on a network where these services are much less expensive and the public involved a very large one.

We have had to wait for about 25 years, however, for this communications architecture to become a social phenomenon. Having become **the world's largest source of information accessible from a simple micro-computer** (Mac or Personal Computer) equipped with a modem, and also the

¹ in *The Whole Internet, User's Guide and Catalog*, Ed Krol, 1992, 'What Is the Internet?', p.11.

world's largest mailbox, the Internet makes it possible to exchange messages and documents in real time over distances of several thousands of miles¹.

The public financial support it has been accorded, especially by the Federal Administration,² has given it a decisive advantage: under the guise of public research investments, both in America and Europe, an infrastructure has been developed which offers connection possibilities by the leasing of telecommunication lines, with access to all the information on the network, regardless of its origin or volume. This infrastructure has been financed by a global flat-rate system of charges which were paid into an independent fund.³ In other words the network was not free but the services were. By way of comparison, OSI has always used an independent transport layer acting as a gateway to non-specific public networks, which presupposes a high utilization cost depending on the amount of information conveyed.

The use of the Internet has also been simplified by the fact that local computer networks (Local Area Networks, LAN) could connect up to the main Arpanet network and act as a relay for user groups;⁴ at the same time most of the Internet applications and software were available free on the network.⁵

It should also be mentioned that in the absence, for several years, of any other product, applications based on the TCP/IP standards became established.

Apart from this last point, the main lesson to be learnt from this overview is that **the Internet has in fact developed in a non-commercial environment into the leading major international non-regulated network of added value services.**

¹ 'From 1985 to April 1994, the Internet has grown from about 200 networks to well over 30 000 and from 1 000 hosts (end-user computers) to over 2 million (...) The traffic on the network is currently increasing at a rate of 6% a month', according to Jeffrey K. MacKie-Mason, University of Michigan (in FAQ (Frequently Asked Questions) 'Economics about the Internet' of 13 May 1994 - available on the *Internet* network). According to latest estimates (December 1994), the Internet covers 84 countries and some 32 million users.

² The NSF (National Science Foundation) made a grant to support the principal network, officially in order for it to maintain its independence from the private sector.

³ A university in the United States pays an annual subscription of between 60 000 and 100 000 dollars for connection to a regional network of the Internet; in Europe, connection to a main network of 64 kilobits costs ECU 100 000 and to a high capacity network of 2 megabits, ECU 1 million.

⁴ The European institutions use the TCP/IP protocol for their local networks (LANs), together with the X25 protocol.

⁵ In 1979, Microsoft, which was to become the software Number 1, reached an agreement with AT&T for the transposition of the UNIX data operating system to micro-computing: the microcomputers sold were therefore designed to be used under UNIX.

☑ What are the consequences of this success?

'The Internet (...) this anarchic network has had the great merit of revealing, by way of a really large worldwide experiment, an immense need for services of a new type. This is why it would be dangerous for the Europeans to refuse to have anything to do with this immense laboratory of interactivity'.¹

This situation profited from more or less active support from dataprocessing professionals in Europe. Despite an official policy geared to developing OSI, some networks were even constructed on the basis of Internet protocols in the public, national and European sector.

At the present time, a growing number of voices are calling, even officially, for European policy to take full account of the PAS and to admit international recognition of their existence - on the grounds that it is now essential to back those standards which are best adapted to existing markets. Recognizing the TCP/IP standards is thus a way of making Internet's European and world penetration official.

The main supporters of PAS consider that it is only the questions of security of data and intellectual property which merit in-depth examination in order to establish the use of the relevant standards.

Despite the significance of TCP/IP standards it is nevertheless acknowledged that there is virtually no way of detecting the quality of the information sought on the Internet, and to classify, in terms of relevance, the flow of information available on the network. Moreover - and this is perhaps the most important aspect - the standards used on the Internet do not seem to suit the specific multicultural character of Europe.²

However, despite saturation of the network and as yet limited user-friendliness, **the Internet is now seen as the ideal support for setting up information highways on the Old Continent.**³

A large number of access points have already made an appearance in Europe: it is possible to consult the databases freely on the European

¹ in *Futuribles, Les enjeux du multimedia*, October 1994: 'Les promesses de l'unimédia' by Xavier Dalloz and André-Yves Portnoff.

² see section on the advantages of OSI, p.8

³ see *Courrier International* for the week of 6-12 October 1994, the editorial 'Internet, média du futur' and the articles in section 'Internet fête ses 25 ans - Les cybernautes'.

Union's ECHO (European Community Host Organisation)¹ server via the Internet and the new 'I'm Europe' initiative of the Commission's DG XIII also uses the network.

A more revealing fact is that the most sophisticated information tool at present available on the Internet, the World-Wide-Web (WWW) was conceived by... Europeans, but is being operated by the Americans.² Tim Berners-Lee, of the CERN ('Centre européen de recherche nucléaire', European Organization for Nuclear Research) in Geneva, is the principal developer of this concept for hypertextual searches of multimedia documents. It is also interesting to note that the European Commission has proposed a contribution of some ECU 1.5 million for this project. Why has the WWW not been operated on the basis of networks corresponding to the OSI standards?³ Without doubt because it would not then have benefited from the formidable development support offered by the Internet. The public success of software using the WWW is, moreover, one of the main reasons why the business world has taken such an interest in the Internet because this software promotes greater user-friendliness in the utilization of the network and offers the possible prospect of economies of scale in its operation.

The research organization RARE, itself subsidized by the Commission, openly supports the WWW which is seen as a key element in the development of information services for researchers in Europe. The Commission has also approved the creation of a consortium to develop an interconnectivity gateway using the Internet software WAIS (Wide Area Information Services) between CERN and MIT (Massachusetts Institute of Technology).

The Internet has therefore established itself as *the* world network. Due to its success, **the Internet has become an ideal support for the promotion of *de facto* standards intended for international recognition.**

The problem would not arise if this recognition was to be carried out in the framework of ISO. But certain industrial and political circles, not only in America, seem to think that the predominance of the Internet, a homogenous network spanning the globe, practically means abandoning the

¹ <http://www.echo.lu/>

² In the same way the development of the WWW servers and applications for the public (such as Mosaic or Netscape, which are called 'browsers' or 'killer software') is carried out principally in the USA.

³ The fundamental concepts of WWW constituted by the *hypertext* protocol (HTTP) and language (HTML) are linked to the OSI *hypertext* processing standard SGML (Standard Generalized Markup Language).

OSI, the architecture for interconnecting heterogeneity. The use of certain OSI standards on the Internet, and particularly the X500 directory service, seems therefore to be due solely to their better technological performance in comparison with the TCP/IP standard.

What are the shortcomings of ISO?

It would be simple to conclude that the dominance of IPS is due to the fact that it is more in line with market laws. At the same time it has to be admitted that the development of ISO standards is particularly slow.

Whatever strategy is adopted, it is generally accepted that **speedy standardization is essential for the future of information technologies (IT)**. The world system is subject to great pressure because it has to take part in drawing up standards at regional level as quickly as possible in order to influence the final decisions. European standardization, modelled on the world system, remains subject to these vicissitudes.

It should also be noted that:

- The time taken to develop an OSI standard is much greater than that required for TCP/IP standards.¹
- The documents providing information about the OSI standards are claimed to be sold by ISO at a high price and their availability on the Internet very limited; students and researchers with limited budgets are therefore not readily able to access them.²
- The multilayered structure of OSI seems to be controversial for some people,³ who believe that this makes the standards too complex.

¹ For example, it will have taken ten years to bring out the X400 (electronic mail) standard as compared with one year for the first version of the corresponding SMTP (Simple Mail Transfer Protocol) standard! It is true that the validation of two RFC (Request For Comments, addressed to the IETF) applications suffices for a new application on TCP/IP.

² However, some OSI documents are available at a very reasonable price, and even free in some cases, from the International Telecommunications Union (ITU), IETF or ECMA (European Computer Manufacturers Association).

³ Avoiding the *redundancies* in the functions in the different layers is one of the official principles of the OSI model. Some people think that the redundancies abound; but the defenders of OSI believe that there is a clear difference between redundancies and *overlapping* between the functions of the model.

- o Many people in the standardization field even believe that OSI technology is now obsolete.¹

We should not however forget the historical context: the OSI applications are very recent. They only really started to become operational in 1992 whereas the first TCP/IP standards appeared in the 70s; twenty years difference! Moreover, the adoption procedure for ISO standards is very formal: it attempts to find a formal basis from the widest possible consensus which does indeed take a long time.

The main point is that **the development of OSI standards is not based on existing user practice on a sufficiently wide scale.**

The OSI has suffered from bad promotion and this explains its lack of popularity. The Commission issued a warning in 1988 that *'the risk of regional differences [regarding universal standardization], though unwelcome, is insignificant compared with the risk that if OSI were to make a chaotic start, the situation would be difficult to rescue later, politically, commercially and technically'*.²

The American Federal Aviation Administration believes that the slow development of OSI products is caused by the lack of a government political machinery to enforce the US GOSIP mandate and the willingness on the part of government engineers and public procurement officials to ignore this mandate. This phenomenon can also be seen in Europe.

Steve Kille, of the ISODE consortium, admits, does he not, that *'US GOSIP has done enormous harm to OSI'* because of an ill-adapted procedure?³

¹, 'As far as the market is concerned, OSI now seems to be extremely passé, (...) Everything progressed to Unix; but now Unix is becoming passé. Possibly, the most open definition of 'open' has yet to be achieved, but the initial open systems have become obsolete before they've become successful. Maybe openness, like beauty, is in the eye of the beholder', according to Christopher Read, of Apertus Ltd, an England-based consultancy (in *CommunicationsWeek International*, of 27 June 1994, 'TCP/IP: it's official').

² 'European standards' in *Standardization in information technologies and telecommunications*, DG XIII of the Commission of the European Communities, Fact Sheet, May 1988.

³ in *CommunicationsWeek International* of 14 November 1994, 'Rival E-mail camps forge uneasy pact'. ISO-D-E (the ISO Development Environment) is responsible for implementing layers 4 to 7 of the UNIX dataprocessing system. Making its appearance at the start of the 80s in Canada - even before the first ISO standards became operational - ISODE was to be the basis for the development of large-scale ISO standards by offering free use on the model of the Internet...

The commercial policy has been inadequate and even disregarded. In reality, 'the users basically don't care whether X400 (electronic mail) uses X25 [transport networks] or not [in preference to TCP/IP networks]', says Mike Simmonds, a British Petroleum consultant. 'But TCP/IP over a leased line is likely to be less expensive than X25. If X400 charges stay as high as they are, people will switch over to IP service providers'.¹ The ITU (International Telecommunications Union) itself, which previously used only X400 electronic messaging, now provides all staff with full Internet access. A range of electronic services were built around the Internet because it is the most widely accessible technology for data communications and less expensive than X400.²

The slowness of IGOSS (Industry-Government Open Systems Specification) in combining the four North American OSI profiles (US GOSIP, EPRI, MAP/TOP and COSAC) - a combination which should constitute a very influential purchasing power for the adoption of OSI standards in this part of the world - has not favoured OSI either.

At all events:

- The success of the Internet is not circumstantial: it has benefited from financial and political support, something which is not controversial in itself and may even be laudable, but which is undeniable. The regional TCP/IP standards and alternative technologies have had the full benefit of this.
- The American Administration no longer appears to want to give sufficient support to OSI, allowing competition to develop between standards of national origin and standards designed as the fruit of international cooperation.

The fact that the partisans of the Internet officially intend to endorse a situation which they have allowed to develop, by moving forward now to international recognition of IPS, at least has the merit of clarity. Thus, following a report on US GOSIP, **an agreement was concluded in June 1994 between OSI and IETF on some mutual recognition of Internet and ISO protocols** and on the organization of joint activities.³

There exists therefore for the time being a formal liaison between the two organizations to accompany the ongoing process of IPS internationalization.

¹ in *CommunicationsWeek International* of 14 November 1994, 'Rival E-mail camps forge uneasy pact'. It should be recalled that access to X400 via X25 requires an access payment which depends on the volume of information transmitted, whereas the payment for Internet is a flat-rate one!

² in *CommunicationsWeek International* of 6 February 1994, 'Groups tap Internet to drive standards work'.

³ Since 1992, the IAB (Internet Architecture Board) had been asking for liaison to be established between some of the ISO and IETF working parties. The June 1994 agreement was concluded under the aegis of IAB.

☑ What is the European Union's policy?

*'It will identify measures for the improvement of planning and prioritization, for facilitating consensus-building, for speeding up the standard-making process and for appropriate use of standards in the international context.'*¹

Serious thought has been given to how to respond to the shortcomings of European standardization which is closely linked to international standardization.

For this purpose, and following proposals contained in the Commission Communication 'Europe's way to the information society, an action plan',² a workshop was held in Brussels at the end of November 1994. Its conclusions were as follows:

- proposal to set up quickly a high-level independent and industrial strategic group to undertake a review of the situation regarding European IT standardization in preparation for the G7 meeting on 25 and 26 February 1995;
- extension of the terms of reference of ITSTC (Information Technologies Steering Committee) to make it into a European industrial organization responsible for taking account of market priorities in this field by proposing draft standards as rapidly as possible; and reform of EWOS (European Workshop for Open Systems) into a cooperation structure more open to activities linked to standardization;
- adoption of PAS as officially recognized standards, but in a joint framework with the officially approved organizations;
- reorganization of the organizational structure responsible for European IT standardization through the creation of a single workshop;
- better utilization of R&D funds to make prototypes and development tools, available more rapidly.

To sum up, the policy of promoting standards through public procurement seems to be jeopardized³ and the expectations of the market have been made the central concern as regards standards.

¹ in *Europe's way to the information society, an action plan*, Commission Communication COM (94) 347 final of 19/07/94, 'Standardization, Interconnection and Interworking', p.4.

² COM (94) 347 final of 19/07/94.

³ Decision 87/95/EEC (see section on the consequences of international recognition of IPS, p.34).

EUROPEAN INFORMATION HIGHWAYS: WHICH STANDARDS?

In its plan of action set out in the May 1994 report, the group of prominent persons under Mr Bangemann also recommended a revision of European standardization procedures to bring them more into line with the market and thereby to accelerate the interconnection of networks and interworking of services and applications in the telecommunications sector.

Despite the priority still given to international standardization, this alignment on American policy could lead to a calling into question of the very philosophy of OSI standardization.



Are these different objectives compatible?

Underlying the defence of the TCP/IP standards, there is a dominant feeling that the priority now is to ensure the rapid development of protocols in response to the needs of consumers throughout the world, essentially on the basis of short-term profitability.

On the one hand there is an increasingly clear move towards making the process of recognition of standards developed outside ISO official: Christian Huitema, chairman of the IAB (Internet Architecture Board), considers that the distinction between *de facto* and *de jure* standards no longer holds water.¹ On the other hand it is hoped to improve the process of European standardization by aligning it more closely with the development of technologies available on the market.

It is therefore possible that we may see a reversal of priorities in the future with the strategy of some industrial circles strongly influencing international standardization policy.²

So not only is international standardization directly concerned, but European policy, which takes its lead from that, could undergo a complete U-turn.

The authors of American commercial policy seem to be reticent about the idea of absorbing OSI into IPS. Following the report on US GOSIP the suggestion of dovetailing IETF better into the shaping of stable open standards - and thus avoiding incompatibility between OSI and TCP/IP standards - was not adopted. Finally, a minimum of control and a maximum of decentralization in everything concerning the Internet has become a matter of pride and a guarantee of the future commercial success of the network.³

¹ in *Le Monde informatique* of 4 November 1994, 'Internet demain: plus sûr et mieux commercialisé'.

² '[Concerning OSI and IPS,] the question isn't Europe versus the United States. The question is political solutions versus engineering solutions', according to Marshall Rose, chairman of *Network Management Working Group*, IETF (in *CommunicationsWeek*, 22 November 1993, 'Is Internet for Europe?').

³ 'The Internet is a loose amalgamation of computer networks run by many different organizations in over seventy countries. (...) one of the advantages of the Internet is that it is so decentralized: information sources are located on thousands of different computers', according to Jeffrey K. MacKie-Mason, University of Michigan (in FAQ (Frequently Asked Questions) 'Economics about the Internet' of 13 May 1994 - available on the *Internet network*).

The consequences of this situation, initiated by a country whose IT market is the largest in the world and whose commercial influence is decisive, could be fundamental.

If the European Union in its turn abandons its public policy of promoting products which conform with OSI, by giving up the lever of public procurement, there will no longer be any serious competitor for IPS. However, most of the products which conform to TCP/IP standards have been marketed mainly by American firms and Europe, where many industries and firms - which do not have their own *Internet* - have opted for OSI products prescribed by public procurement orders, now finds itself in a position of inferiority.



Complementarity or competition between the two systems of standardization?

'The ability of the Internet to speak OSI protocols should help the Internet to expand into more countries (...) Most of Europe regards IP as a cultural threat akin to EuroDisney. Networks based on the OSI protocols are much more palatable for them. If the two protocols could coexist, everyone would be happy'.¹

Politically there are some who claim that we are witnessing co-existence between two systems with different underlying values and priorities.

On the one hand ISO/IEC, presented as a hierarchical control system:

- public interest is a direct objective which presupposes positive action;
- the public authorities should guide the choice of standards;
- there is a formal coordination structure, with a majority vote.

On the other, IAB and the associated bodies IETF and IESG, presented as an autonomous decentralized group:

- public interest is the outcome of the confrontation of private interests;
- the public authorities can only set major objectives, without imposing the means for their achievement;
- the structure offers a more informal voting procedure and would be open to all kinds of participants: the systematic search for a consensus depends on commercial issues.

This over-simplified comparison puts the emphasis on the supposed advantages of IPS over OSI, as a cumbersome, slow structure.

At the same time the OSI philosophy is precisely to avoid the existence of a centralized system centred on a dominant constructor or group of constructors. The declared aim is to develop the best tools for information network interconnection, of whatever geographical origin, purpose or type of equipment.

This explains the existence of a multiplicity of committees, technical groups and other organizations, and the numerous procedures for OSI standardization. They make possible **the application of the basic standardization principles, i.e. transparency of decisions, possible participation by all parties concerned and the obtaining of the broadest possible consensus.**

¹ in *The Whole Internet, User's Guide and Catalog*, Ed Krol, 1992, 'What Is the Internet?', 'What Does the Future Hold?', p.16.

Apart from the technical question, are not guarantees for the development of stable standards using a participatory rather than centralized procedures exactly what industrial leaders are looking for?

In parallel with this, most of the technological decisions relating to the Internet are taken by small committees of volunteers¹ which essentially fix the standards on the basis of market expectations. Despite a very decentralized structure, some network functions, such as the standardization or attribution of electronic addresses, are taken care of by a centralized 'Internet Society'. There is no voting procedure nor is there any requirement concerning the application of these standards; the groupings of like-minded players and the technical solutions are worked out with a minimum of supervision.

In theory, at the end of the day, the comparison between, on the one hand a general open framework capable of assimilating *de facto* protocols and making them into international standards, and on the other, a long-standing protocol which is in constant evolution, but is no more than a protocol, is not relevant.

In practice, on the other hand, it has to be admitted that **the coexistence of the two systems persists in a situation of total confusion, to the benefit of Internet applications.**

The organization known as RARE ('Réseaux Associés pour la Recherche Européenne', Associated Networks for European Research), subsidized by the Commission, promotes interconnectivity between European research networks by means of gateways between X25 et TCP/IP.² For this purpose RIPE ("Réseaux IP européens", European IP networks) has been set up as the result of collaboration between European network operators using IPS. Although it works openly for the combining of OSI and TCP/IP standards, RARE was the originator of COSINE (Cooperation for Open Systems Interconnection Networking in Europe), which made it possible to create one of the first pan-European networks via IXI (International X25 Infrastructure) - replaced since February 1993 by EuropaNet.

Meanwhile, in the private sector, the EEMA (European Electronic Messaging Association) has recently authorized the dropping of the X25 public network in favour of IPS and is recommending more and more openly the

¹ IETF, IESG and IAB (see Chapter 1).

² RARE consists of representatives of more than forty countries and organizations from all over the world.

development of gateways between the standards for X400 (electronic mail) applications and TCP/IP standards.¹

As traffic from the Internet towards networks using X400 is six times greater than in the other direction and as for the present only one third of service suppliers on X400 offer access to the Internet,² it is easy to imagine the outcome of this compromise.

So it is improbable that, in the years to come, the Internet and OSI will share the tasks without any problems, the first concentrating on hardware, and the other on software. It therefore seems optimistic to imagine that a 'Multiprotocol Working' will become the simple rule whereby a proportion of the applications using OSI standards will use Internet protocols.

The OSI standards developed for the Interlibrary Loan Protocol, for example, is likely to be used only as a minimum basis of functional standards which are adapted to the real needs of the market, in parallel with the TCP/IP standards. The few OSI applications which are geared to present requirements will thus be preferred to fundamental research and the anticipation of future requirements.³

It is also planned that ISO should in the near future adopt the American ANSI/NISO Z39.50 standard revised in 1992,⁴ which is used by a large community of users on the other side of the Atlantic; whereas we have since 1991 had the SR (Bibliographic Search and Retrieval) standard, developed by ISO at the initiative of the US itself, with performance ratings comparable to those of the revised Z39.50... This shows that an OSI standard can indeed anticipate market expectations.

¹ The OSI/6000 standard makes it possible to use OSI applications to communicate with similar applications on IPS networks, via RFC 1006 (especially for SMTP (Simple Mail Protocol) and FTP (File Transfer Protocol) applications). EEMA is also proposing use of the RFC 1327 standard as an interconnection gateway between the Internet and X400.

² According to Steve Kille, in *CommunicationsWeek International* of 14 November 1994.

³ In the library interconnection projects, the first concern is therefore the utility aspects of the OSI standards, at the risk of disregarding the innovative aspects. This decision is based on the simple observation that most of the possibilities offered by the 10160/10161 OSI standards are not used (90% of the users of these two standards use only 50 per cent of the potential on offer).

⁴ An ISO meeting is scheduled for May 1995, in Canada, for this purpose. The Z39.50 standard offers a program giving a uniform access procedure to international data banks from various sources, such as library catalogues. Developed in the framework of OSI, this standard, introduced by ANSI (American National Standard Institute), is nevertheless American in origin. It has the active support of the services of the American Congress Library.

As we can see, there is no lack of duplication between OSI and TCP/IP standards. It is virtually a foregone conclusion that the market, supported by the Internet community, will have the final say.

Consequently, it is a legitimate exercise to look at the effects of the competition between the two systems, rather than improbable complementarity.¹

Of course there is at least one other example of non-conflictual lasting co-existence between an Anglo-Saxon system and a system originating in continental Europe: the metric system. In this case the barrier is clearly a cultural one; but the economic implications and the consequences are clearly not the same.

The question then remains open as to whether the parallel development of the two systems of standards in the highly commercial strategic sector of IT will not in the long run favour **the disappearance of the OSI standards, which although certainly very sophisticated are apparently less well-adapted to the American market and above all vulnerable to counter-arguments of immediate utility and cost.**

¹ 'IP and X25 will be complementary, not exclusive, backbones', thinks Gilles Antoine, of the EEMA (European Electronic Messaging Association). 'Internet and X400 can coexist', believes John Mahoney, of Infonet Software Solutions. Others consider that, on the contrary, SMTP will sweep aside X400 as it did X25 (in *CommunicationsWeek International* of 14 November 1994, 'Rival E-mail camps forge uneasy pact').

What are the advantages of OSI?

'It is also important to recognize the dangers of premature standardization. Because no-one can predict with certainty how network usage will evolve, standards must not simply be imposed but instead allowed to evolve'.¹

The apparent complexity of national, European and international rules for OSI standardization does offer, firstly, a double guarantee for the user: the consideration of all aspects relating to interfunctionality and the guaranteed absence of a single authority which would impose its hegemony. In contrast to Internet, OSI depends on an intergovernmental type institutional organization, ISO/IEC, in which representatives from all the countries work together. The principle of unanimity guarantees similar conditions everywhere in the world.

Secondly, although ISO/IEC has as its essential aim the facilitation of exchanges of goods and services by doing away with any technical elements which might stand in their way, the strategy adopted for this is to develop standards in advance, worked out before a real need becomes manifest. This explains the growth of autonomous organizations attached to ISO/IEC reflecting on future needs.²

The arbitrary choices made by known expert users simply confronted by new products appearing on the market, is no guarantee in fact that the best solution will ultimately be adopted. **It is essential to ensure the elaboration of standards which can evolve towards future developments** - new technologies but also new expectations. In other words, in the IT world, and particularly in the world of standardization, existing technologies and systems cannot be the only point of departure. Consideration also has to be given above all to potential

¹ *Serving the Community: a Public Interest Vision of the National Information Infrastructure*, Computer Professionals for Social Responsibility, 1993, 'Computer Professionals for Social Responsibility', p.27 - referring to the Clinton administration's project for setting up an information infrastructure available to all citizens wishing to obtain information about questions in the public domain.

² Such as the Advisory Board of the chairmen of ISO/IEC on Technological Trends (ABTT), and the ISO/IEC ad hoc group on long-term planning (LRPG) which undertakes worldwide surveys into future requirements regarding standardization.

technologies and systems - since progress is always faster than the imagination.

By forcing the market to give up the immediate advantages of marketing the first available standard instead of collecting information about competing standards and the structure of potential demand, the political authority has the possibility of increasing the probability that the final choice will be a more sophisticated standard offering better prospects.

This authority's role is to arbitrate between the many interests inherent in corporate strategies. Although far removed from the market, it offers a long-term vision and impartiality which the market often lacks; it is in just the right position to take account of the development of the world environment.

Consequently, the slow progress of work may be the price that has to be paid for meeting the desire for a systematic study of the technical and political questions and for decisions based on the broadest possible consensus. There is also the resulting difficulty of involving all potential users, known and unknown, in the process of standardization.¹

From this point of view, cooperative research in the standards sector is an essential approach. This is the conclusion from observation of the importance of the creation of collective structures for the production of standards, in order to allow industry to support and share the inevitable costs of adapting standards.

Three complementary paths thus become apparent:

- the development of interinstitutional structures for cooperative research;
- the enhancement of the role of intercorporate research in the process of the definition of standards;
- the enhancement of the role of informal workshops.

It is in this way that the world system has shown some aptitude for making good its shortcomings.

We have witnessed the emergence of complementary *para-standardization* organizations at national and regional levels which have tended to be less rigid and less strictly bound by the formal complex standards adoption procedures.

¹ In its opinion on the proposal for a Council directive on standardization in the field of IT the *Economic and Social Committee* 'stresses the importance of a timely and comprehensive information policy. Only if the interested public (EC bodies and competent authorities, competent national authorities, social interest groups, technical and scientific institutes and organizations, final consumers and users) receives comprehensive, up-to-date information on projects and results, will there be a chance of preventing developments from taking roundabout routes or heading in the wrong direction at great expense' - OJ C 303, 25.11.85, p. 4.

Since 1988, working through ETSI (European Telecommunications Standards Institute) and the European Workshop on Open Systems (EWOS), **the European Community has started by deploying a standardizing arsenal in conformity with OSI and used public contracts to influence users as a whole.**¹ European projects then became more numerous, for example JESSI (Philips, Siemens, Thomson) and Megachip (Philips and Siemens). Various para-standardization organizations also appeared on the European scene, in particular:

- SPAG (Standard Promotion and Application Group) created in 1983 in the form of an association between twelve leading European industrial players in the dataprocessing and telecommunications fields, whose objective was to create a unified European market for, and by using, OSI standards;²
- X/Open, founded by six European manufacturers in 1985, which has become international in scale;
- RARE, mentioned above.

On the other side of the Atlantic, apart from NIST, which is responsible for US GOSIP, and which comes under the US Administration, COS (Corporation for Open Systems), created in December 1985, was to have until recently a regional role in the promotion of OSI standards, with a sphere of influence covering the three Americas.

In Japan, POSI (Promoting Conference for OSI), created in November 1985, covers the Asiatic and Oceanic areas.

This proliferation of organizations and players involved in OSI work shows clearly how the different levels of standardization (international, regional and also national) can overlap and be interdependent. Much effort has indeed been invested in the improvement of the implementation of a universal system to meet every type of requirement in a genuine concern for international cooperation.

¹ Council Decision 87/95/EEC, op. cit.

² It was at the request of European Commission Vice-President E. Davignon, that SPAG set out in 1983 proposals for a European standardization policy including the proposal to provide various incentives for public authorities to favour the use of OSI; these measures took the form of European rules on public contracts such as Decision 87/95/EEC.

What stage have the Europeans reached?

Much time and money has therefore been devoted to the development of *de jure* international standards, with the active support of the Europeans.

The history of European standardization in the IT field can be summed up as follows:

- alignment on international standardization has remained the key word;
- with the development of IT and its increasing penetration into the various sectors of economic and social activity, the need has been felt for more complex and precise standards;
- special IT structures have been created: ITSTC (Information Technology Steering Committee), created by CEN and CENELEC, and ETSI and EWOS, the latter to take account of the need to use the *workshop* mode to ensure that the documents drawn up benefit from the participation of a larger number of players;
- the definition of European standards has thus been geared towards greater working speed;
- European standardization has therefore tended to further the work of international standardization and worldwide convergence: in other words **the European Community has always been concerned to respect the OSI philosophy even though the objective of the Single Market has led Europe to develop its own standards arsenal.**

'The experience of recent years has shown that Community standardization policy on IT and telecommunications, far from leading to isolation or a defensive fortress, has helped to strengthen international cooperation and emphasized the key role of the international standards institutions', as the Commission stated in 1991.¹

The following year the Commission emphasized 'the strengthening of cooperation between the European standards organizations and the international standards bodies'.²

¹ Extract from the first Commission report on progress on standardization in the field of IT, drawn up in implementation of Article 8 of Decision 87/95 - SEC/91/786. p.13.

² Extract from the second Commission report on progress on standardization in the field of IT and Telecommunications, drawn up in implementation of Article 8 of Decision 87/95 - SEC/92/1598, p.10.

This has not prevented orientation towards:

- the international recognition of the TCP/IP standards;
- the progressive abandonment of OSI applications on transport networks such as X25, and their replacement by IPS applications, also on the computer networks of public institutions, despite the existence of binding legislation concerning public contracts.

The decision of part of the American Administration to withdraw its support from GOSIP is not without consequences for the rest of the world. For example, the activity of the Japanese POSI is carried out in close coordination with that of the American COS and NIST and the European SPAG.¹

It is a fact that, towards the end of the eighties, stormy debates on the *information highways* led the governments of various industrialized countries to adopt more individualistic lines in the IT field. There was increasing talk of national and universal strategies, of the restructuring of the IT industry, and of experience with the Internet and the French Minitel as networks for multimedia applications.

It is doubtless in this context that one should see the decision of the American Department of Commerce to discontinue exclusive support for *de jure* standardization.

In Europe, there are now two complementary directions.

- On the one hand, the rapid expansion on the Internet of smart services of European origin: the added value seems to be concentrated on concepts which are invented and take shape in Europe but are developed in the United States as software for the public at large. Here the history of the development of the WWW is most revealing.
- On the other hand, there are European-scale initiatives comparable to the Internet: apart from Télétel, which is almost exclusively limited to France, these initiatives have only been taken at a late stage to support rapid expansion of standards selected by those responsible in Europe. Examples of this are Profile, the European Space Agency, Datastar, the European Online attempts and the EINS (European Information Network Services) project.²

¹ in *Concepts Réseaux - Concepts OSI/DSA, Une introduction aux systèmes ouverts*, op. cit, p 2.12.

² It is interesting to note the existence, since May 1990, of an international network independent of the Internet linking tens of thousands of non-governmental organizations in almost 100 countries: the APC (Association for Progressive Communications). This network of networks, originally designed for the passing of electronic mail, supports the holding of hundreds of permanent electronic conferences throughout the world on many subjects related to the development of the world's poorest countries. The Internet and APC are interlinked.

EINS is a conceptual model for the linking of professional databases. The system is to be both universal and fast and sophisticated in its operation thanks to the use of a uniform database query language.¹

In parallel to this, *Europe Online* (E.O.) hopes to become the first European platform for the collection of information in electronic form, to be made available to the largest possible number of people. Launched by publishing and financial groups,² and based in Luxembourg, E.O. is modelled on the American mass public servers, CompuServe and America Online, with which it intends to compete: it will be 100% compatible with all the Internet resources, including WWW. It is due to start operating its services in the second quarter of 1995.³

Mention should also be made of the many European initiatives to ensure that ultra-high performance infrastructures are available as soon as possible. The development of broad bands and ATM (Asynchronous Transfer Mode), making possible the acceleration of data flow exchanges on the networks, shows a definite desire not to be left behind.

At the same time, although France and Germany are recommending large-scale use of ATM technology, some people wonder about the advisability of this development which they consider to be premature.⁴

¹ The language would be uniform thanks to the use of standards such as the Z39.50. *EINS* also proposes uniformizing the interface between users and the computing applications they use, and the financing mode for the marketing of the information.

² Burda (Germany), Matra-Hachette (France), Pearson (United Kingdom), Schwartz-Schilling GmbH, various Luxembourg banks and Meigher Communications (America Online) are the principal shareholders.

³ In preparation for the creation of E.O., at the end of October 1994 *Der Spiegel* became only the third newspaper publisher in the world to offer illustrated pages of information on the WWW, after *Business Week* and *The Economist*.

⁴ 'The technology is there, but there are no real needs (...) ATM will not be developed before the year 2000 and will only concern a small number of large groups (...) [We should maintain a healthy scepticism regarding these new technologies] supported by industrialists who have an interest in furthering technological discontinuity' writes Robert Tréhin, Director-General of Cable & Wireless France (Mercury). 'This system will operate at three speeds. The main debate will concern the last kilometre of cabling to the subscriber (...) [The European projects in this field] lack motivation' according to Eric Benhamou, who founded the American firm 3 Com (in *Les Echos, Industry supplement*, 1 June 1994, 'Les grandes incertitudes du marché des télécommunications').

There is also the question of how it will be possible to reconcile the aim of universal service with that of applied technological excellence. Is it possible to ensure both economic and social cohesion regarding telecommunications with a view to geographical universality, and at the same time Europe's international competitiveness which presupposes the priority development of ultra-high performance information infrastructures?

Behind this technological proliferation, one can make out **three key factors which remain decisive in explaining the desire to protect the future of OSI and its ambition of excellence:**

- the problems connected with the international recognition of IPS;
- the need to cater for specific European features (see section on technical comparison of OSI and IPS, p.37);
- the importance of standards for the content of information.

What would be the consequences of international recognition of IPS?

The advantages and disadvantages of such recognition can be set out quite simply.

The advantages are as follows:

- avoidance in the long term of duplication and overlapping of functions between different types of standards, a possibility inherent in the coexistence of OSI and IPS;
- allowing the most competitive standards to develop;
- meeting the immediate urgent expectations of certain users.

The disadvantages are as follows:

Two of these have already been identified. The first is that industrialists, in Europe and elsewhere, who have invested in the development of OSI applications will be put at a disadvantage, at least initially. Secondly, it will certainly be essential to adopt standards adapted to users' needs, but these needs have first to be clearly identified: as regards information technologies in constant evolution nothing could be less self-evident.

A third aspect deserves our attention: **international recognition of IPS could cause Community legislation on public telecommunications contracts to be called into question.**

Decision 87/95/EEC of the Council of Ministers on public procurement in the field of information technology stipulates that Member States shall take the necessary steps to ensure that reference is made to European standards in public procurement orders relating to information technology. This is tantamount to saying that public procurement orders must specify conformity with these standards.¹

Of course this legislation does not make explicit reference to OSI standards which are not deemed to be the only source of international standardization.²

¹ This decision represents a general reinforcement of the existing national rules. Also, three national European organizations have worked on a European Procurement Handbook for Open Systems (EPHOS).

² Article 2 of the decision only speaks of 'international standards' and 'international specifications' as the basis of European standards and prestandards; Article 5 stipulates that Member States should take the necessary steps to ensure that reference is made, in public procurement orders, to European standards and prestandards (as described in Article 2) and to international standards, without further definition.

However, in contrast to the revised directive 80/767/EEC on public contracts, neither does Decision 87/95/EEC stipulate explicitly that European standards take priority over international standards. It is clear that, although *any* product which conforms to a European standard also conforms to international standards, the opposite is not necessarily true.

In other words, up until the present time, an IT product used on a large scale in Europe could, even though it conforms with internationally recognized standards, provisionally infringe European standards legislation - which is oriented in the long term towards conformity with international legislation. Of course this is a theoretical case. In reality the opposite has tended to be true, since European standardization has to some extent offset the slowness of international standardization. But what will happen if TCP/IP standards are internationally recognized? Will European standards have to be aligned to endorse public procurements?¹

In this connection, it would seem that **the situation in the United Kingdom confirms the trend observed in the United States**. The British also have their GOSIP, but only to make recommendations with a role directed towards simple coordination of the different types of standards whether international or not - to ensure respect for European legislation. This is the reason why the United Kingdom has planned a *strategy of coexistence* supported by the development of gateways, particularly between OSI and IPS.

Conformity with national standards does not in itself guarantee compatibility between the two systems. This is why there is a need to develop gateways for interconnectivity between systems with different specifications. It is unanimously acknowledged, however, that, where applications are

¹ On this subject, Mr A. Mattera, Director-General of DG XV at the Commission, believes that 20 years of European legislation have not sufficed to make the operation of public procurement more transparent: psychological factors related to national customs (influence, prestige, etc.) are the only explanation for this type of market left over from the past century. (cf *Le Marché Unique, Règles et Fonctionnement*, 1990, A. Mattera, Chapter V on 'The liberalization of public procurement', p.385).

In the specific field of information, some people radically advocate the abolition of European public contracts: with ongoing privatization of telecommunications operators, conditions on a healthy market should be the same for all; furthermore, foreign competitors should not be put at an advantage by letting Europeans unveil their commercial strategy in the course of cumbersome detailed procedures in the absence of any guarantee of reciprocity on the rest of the world's markets (the 1994 Marrakech GATT Agreement contains no clear provision regarding public telecommunications contracts).

concerned, recourse to gateways of this kind, often presented as provisional solutions,¹ although they may be extremely complex, presents too many problems to users at the quest for simple, effective systems.²

In order to put an end to situations of the kind encountered on the other side of the Channel, the Commission's action plan of July 1994³ did make provision for the adaptation of European legislation by June 1995. The workshop held in November confirmed this trend.

¹ Services using OSI standards which are being developed now on the Internet (on the basis of X400 and X500) use the Internet conversion standard RFC 1006, originally considered to be a temporary solution pending adaptation of the Internet connection mode to that of OSI...

² The development of network interconnection gateways is probably necessary in order to ensure the interoperability of different systems, even within Europe. As regards applications, on the other hand, it is an aberration which can only lead, sooner or later, to the predominance of certain standards over others.

³ COM (94) 347 final.



A technical comparison of OSI and IPS¹

From a technical point of view, a comparison between OSI and TCP/IP standards does not make it possible to come to a decisive conclusion in favour of IPS.

First of all, because the OSI standards are functional (multilayer system) it is possible to make changes to each of the system elements while maintaining a stable interface between the layers. This is particularly important if we take account of the fact that the options based on the standards may constitute so many extra functionalities - such as *intelligent agents*, which are programmes providing the user with assistance and acceleration in his transactions with the *server* of which he is the *client*, and on the basis of which it is possible to offer services adapted to different needs while avoiding difficult learning processes.²

This characteristic makes it possible to allow a broad measure of freedom for deciding the way in which standards will be respected and gives the model a certain amount of flexibility.

User assistance software is therefore not the prerogative of the Internet;³ the development of OSI equivalents depends only on greater resolution on the part of its developers.

As regards applications:

¹ Information taken partly from two FAQ (Frequently Asked Questions), 'International Standards' and 'OSI-protocols' of 1 August 1994 - information available on the *Internet* in electronic form.

² The best proof of the existence of this flexibility is that OSI applications can be developed on IPS as well as OSI transport layers. The contrary - the development of TCP/IP applications on OSI layers - is also possible, which explains how Internet has also been promoted through X25 transport networks.

³ Gopher, WAIS, Mosaic, Cello, Netscape, etc, are all examples of navigation or access software with a greater or lesser degree of user friendliness, developed on the Internet. OSI has equivalent programmes, which have not been so widely marketed and are therefore less well known, such as DFR (Document Filing and Retrieval) for Gopher, SR (Bibliographic Search, Retrieval and Update Service and Protocol) for WAIS, and VT (Virtual Terminal) for Telnet.

OSI standards can be very powerful:

- X400, an electronic mail system which now also supports voice messages, electronic data interchange (EDI) and file transfer in the mail system - equivalent to the Internet SMTP, MIME and RFC822 protocols - , has the advantage of notifying users that messages addressed to them are waiting;
- DFR (Document Filing and Retrieval), which uses ISO 10166, and which offers possibilities that the Internet application Gopher does not, such as ordering and modifying documents, access control, attribute searches, etc.
- VT (Virtual Terminal), which uses ISO 9040/9041, and is much more powerful than the Internet application Telnet;
- SR (Bibliographic Search, Retrieval and Update Service and Protocol), which is based on the American ANSI/NISO Z39.50 standard, like its Internet equivalent WAIS.

Some OSI protocols do not have IPS equivalents:

- X509, which concerns **the security of public data**, used in the Internet PEM (Privacy Enhanced Mail) protocol;
- X500, an interactive search procedure for addresses in the X400 directory, enhanced for facsimiles ('replication'), data search methods, file access rights, etc.;
- MMS (Manufacturing Message Specification);
- Interlibrary Loan Protocol, defined on the basis of ISO 10160/10161;
- Some parts of DFR (Document Filing and Retrieval);
- JTM (Job Transfer and Manipulation), defined on the basis of ISO 8831/8832, a control protocol;
- RDA (Remote Database Access), defined on the basis of ISO 9579.

But there are limits to this technical comparison. It does not allow a definite conclusion, since one could always put forward the argument of better progressive adaptation of the TCP/IP standards to the expectations of millions of Internet users.

A more important fact, certainly, is that **OSI, which has its resources in many different cultures, is a polyculturally inspired model.** It therefore seems particularly well-adapted to the requirements of Europe and its large market and socio-cultural diversity.

In comparison, IPS, originally developed in the United States in response to specific needs, remains for the present an essentially monocultural model.

A wide range of OSI standards covers several languages and alphabets, and transcription between these languages and alphabets:

- the ISO 8859 series, at times widely disseminated, offers dictionaries in the Latin alphabet and its many translated forms (including ISO 8859-10, the latest, on the Baltic countries);
- ISO 9, ISO 233, ISO 59, ISO 3602 and ISO 7098 are standards for transcribing between Latin or Roman characters and characters from oriental languages.

*The OSI standards thus constitute an appropriate tool for meeting global requirements, providing a high degree of operational security and network protection with the necessary flexibility to offer a multitude of high-quality services:¹ **these standards are particularly well suited to the ISDN operating mode,**² the genesis of which cannot be dissociated from OSI, and to the ENS (European Nervous System) project, which is to use the X25, X400 and EDI protocols,³ and to the ATN [Aeronautical Telecommunication Network] project.*

¹ 'Is Internet the model for the future highway for businesses? There is no clear answer: the philosophy held by one person differs from the needs of others (...) To take only electronic data interchange (EDI) and electronic payment transfer (EPT), where there is much activity, guarantees of security, such as authentication, confidentiality and non-repudiation are required by business. Here too, the highways of the future will have to show more professionalism than the Internet', according to Thierry Piette-Coudol, of the Parisian law firm of A. Bensoussan (in Les Echos, 16 January 1995, 'Les autoroutes de type Internet ne sont pas suffisantes').

² People do now seem to be rediscovering the virtues of ISDN (Integrated Services Digital Network), which has been dragging its feet a bit since its introduction in the 80s. The finalization of standards adapted to this kind of network and a reduction in cost are the main factors behind the renewal of interest in a totally digitized procedure (including the local loop linking the subscriber to the network) for traditional telephone networks (a technical improvement of this kind would make it possible to offer simultaneously numerous separate voice and non-voice services).

³ EDI (Electronic Data Interchange) was developed by the TEDIS (Trade Electronic Data Exchange) program. Originally developed for the private sector, it has now become an everyday tool of commerce and industry and could have a positive effect on the way in which public administrations operate.



The question of information content on the networks

*'The availability of knowledge does not do anything to solve the question of the 'desire to know' which remains one of the essential factors in any education system'...*¹

Apart from the questions relating to the integrity of information networks, the protection of data and the guarantee of privacy, without forgetting consumer protection, **the fundamental question of the ultimate purpose of technological development in the field of communication remains largely unaddressed: what technology is required for what mode of usage?**

In this connection it is essential not to lose sight of what is perhaps the most important aspect, the content of the information (contentware), which presupposes the use of technology adapted to immediate and future needs. In Western Europe, the industry which produces information content - the audiovisual sector (programme production and distribution), and the telecommunications and computer sectors (distribution of services) - represents four million jobs and an annual turnover of about ECU 137 billion with a very high growth potential.

At the same time the Europeans have many handicaps in the information field: apart from the linguistic barriers and the intense competition from the United States, it is to be noted that the national regulations are still very different, the European market is still very fragmented and small businesses have limited resources.

Indeed, is there any prospect of European legislation relating to the content of information if one bears in mind the sensitivity of the Member States regarding audiovisual programmes, mass media, and more generally anything which concerns multimedia?² The Bangemann report does not address these problems and confines itself to aspects relating to the *receptacle*, the infrastructure, i.e. the programs and equipment (hardware and software), used in IT.

However, at a time when the 'Television without Frontiers' directive is being revised, and particularly with regard to the question of quotas, the controversy between advocates and adversaries of the unconditional

¹ in 'Informatique et utopie', Philippe Breton, *Le Monde diplomatique*, May 1993.

² Added to these, as regards data of a personal nature, one could also cite the way in which European policy is marking time over the setting up of Europol.

opening- up of the European audiovisual market is obliging the European Commission to reconsider the subject of contentware.

Prodigy and CompuServe, as well as America Online, Delphi and Genie, are the world's largest offerers of services for the public and people working at home over the telephone lines. Combined with the commercial services which are starting to proliferate on the Internet, the impressive growth of these major groups on the same network is leading to a situation in which a very large majority of the information available is of American origin.¹ Although the Internet has to be seen as a principal electronic artery for Europe, it is a matter of urgency to work out how to find alternatives of European inspiration. We have already mentioned EINS and Europe Online as European information servers but they are still at the prototype stage.

The arrival of commercial enterprises is one of the main factors in the evolution of the Internet and, more generally, of global information highways. EUnet, which is the biggest European commercial operator on the Internet (of British origin) has been in existence since 1982; it introduced an innovation in the form of services for which a charge was made on the basis of lines leased to commercial users of the network. The more recent development of a number of initiatives, such as Internet Shopping Network, CommerceNet and MecklerWeb², confirms this trend.

The Internet is bound to evolve very strongly towards highly commercial services for a general public. It will be necessary to manage this general transition to a profit-making body and from the philosophy of bartering to one of market economy.³

¹ In 1994 the number of clients on these servers grew by 38% (6,32 million users), and the forecast for 2002 is of the order of 33 million users. The arrival of new major service providers such as Microsoft Network and Apple eWorld will accentuate even more the presence of American firms in the field of electronic information services.

² More than 100 000 people have already used the services of the *Internet Shopping Network*, founded in June 1993; this network was bought up in September 1994 by the Home Shopping Network, America's biggest TV cable chain, which intends to use the Internet for the development of interactive commercial services. *CommerceNet* was created in April 1994 by a consortium of American firms subsidized by the government to the tune of 6 million dollars; *MecklerWeb* is another recent commercial arrival sponsored by American conference publishers and organizers.

In these last two cases, the commercial purpose is not clearly demarcated. CommerceNet is proposing initially an electronic commerce service for professionals but plans to extend to all types of firms and all kinds of electronic selling, for commercial purposes (sales, marketing); the information agencies are interested because they want to develop commercial information sales services. In the case of MecklerWeb, users will have free access to promotional information.

³ We note in passing that most of the IP addresses on the Internet are now private firms.

Payment for the commercial services is already made on the basis of the amount of traffic and the value of the information. But it is probable that a single system of payment depending on the type of service and use of the network will be set up sooner or later, rather on the model of EINS.

However, this development could radically change the very purpose of the Internet: originally conceived as an academic network, offering a public information area, its commercial exploitation calls into question its experimental nature and probably also the universal character of the information available.

'The current initiatives in the technological industry and the entertainment business presage a very different development of the Internet [from that noted hitherto]. The concerns of the public are being disdainfully disregarded as greater support is given to the objectives of the giant cable, telephone and leisure companies'.¹

The objective of opening up the network hitherto used by academics, professionals and amateurs to commercialization is, however, to address the broadest possible clientèle.²

¹ in *Le Monde diplomatique*, March 1994, 'Reléguer le bien public sur les bas-côtés'.

² In addition to the telecommunications and equipment costs, the average user of the commercial services offered on the Internet spends up to 300 dollars a year.

Is there still time to reverse the observed trends or should European strategy simply be to adapt to the reality of the Internet?

'There are no grounds for opposing the rapid development of an extraordinary technological innovation and the objective which consists in equipping the European Union with its own normative instruments and operational programmes in order to ensure its presence in a market which is increasingly acquiring a worldwide dimension'.¹

The Internet is knocking more and more loudly on the doors of Europe: its growing success is a fact which obviously favours such a development. There is no point in denying it; this is the situation.

Given this situation, it could be beneficial to promote a supplementary positive policy to **develop a specifically European Internet as a support for the standards chosen by the Europeans** both for equipment and for services (applications), and by means of tax incentives, for example, for small businesses and the citizens.

'Rather than remaining merely clients, we in Europe should consider following the evolution of Internet closely, playing a more active role in the development of interlinkages [with our own networks]', to quote the Bangemann report.² This is a clear invitation to Europe to propose its own technical solutions.

The promotion of a certain type of standard depends on their large-scale use (relevant services at a reasonable price) and on the rapid development of prototypes (more pilot applications, for example): an active policy can be undertaken.

Seen in this way, international cooperation remains essential in order to ensure the convergence of standards. Indeed, in a situation where there is only one winner, Europe could be the loser: there is always a risk in actively promoting standards which do not become the dominant ones.

¹ European Parliament resolution on the information society of 30 November 1994, paragraph 31, A4-0073/94.

² in the Bangemann report of 26 May 1994, p.23.

The main thing is to *'reduce the internecine ambition to produce the first standard to be applied on the market, possibly at the expense of better but later standards'*.¹

The combination of a policy of cooperation with a policy of specially adapted precompetitive R&D could provide the prospect of an agreement on standards for applications at birth rather than when they have already been commercialized.

This means that the most sophisticated products should not be abandoned on the grounds that they have not been supported by a sound commercial policy: the rejection of a product on the grounds that it is unsuitable should not be used to mask confusion of the proven lack of user interest with lack of comprehension of the possibilities of the product - not to mention the pressure exerted by interest groups..

One cannot conclude that a product is immature if it has not been given the means to prove its maturity.

¹ in *The economic dimension of IT standards*, ©ECD, 1991, p.106.

☑ What aims for Europe?

'New basic (telecommunications) services are needed (...) Two basic elements are needed for such services: unambiguous standards and critical mass. (...) Once this critical mass has been achieved, growth rates can increase dramatically, as in the case of Internet'.¹

Basically, however, the problem is not whether the Internet protocol is superior or what technology is required, as if this was an isolated concern. A technology responds to needs and corresponds to values which first have to be defined.

One element remains essential for the European Union: **information cannot be treated like merchandise and this implies deeper consideration of its ultimate purpose.**

What fields have priority? What types of multimedia application merit development of electronic infrastructures? How can the public service element be preserved? How can we move towards a universal service? Once these questions have been addressed, it will then be possible to decide whether it is really judicious to see the Internet as the embryo of a European information infrastructure; and how it should be used. It will also be easier to determine the respective roles of the private and public sectors which must act in concert.

Underlying these questions, it would seem ultimately essential to reconcile:

- the short and long terms;
- rapid commercialization and forward planning; industrial requirements and social expectations (which are more difficult to identify);
- interoperable infrastructures and information adapted to real needs;
- professional and public information highways;
- commercial service, public service, universal service.

Indirectly, the European Parliament is voicing these concerns when it insists on the different aspects of the purposes of technological progress.

'If no account is taken of the social, cultural and linguistic aspects of the information society such as it is emerging at international level, if strict coordination is not instituted in the field of scientific research and technological development and if a 'contents strategy' allowing the current challenges to be met is not defined within the audio-visual sector, the

¹ in the Bangemann report, May 1994, p.23.

EUROPEAN INFORMATION HIGHWAYS: WHICH STANDARDS?

hopes raised may well prove to be the results of excessive euphoria rather than the outcome of a serious assessment of existing potential.¹

¹ European Parliament resolution on the information society, 30 November 1994, § 41, A4-0073/94.

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Resumé

Zusammenfassung

Περίληψη

Resumen

Sintesi

Resumé

Resumo

Fremtiden for OSI-standarderne (Open Systems Interconnexion) er blevet særdeles usikker, efter at USA's regering er begyndt at overveje ikke længere at forbeholde den offentlige støtte til den internationale standardiseringsproces inden for IT (informationsteknologien) udelukkende for standarder, der benyttes af Internet. Dette kunne få meget store følger for den øvrige verden i betragtning af det amerikanske IT-markeds størrelse og betydelige indflydelse.

Europæerne har al mulig grund til at tro, at en sådan beslutning totalt vil underminere deres egen normative strategi, der er lagt tæt op ad den strategi, der er valgt for OSI.

Den internationale anerkendelse af Internet-protokollen IPS (Internet Protocol Suite) er umiddelbart forstående og risikerer at ødelægge den europæiske politik for offentlige kontrakter. Anerkendelsen vil desuden medføre, at to normative systemer, der teoretisk set ikke befinder sig på samme plan, vil komme til at konkurrere med hinanden. Hvis man evaluerer de forskellige mål og mulige (in)kompatibilitet mellem disse to systemer, forekommer det ikke berettiget at opgive ræsonnementet bag politikken med åbne systemer. Der er i øvrigt overhovedet ikke nogen tvivl om udfaldet af denne tvungne sameksistens i betragtning af den handelspolitik, der ligger til grund for den kraftige vækst i IPS, og navnlig den enorme støtte IPS har nydt godt af i årevis takket være udviklingen af Internet-nettet og elektroniske applikationer på World-Wide-Web.

Stiller man Internets forhistorie og den gradvise udbredelse af OSI op over for hinanden, må det konstateres, at de europæiske langsigtede retningslinjer, som gjaldt indtil for nylig, i særlig grad syntes at imødekomme det gamle kontinents specifikke politiske og kulturelle forhold. Udbredelsen af europæiske grupper og organer for parastandardisering, fremme af standardisering gennem offentlige kontrakter og initiativer til at overvinde den langsommelige internationale proces viser alt sammen tydeligt, hvor beslutsomt den europæiske standardiseringspolitik har været ført. Det Europæiske Fællesskab har altid tilstræbt at inddrage flest mulige aktører så snævert som muligt i en gennemsigtig politik, som alle kunne tilslutte sig, hvilket er helt på linje med hovedsigtet med OSI.

Er det nu nødvendigt at opgive denne politik for bedre at imødekomme de presserende behov på IT- og telekommunikationsmarkedet? Skal man forholde sig passiv over for den kraftige vækst i Internet-nettet uden at beskæftige sig med dets brug til kommercielle formål? Kan det endnu nås og betale sig at fremme alternative internationale informationsnet, der benytter standarder valgt og udviklet af det internationale samfund?

Disse spørgsmål kræver ikke alene et hurtigt svar, de rejser også fundamentale spørgsmål om Europas teknologiske og sociokulturelle fremtid, især i forbindelse med *informationsmotorvejene*. Valget af standarder i de pågældende sektorer er i høj grad afgørende for, hvilken teknologi og informationstype der benyttes på de elektroniske net.

Hvis USA's handelspolitik får tildelt fordele på et så strategisk område som information, kunne markedskræfternes frie spil let blive fordrejet. Kan man i øvrigt overlade det ene og alene til markedskræfterne at opfylde de europæiske borgeres forventninger, når man tager i betragtning, hvilke krav der må stilles med hensyn til informationernes indhold og formålet med de elektroniske infrastrukturer?

Det er klart, at standarderne på informationsområdet er så afgørende, at der må træffes definitive politiske valg angående standarderne med hensyn til:

- at vedtage en væsentlig mere offensiv handelsstrategi fra Den Europæiske Unions side for at frigøre markedskræfterne, der er hovedincitamentet til innovation og finansiering - således som der opfordres til i Bangemann-rapporten
- sideløbende hermed at gennemføre en dybtgående analyse af, hvilke standarder der bedst imødekommer de specifikke forhold i Europa: trods det kommercielle pres er det vigtigt at undgå forhastede og måske uigenkaldelige beslutninger om den fremtid, der ligger foran os med indgangen i *det nye tekniko-industrielle systems æra*¹.

¹

I I&T Magazine, forår 1994, "Les réseaux d'information transeuropéens" (de transeuropæiske informationsnet), G. Santucci, Kommissionens GD XIII.

Seitdem die amerikanische Bundesregierung in Betracht gezogen hat, nicht mehr ausschließlich dem internationalen Normungsprozeß in den IT (Informationstechnologien) staatliche Unterstützung zu gewähren, sondern auch die von Internet verwendeten Normen zu unterstützen, ist die Zukunft der OSI (Open Systems Interconnexion)-Normen besonders ungewiß geworden. Die Folgen könnten in Anbetracht des Umfangs und des großen kommerziellen Einflusses des amerikanischen IT-Marktes für die übrige Welt von großer Bedeutung sein.

Die Europäer haben guten Grund zu glauben, daß ein derartiger Beschluß ihre eigene Normenstrategie, die sich eng von der Strategie der OSI leiten läßt, grundlegend in Frage stellt.

Die internationale Anerkennung des Internet IPS-Protokolls (Internet Protocol Suite), die gerade im Gange ist, bringt die Gefahr mit sich, daß die europäische Politik der öffentlichen Beschaffung gefährdet wird. Sie wird ferner offiziell anerkennen, daß zwei normative Gesamtheiten in Wettbewerb treten, die theoretisch nicht auf dem gleichen Stand sind. Eine Bewertung der verschiedenen Ziele und möglichen (Un-)Vereinbarkeiten zwischen diesen beiden Gesamtheiten kann nicht die Aufgabe der Theorie der Offenen Systeme rechtfertigen. Die Handelspolitik, die dem Aufschwung des IPS zugrundeliegt, und vor allem die außergewöhnliche Unterstützung, die das IPS seit vielen Jahren dank der Entwicklung des Internet-Netzes und der elektronischen Anwendungen auf das World-Wide-Web genießt, lassen dennoch keinen wirklichen Zweifel hinsichtlich des Ausgangs dieser Zwangskoexistenz zu.

Vergleicht man die Vorgeschichte von Internet und das allmähliche Entstehen von OSI, so ist festzustellen, daß die langfristigen europäischen Ausrichtungen, die bisher überwogen, anscheinend vor allem den politischen und kulturellen Besonderheiten des alten Kontinents entsprachen. Das verstärkte Aufkommen von europäischen Para-Normungsgruppen und -gremien, die Förderung der Normen durch das öffentliche Beschaffungswesen, die Initiativen zur Überwindung der Langwierigkeit des internationalen Prozesses zeigen deutlich die Entschlossenheit, mit der die europäische Normungspolitik verfolgt wurde. Die Europäische Gemeinschaft war stets bemüht, in einem transparenten und einvernehmlichen Vorgehen möglichst viele Akteure so eng wie möglich zu beteiligen, wie es auch dem Geist für das OSI entspricht.

Ist es jetzt angebracht, diesen Lösungsansatz aufzugeben, um der auf den IT- und Telekommunikationsmärkten festzustellenden Ungeduld stärker Rechnung zu tragen? Muß man angesichts des Aufschwungs des Internet-Netzes passiv bleiben, ohne sich um seine Verwendung zu kommerziellen Zwecken zu kümmern? Ist es noch Zeit bzw. zweckdienlich, alternative internationale Informationsnetze zu fördern, die Normen verwenden, die die internationale Gemeinschaft gewählt und entwickelt hat?

Diese Fragen sind nicht nur dringlich, sie greifen jedoch auch wesentliche Fragen für die technologische und soziokulturelle Zukunft Europas auf, insbesondere in der Perspektive der *Datenautobahnen*. Die Wahl der Normen in den fraglichen Bereichen bedingt zum Großteil die Technik und den Informationstyp, der in die elektronischen Netze eingespeist wird.

Wenn die amerikanische Handelspolitik Vorteile in einem so strategischen Bereich wie der Information erhält, könnte das Marktspiel leicht verfälscht werden. Kann man sich im übrigen nur auf die Marktmechanismen verlassen, um den Erwartungen der europäischen Bürger zu entsprechen, wenn man an die Erfordernisse im Bereich des Inhalts der Information und der Zweckbestimmung der elektronischen Infrastrukturen denkt?

Wie man sieht, sind die Normen im Bereich der Information derart entscheidend, daß sie verbindliche politische Optionen hinsichtlich folgender Punkte verdienen:

- Annahme einer deutlich offensiveren Handelsstrategie von Seiten der Europäischen Union, um die Marktkräfte freizugeben, die den Hauptantrieb für Innovation und Finanzierung darstellen - wozu der "Bangemann-Bericht" auffordert;
- gleichzeitig gründliche Überlegung über die Normen, die am geeignetsten sind für die Besonderheiten von Europa: trotz des kommerziellen Drucks ist es wesentlich, übereilte und vielleicht nicht umkehrbare Entscheidungen über die Zukunft zu vermeiden, die uns den Eintritt in ein "neues Zeitalter des technisch-industriellen Systems" bringt.¹

¹ I&T Magazine, Frühjahr 1994, "Die transeuropäischen Informationsnetze", G. Santucci, GD XIII der Europäischen Kommission.

Από τότε που η ομοσπονδιακή κυβέρνηση των ΗΠΑ άρχισε να εξετάζει το ενδεχόμενο να αποσύρει την αποκλειστική δημόσια υποστήριξη που παρέιχε μέχρι τότε στη διεθνή διαδικασία τυποποίησης στον τομέα των ΤΠ (τεχνολογιών της πληροφορίας), και να στραφεί προς τα πρότυπα που χρησιμοποιεί το Internet, το μέλλον των προτύπων OSI (Open Systems Interconnection - Διασύνδεση Ανοικτών Συστημάτων) έχει καταστεί εξαιρετικά αβέβαιο. Οι συνέπειες για τον υπόλοιπο κόσμο θα μπορούσαν να αποδειχθούν σοβαρότατες, δεδομένου του μεγέθους και του τεράστιου εμπορικού βάρους της αμερικανικής αγοράς ΤΠ.

Οι Ευρωπαίοι έχουν βάσιμους λόγους να φοβούνται ότι μια τέτοια απόφαση θα ανέτρεπε εκ βάθρων τη δική τους στρατηγική σε ό,τι αφορά τα πρότυπα, στρατηγική στενά συνδεδεμένη με την OSI.

Η διαδικασία διεθνούς αναγνώρισης του πρωτοκόλλου Internet IPS (Internet Protocol Suite), η οποία βρίσκεται στα πρόθυρα της ολοκλήρωσης, θα μπορούσε να θέσει σε κίνδυνο την ευρωπαϊκή πολιτική δημοσίων αγορών. Εξάλλου, η εξέλιξη αυτή θα επισημοποιούσε την παράλληλη και ανταγωνιστική ύπαρξη δύο συστημάτων προτύπων τα οποία δεν είναι, θεωρητικά, ισοδύναμα. Η αξιολόγηση των διαφόρων στόχων και πιθανών σημείων ασυμβατότητας των δύο συστημάτων δεν φαίνεται να οδηγεί στο συμπέρασμα ότι πρέπει να εγκαταλειφθεί η μεθοδολογία των Ανοικτών Συστημάτων. Αλλά η εμπορική πολιτική που αποτελεί το υπόβαθρο της ανάπτυξης του IPS και, πρωτίστως, η ισχυρότατη υποστήριξη την οποία παρέχει, εδώ και πολλά χρόνια, στο σύστημα αυτό η ανάπτυξη του δικτύου Internet και των ηλεκτρονικών εφαρμογών με βάση το World-Wide-Web, δεν επιτρέπουν ψευδαισθήσεις ως προς την έκβαση της υποχρεωτικής αυτής συμβίωσης.

Μία συγκριτική εξέταση του ιστορικού του Internet και της σταδιακής εξέλιξης του OSI οδηγεί αναπόδραστα στη διαπίστωση ότι οι μακροπρόθεσμοι ευρωπαϊκοί στόχοι, οι οποίοι ήταν μέχρι πρόσφατα το καθοριστικό στοιχείο της πολιτικής, ήταν σε στενή αντιστοιχία με τις πολιτικές και πολιτιστικές ιδιαιτερότητες της Γηραιάς Ηπείρου. Ο πολλαπλασιασμός των ευρωπαϊκών οργανισμών και φορέων ανεπίσημης τυποποίησης, η προώθηση προτύπων μέσω των δημοσίων αγορών, καθώς και οι πρωτοβουλίες με στόχο να παρακαμφθούν οι αργοπορίες της διεθνούς διαδικασίας τυποποίησης, δείχνουν καθαρά την αποφασιστικότητα που χαρακτήρισε την ευρωπαϊκή πολιτική τυποποίησης. Η Ευρωπαϊκή Κοινότητα προσπάθησε πάντα να προωθήσει την όσο το δυνατόν στενότερη συνεργασία μεταξύ όσο το δυνατόν περισσότερων παραγόντων σε μια διαφανή και συναινετική πορεία, σύμφωνα με το πνεύμα της OSI.

Θα ήταν τώρα σκόπιμο να εγκαταλειφθεί η προσέγγιση αυτή, προκειμένου να μπορέσει η Ευρώπη να ανταποκριθεί καλύτερα στη διαπιστωμένη ανυπομονησία που διακατέχει τις αγορές ΤΠ και τηλεπικοινωνιών; Μπορούμε να μείνουμε αδρανείς μπροστά στην εξάπλωση του δικτύου Internet, χωρίς να μας απασχολεί η χρήση του για εμπορικούς σκοπούς; Υπάρχει άραγε ακόμη χρόνος, και θα ήταν σκόπιμο, να προωθήσουμε εναλλακτικά διεθνή δίκτυα πληροφοριών που θα χρησιμοποιούν τα πρότυπα που επέλεξε και διαμόρφωσε η διεθνής κοινότητα;

Τα ερωτήματα αυτά όχι μόνον προσλαμβάνουν επείγοντα χαρακτήρα, αλλά και θέτουν καίρια και θεμελιώδη ζητήματα ως προς το τεχνολογικό και κοινωνικο-πολιτιστικό μέλλον της Ευρώπης, ιδίως με την προοπτική των λεωφόρων πληροφοριών. Η επιλογή των προτύπων στους εξεταζόμενους τομείς προδιαγράφει σε μεγάλο βαθμό την τεχνική που θα χρησιμοποιούν και το είδος των πληροφοριών που θα παρέχουν τα ηλεκτρονικά δίκτυα.

Εάν παραχωρηθούν στην αμερικανική εμπορική πολιτική τέτοια πλεονεκτήματα σε έναν τομέα τόσο μεγάλης στρατηγικής σημασίας όσο είναι ο τομέας της πληροφορίας, τότε η λειτουργία των νόμων της αγοράς θα μπορούσε να αποδειχθεί παιχνίδι με σημαδεμένη τράπουλα. Εξάλλου, μπορεί κανείς να δεχθεί τους μηχανισμούς της αγοράς ως μοναδικό και αποκλειστικό μέσο για την εκπλήρωση των προσδοκιών των ευρωπαϊκών πολιτών, όταν ληφθούν υπόψη οι απαιτήσεις ως προς το περιεχόμενο της πληροφορίας, καθώς και ο τελικός σκοπός των ηλεκτρονικών υποδομών;

Είναι σαφές ότι τα πρότυπα στον τομέα της πληροφορίας είναι σε τέτοιο βαθμό καθοριστικά, ώστε να επιβάλλουν σταθερές πολιτικές επιλογές σε ό,τι αφορά:

- την υιοθέτηση μιας σαφώς επιθετικότερης εμπορικής στρατηγικής από πλευράς Ευρωπαϊκής Ένωσης, προκειμένου να απελευθερωθούν οι δυνάμεις της αγοράς - βασικός κινητήριος μοχλός της καινοτομίας και της χρηματοδότησης, όπως επισημαίνει η "Έκθεση Bangemann".
- την παράλληλη σε βάθος μελέτη με σκοπό να επιλεγούν τα πρότυπα εκείνα που προσοδιάζουν καλύτερα στις ιδιαιτερότητες της Ευρώπης: παρά τις εμπορικές πιέσεις, είναι πρωταρχικής σημασίας να αποφευχθούν οι βιαστικές, και ενδεχομένως αναντίστρεπτες, αποφάσεις για το μέλλον που μας επιφυλάσσει η είσοδος σε μια "νέα εποχή του τεχνικο-βιομηχανικού συστήματος".¹

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από το I&T Magazine, Ανοιξη 1994, "Les réseaux d'information transeuropéens", G. Santucci, ΓΔ XIII της Επιτροπής των Ευρωπαϊκών Κοινοτήτων.

Desde que el gobierno federal americano ha previsto no seguir prestando un apoyo público exclusivo a. proceso internacional de normalización en las TI (tecnologías de la información), en beneficio de las normas utilizadas por Internet, el futuro de las normas OSI (Open Systems Interconnexion) está lleno de incertidumbres. Teniendo en cuenta las dimensiones y el poder de influencia comercial del mercado americano de las TI, esta situación podría tener importantes repercusiones en el resto del mundo.

Los Europeos tienen buenas razones para creer que una decisión de esta índole cuestiona fundamentalmente su propia estrategia normativa, basada principalmente en la adoptada para la OSI.

El reconocimiento internacional del protocolo Internet IPS (Internet Protocol Suite), que se encuentra en su fase final, podría comprometer la política europea de contratos públicos y va a oficializar, además, la competencia entre dos conjuntos normativos que no se encuentran, en teoría, en el mismo plano. Una evaluación de los diferentes objetivos e (in)compatibilidades posibles entre estos dos conjuntos no parece justificar el abandono de la filosofía de los Sistemas Abiertos. No obstante, la política comercial latente en el desarrollo del protocolo IPS y, sobre todo, el increíble apoyo que se viene prestando a este último desde hace algunos años gracias al desarrollo de la red Internet y de las aplicaciones electrónicas sobre el World-Wide-Web no plantean ninguna duda en cuanto al futuro de esta coexistencia forzada.

Considerando de manera paralela la evolución histórica de Internet y el desarrollo progresivo de la OSI, cabe destacar que las orientaciones europeas a largo plazo, que son las que han prevalecido hasta hace poco tiempo, parecían ser las adecuadas para las especificidades políticas y culturales del Viejo Continente. La proliferación de grupos y organismos europeos de paranormalización, el fomento de las normas a través de los contratos públicos y las iniciativas encaminadas a solventar la lentitud del proceso internacional ponen de manifiesto la determinación con la que se ha llevado a cabo la política europea de normalización. La Comunidad Europea siempre se ha esforzado por asociar lo más estrechamente posible a un máximo de actores a una gestión transparente y consensual, de conformidad con la ideología de la OSI.

¿Conviene ahora abandonar este enfoque para hacer frente de manera más adecuada a las impaciencias que se han detectado en los mercados de las TI y de las telecomunicaciones? ¿Debemos mantenernos pasivos ante el desarrollo de la red Internet, sin preocuparnos de su utilización con fines comerciales? ¿Estamos todavía a tiempo o sería todavía conveniente fomentar unas redes internacionales alternativas de información que utilicen unas normas elegidas y desarrolladas por la comunidad internacional?

Estos interrogantes no sólo son urgentes, sino que además plantean unos problemas esenciales sobre el futuro tecnológico y sociocultural de Europa, en particular en la perspectiva de las *autopistas de la información*. La elección de normas en los sectores de referencia condiciona en gran medida la técnica y el tipo de información de las redes electrónicas.

Si se permite que la política comercial americana disfrute de ventajas en un ámbito tan estratégico como es el de la información, podría falsearse el funcionamiento del mercado. Además, si se piensa en las exigencias en materia de contenido de la información y en la finalidad de las infraestructuras electrónicas, ¿es posible encomendarse únicamente a los mecanismos de mercado para hacer frente a las expectativas de los ciudadanos europeos?

Es evidente que las normas en el ámbito de la información son hasta tal punto determinantes que se necesitan unas elecciones políticas firmes en cuanto a:

- la adopción de una estrategia comercial mucho más ofensiva por parte de la Unión Europea con el objeto de liberar las fuerzas de mercado, principal motor de la innovación y de la financiación -tal y como se pide en el "Informe Bangemann";
- una reflexión profunda y simultánea sobre las normas más adecuadas a las especificidades de Europa: a pesar de las presiones comerciales, se han de evitar las decisiones apresuradas, y quizás irreversibles, sobre el futuro que nos reserva la entrada en una "nueva era del sistema técnico-industrial".¹

¹ En I&T Magazine, primavera de 1994, "Las redes de información transeuropeas", G. Santucci, DG XIII de la Comisión Europea.

Da quando il governo federale americano ha previsto di non continuare a fornire un sostegno pubblico esclusivo al processo internazionale di normalizzazione nel settore delle TI (tecnologie dell'informazione), a vantaggio delle norme utilizzate da Internet, il futuro delle norme OSI (Open Systems Interconnexion - Interconnessione di sistemi aperti) si è fatto particolarmente incerto. Viste le dimensioni e il potere di incidenza commerciale del mercato americano delle TI, le ripercussioni potrebbero essere molto rilevanti per il resto del mondo.

Gli Europei hanno buoni motivi di credere che una tale decisione rimetta fondamentalmente in discussione la loro stessa strategia normativa, strettamente ispirata a quella adottata per l'OSI.

Il riconoscimento internazionale del protocollo Internet IPS (Internet Protocol Suite), sul punto di essere concluso, rischia di compromettere la politica europea degli appalti pubblici. Tale riconoscimento ufficializzerà altresì la concorrenza tra due insiemi di norme che, in teoria, non si trovano sullo stesso piano. Una valutazione dei vari obiettivi e delle possibili (in)compatibilità tra questi due insiemi non sembra giustificare l'abbandono della filosofia dei Sistemi aperti. Ciò nondimeno, la politica commerciale alla base del successo del protocollo IPS e, soprattutto, il sostegno formidabile su cui quest'ultimo può contare da numerosi anni grazie allo sviluppo della rete Internet e delle applicazioni elettroniche sulla World-Wide-Web non lasciano alcun dubbio in merito agli esiti di questa coesistenza forzata.

Esaminando parallelamente l'evoluzione storica di Internet e lo sviluppo progressivo dell'OSI, bisogna constatare che gli orientamenti europei a lungo termine, prevalsi fino a poco tempo or sono, sembravano i più adeguati alle specificità politiche e culturali del Vecchio continente. La dispersione dei gruppi e degli organismi europei di paranormalizzazione, la promozione delle norme da parte degli appalti pubblici e le iniziative adottate per ovviare alle lungaggini del processo internazionale dimostrano chiaramente la determinazione che ha caratterizzato la politica europea di normalizzazione. La Comunità europea ha sempre tentato di coinvolgere quanto più strettamente possibile il maggior numero possibile di protagonisti in un'impostazione trasparente e consensuale, conformemente alla filosofia dell'OSI.

E' opportuno abbandonare attualmente questa impostazione per far fronte in modo più adeguato ai problemi urgenti individuati sui mercati delle TI e delle telecomunicazioni? E' necessario adottare una posizione passiva di fronte al successo della rete Internet, senza preoccuparsi del suo uso a fini commerciali? Siamo ancora in tempo per promuovere reti internazionali alternative di informazione che utilizzino norme scelte e sviluppate dalla comunità internazionale ed è ancora utile farlo?

Questi quesiti non solo sono urgenti, ma sollevano interrogativi essenziali sul futuro tecnologico e socioculturale dell'Europa, segnatamente nella prospettiva delle *autostrade dell'informazione*. La scelta delle norme nei settori in questione condiziona in gran parte la tecnica e il tipo di informazioni diffuse sulle reti elettroniche.

Se la politica commerciale americana beneficia di vantaggi in un settore strategico come quello dell'informazione, il funzionamento del mercato potrebbe risultarne falsato. Si può peraltro affidarsi ai soli meccanismi di mercato per rispondere alle aspettative dei cittadini europei quando si pensa alle esigenze in materia di contenuto dell'informazione e alla finalità delle infrastrutture elettroniche?

E' evidente che le norme nel settore dell'informazione sono tanto determinanti da meritare chiare scelte politiche riguardo:

- all'adozione di una strategia commerciale nettamente più offensiva da parte dell'Unione europea per liberare le forze di mercato, principio motore dell'innovazione e del finanziamento, come invita la "Relazione Bangemann";
- al contempo, a una riflessione approfondita sulle norme più adeguate alle specificità dell'Europa: a dispetto delle pressioni commerciali, è essenziale evitare le decisioni affrettate, e forse irreversibili, sul futuro che ci riserva l'entrata in una "nuova era del sistema tecnico industriale"¹.

¹

in I&T Magazine, primavera 1994, "Les reseaux d'information transeuropéens", G. Santucci, DG XIII della Commissione europea.

Sedert de Amerikaanse Federale regering zich voorgenomen heeft geen exclusieve ondersteuning meer te geven aan het internationale normalisatieproces op het terrein van de IT (informatietechnologieën) ten gunste van de door Internet gehanteerde normen, is de toekomst van de OSI-normen (Open Systems Interconnexion) bijzonder onzeker geworden. De gevolgen zouden voor de rest van de wereld, gezien de marktomvang en de sterke commerciële positie van de Amerikaanse IT-markt, zeer ingrijpend kunnen zijn.

De Europeanen hebben gegronde redenen om aan te nemen dat dit besluit hun eigen normalisatiestrategie, die nauw aansluit bij die voor OSI, op losse schroeven gezet heeft.

De internationale erkenning van het Internet-protocol IPS (Internet Protocol Suite), die binnenkort een feit zal zijn, dreigt het Europese beleid inzake de markten voor overheidsopdrachten in gevaar te brengen. Bovendien zal daardoor de rivaliteit tussen de twee transmissieprotocollen naar buiten treden, die, in theorie, niet van hetzelfde niveau zijn. Een evaluatie van de verschillende doelstellingen en eventuele (in)compatibiliteiten tussen de twee systemen lijkt er niet op te wijzen dat de filosofie van de Open Systems in de Europese Unie moet worden verlaten. Echter de commerciële argumenten die aan het besluit inzake IPS ten grondslag liggen en met name de formidabele steun waarvan dit vele jaren geprofiteerd heeft dank zij het succes van Internet en zijn toepassingen op het World-Wide-Web laten ruimte voor twijfel over de afloop van deze krachtmeting.

Bij vergelijking van de geschiedenis van Internet met de gestage ontwikkeling van OSI moet worden geconstateerd dat de Europese richtlijnen op langere termijn die tot nu toe gedomineerd hebben, goed leken te passen bij het bijzondere politieke en culturele karakter van het Oude Continent. De groei van het aantal "para-standaardisatie"-groeperingen en -organisaties, de bevordering van normen via overheidsopdrachten, het initiatief om het trage verloop van de internationale onderhandelingen de baas te worden laten de vastbeslotenheid zien waarmee het Europese standaardiseringsbeleid ten uitvoer gelegd is. De Europese Commissie heeft zich er voortdurend voor ingezet zo veel mogelijk partijen bijeen te brengen om door openheid en overleg vooruitgang te boeken, overeenkomstig de geest van OSI.

Is het verantwoord om thans deze aanpak in antwoord op de zorgen die de IT- en Telecommunicatiemarkten hebben geuit te laten varen? Moet de groei van Internet passief worden gadeslagen zonder zich zorgen te maken over de consequenties van een volledig commercieel gebruik ervan? Is er nog tijd voor en heeft het nut om alternatieve internationale informatienetwerken die normen gebruiken die door de internationale gemeenschap gekozen en ontwikkeld zijn, te bevorderen?

Deze kwesties zijn niet alleen urgent; zij roepen fundamentele vragen op inzake de technologische en sociaal-culturele toekomst van Europa, met name in het perspectief van de *informatiesnelweg*. De keuze van de normen in deze sectoren zal een belangrijke invloed hebben op de technologie en op de typen informatie die via elektronische netwerken verspreid zullen worden.

Indien het Amerikaanse handelsbeleid de kans krijgt op een zo strategisch terrein als de informatie-industrie een voorsprong te nemen kan dit de werking van de markt verstoren. Is de markt bovendien het enige betrouwbare mechanisme wanneer het erom gaat te voorzien in de bijzondere behoeften van Europa ten aanzien van de inhoud van de informatie en de daarvoor benodigde infrastructuur?

Het is duidelijk dat de normen op het terrein van de informatie zo belangrijk zijn dat zij een definitieve keuze wettigen voor:

- een beslist offensievere handelsstrategie van de zijde van de Europese Unie, ten einde de werking van de markt te liberaliseren, daar deze de belangrijkste stimulans voor innovatie en financiering is - waarvoor ook in het rapport-Bangemann gepleit wordt;
- gelijktijdig een onderzoek naar de meest geschikte normen voor Europa in de wereld: ondanks de commerciële druk is het van essentieel belang dat overhaaste besluiten inzake toekomstige ontwikkelingen die de intrede van Europa in een "*nieuw tijdperk van het technisch-industrieel bestel*"¹ met zich mee zal brengen, vermeden worden, daar deze wellicht onomkeerbaar zouden kunnen zijn.

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In *I&T Magazine*, voorjaar 1994, "Transeuropean Information Networks", G. Santucci, DG XIII van de Europese Commissie.

Desde que o Governo Federal americano se dispôs a não dar mais apoio público exclusivo ao processo internacional de normalização no domínio das TI (tecnologias da informação), em benefício das normas utilizadas pela Internet, o futuro das normas OSI (Open Systems Interconnexion) tornou-se particularmente incerto. As consequências para o resto do mundo poderão ser muito importantes, tendo em conta a dimensão e o poder de influência comercial do mercado americano das TI.

Os europeus têm boas razões para crer que tal decisão põe fundamentalmente em causa a sua própria estratégia normativa, que se inspira estreitamente na estratégia adoptada para as OSI.

O reconhecimento internacional do protocolo Internet IPS (Internet Protocol Suite), a ponto de se realizar, arrisca-se a comprometer a política europeia dos concursos públicos. Além disso, irá tornar oficial a concorrência de dois conjuntos normativos que, teoricamente, não se encontram no mesmo plano. Uma avaliação dos diferentes objectivos e (in)compatibilidades possíveis entre estes dois conjuntos não parece justificar que se abandone a filosofia dos sistemas abertos. No entanto, a política comercial subjacente à divulgação do IPS e, sobretudo, o formidável apoio de que este beneficia há já vários anos graças ao desenvolvimento da rede Internet e das aplicações electrónicas no World-Wide-Web não deixam realmente lugar a dúvidas quanto ao resultado desta coexistência forçada.

Ao considerar paralelamente a história da Internet e a eclosão progressiva da OSI, somos obrigados a constatar que as orientações europeias a longo prazo, prevalentes até há pouco, pareciam convir em especial às especificidades políticas e culturais do velho continente. A proliferação de grupos e organismos europeus de paranormalização, a promoção de normas através de concursos públicos, as iniciativas tendentes a ultrapassar a lentidão do processo internacional demonstram bem a determinação com que foi conduzida a política europeia de normalização. A Comunidade Europeia teve sempre a preocupação de associar tão estreitamente quanto possível um máximo de actores num processo transparente e consensual, em conformidade com o espírito prevalente na OSI.

Convirá agora abandonar esta abordagem a fim de melhor responder às impaciências identificadas nos mercados das TI e das telecomunicações? Deveremos ser passivos perante a expansão da rede Internet, sem nos preocuparmos com a sua utilização para fins comerciais? Estaremos ainda a tempo, ou será ainda útil, promover redes internacionais de informação alternativas que utilizem normas escolhidas e desenvolvidas pela Comunidade Internacional?

Estas interrogações revestem-se não apenas de carácter urgente, mas suscitam também interrogações essenciais quanto ao futuro tecnológico e sociocultural da Europa, nomeadamente na perspectiva das *autoestradas da informação*. A escolha das normas nos sectores em questão condiciona em grande parte a técnica e o tipo de informação dispensada nas redes electrónicas.

Se à política comercial americana forem concedidas vantagens num domínio tão estratégico quanto a informação, os mecanismos de mercado poderão ser falseados. Por outro lado, poderemos realmente entregar-nos nas mãos dos mecanismos de mercado para responder às expectativas dos cidadãos europeus, se pensarmos nas exigências em matéria de conteúdo da informação e na finalidade das infra-estruturas electrónicas?

Como vemos, as normas no domínio da informação são de tal forma determinantes que requerem opções políticas firmes quanto:

- à adopção de uma estratégia comercial bastante mais ofensiva por parte da União Europeia a fim de libertar as forças de mercado, motor principal da inovação e do financiamento - como o defende o "Relatório Bangemann";
- a, simultaneamente, uma reflexão aprofundada sobre as normas mais adequadas às especificidades da Europa: apesar das pressões comerciais, é essencial evitar decisões apressadas, e talvez irreversíveis, quanto ao futuro que nos reserva a entrada numa *"nova idade do sistema técnico-industrial"*¹.

¹

In I&T Magazine, Primavera 1994, "Les réseaux d'information transeuropéens", G. Santucci, DG XIII da Comissão Europeia.

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