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ISDN: The telecommunications highway for Europe after 1992
or Paving a dead end street?: The politics of pan-european
telecommunications network development

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**ISDN:
"The Telecommunications Highway for Europe
after 1992" or "Paving a Dead-End Street?":
The Politics of Pan-European
Telecommunications Network Development**

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93/6

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Abstract

The paper examines the policies of the Commission of the European Community (CEC) aiming towards a coordinated introduction of an Integrated Services Digital Network (ISDN) in all member countries by 1993. Originally, ISDN was supposed to be a new telecommunications network that would eventually replace the old telephone network. The analysis shows, however, that the ISDN activities of the CEC have been somewhat trapped between the attempt to liberalize the hitherto closed and fragmented European telecommunications markets on the one hand and the aim to build up a strong, independent European telecommunications industry and a Europe-wide telecommunications network on the other. At present, ISDN deployment is far behind schedule, and it will not fulfill the expectations of the Commission. Nevertheless, the CEC has established itself as an agenda-setting actor in European telecommunications policy.

* * * * *

Die vorliegende Arbeit analysiert die Bestrebungen der Kommission der Europäischen Gemeinschaft, ein Dienstintegrierendes Digitales Fernmeldenetz (ISDN) europaweit bis 1993 einzuführen. ISDN war ursprünglich als ein Telekommunikationsnetz geplant worden, das das alte Telefonnetz ersetzen sollte. Die Analyse zeigt, daß die auf ISDN bezogenen Aktivitäten der Kommission von einer Ambiguität gekennzeichnet sind, die den Erfolg der Initiative gefährdeten: auf der einen Seite wollte die Kommission eine neue Infrastruktur mit Hilfe und zur Unterstützung der Monopolnetzbetreiber und der mit ihnen verflochtenen Nachrichtentechnikunternehmen aufbauen; auf der anderen Seite versuchte die Kommission, die fragmentierten und abgeschotteten nationalen Märkte und Monopole aufzubrechen. Der Status der ISDN-Einführung bleibt daher weit hinter den ursprünglichen Erwartungen zurück. Trotzdem hat es die Kommission geschafft, sich als neuer und entscheidender Akteur in der europäischen Telekommunikationspolitik zu positionieren.

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Introduction

Tjakko M. Schuringa, former Director Telecommunications of the EC Commission, said in his opening remarks to the EuroComm 88 Congress: "Europe has again become number one in telecommunications" (Schuringa 1989: 1). This constituted wishful thinking in 1988 as well as today. But perhaps this interpretation can be understood in view of the impressive number of initiatives and bold action coming from the European Community in the field of telecommunications since 1986. One initiative in the field of network development dealt with ISDN – the Integrated Services Digital Network. Schuringa believed that in the process of European "revitalization," ISDN would play a key role for two main reasons. First, as Filippo Maria Pandolfi (then Science, Research and Development Vice President) remarked when the first ISDN report was published in 1989, "ISDN has the potential to develop into an essential component of the new nervous system which the 1992 market so urgently needs" – a telecommunications infrastructure based on a harmonized and integrated network covering the whole of the EC. Second, operating ISDN networks using equipment delivered by European producers would be a good recommendation for sales of European products around the world (Schuringa 1989: 2-3).

In spite of the fact that ISDN has been given considerable attention by the Commission and that the EC technology program RACE in some ways is based upon the development of (narrowband) ISDN, the respective EC activities have not attracted much scholarly attention. In his recent overview article on EC decisions and directives in information technology and telecommunications, Delcourt, for example, only refers to ISDN in a brief footnote (Delcourt 1991).¹ The EC's ISDN plans, however, mirror more closely than other (less "mission-oriented") initiatives the overall expectations of the Commission (CEC), its broad policy aims in the field of telecommunications as well as some of the major problems connected with active EC policies towards 1992.

In this paper I will argue that the ISDN activities of the EC have been trapped between the attempt to liberalize and deregulate the hitherto closed and fragmented European telecommunications markets on the one hand and the aim to build up a strong independent European industry and a Europe-wide telecommunications network on the other hand. The two aims seem to be contradictory. A full-scale liberalization and deregulation would sweep away most

1 Delcourt mistakenly considers the ISDN recommendation to be a directive (Delcourt 1991: 15). The lack of scholarly interest in the ISDN initiatives might well be connected to the shift of emphasis within overall EC plans and perceptions: active industrial policy is being seriously questioned while liberalization and deregulation turn out to be the main targets of the CEC.

of the European producers and would put in limbo the very rationale of the initiatives for a common market in Europe after 1992 – the survival and well-being of European telecommunications industry. But even a slow-moving reform process will lead to a restructuring of markets and will create less powerful telecommunications administrations – while powerful administrations would be best suited to make the far-reaching, long-term network decisions considered necessary to implement ISDN.

Not only the strategic aims of the Community have been ambiguous over time. In telecommunications generally the policy field has become increasingly complex. In the early 1980s small and tightly-knit actor networks – that might very well be conceptualized as "epistemic communities" (Haas 1992) – did make the relevant decisions which seemed to be economically and technically very convincing. The dynamics of the integration process in the EC, the internationalization of markets and new technological developments changed the scope of relevant options, opportunity structures and dominant constraints. In spite of the fact that the same persons have been participating in the decision-making process for the past decade or even longer, the resources which they command, their strategic aims and their institutional positions have changed radically. As a result, the ISDN plans at present are a sharply reduced, severely altered version of the initial programmatic statements.

In spite of the reduced expectations with respect to the actual implementation of ISDN, the CEC has established itself as a key actor in telecommunications which goes beyond passively observing the developments and tries to actively shape the future telecommunications outlook and the political agenda for reform. The role of the CEC is very often underestimated in the literature on the EC. It will be argued that this is due to theoretical deficiencies in the dominant literature on integration and political coordination. The focal point of this paper will be, therefore, an examination of the role of the Commission, which is treated as an independent actor overcoming resistance, adapting to changing situations, pressures and structures. In this respect, while the policy-oriented aims of the Commission (e.g. the original ISDN proposals) might change, the long-term interest of the Commission in guaranteeing its status and in developing its position as a powerful political actor remains stable.

Section One of the paper provides a brief description of ISDN as a technical system. As a technological concept, ISDN has changed its meaning over time. Most references to ISDN, however, refer to the ideas of the original CCITT expert group which made its first serious recommendations in the late 1970s. The technological system referred to as ISDN does not necessarily prescribe a specific strategy of constructing and implementing a telecommunications network. In political discussions ISDN has been identified with a solid and one-

sided top-down strategy. Over the years, new concepts have been developed. A look at the dynamics of network development (Section Two) will help to explain the changing policies of the Commission within this context. A detailed reconstruction of the role of the Commission in the ISDN process follows in Section Three, examining its interests and actions. Based on the empirical case study, the status of the Commission will be evaluated by looking at recent conceptualizations in the literature, taking up the theme of the CEC as an independent, institutional actor (Section Four). Section Five, finally, tries to deal with the problem of assessing successes and failures of the Commission in the area of network development.

1 ISDN as a New Technological System

In 1984 the CCITT, the International Telegraph and Telephone Consultative Committee, a subdivision of the International Telecommunications Union (ITU),² defined ISDN as a telecommunications network "... in general evolving from a telephone IDN (Integrated Digital Network), that provides end-to-end digital connectivity to support a wide range of services, including voice and non-voice services, to which users have access by a limited set of standard multipurpose user-network interfaces."³

Hidden behind this dry definition are developments that mark a significant break with the theory and practice of network developments in the past. Historically network developments in Europe were largely independent from one another. Each country developed its own infrastructure with its national specifications and services. In 1987 an EC report stated that only one true international telecommunications network would be available to customers: the telephone network (Muskens 1988). Even in the last couple of years new services and networks have been introduced that are not compatible with each other on a European basis (like videotext or mobile communication). This impedes, for example, cross connectivity of networks and services and the portability of

2 The CCITT is a permanent body of the ITU which produces recommendations and defines standards for telephone, telegraph, facsimile, and related telecommunications services.

3 International Telecommunications Union, CCITT (Comité Consultatif International Télégraphique et Téléphonique), VIIIth Plenary Assembly of the CCITT, Study Group XVIII, Report R 29, Part V, p.2.

equipment, and thus is a major stumbling block for a true European common market.

Telecommunications networks have been constructed to transmit information. More specifically, they have been constructed to transmit information of a specific kind: the telephone network enables individuals to communicate acoustically, the telex network facilitates written information exchange. Since the telecommunications networks were originally not planned for a general transmission of information, they were service-specific networks: each new service got its own new network. This has changed: Increasingly new telecommunications services are offered in existing networks. Telefax, Videotex and certain services of data communication use the telephone network; teletex and specific services of data communication are offered via the traditional telex network, which has been transformed into an integrated data network. The telecommunications networks are in the process of becoming service-integrated networks.

The telephone network is the world's most extensive telecommunications network. It used to be an analog network. The ongoing digitization of the analog networks is the technological basis allowing the integration of digital data as well as text and even image services into the telephone network. Once the telephone network is completely digital, it will provide the broadest, (in principle) economically most favorable basis for the integration of all voice and non-voice services in a single network. Thus it will become possible to create a uniform "telecommunications highway": the ISDN (Cf. Table 1). The immediate advantages of ISDN are a higher transmission speed for data (compared to existing telephone networks), a more economical use of the various telecommunications services (reduction of user fees), a more comfortable use of the various services, universality of access for text, voice, data and image communication.

In this sense, ISDN is a mixture of a process innovation – the digitization of the network – and a product innovation – already existing services will be altered and new services offered. The digitization does not make it necessary to integrate services. It is, however, to a large extent the precondition for integration and for the creation of new services.

Unlike other innovations of the past, the introduction of ISDN was supposed to take place in a coordinated manner on the international level. Towards the end of the 1970s a consensus among leading experts of the important network operators of the world seemed to exist about the type of new technology to be implemented, its basic features, strategic aims of network developments and the principle of international coordination. This extraordinary combination of factors might explain why ISDN became such a hotly debated issue in the early 1980s in the general public in countries like Germany. Up until then, network

planning was not a topic of general debate.⁴ Some identified the coming information society as "the age of ISDN," while others saw ISDN as the infrastructure of a society that is aiming at the elimination of personal freedoms.

2 Dynamics of Network Development

The characteristics as well as the definition of ISDN given above are the result of a long discussion process conducted in organizations for standardization such as the CCITT. ISDN in the described manner is far from being a technological or economic necessity. Some critics even hold that ISDN will be a major failure and that other technical solutions would be more favorable for telecommunications users (e.g. packet-switched data links, leased lines, private high-

4 A literature review demonstrates that the public as well as the scientific discussion on the social and political consequences of ISDN has largely been a German one. Cf. for example the various publications of Barbara Mettler-Meibom and Herbert Kubicek. Generally the assessment of Noam is correct, that "...[t]here has been no public discussion of the worldwide reorganization of the ubiquitous and universal telephone network" (Noam 1986: 2).

speed networks).⁵ Furthermore, public networks supporting leased circuits, telephone, telex, circuit- and packet-switched data services and ISDN can, from a purely technological point of view, be supplied under monopoly or competitive conditions. The system structure of networks as well as the implementation strategies may differ significantly. Finally, standardizing network characteristics involves the interests of competing groups like the network operators, the regulators in the field of telecommunications, the telecommunications equipment manufacturers, the computer manufacturers, the service providers and the network users. Each group has its own specific interests in ISDN with related conceptions about network architecture, technical requirements, user conditions etc. Economists have repeatedly argued that the ISDN concept is not the result of economic logic but a tool to secure future market power for the monopoly network operators (Kiessling 1992: 16-17).

The ISDN project as it was developed in the late 1970s in fact contained a specific conception of network development. In order to get a better understanding of this conception, it is useful to take a brief look at the different approaches from which the process of network development can be conceived. I will be doing this by adopting ideas from the discussion of political guidance and social order models (Streeck/ Schmitter 1985). We distinguish between four different models (Market, Self-Government, Organizational Concertation, Bureaucracy) that can be arranged along a continuum using the criteria of the degree of the influence and of the participation of public authorities, the formal obligation and the coercive character of agreements and the degree of network integration.

Approach 1: Market. In the first type of network development, the market decides what the optimal network will look like. Different network operators compete for customers and for the most acceptable technological and organizational approach. Only a minimum set of regulations by the state or a regulatory agency is provided. In this case it is possible to experiment with different, necessarily incompatible, ideas, – technical and otherwise. This might imply the development of separate networks that are incompatible with one another. Interconnection across different networks would be difficult or impossible, positive effects of connectivity and affiliation are lost.

New ideas – technical innovations – in general will most probably not interconnect with the prior technology, nor necessarily with other technical innovations being tried at the same time. Suspension of prior standards is essential to enable

5 Thus the reinterpretation of the acronym ISDN as "Ideas (or Innovations) Subscribers Don't Need" (Newstead 1986: 2).

experimentation; equally, formation of a new consensus is essential to regain connectivity. An example for this approach can be detected in the development of E-mail networks in the US. The result is not necessarily the optimal or most innovative network, but the one which is most widely accepted by customers.

Approach 2: Self-Government. This approach would aim to reduce the problems of connectivity and to secure benefits from economies of scale via self-organization. The dominant players (network operators, equipment manufacturers and maybe big users) get together on a voluntary basis to agree on a minimum set of standards and concepts that allow different networks to communicate with each other. The influence of the state is still minimal. An example for this approach would be the process of defining an American ISDN concept in the late 1980s and early 1990s. This approach was masterminded by Bellcore, which had organized the major network operators and equipment producers in the US to formulate an agreement that would allow the interconnectivity of networks and the production of compatible equipment. The enforcement of such an agreement is difficult, to say the least. It relies on the reputation of the organizers as well as individual cost-benefit calculations. Common consent and unanimous agreement are necessary ingredients.

Approach 3: Organizational Concertation. A third approach relies on official agreements, i.e. formal contracts between the dominant players in which the state or state-like monopoly institutions usually participate, as well. The latter also serve as the organizers of consensus formation, not only for one specific case as in Approach 2, but usually within the framework of a longer-lasting cooperation, based on firm rules and mutual acknowledgement of status etc. It involves processes of bargaining and the finding of compromises to suit the interests of the participants as well as the commitment to common goals. In contrast to self-organization, the exit-option is harder to realize and the non-obliging actor faces severe sanctions.

Approach 4: Bureaucracy. A fourth approach builds upon the strength of public or monopoly authority. The network development is prescribed by an authority, which also has the power and the competence to ensure the implementation. Problems of connectivity are minimized. Technological competition and a choice between technological alternatives are outruled. An optimal technology might be introduced in this way, but at the same time road blockades for rivalling technologies might be erected and the search for competing technologies inhibited. Universal access and interconnectivity are leading concepts.⁶

6 The network that corresponds to such a planning concept is described by Noam with the following words: "In many ways, a classical telecommunications net-

Table 2: Concepts of Network Development

Market (private actors)	Self-Organization (private actors)	Org. Concertation (private and public actors)	Hierarchy (public actors)
low.....high Influence of Public Authorities, Formal Obligation, Degree of Network Integration			

These four approaches do not represent alternatives among which one can choose at any given time. The available choices are context-dependent, constrained by existent structures, dominant interests etc. But nevertheless they present different possibilities for the development of networks for which actual examples do exist.

The experts engaged in early standardization of ISDN were not in the mood to let the market decide what is best and let consensus formation happen in some distant future. They wanted to reach consensus before the construction of a new infrastructure and secure a smooth transition from the old network to ISDN. They valued interconnectivity higher than the search for the best by the market. This was also in line with the existing institutional structures. In the early 1980s most countries did not have competing network operators. Thus, Approach 1 was only discussed with respect to some reduced competition within countries, e.g. two or three different ISDN technologies competing with each other. Competition between nations in the early years was not a problem to be taken seriously, either. In principle, a combination of Approaches 3 and 4 was supposed to be adopted: technical standardization and strategical harmonization as far as possible to be enforced by the national network operators. Connectivity between national networks was supposed to be guaranteed by standards as well as – if incompatibilities should arise – by contracts and treaties. Although not clearly stated by the participants in the discussion, since economic and political elements were hardly mentioned, ISDN could be interpreted as part of a business and political strategy to consolidate telecommunications in one standardized network. The idea of integration therefore goes far beyond just basic technological considerations.

work is a metaphor for authoritarianism. It is hierarchical, centralized, orderly, functional, planned, and monopolistic. Its staff is often uniformed; its policies are set by 'experts' rather than 'politicians'; their goals are technical efficiency, standardization, and order; its budget tends to be outside the normal course of parliamentary appropriation" (Noam 1986: 46).

3 History of EC Activities

How did the demand for cooperation at the EC level in the area of network development arise and who provided the leadership in the process of forming consensus, in implementing and further developing this consensus? What were the aims of the Commission and the member countries in the ISDN project?

In the literature on international policy coordination the concept of "national sovereignty" is still at the heart of dominant reasoning. It furthermore seems to be an axiomatic truth that states, i.e. governments, prefer unilateral action to cooperation. Both types of thinking are no longer viable as a general premise for analyzing political action on the EC level – despite the Maastricht vote in Denmark. Along with this the hypothesis that states will surrender the goal of autonomy only when unilateral means have proved to be impossible or too costly (Sandholtz 1992: 3) is, finally, not of much value either for explaining actions in our context.

How did ISDN get on the political agenda of the Commission? For an explanation, one has to take under consideration three interdependent trends: the ongoing modernization of telecommunications networks (1), the actions of technical experts in committees for standardization and in the preparation of political decisions (2), and the eagerness of the Commission to become more active in an area that was considered to be of strategic importance for European industry (3).

The original idea of ISDN was generated in international organizations like CCITT. The initial concept encompassed something totally new: a worldwide telecommunications network with guaranteed compatibility from the start. The new technology would also be a fee-generating machine for the national network operators, putting them at the same time on the leading edge of telecommunications development. This idea was generally accepted on the national level, and via the national level the approach was brought back to the attention of the CEC. This was primarily due to the fact that a rather small and limited group of expert personnel was engaged on all three levels at the same time in the discussion process: CCITT, national level and EC level. It was also supported by the CEC, which desperately wanted to gain footing in this policy area. After repeated failures in the past, starting in the late 1970s and all through the 1980s, the Commission had become more successful in the field of industrial policy and had prepared a number of R&D programs, the main focus of which

were information technologies (e.g. ESPRIT).⁷ It is important to note that the EC initiative was very much fostered by certain individuals from the CEC like Davignon and Carpentier and did not come from a desire of Community member governments to increase cooperation (Cf. Sharp 1989). Information technologies were looked upon by the CEC as the most volatile sector of what became known as the "new technologies." The image of Europe's backwardness at present compared to Europe's preeminence in the past seemed to be most striking in this case. With respect to telecommunications networks the Commission was aware that a modernization of the existing inventory was under way in virtually all member states since the late 1970s. A number of national enquiries had discussed issues of telecommunications and had expressed far-reaching expectations concerning the development of new infrastructures.

Digitization was the key innovation coupled with major technological breakthroughs in the area of data storage and data processing. The Commission wanted to seize the opportunity to steer the modernization process in a common direction and, at the same time, fulfill the aims of the "new" Community of the 1990s: achieving a true common market, and creating European, (globally) competitive high-tech corporations. Telecommunications seemed to be especially well suited for EC interventions, since it constituted a sector traditionally dominated by public decisions and not by market forces.

The official legitimation for EC action was a dramatic failure of national policies to support developments in information technology and the threat to European industry by American and Japanese competitors. For strategic reasons the CEC not only overinterpreted the "crisis" in which the European telecommunications industry supposedly was,⁸ but also overemphasized the importance of a new and common telecommunications infrastructure for the European economy. Impressive calculations were meant to show that the (public) telecommunications infrastructure might be the decisive lever for a revival of the European economy and that it would influence most of the national investment decisions.

The national network operators were not enthusiastic about the EC's attempts, since they were largely satisfied with what CEPT (Conférence Européenne des Administrations des Postes et Télécommunications) was doing on the European

7 Information technologies are the prime recipient of subsidies within the EC Framework Programme of Community Activities in the Field of Research and Technological Development.

8 An evaluation of the Information Technology sector in the EC actually showed that telecommunications was the only area in which Europe was still ahead of its main competitors.

level and since a possible conflict between CEPT and the CEC seemed to be very likely. Furthermore, they considered the crisis interpretation to be exaggerated because the big network operators were undergoing a transition from an old state bureaucratic institution to a more forward-looking service enterprise. Along with this they were being transformed into profit-oriented entities and felt generally in good shape. The CEC itself had noted that telecommunications was still a stronghold of European industry and the network operators (and their respective governments) did not share the desperate feeling of the information technology industry. But, on the other hand, the major operators did not stand to lose much from the proposed cooperation, either. They were not hard pressed by the Commission to do something that they basically did not intend to do anyway. The main thing was a new level of coordination to be introduced: the EC level as a basis for consensus formation. Based on the experiences of the 1970s the network operators, however, did not perceive the CEC as an actor who would be becoming strong and influential very soon and were thus willing to go along.

3.1 The Discussion Process in the Commission Before the Green Paper

Already in 1979 the CEC had spoken of the unique opportunity to create a harmonized infrastructure for the new era of information, once all PTTs started constructing integrated networks based on digital switching and transmission (Com (79) 650 final). In its "Communication on Telecommunications" to the Council (8 June 1983 – COM (83) – 329 final) the Commission states that telecommunications is a stronghold of European industry. Its strong position, however, is challenged by technological developments mainly in the field of information technology, closed national markets, high R&D investments and an onslaught of American and Japanese competitors. The Commission predicted that Europe's telecommunications industry will only be capable of dealing with this situation if a European policy is developed which sets regulatory guidelines, provides policy aims for a European network of the future, R&D cooperation, a truly European market and new political institutions on the European level.

It has to be stressed that the overall justification for more action did not spring from a desire for deregulation or more market competition as such at this moment. The driving momentum was the Commission's strategic interests and concern about the future of the European industry and its perceived inability to cope with a new and challenging situation. In its communication, the Commission identifies problem areas and envisages further action in the form of

reports and investigations into the situation. At this point "ISDN" was not mentioned as a key element of an EC strategy.

In its September 1983 communication (COM (83) 547 final), the Commission again highlighted the strategic importance of telecommunications. The proceeding Communication was written on the basis of national memoranda sent to the Commission, which seemed to have confirmed the Commission's overall analysis of the situation and its main targets. Six action guidelines were developed. In this context ISDN was mentioned for the first time as an area which requires urgent coordination and is instrumental for the competitiveness of European industry. The Commission claims that investments in telecommunications networks are the most important public investment decisions for the decade to come and that within network planning, ISDN seems to be the logical next step – just like the CCITT recommended at about the same time.⁹

In November 1983, a group of high officials from the member countries (the "Senior Officials Group – Telecommunications" - SOG-T) met for the first time in order to work out a more precise action program. The first proposals of the Commission were already presented less than half a year later (23 May 1984 – Com (84) 277 final). They more clearly elaborated on the six action guidelines of the aforementioned communication. These six guidelines encompass: (1) the definition of medium- and long-range goals for telecommunications policy on the EC level; (2) definition and implementation of R&D actions; (3) expansion of the end-user equipment market and the development of community solidarity against the outside; (4) common development of the transnational parts of the future telecommunications infrastructure of the Community; (5) intensive use of the telecommunications technologies for the promotion of disadvantaged regions in the community and for the development of their infrastructure; (6) continuing expansion of those market areas for telecommunications equipment in which procurement decisions of the network operators dominate. The high officials proposed the formation of a group of experts (GAP) which was to work on three tasks: narrowband ISDN, Business Communication Systems and mass video communications (Broadband Networks). Narrowband ISDN was considered the most important task at hand, and the first report on ISDN issues was envisaged for December 1984. The Commission had thus prepared a comprehensive and far-reaching step into telecommunications policy – prior to the Single European Act or a similar decisive institutional reform.

9 This is not an accidental coincidence. As already mentioned, the number of individuals concerned with network planning was small. At the different levels of the national and international planning process very often the same persons were active and responsible for recommendations.

The central role of ISDN was reinforced in the Council recommendation from 12 November 1984 concerning harmonization in the area of telecommunications (84/549/EEC).¹⁰ In this recommendation ISDN is called an especially convenient opportunity for European harmonization. Network operators are called upon to increase their cooperation efforts and to guarantee that all new services introduced after 1985 are based on a common, harmonized concept and that after 1986 all orders for digital switching and transmission systems should encompass the technical capabilities for integration and should also take into consideration all existing European standards – these demands, however, could not be fulfilled in spite of the fact that they did not seem to be unrealistic when formulated.

The specific ISDN report was finally delivered in 1985, and in April of 1986 the Commission – based on the GAP recommendations and the approval of these recommendations by SOG-T (GAP 1985) – proposed a recommendation on the coordinated introduction of ISDN, which was adopted without any noteworthy changes (except for the dates) by the council in December 1986 (86/659/EEC). The EC Commission recommended to the EC Council:

- (a) that the PTTs apply the jointly developed detailed recommendations on the coordinated introduction of ISDN;
- (b) that the application of the recommendations be concentrated on the following items:
 - standards and introduction of the S/T interface;
 - schedule for the ISDN introduction;
 - objectives regarding market penetration;
- (c) that the CEPT continue to harmonize activities on the basis of a schedule of ISDN specifications still to be completed;
- (d) that the PTTs take all the measures necessary to facilitate the coordinated introduction of ISDN;
- (e) that the financing instruments of the Community take this recommendation into account;
- (f) that the member-state governments urge the PTTs to apply this recommendation;
- (g) that the member-state governments inform the Commission annually on the measures taken as well as the problems which have arisen in the application of the recommendation.

10 Sometimes the year 1984 and the 84/549/EEC recommendation are named as the beginning of EC telecommunications policy (e.g. Delcourt 1991: 15). This is obviously inadequate.

Of special interest is the operationalization of the aim "market penetration": it was agreed that by 1993 each member state should ensure that an equivalent of 5% of the total number of telephone subscribers of 1983 be connected to ISDN. This number is telling because it reveals the clear intention of the Commission to treat ISDN not only as a specialized network for business users, but to think of it as a new universal network.

The proposed measures indeed constitute a broadly based policy program. They contain policy aims, identify the addressees of the measures, name mechanisms for achieving the aims of the program as well as procedures for controlling progress. The aims of the program as such also could be called realistic ones, since they were not only agreed upon in a consensual manner, but, more importantly, were also based on proposals coming from the national PTTs, which themselves had close contacts with the equipment manufacturers as their main suppliers. Thus, a conflict between Commission strategies and national strategies was not a very likely prospect. National strategies and Euro-political strategies seemed to converge easily.

ISDN at this moment was not the only telecommunications initiative of the EC. It was one of a growing number of activities that were coordinated and developed by the newly created (1986) General Directorate "Telecommunications, Information Industry and Innovation." In these initiatives, the EC committed itself to a technology push strategy in spite of the fact that the real need for ISDN – especially for broadband ISDN – was far from being clear. Even a FAST research team, the technology assessment brain trust of the EC, made very cautious comments about the potential demand for new public network technologies. In the same year the American telecommunications specialist Noam noted the paradox that while there seems to be a general understanding about the importance of ISDN, he could not find a single study dealing with such problems as the economic feasibility of ISDN plans or the eventual acceptance of the new network by the users (Noam 1986: 3).¹¹ This also holds true for the CEC statements, which repeatedly stress the importance and the benefits of a common infrastructure, but never address the issue of possible alternative options or the economies of the construction of the network.

The Commission of the European Community was convinced early on of the great strategic importance of ISDN as a basis for efficient telecommunications in the Community. The EC's telecommunications infrastructure, and the services

11 The fact that references to economic or social issues involved in ISDN have been almost totally lacking in the negotiations at CCITT is remarkable (Noam 1986: 3).

offered by it, were inadequate when judged in terms of what modern systems could achieve. European telecommunications was still a patchwork of idiosyncratic national networks interconnected via a hodgepodge of often bilaterally negotiated gateways (Hawkins 1992: 12). As business came to depend more and more on advanced telecommunications and IT, this inadequacy in the CEC's evaluation threatened to reduce the economic benefits of the Single Market and to weaken the EC's position in world trade.

The actions by the Community still can be called proactive or, more simply, "early," because no working ISDN projects existed at this time. There were only plans from the network operators, and attempts were under way to standardize important ISDN features at CCITT and CEPT. The chances for the development of a true European network, therefore, were promising. A comparison of the plans of the major telecommunications administrations in Europe at the end of 1985 showed, in fact, that basically the general concept of ISDN was shared by the EC's network operators. They agreed that: (a) ISDN was considered to be a natural evolution of the existing telephone network; (b) ISDN was supposed to aim at the residential population, not only professionals, thus providing a new universal telecommunications network; (c) dates for the introduction of ISDN were mentioned, but they differed significantly for the different member countries (Arnold 1989: 344).

There was also some disagreement. The Danish PTT expressed its doubts about the possibility of fully installing ISDN. The plans of smaller countries like Greece or Portugal were dubious to say the least. But these reservations were not influential enough to counteract the consensus and the determination exhibited by the Commission and the major network operators. The EC recommendation thus mirrored the shared conceptions and expressed the interests of the people who had participated in the process so far. In SOG-T as well as in GAP, primarily technology-oriented people affiliated with the national network operators were represented (Cf. Table 3).

The network operators again cooperated closely with their respective national producers. Thus, a strategy was developed that seemed to fit the interests of those two main actors and was also in line with EC plans. Potential users or interest groups were not included in the discussion process. It was a matter of experts coming from the national telecommunications administrations, their governments and their preferred equipment suppliers.

At the same time a barrier was supposed to be built against what was conceived as one of the main threats to their common status: American and Japanese competitors and an American government pressing for European telecommunications markets to be opened up. After divestiture, IBM and AT&T were

Table 3: Members of GAP (ISDN recommendation, June 1985)

Categories of Membership	Number
Commission	4
National Network Operators and Administrations	29
Other government officials	13
Industry	14
CEPT	3
Consultants (SCICON)	5
Total	68

Source: Gruppe Analysen und Prognosen 1985; author's calculations.

considered by some EC policy planners to be forceful competitors that would endanger the status of European producers (Cf. Carpentier/ Farnoux-Toporkoff/ Garric 1991). The PTTs were clearly thinking in terms of a new universal network for both private and business users which would require huge investments, but which also promised considerable revenues in the future. The hardware manufacturers could be more than pleased by these plans: ISDN promised them hardware orders for a long period of time and considerable rewards for their huge investments in R&D. It had also become obvious, however, that only very few European producers would be able to invest R&D billions in the development of new digital switching and transmission technology. A closer look at the negotiation process reveals that it was tacitly understood that some of the European producers would simply have to go out of business or merge with other corporations. R&D cooperation was to be encouraged (Arnold/ Guy 1986: 28-29). Secondly there would have to be financial incentives for the less affluent member-state PTTs that would otherwise not introduce ISDN on their own; this found its imprint in the STAR Program.¹² In this sense the negotiation process encompassed some distributive issues, but they were small compared to the overall consensus regarding the definition of the problem, the direction developments should take and the belief that everybody participating would, if not benefit, at least not have to face severe losses from the outcome. The PTTs had everything to gain from the success of ISDN.

¹² Council Regulation of 27 October 1986 Instituting a Community Programme for the Development of Certain Less-Favored Regions of the Community by Improving Access to Advanced Telecommunications Services (STAR-programme) (86/3300/EEC).

The EC's plans as such did not simply summarize official national announcements. They were more precise and more far-reaching than most of the (collected) statements by the network operators available in 1983/84. In this sense the Commission succeeded in achieving a compromise that was far beyond the expectation that only a smallest common denominator would be left at the end of EC negotiations. Two points must be stressed, however, which were instrumental for the success: the decision-making process at this point still was dominated by like-minded technical experts, and there was still a low degree of politicization of ISDN and telecommunications issues more generally. The full impact of the ISDN recommendation was undoubtedly not evident to the decision makers in the Council.

3.2 The Green Paper

Parallel to the development of the ISDN plans, the consultation process leading to the Green Paper on the Development of the Common Market for Telecommunications Services and Equipment¹³ substantiated the consensus that the current and future integrity of the basic network infrastructure must be maintained or created. This implied, in particular, a continuing strong role for the telecommunications infrastructure, and a strong emphasis on Europe-wide standards in this area. It also implied safeguarding the financial viability of the PTTs in order to ensure the build-up of the new generations of telecommunications and the necessary levels of investment. Since the EC will not invest much financially in ISDN development, the PTTs are expected to invest billions of dollars in the network modernization to guarantee the success of ISDN. Private or deregulated network operators would hardly be willing to put up the enormous investments required.

Nevertheless, the main impact of the Green Paper was on regulatory issues and not in the field of industrial policy. The final aim was to develop a European market in a direction that would offer the European user telecommunications services of a greater variety and better quality at lower costs. This is a change of emphasis, when compared to the first telecommunications initiatives. Proping up European industry was no longer the prime motivating factor, but rather a new regulatory environment was to be achieved from which European

13 Green Paper on the Development of the Common Market for Telecommunications Services and Equipment (Com 87 (290) final, June 30, 1987) and Towards a Competitive Community-Wide Telecommunications Market in 1992: Implementing the Green Paper on the Development of the Common Market for Telecommunications Services and Equipment (Com 88 (48) final, February 9, 1988).

industry might profit later on. Similarly, the proposal for a council decision on the development of a common market for telecommunications services and telecommunications equipment (Com 88 (336)) saw the consensus among the member countries primarily in the field of deregulation. At this point the conflict between more market, i.e. deregulation, on the one hand and active industrial policy on the other became the object of discussions but was not yet conceived as a major impediment for the realization of the network plans.

3.3 Disillusionment After the Green Paper

The Green Paper had set the stage for a new phase of development in the EC's telecommunications policy. It opened up a period of rapid change. The relationships between the CEC and the main telecommunications actors changed as well. The traditional cozy relationship between monopoly network operators and industry that had also helped in producing the ISDN plans was not the idea behind the Green Paper. The ISDN proposals were thought to be the product of a positive common understanding; the Green Paper and the ensuing initiatives, however, posed threats to many of the old actors. Actions of the EC could not be considered benevolent as such. This implied negative long-term consequences for the ISDN plans.

The first intermediary report on the introduction of ISDN in the EC, published in October 1988, was not very encouraging indeed (Com (88) 589 final). The PTTs were well behind schedule, for "technical and industrial reasons," as the Commission reported. The 1988 SCICON report (Carter 1989) – a consultant group employed by the CEC – had made clear that the Community was heading in a certain direction. Considerable progress had been made towards the introduction of ISDN in Europe, in particular in the availability of switched 64-kbit/s transmission paths. The report also clearly identified a number of deficiencies in the various administrations' plans. Not only was the introduction of ISDN at the national level very much behind schedule when compared to the recommendation of 1986, but the introduction at the international level was also progressing more slowly than planned, so that it will not take place until long after the national services are available. In addition, a considerable variation in the standards being adopted in the various member states was detected. Current and planned implementations were largely incompatible. Historically, this was due to the lack of appropriate and complete international standards during the early planning and pilot schemes. However, the emergence of international standards had not led to all network operators using them: West Germany, for example, was not using the ISO-8877 standard plug for terminals. Neither DBP nor British Telecom nor France Telecom were using the protocols

specified by CCITT. There were considerable variations with respect to codings used for control purposes, mandatory services and numbering schemes. This list of problems and inconsistencies is far from comprehensive. Further initiatives from the Commission and near-market activities by the telecommunications administrations would be needed to ensure "the timely and widespread availability" of ISDN throughout the Community.

The recommendation that stronger actions should be taken found its imprint in a new Commission proposal to strengthen attempts to introduce ISDN issued at the end of November 1988 (Com (88) 695 final). The proposal was approved in July 1989. Several measures were listed, aimed to bring the ISDN activities back on schedule: speeding up the standardization work,¹⁴ the signing of a "Memorandum of Understanding" (MoU) between the PTTs,¹⁵ a new Commission directive on Open Network Provision (ONP) and Data Protection activities. In spite of the fact that most of these measures were put into practice relatively quickly (generally by the end of 1990), the Commission and its plans simply came too late now. National ISDN networks and trials had been developed using different specifications and non-compatible standards, the equipment industry had remained passive, the technological and institutional environment was changing quickly, the whole network market had undergone dramatic developments that were not reflected in the Commission's proposals. Discussions moved away from the idea of universal (telephone) networks and now centered on improved data communication via Local Area Networks, Metropolitan Area Networks, Private Networks and new developments not related directly to ISDN such as Intelligent Networks and Mobile Phones. Telecommunications had moved out of the realm of experts' discussions and became the interest of more general politics, especially under the auspices of deregulation and liberalization. ISDN no longer looked like the best route for network development.

Nevertheless the new proposals of the CEC were the result of a conscious strategic choice. It had become obvious that the expectation that the ISDN process would simply proceed by itself without needing much support from the CEC, propelled by an ongoing international standardization, was completely wrong. The Commission had initially judged the network plans with respect to their

14 This was to be achieved mainly by the newly created ETSI in Southern France. Cf. Resolution: Establishment of a European Telecommunications Standards Institute, CEPT, January 1988.

15 "Memorandum of Understanding on the Implementation of a European ISDN Service by 1993." Among the services to be standardized were 7 kHz-telephone calling, Telefax group 4, ISDN-Telefax, services for "PC-Communication."

instrumental character for European purposes. It never had the independent ability to evaluate the technological and economic feasibility of the plans. It simply relied on the national experts. Faced with the prospect that the initial plans would not materialize, the CEC had to discuss new options: (1) a retreat from the ambitious ISDN plans in favor of other network options in technological and/or organizational respects, an adaptation of the CEC's aims to the new national development plans, or (2) new or innovative actions to achieve at least some minimum results. It was clear that the Commission could no longer solely rely on the network operators and their actions – especially not on CEPT as a representative of the telecommunications administrations.

Option 2 became the one favored by the CEC's ISDN people, who now also included telecommunications experts. The Commission from now on tried to exert more active leadership and provide more instruments for a realization of the ISDN program. Initially the ISDN implementation was not conceived as a process harboring serious difficulties. It was rather conceived as something proceeding on its own, based on the agreement among the telecommunications administrations. Over the years problems increased and even newly devised timetables were simply out of touch with the real world. The aforementioned demands of the CEC concerning equipment etc. were simply not taken into consideration.

Measures had to be developed that would strengthen the Community's role in telecommunications and force the member states and their TAs to comply. Again this move met with the criticism of national network operators and CEPT. At this point the integration process had reached a new momentum after the Single European Act, however. Telecommunications had become an intensely politicized issue, and a retreat of the EC would have been a negative symbol for the whole 1992 process. It was no longer the technical experts and business representatives who were the driving forces, but rather the economists and their idea of a functioning free market. This movement toward liberalization and deregulation weakened the traditional monopoly network operators and CEPT. In the end they were obliged to reach compromises with the Commission.

One element of this compromise entailed the speeding up of the standardization work to be done with the help of the newly created "European Telecommunications Standards Institute." The European Community had only limited influence on details of national telecommunications policies. For the national network operators, CEPT used to be a far more important institution than the EC. At CEPT, network operators were also trying to coordinate their ISDN plans especially in the area of standardization, but not very successfully. So far, standardization had been propelled by national institutions and by the CCITT on the

international level. The CCITT recommendations on ISDN, however, offered many technical options, so that the application of common standards could not be guaranteed. The European standardization bodies did not prove to be very effective. The EC therefore was looking for a new solution to get through the "standards bottleneck." In its 1987 Green Paper it had proposed the foundation of a new European institution for standardization. Based on an agreement between the Commission and CEPT, the latter began forming ETSI in 1988, which was to restructure the institutional outlook of European standardization. Before that, the EC had established a Memorandum of Understanding with CEPT that had failed to be as effective as the CEC had hoped. The CEPT's standards committees, staffed by personnel from the network operators, presented a too narrow and conservative view for the pace of standards developments required in Europe. There were not enough standards available in time for the new services. The result of CEC's impatience was the establishment of the ETSI in February 1988 after only eight months of preparation since the notion was introduced in the Green Paper. ETSI has far-reaching powers, and its creation was considered by some to be a symbol for a paradigm change in the field of standardization with consequences for international standardization as well.

Membership in ETSI is drawn from telecommunications administrations, manufacturers, user groups, network operators, and research bodies. CEPT transferred its technical study groups to ETSI, but kept the study groups on tariffs and other managerial subjects. Membership in ETSI is especially significant if one considers that it is generally believed that control over regulations and standards has been used by monopolists to maintain exclusive control over the design parameters of the network, and hence over the terms of access, and over the nature and cost of the services (Cowhey 1990).

Table 4: ETSI Membership (March 1991)

Membership Category	Number	in %
Manufacturers	167	62.08
Public Network Operators	40	14.87
Administrations	28	10.41
Users	23	8.55
Research Bodies and Others	11	4.09
Total	169	100.00

Source: ETSI highlights

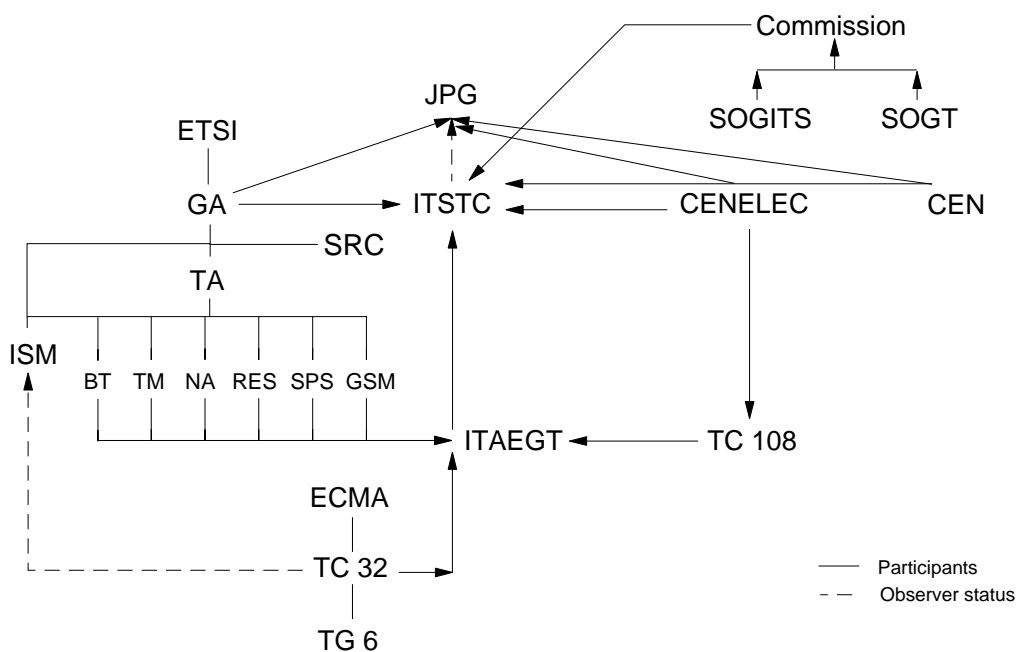
One of the key issues of ETSI from the beginning has been ISDN standardization. For this purpose a specific sub-organization, the ISDN Standards Management Group (ISM) was set up. ISM was created at the 3rd ETSI Technical Assembly (TA) with the purpose of coordinating the preparation of all ETS (European Telecommunications Standards) to ensure that the objective of the MoU be met. ISM members are the chairmen of all Technical Committees and Technical Sub-Committees of ETSI responsible for the elaboration of standards. ETSI-TA also established a Technical and an Administrative Core Team to support the activities of ISM. In April 1990 a Strategic Review Committee was set up which was to concern itself with ISDN terminal equipment standardization. This committee had an additional "political" role because its main objective was to gain an understanding of how ETSI could best contribute to the success of ISDN by ensuring appropriate and timely production of standards for terminal equipment.

Compared to CEN/CENELEC or CEPT, ETSI provides a dramatic broadening of the membership category. ETSI is open for all interested groups notwithstanding their national origin. This means that standards are no longer worked out as a compromise between national delegations, but as a compromise between groups interested in developing standards. Members of the Core Teams are experts dedicated partly or full-time to ISM activities. The Core Teams are located on the ETSI premises in Sophia Antipolis in the South of France.

The initial lifetime of ISM had to be prolonged several times due to its inability to meet the deadlines. ISM was supposed to finish its work within one year. But soon it became clear that, despite the new organization and institutional innovations, work on standardization would take longer. One crucial problem was the intention of ISM to develop common service descriptions for public and private ISDN. This required close cooperation with standards organizations who had an interest in private ISDN, especially the European Computer Manufacturers Association (ECMA) and the Information Technology Ad Hoc Expert Group Telecommunications (ITAEGT). Table 5 illustrates the coordination work going on in order to develop European standards that would please both private and public sector actors, guarantee European compatibility and respect international developments. This diagram very vividly demonstrates that ISDN standardization was no longer the concern of only a small group of like-minded and interdependent experts. The new arrangement brought new people and interests to the fore and created new chances for coalition building. The Approach 4 for network development had already become a picture of the past. Given the complex situation, the CEC was now performing the task of creating a network of the institutions and groups necessary to construct a new ISDN consensus – a consensus that would take under consideration also the specific interest of private network manufacturers and big users. The complexity of the

original network as it is depicted in the table results partly from the fact that the available institutions had to be brought into contact with each other and formal relationships had to be established on the basis of – mostly bilateral – agreements. Important actors in this network should – based on conventional wisdom – have no interest at all in ISDN. Hills (1986), along with many others, has repeatedly argued that the only actors interested in ISDN would be the network operators and the telecommunications equipment manufacturers. But if we look at the network as it actually emerged, we see that supposedly hostile elements, i.e. interest organizations of computer manufacturers etc., have been successfully included. The complexity of the network as such, however, was neither intended nor foreseen. The Commission's active interest in the future became oriented towards streamlining by reforming the complex structure.

Table 5: European Bodies in the Field of ISDN Standardization (as of January 1990)



The signing of a "Memorandum of Understanding" (MoU), again under the CEPT umbrella, complemented the EC proposals on ISDN. Just as in the case of standardization, CEPT had reached a verbal agreement under pressure from the CEC in order to improve the position of European ISDN. The Memorandum was initially signed by 22 network operators from 18 European countries including all EC member states.¹⁶ The signed document is more precise with

¹⁶ At the end of 1990 there were 26 signatories from 20 countries.

respect to technical aspects than the EC program, but far less wide-ranging in its content. The advantage of the CEPT document is, however, that its character is obviously looked upon as being far more binding by the network operators than that of the relevant EC document. Furthermore, it is important to note that at this point CEPT assembled the network operators, while the EC increasingly failed to address the network operators directly, since the roles of regulators and operators were in the process of being divided up – based on the demands of the Green Paper. The document stresses the close cooperation with ETSI and the fact that the signatories "recognize" the EC recommendation. This is significant, because the MoU thus defines itself as an instrument to carry out an EC recommendation. It is an expression of a clear shift of institutional power away from CEPT.

The Memorandum of Understanding constructs a framework for the opening of commercial public ISDN services to common standards across Europe by 1992. It provides for:

- (a) a common range of services which all signatories will provide. In addition there is a list of further optional services which will be provided to common standards as the market demand develops;
- (b) support for common standards for customer equipment. The aim is that any terminal made to agreed standards can be used in any country where the operator has signed the MoU;
- (c) agreed arrangements for interconnecting national systems in order to provide international services.

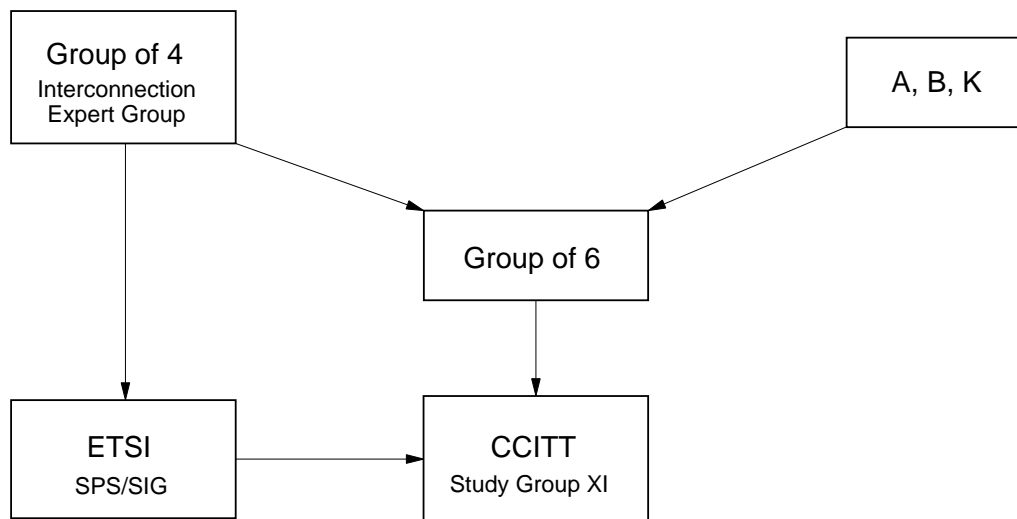
Based on the Memorandum, an ISDN MoU Implementation and Management Group (IMIMG) was constituted to watch the progress being made. Besides the activities going on under the MoU umbrella, coordinating efforts were being pursued by network operators on other levels with other partners. Table 6 depicts the most important coordination relationships between network operators and standardization organizations involved in developing international interfaces. These activities were not simply complementary to what happened at ETSI – they constitute another level. This is the rather traditional level of bi- or multilateral agreements between network operators on which the CEC or the negotiations at ETSI had only a mild influence.

The work on the ISDN-related parts of the Open Network Provision (ONP) and the data protection directive have yet to be completed.¹⁷ Both directives are in a state where they have been sent out for comment or are being discussed in parliament. Both are also hotly disputed. The data protection initiative was

17 Status as of August 1992.

started after it had become clear that privacy issues might jeopardize the development of international ISDN links and services. It therefore seeks to develop a common basis for national regulations. It is central to the data protection initiative that the collection and storage of data by operators' organizations are to be used for telecom purposes only and not for marketing use. The data protection initiative goes far beyond what the member states have realized as national solutions in their legislation (some states have no such legislation at all).

Table 6: Cooperation between network operators for the introduction of the ISDN international interface



Group of 4: British Telecom, Deutsche Bundespost Telekom, France Telekom, Italtel

Group of 6: + AT&T, KDD

A, B, K: AT&T, British Telecom, KDD

In practice, this means that billing data may be retained for only a statutory period during which the user can challenge the bill. Also, call line identification (CLI) will be allowed, but the calling party must be able to disable this feature if desired. Call forwarding is only possible with the permission of the third party. Additional measures are proposed as well, such as the deletion of the last four digits of itemized bills and the barring of unsolicited calls, both granted on request.

The data protection initiative has to face a situation in which some countries such as Belgium have no data protection legislation at all, while others, such

as Germany, are the scene of a heated debate on data protection in ISDN.¹⁸ The outcome of the debate is not yet clear. Surely it will produce some data protection regulations; the time frame for the realization and the scope of these regulations is still rather tentative, however. The proposal sent out to the European Parliament met with heavy criticism from business groups in Europe as well as abroad, especially from the US. Countries outside of the EC are worried about the provision that data may be transferred only to countries with adequate data protection legislation, which might even exclude countries like the US. European business is concerned about overregulation and what have been called "unnecessary restrictions."¹⁹ A real implementation of European services as envisaged in the 1986 recommendation will nevertheless make common regulations obligatory.

The Directive on Open Network Provision²⁰ concerning ISDN is in the state of open debate as well. The ONP framework directive, which went into effect in 1990, is to transform how telecommunications services are offered in Europe, the goal being to harmonize service offerings. The specific directives and recommendations for the key areas – leased lines, voice telephony, packet switching networks and ISDN – have not yet been generally adopted by the Council. Since publication, the ISDN draft paper has drawn considerable criticism for going too far or not far enough. To this date only three member countries have fully pledged support for the draft directives and only two of those have officially supported the ISDN minimum set of offerings by 1994 as mentioned in the ONP.²¹ Criticism included also a harsh statement by the US government about unfair trade restrictions.

3.4 The Second Progress Report

In 1990 (March 23) the second report on the progress of ISDN was published. It stated that 60-70% of the work on the harmonization of standards has been

18 Cf. Deutscher Bundestag. Ausschuß für Post und Telekommunikation, Unkorrigiertes Protokoll der 3. Sitzung des Ausschusses für Post und Telekommunikation am Dienstag, dem 5. März 1991, 11.00 Uhr in Bonn, Bundeshaus, Sitzungssaal NH 1903 und Anlagenband zum Protokoll.

19 Cf. *CommunicationsWeek International*, 16 September 1991: 4; 2 March 1992: 54.

20 Council Directive of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of Open Network Provision (90/387/EEC).

21 *CommunicationsWeek International*, 11 May 1992: 8.

completed – thanks especially to ETSI and the procedures governing its work. The report also acknowledged the attempts by the four core countries – Germany, France, Italy and the United Kingdom – to connect their ISDN networks at an early stage. They are praised as forerunners, and there is still hope that by the end of 1992 all EC member countries will offer some ISDN services.

The Council, however, also had to admit that new types of action such as increased marketing activities, a User Forum (modelled after the North American User Forum – NISF), and a European ISDN Atlas are necessary. Furthermore it stresses the importance of the availability of cheap equipment as a necessary precondition for the success of ISDN as well as equipment that is compatible throughout Europe. The EC progress report notes that the few ISDN terminals currently under development will not be capable of connecting to all ISDNs, and that many European suppliers are cautious about future network development. The Commission is now taking a further step in its attempts to guarantee success. Most of the activities taking place now point to the possible users of ISDN. The ISDN Atlas is supposed to increase information about what ISDN is all about, and who does what. The European ISDN User Forum is organizing actual and potential users of ISDN with the aim of sharing experiences and constituting a pressure group for more action by the Telecommunications Administrations to do something about ISDN and also to create input for further action by the CEC. The European ISDN Atlas was published in November 1991, and the User Forum (EIUSF) has met three times so far – with growing participation.²² The User Forum's meetings are still dominated by the "sellers." It is evident, however, that there is a growing interest among users of ISDN who are disoriented about what is going on in the telecommunications world. This disorientation has a real factual basis. When the second progress report was published, the consensus on ISDN activities was already shaky. Even within the core group, British Telecom became more than nebulous about its support for the ISDN plans and openly announced that it would not use all the agreed-upon standards.²³ At the same time the EC was demanding new marketing efforts and the creation of User Forums, the UK was curtailing its respective activities. This might be interpreted as the familiar trend of substituting EC-sponsored activities for national activities. But more at heart of the matter are the pressures coming from liberalization and a tendency to expect quick returns on investment – which seemed unlikely to happen in the case of ISDN. Users

22 At the third meeting approx. 150 persons representing institutions, consulting firms, single users as well as user organizations and administrations were present.

23 British Telecom considered some advanced features to be unnecessary and over-regulated. It promised compatibility, however.

are also worried about the growing array of services offered by the network operators. Initially ISDN was conceived as being a new universal network. Meanwhile, a variety of competing networks was under development as well as services that need or do not need ISDN. Furthermore, the private networking market started to attract more investments than the public networking market. In the private sector ISDN developments were rather the exception than the rule.

Nevertheless, there was a considerable degree of cooperation among the different organizations, mainly the network operators. Phase 1 services, which were supposed to be offered across all EC networks by January 1993, are also covered

Table 7: Timetable for ISDN services

Phase 1	
Bearer services	Circuit mode 64-kbps unrestricted bearer service Circuit mode 3.1-kHz audio bearer service
Supplementary services	Calling line identification (CLI) Calling line identification restriction (CLIR) Direct dialling-in (DDI) Multiple subscriber number (MSN) Terminal portability (TP)
Phase 2	
Bearer services	Circuit mode 64-kbps unrestricted bearer service on reserved or permanent mode Packet mode bearer service case A and case B
Supplementary services	Closed user group User-to-user signalling Reverse charging Terminal addressing Network management service PSPDN interworking
Phase 3	
Bearer service	Circuit mode speech Circuit mode 2x64 kbps unrestricted
Supplementary services	Advice of charge services Number identification services Call waiting Completion of calls to busy subscriber Conference service Diversion service Freephone Malicious call identification Subaddressing Three-party service

by the CEPT MoU. Phase 2 is supposed to be in place by January 1994 – although serious doubts with respect to its realization are more than justified. No date has been set for Phase 3 services. It is also obvious – just like after the first ISDN progress report – that the Commission is expanding its activities continuously and is pursuing new types of action. Even if some of the activities turn out to be useless, the simple fact of the EC's activity make it a center of concern and interest.

3.5 ISDN in a New Regulatory and Economic Environment

What does the 1992 status look like? Towards the end of 1991 the third EC progress report was published. The mixed evaluation offered in the previous reports is continued here. At the time of publication (November 1991), five countries offered commercial ISDN services, another five countries offered pilot services and two countries had no ISDN at all (Cf. Table 8).

Table 8: ISDN implementation status (December 1991)

Commercial Services	Pre-ISDN Services	No ISDN
Belgium	Denmark	Greece
France	Ireland	Luxembourg
Germany (West)	Italy	
Netherlands	Portugal	
United Kingdom	Spain	

Source: European Commission

First comments to the EC report say that the network operators will not be able to fulfill all of their commitments. The status of international interconnection between the member states is behind even the reduced expectations. A variety of differing protocols is still being used in international gateways, only five operators use the protocol suggested by the Council recommendation. Little information is available on the range of services provided via international interconnections. The existing implementations of the user-network interface show considerable differences with regard to signalling protocols, addressing mechanisms for terminals and support for supplementary services. Four different plugs are used; only one plug had been recommended. Frequently stated reasons for this delay are that all necessary standards are not yet available and

that cheap and compatible equipment is not on the market (König 1991). The process of information gathering to form consensus proposals is furthermore flawed by the reluctance of some network operators (notably British Telecom and Mercury Communications) to make available data that are considered commercially sensitive. As competition for positioning within the Single Market between the more entrepreneurial of the telecommunications administrations increases, such constraints will continue. Underlying all these problems, however, seems to be the a lack of consensus at the present time on what ISDN will actually mean in the future and what role it will play more generally in network developments.²⁴

On the positive side it must be acknowledged that, in spite of being behind schedule, the standardization efforts are impressive. The consensus may be crumbling, but there is still a commitment by all EC members that will lead to some kind of ISDN implementation in all countries; France and Germany are the closest to keeping up with the introduction schedule. Furthermore the Market for ISDN end-user equipment, which totalled only 60.1 million dollars in 1990, is supposed to skyrocket to 3.8 billion dollars in 1995.²⁵ The ISDN market thus can boast impressive growth rates.

The situation for the CEC nevertheless has changed dramatically. While at the beginning of the process Approach 4 or 3 to network development was favored, the options of the CEC are now rather between Approaches 2 and 3. A range of competing networks has come under development on the national as well as the international level. International networks are competing with Euro-ISDN. Private international ISDN networks, the status of which is yet to be defined, are under construction or already working. The CEC can no longer hope to build one consistent, harmonized, universal network. Rather, the task of the CEC in the future will be to fit ISDN into a new deregulated and dynamic environment. Instead of maximum compatibility, some minimum compatibility will have to be achieved in cooperation with actors that do not base their power on monopoly power but rather on market success. This leaves the CEC much work to do, many different tasks to perform when compared with what they started out to achieve. With respect to the role of the CEC itself, the situation has changed as well. In the early 1980s the CEC was initiating actions of the member countries that were supposed to be coordinated by the Commission and only required some minimum efforts. In the early 1990s the CEC is devel-

24 The controversial discussion is highlighted in *CommunicationsWeek* of 19 August 1991: 1, 8. *CommunicationsWeek* regularly reports on ISDN failures and publishes recommendations not to invest in ISDN equipment.

25 Cf. *Wirtschaftswoche*, 13 March 1992: 106.

oping actions and initiatives on its own and is cooperating with the national governments more like a *primus inter pares*. Priorities in these negotiations are undoubtedly set by the Commission and not by the member countries. Thus a decisive change in the role of the Commission has taken place.

4 ISDN as an Example of International Policy Coordination

Based on the in-depth empirical analysis of the ISDN process, I am now going to address some substantial problems that concern the analysis of political coordination on the EC level. I will focus the discussion on the role of the Commission. The historical analysis intended to show that the CEC has worked as an initiator of a policy process and had tried to adapt its strategy to a changing environment. The partial failure of the ISDN program has thus not weakened the Commission but is rather a part of a further strengthening of its role in telecommunications. The available approaches to the study of political integration and policy coordination do not suffice to help us explain this outcome.

4.1 Policy Coordination in the EC as a Conceptual Problem

Keohane has argued that cooperation "...[r]equires that the actions of separate individuals or organizations – which are not in pre-existent harmony – be brought into conformity with one another through a process of negotiation, which is often referred to as 'policy coordination'" (Keohane 1984: 51). Cooperation is distinguished by Keohane from harmony and discord. "Harmony refers to a situation in which actors' policies ... *automatically* facilitate the attainment of others' goals." In cases of discord, one actor's policies hinder the realization of others' goals, and are not adjusted to make them more compatible. In both instances actors have no incentive to change behavior. Cooperation, on the other hand, "...[o]ccurs when actors adjust their behavior to the actual or anticipated preference of others, through a process of policy coordination" (Keohane 1984: 51).

This means that when cooperation takes place, each party changes behavior dependent on changes in the other's behavior. The impact of cooperation might be measured by the difference between the actual outcome and the situation that would have been obtained in the absence of coordination – to the extent that there exists a possibility of "measuring" at all. Keohane remarks: "Genuine cooperation improves the rewards of both players" (Keohane 1989: 286). In spite

of the fact that these definitions do make sense and that they seem to be able to capture the cooperation problem in the ISDN case as well, some of the underlying basic assumptions have to be further examined. Keohane knows only policies that either hinder or foster the attainment of individual actors' policies. In the first case cooperation is not necessary. In the second case cooperation or discord might result (Keohane 1984: 53). At this point of his classification the possibility is ruled out that actors might get together to develop policies in a cooperative manner for some common benefit or purpose without being immediately forced to. But exactly this seems to have happened in the ISDN case. The policies of the national network operators did not hinder the attainment of the other network operators' goals. Nor did the policies developed directly facilitate the attainment of the (original) individual actors' goals. Nevertheless, cooperation did take place in order to achieve a seemingly better solution for all parties engaged. Keohane's analysis leaves questions unanswered as to what exactly might cause actors to cooperate, what the outlook of the compromise might be, the rewards that the players might have in mind and what keeps cooperation going.

Some of these conceptual difficulties could be eased if one conceptualized the EC in terms of conventional international relations theory or in terms of international organization theory. The CEC in our case study acts as an actor in its own right. It even tries to force member states to do something against what they conceive as being their own best interest. Some examples beyond the ISDN case are: The EC Commission is currently reviewing the exclusive rights of network provision and voice telephony granted by national governments to national network operators. By discussing the introduction of competitive international voice telephony services in the EC, the Commission sets the stage for de facto unsustainability of the infrastructure monopoly. The CEC is attacking the voice monopoly in telecommunications and, thus, the infrastructure monopoly, in spite of the fact that it still exists in most member countries and only few countries have spoken in favor of a preference for weakening the voice monopoly. Schneider/ Werle (1989a: 266) have identified the directive of 16 May 1988 as the first one in telecommunications aimed "against" *all* the member states, which was then followed by a series of others.

In the past, the EC has very often used the (in)famous Article 90 of the EEC Treaty to occupy new policy territory and to force community regulations upon unwilling member states. The CEC operates in like cases as an actor pursuing an active policy which wants to neutralize potential resistance from the member states by bypassing the Council and the direct national influences there. The issuing of key telecommunications directives (terminals and services) under Article 90 of the EEC Treaty has in fact caused considerable tension in the relations between CEC and some member states, but so far it has not led to

a retreat of the CEC. The use of Article 90 is part of a general determination by the CEC to demonstrate that it can use its existing powers effectively to further the Single Market, and that it will take a hard line especially on competition policy, under which it meanwhile subsumes much of the debate on telecommunications. The CEC is supported in its activities by the independent European Court of Justice, which is concerned with breaches of European law and the compatibility of national with European law and which, in important rulings, has sanctioned the CEC's use of Article 90.

These developments might in fact make us think of a rejuvenation of neofunctionalist theories, which have assigned international organizations a major role not simply as passive recipients of new tasks and authority but as active agents of "task expansion" and spillover (Kratochwil/ Ruggie 1986: 757-758). In this line of reasoning, international institutions are treated as acting on their own with specific self-interests. This approach has been extended in works that consider the EC to be a "corporate actor." Schneider/ Werle (1989b: 423) view the EC as an actor which is restricted in its actions by the veto powers of member governments, but at the same time it is also an actor that is bestowed with significant supranational competencies, powers and resources. A corporate actor comes into existence if and when individual resources (law, money) become transferred to a new organizational unit by its component parts. This organization is thus empowered to act in a circumscribed area in place of its "founders." Once institutionalized, the new actors are not simply aggregating individual interests and transferring them to a new level. The new corporate actor develops interests of its own, oriented primarily towards its own survival and well-being. Once a new actor unit has been established, there is the possibility that processes of autonomization start to work which might put the organization beyond the immediate reach and interests of its subunits. At some point it may become an "...[a]utonomous actor which defies the intentions of its creator(s)" (Flam 1990: 5).

The CEC derives (formal) power within the EC from two sources: powers granted under the treaty and its amendments, and control of the legislative program of the European Council, the EC's ruling body. The latter control allows the CEC to determine, within limits, the content and the timing of EC legislation, giving the CEC opportunity for diplomatic maneuvering that Commissioners and the Directorates General can exploit. The Council, however, makes the final decisions and may amend the proposed legislation. Submission of directives for Council authorization is the standard procedure under Article 100 of the Treaty; such directives are usually referred to as Council directives. The CEC is also empowered by the Treaty to issue directives on its own authority, without reference to the Council, in its role of policing EC trade for such treaty violations as cartels and abuse of dominant market position or special conces-

sions. The CEC is vested with this power under the aforementioned Article 90, which deals with public undertakings and those with special or exclusive rights, and includes as a subcategory undertakings of general economic interest or having the characteristics of a revenue-generating monopoly. The "corporate actor" approach seems best suited to capture the impression that the EC acts proactively, based on a program of its own that is not identical with aims of member countries or of some few of them, nor simply an aggregation in the sense of a smallest common denominator.

But maybe this is still not going far enough. An in-depth analysis would have to dissect the actor "CEC" even more and apply also the results of recent writings on the state apparatus. The Commission is not "one" consistent actor. Hesse has called the state a polycentric actor, a multiorganizational system (Hesse 1987: 79). He wants to highlight the development that in spite of the fact that there seems to be something like an actor "state," it hardly acts in a consistent and directing manner. The state or, more specifically, the state apparatus consists of a variety of levels, is engaged in a variety of actions and hardly follows consistent aims or interests over time in spite of its institutional stability. Descriptions like these also seem to fit the image that the CEC is presenting. Comparisons of CEC policies have shown that a wide variety of patterns and logics are employed and specific policy aims might be shifting rather quickly. This also holds true for the ISDN case. The emphasis of the CEC in the beginning was more industrial-policy oriented, but over time became more and more oriented towards deregulation and liberalization. Furthermore, different groups within the EC support diverging strategies. There is not only a successive shift of political priorities; there are also conflicting factions and groups within the CEC with conflicting priorities.

In this sense the EC cannot even be interpreted solely in terms of a two-level game (Putnam 1988) in which national and EC interests represent different but nevertheless consistent levels, but rather as a multilevel game exercised by a network of networks. Neither the CEC is a consistent actor, nor are the member states. For Germany it has been repeatedly noted in the literature that a "national" EC policy is hardly visible (Bulmer/ Paterson 1987). It is a sectoralized policy with countervailing interests of the German *Länder*. The CEC itself is split between factions that are strictly opposed to any kind of industrial policy, and those who favor active initiatives. Between these two poles are people like the present head of DG XIII, who occasionally shifts positions. The EC level can be used in a strategic manner by national groups to achieve results not amenable on the national level. These interests, however, need not be national interests, but can also be those of (trans)national interest groups. In a more advanced state of policy development and with multiple interest groups at the EC level, it becomes more and more difficult to speak about national interests. This can

be easily exemplified by the situation at ETSI, where transnational coalitions exist, but also by the fact that national actors might have increasingly diverging interests. In our case the interests of the former monopoly network operator DBP and the ministry were officially identical. Meanwhile, the official spokesman of German national interests, the ministry, disagrees with the new German Telekom on many issues; Telekom, however, is also considered to be a representative of national interests in negotiations at the EC level.

Keohane/ Hoffmann came to the following conclusion, which is also of interest for our discussion: "The European Community operates neither as a political 'market' – characterized by arm's-length transactions among independent entities – nor as a 'hierarchy,' in which the dominant mode of regulation is authoritative rule. Rather, the EC exemplifies what sociologists refer to as a 'network form of organization,' in which individual units are defined not by themselves but in relation to other units. Actors in a network have a preference for interaction with one another rather than with outsiders, in part because intense interactions create incentives for self-interested cooperation and for the maintenance of reputations for reliability" (Keohane/ Hoffmann 1991: 13-14). As the authors correctly mention, this characterization does not yet say very much about the specific structure, content and success of EC policies. It directs attention, however, to the specific mode of the creation and implementation of policies in specific policy areas. There might be a great variation across various areas. In this way, the EC operates very much like a "fragmented state" or a "state without a center" (Katzenstein 1987).

4.2 Cooperation and Leadership

The network character of the process as well as the role of the Commission can be further elucidated if we look at the roots of cooperation in the case of ISDN. What made the sovereign countries be willing to cooperate? Why did the member states choose to cooperate when their preference had previously been for national autonomy? Reviewing the current literature, Sandholtz has found two major explanations for the demand for cooperation. "The process by which states discover the practical limits to autonomy is a species of cognitive change that I call 'adaptation'" (Sandholtz 1992: 3). Adaptation is defined as learning from experience. In our context, it is learning that national solutions to policy problems do not suffice any longer. This can either happen in a lengthy process with marginal adjustments to existing policies (a) or it can be the result of dramatic policy failure or breakdown (b). "Incremental learning occurs when bureaucracies or elites learn that certain approaches work better than others. International regimes probably play a significant role in incremental learning

because in such settings they can: 1) change standard operating procedures for national bureaucracies; 2) present new coalition opportunities for subnational actors and improved access for third parties; 3) change the attitudes of participants through contacts within institutions; 4) provide information about compliance with rules, which facilitates learning about others' behavior; and 5) help to de-link one issue from others, thus facilitating learning with specialized groups of negotiators" (Keohane/ Nye 1987: 751).

In the case of telecommunications, the taking over of responsibility and the plans to be carried out by the Commission were more than just an incremental adaptation, they were aimed at a qualitative new step: a reorganization of competencies and the development of a new policy strategy, not simply small changes in existing competencies or available policy programs. In our example, then, both explanations distinguished by Sandholtz do not seem to fit neatly. As mentioned before: in the field of telecommunications there was no major policy failure to be detected. Rather, the CEC's position was that a future breakdown or policy failure should be proactively prevented. The ensuing danger had been clearly overstated by the CEC for strategic reasons in order to gain support. Interestingly the national network operators and their governments accepted the interpretation of a (pending) crisis in spite of the fact that the majority among them did not share this interpretation – at least not with respect to ISDN. Thus it is not only learning from past failures or incremental adaptation to a changing environment, it is rather the development of an active strategy in order to cope with future problems by the Commission.²⁶ Sandholtz's theorizing again suffers from the orientation towards national sovereignty and the related assumption that national sovereignty is such a highly valued asset that nobody is willing to give it up voluntarily – not even pieces of it: "The notion of adaptation implies the following: when national autonomy is a matter of policy, the failure of unilateral strategies provokes a rethinking of policy and a search for new approaches" (Sandholtz 1992: 3).

If a proactive program is being developed, the problem of leadership has to be considered carefully. Cooperation is not spontaneously generated; it requires the decisive actions of political actor(s), even more so if it deals with a long-term project. Traditional literature on international relations would have us look

26 The interpretation that the CEC's action was accepted by the national actors because it promised them a defense for their domain of power and influence is not convincing (e.g. Flam 1990: 37). In the early years, when the CEC could in fact have been used for domain defense, the national actors did not wholeheartedly support the EC's moves. After 1986 the CEC can hardly be considered an agent for domain protection. With the exception of Great Britain, the CEC turned into a threat to the status quo of the Telecommunications Administrations.

first at national governments in search of an answer. But, again, we have to be cautious. It is true that some individuals were very instrumental in bringing about the ISDN proposals and that some PTTs, notably France Telecom and DBP Telekom, were forerunners in the ISDN development, but both were reluctant with respect to Euro-ISDN. For a long time, France was discussing the preeminence of broadband development as compared to narrowband ISDN, and Germany developed a network not based on Euro-standards. The ISDN forerunners were hardly the driving forces in the EC. Both operators furthermore argue that their initial plans were not influenced by EC negotiations and decisions.

The leadership was undoubtedly provided by the Commission, supported by a group of ISDN experts who wanted to realize a technically optimal solution. An effective leadership requires certain preconditions which can also be called resources, such as the availability of technical expertise, charismatic leadership and/or periods of widespread policy failure and crisis. In our case the availability of technical expertise seems to have been the decisive factor. The technical expertise, however, is not directly located within the CEC; it has to be recruited and mobilized. The CEC staff is still very small. At the moment there are, at best, a handful of ISDN experts in the Commission; when the process began, there were none. But the CEC succeeded in soliciting the support of national experts, who over time started to prepare European solutions. The type of leadership exercised by the Commission varied over time. It was strong in the beginning of the planning process, but it receded afterwards, based on the belief that ISDN would be implemented quickly by the national telecommunications administrations, and became stronger again once the ISDN project became doomed to fail in the late 1980s.

The Commission cooperated with a group of experts who were convinced from the start that ISDN was the most favorable solution. Most of the people present at the GAP meeting knew each other from previous ISDN meetings in standardization committees or national planning meetings. Their interest was in developing a wide-ranging and optimal ISDN concept – especially from the technological standpoint. They also intended to use the EC consensus as an instrument to convince the national network operators about what further course of action they should take. It was easier for them to reach a consensus on the EC level because immediate financial problems of the realization of the ISDN plans were not discussed, the problem of options which was discussed at the national level was unimportant, and the group was an "ISDN expert group." This also explains why regulatory implications were not discussed – they were unimportant for the group. When interviewed today, members of GAP say that they themselves were surprised that the ISDN proposals were accepted without many problems in the Council, or among the national governments. They attribute

their success to a favorable political climate which helped in supporting wide-ranging initiatives especially in technical areas, where the immediate interest of national governments was low.

The ISDN experts' idea about international networks was without any doubt more in line with the thinking of the CEC than that of some of the national operators. In this sense the Commission built up a support coalition based on technical and economic arguments. It was helped by the fact that network decisions were generally politically low-key and, out of habit, only the concern of closed circles. Governments were not used to interfering with network planning.

5 What Is in the Making – a European White Elephant or a European MITI Strategy?

After this more general discussion, let us turn back to the ISDN issue in order to evaluate the ISDN proposals of the EC. The RACE program and the ISDN recommendations have received a variety of interpretations. At the extremes they range from the fear (or hope) that the EC is developing MITI-type strategies to the expectation that the EC plans will be a huge failure, that a European White Elephant is being constructed. Before trying to answer the question of how to evaluate the activities of the Community and ask whether a European white elephant or a MITI-type strategy is being developed, one surely has to admit: the whole development involves a further significant annexation of territory within the industrial policy domain by the Commission. A close look at Commission proposals concerning ISDN as well as other issues in the last years suggests that now the Commission, or rather the EC as a whole, is in a good position to make the modernization of Europe's infrastructure and, moreover, its industry a focal point of its activities both present and future.

While government intervention in support of national industry and industrial development used to play an important role, these national interventions are now limited and openly constrained by European institutions. The Commission exerts leadership in such diverse areas as domestic regulation to technology development, where Brussels initiatives used to be severely limited. Woolcock (1984) has enumerated the various initiatives related to information technology that have failed during the 1970s. Similar initiatives were successful in the 1980s. As a reason for the failure of the initiatives in the 1970s, Dang-Nguyen states: "PTTs considered, rightly or wrongly, that the Commission had no legitimacy whatsoever to intervene in telecommunications issues. Also, the national

manufacturers feared the opening of procurement policies, because they were not sure of reciprocity" (Dang-Nguyen 1989: 9).

In the light of these statements, the 1980s were a decade of complete success for the Commission. It has established itself as a determinate and influential actor in the field, procurement policies are being opened up, and the national manufacturers have largely supported the CEC's broad policy aims. The manufacturing companies in this process have recognized that cooperation will be a key to their success in the future. A network of collaborative projects has come into existence that may well survive the end of the individual EC programs like RACE or the ISDN recommendations. A wave of mergers and of concentration in the industry is also under way, thus fulfilling the hopes of the Commission to create pan-European corporations. In the public switching market, which is at the heart of the ISDN infrastructure, it seems more than likely that only two EC corporations will survive on the world market, one conglomeration led by Alcatel (France) and the other led by Siemens (Germany) (Cf. Table 9).

The shortcomings of the EC's initiatives should not be overlooked, either. Just a reminder about the status of ISDN plans: the aims with respect to standardization and availability of "cheap" equipment have not been fulfilled. Although it can be easily admitted that in recent years the importance of national standard setting has been reduced, in the leading countries standard setting in the case of ISDN has been a national endeavor; and these different national standards must be switched to European standards after 1992/93. In several countries national standards and European standards will be used side by side. This makes the whole process a more messy and costly endeavor and contributes

Table 9: Market for Public Telecommunications Networks (1991)

Rank	Corporation	Origin	Turnover (in mill. ECU)
1.	Alcatel NV	EC	14,454
2.	AT&T	USA	8,337
3.	Siemens	EC	7,980
4.	Northern Telecom	Canada	6,596
5.	NEC	Japan	6,010
6.	Ericsson	Sweden	5,751
7.	Robert Bosch	EC	3,867
8.	Motorola	USA	2,925
9.	Fujitsu	Japan	2,669
10.	IBM	USA	2,109

Source: EC-General Directorate XIII (1992)

to users' confusion about what really is going on "out there" in telecommunications network development. Furthermore, whereas the EC objective was to penetrate 5% of the network by 1993, recent market studies forecast an actual penetration of less than 1%. The 5% target was chosen to represent the minimum amount below which investment will be needed to achieve the timely introduction of ISDN and above which market forces will stimulate natural growth and migration to ISDN. In addition, the level of 5% also meant that ISDN must penetrate not only the segment of big business users, but the small business and residential markets as well. At present it is not evident that effective policies have been started by the Telecommunications Administrations to address these areas. In particular the lack of a European multi-line ISDN interface standard, unclear service benefits for small users and the lack of a harmonized standard for use behind a Private Automatic Branch Exchange (PABX) compel ISDN to remain a technical capability, rather than a major new service initiative, let alone a new universal telecommunications network.

Finally, if we look at the competitiveness of the European telecommunications industry, the figures so far are not very impressive, either. The dominant theme of 1991 was the call for more protection and again for more active industrial policy by the EC. A recent conference of the International Telecommunications User Group (INTUG) echoed the fear that the CEC might make undue concessions to equipment manufacturers that are inspiring protectionism in view of an unprecedented growth of imports in telecommunications.²⁷ Even if we look at the introduction of ISDN at the international level, we do have to admit that when compared with the US and Japan, the EC as a whole is lagging behind. It is granted that the US in particular has worked out a different ISDN concept than the EC and that, as a result, US and European figures are hard to compare. Nevertheless, the Commission's self-proclaimed role as a leader in ISDN development must be questioned (Cf. Table 10).

What have been the reasons, not for the total failure, but for the serious miscalculations and changes in the ISDN process? In the beginning I stated that the main thesis of this paper is that partial failure resulted from the irreconcilable conflict between the aim to deregulate and liberalize telecommunications markets and the aim to build up a strong European telecommunications sector. This mismatch has been built into the program from the beginning. The introduction of ISDN is not only a process of technological innovation, it is also a policy process. Contrary to the early phases of electrical power, railroad or telephone system development, ISDN, like other telecommunications innovations, has been planned as a nationwide and Europe-wide system from the very beginning

27 *Telecommunications*, July 1992: 12.

(Mayntz/ Schneider 1988). The basis of the planning process in the European countries was the existing telephone monopoly that provided both the central government and its telecommunications administration with a focal role in the planning and construction of the network. ISDN plans have been worked out by a tightly-knit policy community, a well-established network without much public discussion. Economic considerations were secondary, since PTT plans dominated all considerations of development policies. Concepts such as universal access, common architecture and standards mirror the old preconceptions of the PTTs. Besides, ISDN seemed to be a very elegant solution on technical grounds as well. The planners among the manufacturers were pleased because long-term plans by the PTTs could secure profitable and worry-free market shares in the future. The initial plans were overenthusiastic, however.²⁸

The EC was pleased not only because of the obvious consensus, but also because of the existence of partners with whom it could most probably conduct a long-term and reliable policy: public network operators and big business.

28 There are specific national factors that account for the failure and the redefinition of the national plans. These are not the subject of this paper.

Thus, the Commission was also prepared to guarantee the further existence of somewhat reduced telecommunications monopolies. "...[P]art of the reason for this extra degree of protection is derived from the CEC's determination to encourage member states to install ISDN. Such networks represent very substantial investment expenditures which may not be recouped (or investment not undertaken) if an alternative technology threatens to undermine the revenue base of ISDN. Satellite-based services could present a threat to certain segments of non-reserved services and undermine the viability of an ISDN grid. Clearly, though the Green Paper takes a pro-competitive stance, it maintains some interest in technological and industrial objectives which have wide ramifications" (Locksley 1990: 38).

Concepts based on the old telecommunications monopoly and on the idea of universal access prevented the Commission from looking at technological alternatives that were developing at the same time, but with more limited influence of the PTTs. But, nevertheless, the situation for active policy making was very favorable in the mid-1980s. A network of competent actors that agreed on a common program had been established. The participating actors seemed to command the necessary resources for strategic actions, too. In his treatise on the "joint-decision trap," Scharpf (1987) argued that success in complex decision-making situations, which are typical for the EC level, depends on the willingness of the partners to cooperate and formulate consensus; they have to demonstrate a "problem-solving attitude." The history of the EC gives ample evidence that this is not a trivial precondition. Oran Young has developed a distinction between "integrative bargaining" in successful institutional negotiations, which loosely refers to a problem-solving approach to "expanding the pie" in negotiations and "distributive bargaining," which is understood as the adversarial process of "dividing the pie" (Sebenius 1992: 329). "What is necessary for the 'problem-solving' style to emerge is an orientation towards *common* interests, values or norms which are separate from the individual self-interest of participants and which, therefore, may facilitate voluntary agreement even when sacrifices in terms of individual self-interests are necessary" (Scharpf 1987: 26). These conditions have been met in the formulation of the ISDN recommendation.

But why, then, was there "failure"? I do not mean failure in the formulation of a policy proposal or with respect to the growing importance of the CEC in telecommunications in general. The bulk of the literature on international cooperation is oriented towards the single incident of reaching a compromise or signing a contract, but very often leaves questions aside about what exactly happens to the result of a negotiation process. Our theoretical discussion in Section 4 was also basically oriented towards the problems of bringing about a cooperative program, but did not concern itself so much with the implementation and the further development of the ISDN recommendation. It is true that

the success of a program is hard to evaluate, if one does not stick solely to the originally stated aims. The implementation literature has amply shown that stated or intended aims are usually not achieved anyway. Sometimes a realization of the original aims might be even suboptimal or counterproductive. This also holds true for the ISDN recommendations. A realization of the full potential and the full implications of the original ISDN concept would in fact have created an outdated, costly white elephant with very dubious benefits for everybody. But still the question of what mechanisms produced the partial failure continues to be of interest.

Mayntz has recently argued that networks might be a superior form of coordination when compared to markets and hierarchies: "The network, ..., appears at least *potentially* capable to avoid both dysfunctions by combining the individual autonomy of the market participants with the capacity of hierarchies to pursue goals consciously and to control their actions deliberately in view of their anticipated effects" (Mayntz 1991: 12). In order for a network to fulfill these expectations, some preconditions are necessary, as the ISDN case demonstrates. First, effective networks are based on a restricted number of members and problems. In other words, not all groups or actors interested or concerned with the specific problem are part of the network, but usually only a certain exclusive few.²⁹ These few, however, have to command the necessary competence and resources to tackle the problem. Second, the interests in achieving a common solution must remain stable over time. This stability can be supported by institutional mechanisms.

In the case of ISDN, these preconditions could not be met. While at the beginning of the planning process the EC was talking to network operators – who were in most cases identical with the regulators –, today it talks primarily with the regulators alone as the representatives of the member states. The regulators have increasingly diverging interests from the network operators. They also have a different outlook on network planning. While the old German PTT and its ministry were proud to support a wide-ranging concept of a universal ISDN network, the new ministry in its self-interpretation as a regulatory agency does not even require the PTT to consider ISDN an obligatory service.³⁰ Furthermore, the spread of data networks set up by computer companies such as DEC, IBM and the increasing number of network operators as a result of deregulation

29 "...[D]er Verhandlungserfolg [hängt] immer noch von der rigorosen Beschränkung der Zahl der Beteiligten oder der Agenda ab" (Scharpf 1991: 17).

30 Cf. Bundesminister (1991). It is also claimed that the Commission can by no means argue that its recommendations, directives or proposals demand the introduction of ISDN as an obligatory service (Bundesminister 1991: 100).

do not only pose a threat to the old network operators' status and power, but also signify a change in who is important more generally in telecommunications. Faced with a more competitive situation, the old network operators furthermore have to aim for profitability, since less profitability increases the likelihood for further deregulation. Parallel to this reorientation in a very dynamic situation, the network plans of the operators did change. The idea of universal networks (the original justification for promoting ISDN) is gradually losing importance, while custom-made, client-oriented networks and services are becoming more popular. Both France and Germany have retreated from their most ambitious plans and are following – albeit hesitantly – the lead of British Telecom, which is concentrating its activities on the extension of business networks. In 1986 ISDN was not the object of a true distributive conflict. In 1990 it is a distributive conflict in as much as a concentration of resources on ISDN impedes the development of other network and service developments. The EC will have to build up a new support coalition and use new instruments if it wants to secure a longer-lasting success of a new and altered version of ISDN.

This gives us an answer to the question raised at the beginning of this section as well. A MITI-type strategy is not visible on the EC level. Since the Commission cannot force the PTTs and industry to act in a specific manner, e.g. to establish international ISDN connections or to build and sell Euro-ISDN-compatible equipment at reasonable prices, the EC has to work – not only in this field – more as an organizer of dispute, of collaboration and consensus formation, as a catalyst for developments already under way. The EC Commission is, in contrast to general opinion, not a new super-bureaucracy that shells out considerable amounts of money, at least not in telecommunications. It has demonstrated insight in existing restrictions and willingness to learn from mistakes of the past that were committed most strikingly in the sector of agriculture. To illustrate this point, we can look at the budget of RACE, which adds up to 500 million ECUs for the years 1987-1992 – a meager amount compared to the R&D investments made by the key corporations, and compared to the investment costs to be covered by the network operators. The full cost of installing an Integrated Broadband Communications Network throughout the EC is likely to be approximately 350 billion ECUs spread over 10 years – if one believes conservative estimates. The Commission strongly favors the widespread installation of ISDN in member states, but it has no powers to enforce it. It can sponsor technological research, but it is the creation of conditions conducive to investments in these networks that remains the prime instrument of policy. Network development Approaches 2 and/or especially 3 are far more in line with the real capabilities of the CEC and might be in the end even more successful than the attempt to prescribe specific policy outcomes and define ambitious policy programs without the available resources for controlling implementation.

An evaluation of EC policies thus has to take into account the character of the specific structures of policy making, development and implementation. In the case of telecommunications, the CEC is working on the construction of actor networks that are in most cases not yet firmly institutionalized, but are open and may change rather quickly. The Commission has developed a remarkable amount of autonomy and competencies over a short period of time. The new structures, however, are not yet firmly established. There is still a high degree of openness, and the exchange and access routes are still largely unstructured. "...[W]e find growing evidence of 'Disorganized Capitalism' at the Community level, without the elements of official recognition, ensured access, hierarchy, and monopoly" (Schmitter/ Streeck 1991: 67). The CEC is neither a state nor "just" an international organization. Independent resources are at the disposal of the Commission. On the long run, the success of the CEC in policy areas like telecommunications will depend on the managerial capabilities of the CEC and the willingness of the member states to accept the ongoing European integration.

Appendix

tabelle 11 kleben

tabelle 12 kleben

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