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on

Barriers to widespread access to new services and applications of the information society through open platforms in digital television and third generation mobile communications

EXECUTIVE SUMMARY

Achieving widespread access by all citizens to new services and applications of the Information Society is one of the goals of the EU for the coming decade. In a “multi-platform” approach, digital television could play a key role for future access to Information Society services, owing to the pervasiveness of television. Third generation (3G) mobile communications will offer Information Society services to users on the move. The Internet will remain a major delivery mechanism for those with PCs and content from the Internet will be accessible via other platforms, such as 3G and DTV.

In future, all digital communication platforms will be able to deliver electronic and Information Society services, although the precise capabilities of each platform will differ. Open platforms for digital television and 3G mobile will contribute to user choice and interoperability. Both 3G mobile and digital TV currently use proprietary standards, in particular for the Application Program Interfaces or APIs used in digital TV set-top boxes and third generation mobile handsets but not for network or access technology. In 3G mobile communications, industry itself seems to have recognised the need for such services to be interoperable and is taking the steps to reach agreement on standards that will deliver interoperable 3G services. The Commission services propose to monitor developments in the delivery of and access to such services and to consider action if proprietary technology has the effect of depriving users of widespread access to Information Society services over 3G networks. For digital TV, Memoranda of Understanding have been agreed at national and regional level between broadcasters and manufacturers of digital interactive TV to promote the future use of the Multi-media Home Platform (MHP) standard – an open API. The new regulatory framework for electronic communications requires an examination of the extent to which interoperability and freedom of choice have been achieved in Member States by no later than July 2004. If these objectives have not been adequately achieved, the Commission may make a previously published standard compulsory, following a public consultation, and with agreement of the Member States.

The new regulatory framework for electronic communications recognises the challenges inherent in dynamic technologies when regulating this area, and sets clear objectives and creates powers for regulatory intervention to achieve interoperability and user choice.

The “openness” of 3G and DTV platforms is an important element among several that affect access to Information Society services. Other issues, such as the development of attractive consumer services, the creation of a secure environment to inspire consumer confidence, and an environment of regulatory clarity for new electronic services, are equally important. European cultural diversity must be recognised and exploited in creating an Information Society for all. Public authorities can accelerate an Information Society, as legislators, regulators, promoters, and public procurement agencies. They must ensure that legislative and regulatory conditions create a favourable environment for business that attracts investment and favours innovation and economic development, as well as safeguards the interests of consumers. They can take the lead in encouraging demand for Information Society services by offering their public services on-line and by following public procurement policies that favour openness and interoperability.

BACKGROUND AND INTRODUCTION

The Barcelona European Summit in March 2002 recognised that *digital television and third-generation mobile communications (3G) will play a key role in providing widespread access to interactive services*. It called upon the Commission and the Member States to foster the use of open platforms to provide freedom of choice to citizens for access to applications and services of the Information Society, and invited the Commission to present, *inter alia*, a comprehensive analysis of remaining barriers to:

the achievement of widespread access to new services and applications of the information society through open platforms in digital television and 3G mobile communications¹.

The present document is one of several reports on, and initiatives taken, in relation to the Information Society. The Commission presented an eEurope 2005 Action Plan², which recognises the importance of an Information Society for all to achieving the long-term objective of making the Union the world's most competitive, knowledge-based economy, to the Seville European Council in June 2002. It was presented together with a communication on third generation (3G) mobile³. Concurrently with the present staff working document, the Commission services address the issues related to the development of eCommerce and eGovernment in a separate report⁴.

In June 2002, the Seville European Council re-iterated the request of the Barcelona Summit to the Commission for a report to the Copenhagen European Council in December 2002 on "*the remaining barriers to open platforms in digital television and third-generation mobile communications*"⁵. This document is a preliminary response to the above request, identifying not only "barriers to open platforms", but also many other issues that will affect access to Information Society services. A range of commercial, regulatory and consumer factors will influence the roll-out of 3G mobile services and digital TV and will therefore determine what services can be accessed from what devices - no less than the openness of a given platform.

1. INTRODUCTION

An "Information Society for all" brings everyone (administrations, businesses, citizens, homes and schools) into the digital age, encourages business to innovate and builds consumer confidence to make use of these new digital technologies and services. First and foremost, an "Information Society for all" is about making electronic services an every-day reality for all citizens. The eEurope 2005 Action Plan calls for the adoption, by end 2003, of an agreed interoperability framework to support the delivery of pan-European e-government services to citizens and enterprises.

Open platforms enhance consumer access to new services and applications, and give citizens a greater choice of services as explained below. Widespread access to Information Society services needs useful and attractive content to create demand. This, in turn, requires that

¹ See point 41 of Council Presidency conclusions at: <http://ue.eu.int/en/Info/eurocouncil/index.htm>

² eEurope 2005: An information society for all COM(2002) 263 final.

³ "Towards the full roll-out of third-generation mobile communications" COM(2002) 301 final.

⁴ Working document of the Commission services [to be published]

⁵ See point 54 of Council Presidency conclusions at: <http://ue.eu.int/en/Info/eurocouncil/index.htm>

developers can create and integrate their new services into existing platforms. Commercial challenges, such as developing viable business models, must also be met successfully. Consumer resistance factors, such as trust in the confidentiality of the communication and in the effectiveness of security measures to protect sensitive data, influence whether even attractive services will be used. Technical, commercial and regulatory factors are part of a complex environment affecting access to services. If the problems inherent in all these factors are not resolved satisfactorily, an Information Society for all will be held back, even if service delivery platforms are open. Both the Commission and Member States have recognised this and have systematically addressed these barriers, working with industry to find solutions within a Community framework.

Some recent Community initiatives put the focus of the current document into context. The Council Resolution of 28 January 2002 on network and information security⁶, the Communication from the Commission on the same subject⁷ and the eEurope Action Plan⁸ recognise that consumers and businesses need a secure environment in which to conduct their communications and to transact business. The security of transactions and data has become essential for the supply of electronic services, including e-commerce and online public services. Directive 2002/58/EC ensures the right to privacy and to confidentiality in communications and transactions will be respected⁹. The Commission intends to set up a temporary interdisciplinary working group in close co-operation with and composed of Member States representatives to conduct preparatory actions with a view to the establishment of a Cyber-Security Task Force as referred to in the Council Resolution of 28 January 2002.

The proposed directive on patenting computer-implemented inventions seeks to harmonise the requirements for patent protection in this area (where the European patent office and some Member States have already granted patents)¹⁰. As regards developing interoperable programs, the requirement for each patent to include an enabling disclosure should facilitate the task of developers to create new programs that are interoperable with an existing program incorporating patented features. The proposed directive preserves the provisions on decompilation and interoperability of Directive 91/250/EEC. In the event that patent rights are exercised in an abusive way by a dominant company, or the patent is not exploited commercially, compulsory licensing may be available under national patent laws, or as a possible remedy under competition law.

In addition, public and commercial services must be offered on a widespread basis for an Information Society for all to happen. The eEurope 2005 Action Plan aims to promote broadband capacity as a means of access to the Internet, and as a way of raising productivity in the private and public sectors, so as to reinforce the pillars of an inclusive Information Society: eLearning, eHealth, and eGovernment. The Commission recognises that the Internet and its widespread use are already a central part of the Information Society and has endorsed the initiative to upgrade the Internet's capabilities in the next Internet Protocol (IPv6)¹¹. To

⁶ (2002/C43/02) http://www.europa.eu.int/information_society/eeurope/action_plan/safe/netsecres_en.pdf

⁷ COM(2000) 298 final of 6 June 2001; COM(2000) 890.

⁸ COM(2002) 263 final.

⁹ Directive of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector, OJ L 201, 31.7.2002, p.37.

¹⁰ OJ C 151, 25.6.2002, p. 129, COM(2002) 92 final

¹¹ Communication from the Commission to the Council and the European Parliament, *Next Generation Internet: priorities for action in migrating to the new Internet protocol IPv6*, COM(2002) 96.

encourage public authorities to make their information available in electronic form, the Commission has proposed a directive on the re-use and commercial exploitation of public sector documents¹².

Of equal importance regarding access to services is how effectively the single market principles are being implemented. The Commission's report to the Council and the Parliament on the state of the internal market for services in the EU finds that many services are not being made available across borders due to weaknesses in the application of single market principles¹³. The report addresses barriers horizontally rather than by sector, emphasising that the recipients of services, and particularly consumers, are the principal victims of the dysfunctioning of the Internal Market. The problems identified in the report, in particular relating to the fact that consumers can be prevented from having easy access to services from other Member States, or that they have to pay a high price, or they lack the confidence to buy from other Member States, are also applicable to electronic communications services.

Consumers today are familiar with many different kinds of public and commercial services both off-line and on-line. The focus of this document is access to Information Society services¹⁴. The term "information society service" is defined in EU legislation as:

"any service normally provided for remuneration, at a distance, by electronic means and at the individual request of a recipient of services"¹⁵.

Information Society services span a wide range of economic activities which take place on-line, such as the selling of goods. Information society services are not restricted solely to services concerned with on-line contracting but also, in so far as they represent an economic activity, cover services that are not paid for directly by those who receive them, such as offering on-line information or commercial communications, or providing tools that allow for research, access to and retrieval of data. Information Society services also cover services that consist of: the transmission of information via a communications network; providing access to a communication network; or hosting information provided by a recipient of a service. Services that are transmitted point to point, such as video-on-demand or the provision of commercial communications by electronic mail, are also Information Society services¹⁶.

Television broadcasting within the meaning of Directive EEC/89/552¹⁷ and radio broadcasting are not Information Society services because they are not provided at individual request. Nor are activities such as the delivery of goods as such or the provision of services off-line considered Information Society services. Activities which by their very nature cannot

¹² Proposed directive of the European Parliament and of the Council on the re-use and commercial exploitation of public sector documents, COM(2002) 207, 2002/123/COD.

¹³ COM(2002) 441 final.

¹⁴ Although this communication does not address barriers that might hinder free movement of products, Member States should be similarly vigilant to avoid creating barriers to the free movement of technical equipment. The development of the Information Society should take into account not only the opportunity to provide widespread access to Information Society services, but also the need to avoid technical or administrative barriers for technical equipment.

¹⁵ Article 1 of Directive 98/34/EC as amended by Directive 98/48/EC, OJ L 217, 5.8.1998, p.18.

¹⁶ See recital 18 of Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, OJ L 178, 17.07.2000, p. 1.

¹⁷ Directive 97/36/EC of the European Parliament and of the Council of 30 June 1997 amending Council Directive 89/552/EEC on the co-ordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities OJ L 202, 30.7.1997, p. 60.

be carried out at a distance and by electronic means, such as the auditing of company accounts or rendering medical advice that requires the physical examination of a patient, are also not Information Society services.

Information Society services can therefore cover: (1) on-line transactional services, e.g., buying goods on-line; and (2) information, research and other on-line services, e.g., travel timetables, catalogues, libraries, interactive games¹⁸.

1.1. Digital convergence and multi-platform access

Digital technologies have revolutionised the transmission of information by allowing information (voice, text, audio and video) to be converted into digital form and deliver better quality more efficiently. Internet protocols facilitate the transfer of digitised data in a common form such that different kinds of digitised information can be transmitted through different kinds of networks and accessed from different end-user terminals resulting in a convergence of services, markets and platforms. For example, voice telephony can be provided over the Internet to a PC equipped with appropriate software; similarly, a data service can be transmitted over the Internet to a television receiver equipped with appropriate software; a cable TV network infrastructure can provide access to the World Wide Web. The overlay of Internet onto traditional regulatory structures for telephony, data communications and broadcasting is depicted in figure 1 in the Annex.

In future, all digital communication platforms will be able to deliver electronic and Information Society services although the precise capabilities of each platform will differ. The attraction of mobile handsets and television as delivery platforms lies in their already high levels of penetration, with the promise of digital television as a possible future delivery platform. Analogue television is already the most widespread communication platform, with an estimated penetration of 98%¹⁹ of total households. The penetration of mobile communications (second generation, GSM standard) is already more than 75% of the population throughout the EU.

2. ACCESSING INFORMATION SOCIETY SERVICES

At present, access to electronic services typically occurs with a personal computer (PC) via the Internet where uptake in the EU is running at about 40% of households²⁰, but 3G handsets and digital TV platforms with appropriate software will nonetheless be genuine alternatives to the Internet/PC model of access. A majority of current home Internet users have a PC with dial-up (narrowband) access over the telephone network, but a growing percentage use xDSL or cable for broadband services. Internet access via satellite is also available, combining a high-speed downlink from the satellite to the PC with a return path provided over the normal telephone or cable network.

Access to the Internet and to Information Society services provided over the Internet is already possible using devices other than PCs, such as mobile handsets and television receivers. Second generation mobile handsets, equipped with appropriate software and

¹⁸ eGovernment services, such as eLearning and eHealth, are not provided for remuneration and may therefore fall outside of this definition, but they nonetheless do fulfil the other criteria of Information Society services. See: Cases 263/85, [1988] ECR 5365, 352/85 [1988] ECR 2085.

¹⁹ Analogue and digital TV (DTV) are here considered together.

²⁰ <http://europa.eu.int/comm/eurostat/Public/datashop/print-product/EN?catalogue=Eurostat&product=1-ir031-EN&mode=download>

hardware, offer a range of services such as news, travel information, sports and e-mail, in addition to their standard voice telephony and Short Message Services (SMS). Fixed line telephones with small screens and some extra software can provide email, SMS and basic Internet access. An analogue TV set, with a digital set top box and connection to the public telephone network, can do the same.

The telephone is inherently a two-way device and provides within itself a 'return channel' over which the user can interact with the information service provider. With the exception of cable, television networks have traditionally been one-way communications systems, requiring a separate return channel to provide full interactivity, which may be provided over any convenient platform, including a conventional dial-up line or a mobile phone.

Delivery of some Information Society services, particularly the multi-media services, will require a broadband delivery system. Digital television networks (satellite, terrestrial or cable) offer one such platform, 3G mobile networks another.²¹ Hybrid systems combining elements of both technologies may appear. Internet use will likewise evolve in terms of services offered. Many people already use the Internet to listen to remote radio stations. While the television equivalent awaits the widespread deployment of broadband infrastructure, use is already being made of multicast and streaming technologies on PCs to watch remote events such as meetings or pop concerts where high quality images are not yet expected.

2.1. General trends in access technologies

Internet take-up and mobile telephony have both experienced huge growth in Europe over the past decade. Over the next ten years, high bandwidth wired Internet access ("broadband") is likely to be available to most households. Television receivers and mobile handsets, already quite widespread, will continue to have high penetration levels. Personal computers are unlikely in the short term to reach penetration levels of TV or mobile communications. Other electronic consumer devices which can be connected to networks, such as personal digital assistants, are likewise unlikely to reach the same levels of penetration as TV receivers or mobile handsets.

On past trends, therefore, it seems likely in the short term that the combination of personal computers and electronic communications networks will provide widespread access to television channels before television is widely used to provide access to Information Society services. However, digital television may ultimately rival the PC/Internet paradigm for access to Information Society services once digital TV is widely implemented in the EU. While pay-TV has driven the initial uptake of DTV in Europe, saturation of the pay-TV market in terms of penetration rates may be occurring. Attention is therefore likely to focus on the free to view markets.

A recurring feature of innovation in networked technologies is the re-combination of technologies; new applications and infrastructure are built on top of existing systems in a cumulative fashion, often using existing technologies in innovative and unintended ways. The resulting interdependencies have made openness and interoperability core principles in facilitating the development of the Information Society in a convergent environment.

²¹ See COM(2002) 43.

2.2. Wireless Local Area Networks

Although this document focuses on two access network technologies, namely 3G and DTV, other wireless access networks also exist. The desire for wireless access to the Internet from portable PC (laptop) users has led to the recent rapid development of wireless local area networks (“W-LAN”) which provide inexpensive wireless access points (AP) interconnecting an electronic device to a Local Area Network (LAN) or to a public communications network. The coverage of a typical AP is in the range of 100 metres easily extendable out to 300 to 500 metres in outdoor deployment. The bandwidth of this technology is significantly larger than that available on 3G technology while the operational frequencies of existing and soon-to-be deployed W-LAN products are also of interest. W-LAN technology was initially developed for use in private environments. A number of networks have recently been deployed in public spaces (e.g., conference centres, airports, hotels), first targeting professional users on the move. As W-LAN technologies provide limited area coverage and do not support user mobility, they can provide complementary access networks to the wide area deployed 2G (GPRS) and 3G networks, as confirmed by the fact that several mobile operators are currently deploying their own W-LAN infrastructure to combine with their existing cellular networks with the aim of offering high quality data services to users in an area with W-LAN coverage while 2G/GPRS and 3G networks provide medium rate data services with wide area coverage to their mobile users.

2.3. Open Platforms: Openness and Interoperability

The Barcelona Summit called upon the Commission and the Member States to foster the use of open platforms to provide freedom of choice to citizens for access to applications and services of the Information Society notably through digital television, 3G mobile and other platforms that technological convergence may provide in the future. This freedom of choice will greatly benefit consumers by offering them a combination of different kinds of Information Society services provided over various delivery systems to different end-user terminals.

The openness of a platform is determined by its interface technology. Application program interfaces (APIs) allow the software of an application (such as an SMS) to interact with the system software and hardware in an end-user device (such as a mobile handset). Third parties require access to the technical specifications of APIs and to the developmental tools needed to design new services and to operate them over the platform, including the right to make use of the specifications without undue legal or commercial restrictions.

Figure 2 in the annex depicts the place of the API in the overall system.

These APIs may use proprietary technology, an open standard (defined below), or even open source (freely available, open and non-proprietary) technology. The Commission promotes open source software in its Interchange of Data between Administrations (IDA) Programme²².

In the case of a platform that uses proprietary API technology, it may be the voluntary choice of the operator to make the technical specifications of the APIs available to third parties.

²² See, e.g., Raymond, E. (1999) *The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary*. Sebastopol, Calif.: O'Reilly & Associates, Inc. and http://firstmonday.org/issues/issue3_3/raymond/.. IDA's "Pooling Open Software Study, " <http://europa.eu.int/ISPO/ida/jsp/index.jsp?fuseAction=showDocument&parent=news&documentID=550>

However, the platform owner remains in control of the technical specifications and any modifications thereof.

Access to platforms using proprietary APIs can if necessary be imposed by law, to compel platforms to become “open”, as was the case with Open Network Provision – a Community policy that mandated transparent, cost-oriented and non-discriminatory access to an incumbent operator’s networks prior to complete liberalisation of the telecommunications sector in 1998. However, such mandated access is not appropriate in all markets and can have the disadvantage of discouraging investment in innovation by a platform operator. In the new regulatory framework, access obligations on networks can be imposed only on undertakings with significant market power.

A platform that uses open API standards, i.e., standards that are consensus-based (involving all stakeholders, including consumer organisation representatives), publicly available, transparently agreed and commercially exploitable on a fair, reasonable and non-discriminatory basis, is open by design, from its inception. The development and implementation of such consensus-based, open, standards rely on market players seeing such an approach as being in their best commercial interest, because common standards will in the long term promote and enlarge the market. Thus, openness (in different degrees) and interoperability can be achieved either by choice, by design or by law.

Without open APIs between networks and services, it is possible for platforms using proprietary standards to bundle all the elements of electronic services and, if the proprietary technology is unavailable to third parties, to lock in the customer to both the platform and its bundled services, thereby reducing choice.

Open APIs in delivery platforms therefore facilitate interoperability of services and consumer choice. The range of services and applications provided to users of Information Society platforms like 3G mobile and DTV will greatly depend on the degree of openness of the technology used for the APIs in these platforms.

The term ‘interoperability’ includes several aspects: to a network operator, it can mean the ability to inter-operate with other networks and provide seamless services to users; to a content provider or service provider, it can mean the ability to be able to run an application or service on any suitable platform; and, to the consumer, it can mean the ability ideally to obtain the relevant hardware device “and begin to consume and pay for services, without having prior knowledge which services would be consumed, in a simple way”²³. All of these types of interoperability are desirable.

To the extent that an API is a ‘computer program’, it may be protected under the terms of Directive 91/250/EEC which defines the scope of copyright protection granted for computer programs under Community law²⁴. Under this directive, computer programs are subject to specific rules on achieving interoperability. An important exception to copyright protection gives a software developer, inter alia, the right under certain conditions to de-compile an existing program to make a new program interoperable with the existing program. Under the terms of the directive, the authorisation of the right holder is not required where the relevant conditions are met and where reproduction of the code is indispensable to obtain the information necessary to achieve interoperability of an independently created computer

²³ See the charter of the Open Platform Initiative for Multimedia Access (OPIMA), http://opima.telecomitalia.com/opima_charter.htm.

²⁴ OJ L 122, 17.5.1991, p.42.

program with other programs. In practice de-compiling often proves difficult and costly to use as an alternative to direct access to the interface as defined in the documentation and source code of the original program developer. In addition, the provisions of the Directive are without prejudice to the application of the competition rules under Articles 81 and 82 of the Treaty if a dominant supplier refuses to make information available which is necessary for interoperability as defined in this Directive.

3. DIGITAL TELEVISION

Digital technology allows for significant improvement in terms of transmission capacity (number of channels and services), picture quality and information management. Interactive digital TV covers both “enhanced broadcasting” and “true interactivity”²⁵; this document is concerned only with the latter. Interactive television services are just emerging.

Like analogue equipment, digital TV provides free to view reception but, when a return channel is added, also offers access to Information Society services and to interactive digital TV services²⁶. While free to view analogue television covers close to 100% of the population, the chart in the annex to this document (Figure 3) shows that digital TV penetration is for the moment considerably below the level of analogue TV distribution²⁷. Figure 3 demonstrates that digital TV penetration has achieved a 30% or more penetration in only one Member State.

Digital TV was initially offered in Europe as a pay-TV service by vertically integrated service providers. The early implementations of digital TV in Europe used proprietary Application Program Interfaces, as no European standard was available at the start of the digital TV market. The typical service offerings of such companies controlled all elements of the value chain in the delivery of the services to the customers. Such services included free-to-view channels as well as subscription channels. As a result of the lack of industry-wide standards in interactive television, TV and cable operators deployed television set-top boxes using proprietary access methods and standards which enhanced the ability to restrict customers’ access to competing services and content. Once customers have chosen their service provider, they will generally have little freedom of choice thereafter as to what services they access.

When the opportunities offered by convergence for providing new services in DTV were recognised, companies in the Digital Video Broadcasting (DVB) project agreed on a specification for an open European API for digital TV, the Multi-Media Home Platform (MHP)²⁸. The European Telecommunications Standards Institute (ETSI) subsequently

²⁵ “Enhanced broadcasting” means that applications are mounted on a virtual carousel and transmitted in a continuous loop, with the viewer selecting applications via the remote control. Data and/or additional multimedia information can be incorporated into the video stream and made available either upon viewer’s selection in real time, or stored on the hard disk, thus allowing for “local interactivity” and permitting viewers to break free from the constraints of linear broadcasting. “True interactivity” means the user transmits requests through a “return channel” and the provider supplies individually requested data and services separately from the main video programme.

²⁶ “Free to view” television covers transmission by cable, satellite and terrestrial technologies but excludes services to which access is limited by conditional access system such as pay-TV services.

²⁷ Digital television penetration in this context covers households with at least one digital television receiver of any kind (i.e., a set-top box).

²⁸ The Digital Video Broadcasting Project (DVB) is an industry-led consortium of over 300 broadcasters, manufacturers, network operators, software developers, regulatory bodies and others in over 35 countries committed to designing global standards for the delivery of digital television and data services.

endorsed MHP as a Technical Specification. The initial proliferation of proprietary technical solutions, in this case of proprietary APIs, is an innate characteristic of embryonic markets, however desirable the existence an early single standard might have been. The emergence of this single standard was the result of much discussion between stakeholders and a clear demonstration of the viability and the potential of the market in question.

Concerns about interoperability prompted the EU to establish policy tools in relation to digital television. Article 17 of Directive 2002/21/EC (“the Framework Directive”) foresees specific measures that are described further below to ensure the interoperability of services with a view to improving freedom of choice for users. Under the new regulatory framework, the Commission has reserve powers to mandate European standards to the extent strictly necessary to ensure interoperability. Broadcasters have a right to fair, reasonable and non-discriminatory access to conditional access systems for digital radio and television services; and Member States have the right to mandate access to the necessary APIs and electronic programming guides if this proves to be necessary to guarantee accessibility for end-users to digital radio and television broadcasting services²⁹.

While it is easier to run applications over various platforms using standardised systems, limited interoperability of content and services can also be achieved by specialised software that translates the data between different non-standardised applications. For interactive applications to be able to run over a variety of digital TV platforms using different proprietary APIs, application developers must have access to the API specifications and adapt their applications to each one. This process is called “re-authoring” and represents additional costs for service and content providers. This approach is currently the subject of debate amongst market players and is currently under study in relation to issues related to these costs, practical limitations, feasibility and potential uncertainty about specifications.

Under article 18 of the Framework Directive – entitled “Interoperability of digital interactive television services” - Member States must encourage the use of an open API by (1) all providers of digital interactive television services and by (2) all providers of enhanced digital TV equipment³⁰. The Commission intends to include the MHP standard in the list of standards to be published in the Official Journal in early 2003 under article 17 of this directive. Industry will thus be encouraged, but not mandated, to use a single standard API, the MHP standard. Since MHP represents a potentially effective alternative to the millions of digital TV set top boxes currently using proprietary APIs, a progressive migration from these proprietary systems towards MHP can be foreseen. In addition, choosing MHP for “greenfield” markets would avoid the migration and legacy issues of pay-TV systems.

To facilitate the voluntary deployment of MHP, various Memoranda of Understanding and migration plans have been agreed at national and regional level between broadcasters and manufacturers, with the result that a majority of new interactive digital TV services in areas without any digital television penetration are likely to use the MHP standard in particular for free to view TV. Broadcasters, mobile operators and consumer equipment manufacturers are actively exploring the possibilities offered by the joint utilisation of their infrastructures and the complementary delivery of new services which could equally benefit from the use of open interoperable standards (as was the case with GSM, the second generation mobile standard) and which include benefits of economies of scale.

²⁹ See Article 5(2) of Directive 2002/19/EC, *op.cit.*, *infra* fn. 47.

³⁰ OJ L 108, 24.4.2002, p.33.

Article 18(3) of the Framework Directive provides that, by no later than July 2004, the Commission will examine the effects of this article. If interoperability and freedom of choice for users have not been adequately achieved in one or more Member States, the Commission may take action under the terms of Article 17, wherein a previously published standard may be made compulsory, following a public consultation and with agreement of the Member States³¹.

4. 3G MOBILE COMMUNICATIONS

The mobile telecommunications industry is evolving from being primarily voice telephony service providers (with extra features like SMS) to delivering a combination of voice, information and audio-visual services. Improved network technologies and software in 3G will improve the range of services and applications available, particularly by increasing the speed at which services will run over these networks. This will improve the usability and interactivity of services, such as booking of tickets, downloading of audio and video clips, banking and payment transactions and location-based services, such as finding a local restaurant.

The Commission's Communication of June 2002, "Towards the Full Roll-Out of Third Generation Mobile Communications"³² reviews the past and current situation of the 3G sector from the financial, technical, market and regulatory perspectives. It pointed to the rapid growth in data traffic in the form of short message services (SMS), which points the way towards more sophisticated services making use of 3G.

Each 3G mobile operator is expected to develop and operate its own configuration of network infrastructure and services. Mobile operators are expected to offer a variety of "service packages" depending on the type of customer targeted, i.e., a combination of voice, SMS, email, information and content services. Although each bundle of service offerings would limit the services available to each subscriber, access to the Internet and Internet-type services are likely to be a key part of any service offering. It appears that mobile telephone use will become nearly ubiquitous. Consumers are likely to want access to the Internet and to Information Society services while on the move. Mobile Internet access (where IPv6 will have an important role in supporting mobile services) could be a significant development in electronic communications in future. In that event, industry would need to address some commercial and technical issues (such as, identification, authentication, encryption, electronic payment systems, location-based services, bandwidth sharing, handover) and would also need to develop successful business models including adequate revenue sharing arrangements.

In practice, attractive service offerings by 3G mobile operators will include access to the services of other service providers, for example, in order to download short video clips from a content provider. To deliver these combinations of services, 3G mobile operators will need to ensure interoperability between the software in the end-user's handset and the third party's services software. APIs will be required in the handset to interface between the third party's service software and the handset.

Although some standardisation efforts have been undertaken, developments in this technologically dynamic environment are sometimes unpredictable. As has been noted, solutions tend to be proprietary in embryonic markets as an outcome of the competitive

³¹ *ibid.*

³² COM(2002) 301.

tensions between network operators, handset manufacturers, services developers; sometimes these market players co-operate to develop their own unique software applications and innovative services. As a result, new offerings may not initially inter-operate across different networks or between different service providers.

Recognising that interoperability is essential for consumer acceptance of new services, the mobile industry has come together in a global alliance³³ to tackle barriers to interoperability of services and to define specifications designed to accelerate the development and adoption of new mobile services combining information, communications and other content services. These market players see it as being to their advantage to work together to ensure that 3G services inter-work seamlessly, independent of the network operator or terminal manufacturer, and despite any differences in underlying standards. The Commission services intend to monitor closely the evolution of the value chain surrounding 3G services, and consider action if the evolution of 3G towards an open and competitive service environment would be threatened by proprietary solutions chosen by individual undertakings.

5. BARRIERS IN THE ROLL OUT OF DIGITAL TELEVISION AND 3G MOBILE COMMUNICATIONS

The interconnection of networks, technical interoperability of services and technical compatibility of equipment have been the primary tools to liberalise and harmonise the EU telecommunications sector over the last two decades and remain important for achieving a pan-European market.

In the case of digital TV and 3G mobile communications, there are justified restrictions that – while not barriers as such – nevertheless affect the ability of undertakings to enter and compete in these markets. They include obligations imposed on undertakings that impact on key inputs at the wholesale level of the value chain, such as licensing conditions for radio frequency, or “must carry” obligations. The Commission has already adopted two communications on mobile communications³⁴. To clarify the single market principles and provisions of the new regulatory framework relating to “must carry” rules, the Commission services plan to prepare further guidance on this subject in 2003.

Spectrum scarcity is a potentially significant barrier to the successful roll-out of digital terrestrial services in Europe, given the temporary lack of available frequencies that will arise with the simulcast transmission of both analogue and digital broadcasts during the transition period to digital transmission. The reform of the 1961 Stockholm Frequency Plan will be important for maximising efficient use of terrestrial broadcasting spectrum in a future all-digital environment. The challenges for regulators on this and other issues related to DTV roll-out will be addressed in the Commission’s communication on digital TV switchover in 2003.

5.1. Factors – other than openness - affecting access to services

Factors that could limit widespread access to electronic services in future go beyond those of open interfaces and open platforms. Technology barriers can be overcome wherever there is a

³³ The “Open Mobile Alliance” (OMA) is composed of handset manufacturers, network operators and application developers.

³⁴ COM(2002) 301 - COM(2001) 141.

strong commercial incentive to do so. But the creation of an Information Society means putting into place a series of measures, both technical and non-technical, to create the conditions necessary for an Information Society to happen. These are addressed in sections 5.2 to 5.5 below. However, even open platforms, while a necessary pre-condition, cannot alone guarantee widespread access to electronic services³⁵. There are some relevant issues affecting access to services touched upon only briefly below, as they raise wider issues than those of platform openness, and merit a fuller examination than is possible here. They concern possibly unforeseen policy conflicts between interoperability and creating industrial property rights, and insufficiently harmonised digital rights management.

As an Information Society gradually becomes more of a reality, the source of economic growth becomes increasingly information and knowledge-based. This shift in the drivers for growth has disturbed the traditional balance in society between openness, innovation and competition.

The terms and conditions for access to information itself are becoming increasingly important for the further development of Information Society services and the economy. For example, the aim of the patent system is to maximise the social benefits of innovation by guaranteeing time-limited monopolies in exchange for the disclosure of a technical invention. It is a policy tool that tries to balance openness, the promotion of innovation, and the encouragement of competition. However, there are some indications that a significant increase in patenting has occurred during the last decade which has been related more to the creation of competitive barriers than to an increase of investment in research and development³⁶. Strategic patenting and “patent races” seem to have become particularly important in networked areas that develop interdependent products such as those offered on DTV and 3G mobile platforms. Market entry often requires large portfolios of intellectual property rights and licenses relating to APIs which create considerable barriers for small and medium sized enterprises when they try to create new applications and services.

The Commission’s proposed directive on the patentability of computer-implemented inventions seeks to promote innovation in this area and to harmonise the patent grant practices of the European Patent Office and Member States³⁷. The intentions behind this proposed directive are to promote interoperability by preserving the provisions on decompilation and interoperability of Directive 92/250/EC (relating to copyright) as well as encourage innovation and competition.. The Commission services intend to examine the extent to which these objectives are being met in the context of its review of the operation of the proposed directive.

If an absence of harmonised digital rights management has the effect of precluding access to copyrighted content, this could affect the ability of different service providers to offer the same content over different platforms in a pluralistic way. This document does not examine the extent to which the implementation of digital rights management (DRM) in the Member States affects the functioning of the Internal Market but DRM systems may affect widespread access to services. Community harmonisation of obligations on Member States concerning digital rights management should be examined in the context of ensuring widespread access

³⁵ A detailed analysis of these and other issues related to openness and access can be found in *Future Bottlenecks in the Information Society*, Report to the European Parliament Committee on Industry, External Trade, Research and Energy (ITRE), EUR 19917 EN, JRC Institute for Prospective Technological Studies, Seville, June 2001: <http://www.jrc.es/FutureBottlenecksStudy.pdf>

³⁶ “Technology policy in the telecommunications sector,” Enterprise papers 8, Koski, H. (2002).

³⁷ COM(2002) 92 final – 2002/0047(COD), OJ C 151, 25. 6.2002, p. 29.

to Information Society services to determine if the current level of harmonisation is sufficient to ensure the availability of multi-media content over different platforms³⁸.

5.2. Consumer trust and confidence to create mass market demand

In the case of digital television, interactive digital TV (“iDTV”) is still in its infancy in most Member States. Having little experience with iDTV, consumers lack the confidence to use these new services thus keeping demand from arising. However, experience in particular in the UK demonstrates that iDTV’s potential is considerable. Rather than introducing consumers to genuine iDTV services and gradually familiarising them with these services, digital terrestrial and satellite television services are marketed mostly on the basis of the content or number of channels they can offer (e.g., in those countries with low cable TV penetration) or on the advantages of portability of the TV set (e.g., in those countries with high cable TV penetration where many TV channels are already available).

In the case of 3G, rather than a ‘big bang’ introduction of 3G networks and services, industry will progress gradually towards the full range of 3G multi-media services, initially provided over GPRS networks³⁹. This will allow demand to develop progressively. Public authorities can support demand creation by ensuring that their own Information Society services are available over 3G communication platforms.

For both digital television and mobile communications markets, industry, public authorities and consumer organisations play important roles in the areas of promoting user trust and confidence, in particular in relation to privacy protection and protection against the disclosure of consumer data, e.g., credit card information. User confidence and use of digital technologies will increase in proportion to the amount of information available to them (particularly when supported by consumer organisations) as to the existence of guarantees of confidentiality and security and in proportion to the effectiveness of the public and private measures adopted to guarantee them. The Data Protection Directive referred to earlier seeks to build the necessary trust and confidence by creating obligations on operators and service providers to: (1) provide a secure environment for all electronic communications (covering 3G, Internet and DTV); (2) guarantee the confidentiality of communications and the data transmitted therein; and (3) severely restrict their re-use of customer information for purposes other than the service provided⁴⁰.

5.3. DTV roll-out and exploitation of European cultural diversity

Market and regulatory differences between Member States are significant in the TV sector, largely for linguistic and cultural reasons⁴¹. The possibility for free to view television to contribute towards the creation of an Information Society is constrained by the fragmented timing of national digital terrestrial implementations in particular. There are concerns about the underlying business models and constraints appearing in national terrestrial plans. For example, limitations on the carriage of non-programme related data place a ceiling on capacity available for interactive services that are independent of television programming.

³⁸ Directive of the European Parliament and of the Council on the harmonisation of certain aspects of copyright and related rights in the information society, Directive 2001/29/EC, OJ L 167,22.6.2001, p.10.

³⁹ “General Packet Radio Service”, often referred to as “2.5” generation mobile.

⁴⁰ Directive 2002/58/EC on privacy and electronic communications, OJ L 201, 31.7.2002, p.37.

⁴¹ Differences concern the market share between types of TV network (terrestrial, cable and satellite) and business models (e.g. pay-TV versus free to view), the level of digitalisation and other aspects.

Because it accounts for a high proportion of free to view services, terrestrial television is the natural vehicle for open technologies like MHP. However, fragmentation and poor implementation mean that terrestrial and free to view TV are not providing the launch impetus that they should for open technologies. It is the intention to address digital TV implementation in a forthcoming Communication on digital switchover in 2003. Europe needs both to overcome such fragmentation in terrestrial roll-out and to turn its cultural diversity to best advantage.

5.4. Clarity of regulation

Given the ability of DTV and 3G to merge certain features of traditional services and deliver them over a non-traditional infrastructure, such as datacasting services, both the commercial offering and the consumer uptake of these services require clarity with respect to the applicable regulatory treatment of these services.

The new EU regulatory framework for electronic communications adopted on 7 March 2002 provides a common set of rules for the sector⁴². It covers electronic communications networks and services, as well as associated facilities, which support the provision of services via such networks or services, such as conditional access systems. Experience shows that national measures transposing EU directives can sometimes be different, so the risk exists that some implementations may not provide the clarity and legal certainty that market players require for the development of TV, mobile and convergent Information Society services.

In particular, in light of the different regulatory structures in place for broadcasting and electronic communications, it will be important for Member States to clarify the respective responsibilities of the competent regulator(s).

In emerging network architectures, there will be a need for all NRAs involved to work together to ensure that the principles of the new regulatory framework and the general provisions of Community law are applied in a consistent manner to new services and facilities that span the boundary between content and infrastructure. One example is that of new directory services which include databases that convert telephone numbers into Internet addresses, and "yellow pages" type services that provide information on location of services offered. Such directory services may form the basis of some future identity management systems and services that will present challenges for governments and regulatory authorities.

Another example is the impact that convergence in infrastructures may have on content regulation. National rules on harmful and illegal content are challenged by the border-less nature of modern Internet communications. To the extent that concepts of pluralism, cultural content and universal service have been based on a scarcity of broadcast transmission media that may no longer apply, they may need to be redefined in the light of new technologies, platforms and market structures.

Clarification is also needed on the legal framework for third party payments, such as payments related to Premium Rate Services, provided by mobile operators. The relevant Community legislation, such as the Second Banking Directive⁴³ and the Electronic Money

⁴² Directives 2002/19/EC, 2002/20/EC, 2002/21/EC and 2002/22/EC, OJ L 108, 24.4.2002, p.7-77. Directive 2002/58/EC, op. cit., fn. 44, was adopted on 12 July 2002.

⁴³ SECOND COUNCIL DIRECTIVE of 15 December 1989 on the coordination of laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions and amending Directive 77/780/EEC, OJ No. L 386, 15.12.1989, p. 1.

Institution (EMI) Directive⁴⁴ seem to be implemented in this respect very differently in the Member States. In order to achieve a European level playing field for all payment services, the legal framework may need to be revised.

5.5. Radio frequency: assignment and flexibility

To date, spectrum has generally been assigned on an individual basis, linked to conditions related to specific services, territories and undertakings. Broadcasters generally receive spectrum free of charge, in consideration of the general interest objectives with which they are charged (including the remit of public service broadcasting) compliance with which involves substantial costs. On the other hand, for some 3G mobile operators, their license and related rights of use of radio frequency were costly. In the long term, new flexible tools may be needed for ensuring effective use of spectrum, possibly including secondary trading or usage charges.⁴⁵ Placing a value on spectrum will be important whatever it is used for. The new EU regulatory framework for co-ordinating approaches to spectrum management offers forums for such developments to be addressed.

6. CONCLUSIONS AND ACTIONS

6.1. Conclusions

The objective of an Information Society for all remains despite the recent downturn in the telecommunications sector. The commercial and technical environments of DTV and 3G are extremely complex. The interoperability issues linked to open platforms represent only one element in a much wider and more complex set of issues that affect the introduction of new digital TV services and will have a profound effect on widespread access to services. In 3G mobile communications, industry is seeking to achieve interoperability of services while voluntary industry migration to the MHP standard is seen as a likely solution for interoperability in DTV. The development of services that may be offered across the two platforms may also raise issues of cross-platform interoperability. Open platforms and interoperability will not on their own deliver an Information Society for all. Many of the regulatory, commercial and consumer barriers to the creation of an Information Society have been identified by Member States, by the European Parliament, by industry and by the Commission. Industry itself must find solutions to the commercial challenges it faces but must be given a supportive and encouraging environment within which to operate.

6.2. Follow-up action - for Member State governments

Public authorities have important roles to play in creating a favourable environment for business that attracts investment and favours economic development, as well as safeguards the interests of consumers.

⁴⁴ Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions, OJ No. L 275, 27.10.2000, p. 39

⁴⁵ As recommended in the Action Plan *eEurope 2005: an information society for all* and the communication on 3G rollout, op. cit., fn. 2 and 3.

6.2.1. *Government as legislator*

A new regulatory framework for electronic communications networks and services was adopted by the EP and Council during the first half of 2002, and Member States are now in the process of transposing this framework into national law. The full and timely transposition of this legal framework by the deadline of July 2003 will ensure that the EU has a legal framework that overcomes the fragmented approach of the past – whereby separate networks had separate sets of rules – and provide a coherent set of rules for all types of electronic communications infrastructure. The new framework is based on separating content regulation from infrastructure regulation but, unlike previous telecommunications regulation, the new framework covers networks used for the distribution of broadcast signals. A critical short term objective is for Member States to ensure that national law implementing the new framework avoids any ambiguity between legislation on ‘broadcasting’ and legislation on ‘electronic communications services’, so that the applicable rules for new and innovative services are clear.

6.2.2. *Governments and regulators*

Independent national regulators have been given considerable discretion in applying the provisions of the new regulatory framework to the electronic communications sector. To avoid fragmenting the single market, several co-ordination mechanisms are foreseen, both between the regulators and with the Commission, as well as public consultation mechanisms on certain measures. Regulation of broadcasting presents a more complicated picture, with regulatory responsibilities split between local, regional and national bodies in some Member States and, in a few, a single body oversees both the broadcasting and electronic communications sectors. Since interactive television services will be delivered alongside digital television broadcasting services, it is vital to have a clear demarcation of responsibility and good co-operation between national regulators responsible for broadcasting and those responsible for electronic communications.

The European Regulators Group, created by the Commission, is an additional mechanism to ensure consistency by Member States in the application of the new framework, and to co-ordinate at EU level. Such co-ordination will avoid inconsistent approaches and prevent new obstacles to the internal market for Information Society services and, hopefully, avoid creating unnecessary regulatory constraints. Moreover, the Group will provide expertise that can guide the application of regulation to Information Society services, identify gaps in national regimes and, ultimately, in co-operation with other relevant regulators, create a regulatory level playing field in the EU.

6.2.3. *Government as supplier of information and information society services*

Governments are a major supplier of information for the citizen, and the *eEurope 2005 Action Plan* has identified *e-government*, *e-health* and *e-learning* as major priorities in the programme. To date, most activity has been concerned with online publication of government information, rather than provision by government of Information Society services.⁴⁶ Nevertheless the government is also a major supplier of services, and the development of attractive Information Society services will bring users on-line and stimulate the development of other on-line services. Interactive *e-health* services, such as online medical prescription services, are already available in some Member States. Governments should be leaders in ensuring that

⁴⁶ op.cit., fn 13.

their e-services are available in formats suited to delivery over a variety of platforms. The e-Europe 2005 Action Plan calls for Member States to exploit by end 2004 the potential of multi-platform access for basic public services.

6.2.4. *Government as purchaser*

Innovative new services often face the problem that, while demand is low, mass production, which could bring down unit costs is hard to justify, and so costs remain high thereby inhibiting demand. Governments have significant if often fragmented purchasing power, which in some cases can be used effectively to overcome such problems and thus contribute to the creation of an Information Society for all. Governments could use their procurement activities to help stimulate new markets and services and, just as importantly, to create public trust in new services and markets by favouring openness and interoperability.⁴⁷

Past Commission efforts in supporting interoperable standards have not always delivered their intended results. The experience with such initiatives demonstrates that a key ingredient to success is that of scale, and that the scale of any initiative must be EU-wide. Member States could, for example, in procuring services, target one sector (e.g., electronic medical benefits cards) and adopt a single standard for Europe wide implementation. The result would unquestionably set the industry standard and deliver EU-wide interoperability.

6.2.5. *Government as promoter*

Member State governments are active in promoting the roll-out of digital television and, under the eEurope 2005 Action Plan, they will publish by the end of 2003 their intentions for the possible switchover from analogue to digital television. Member States are called upon, in the eEurope 2005 Action Plan, to offer their content on different technological platforms such as interactive digital TV and 3G. In addition the European Commission services plan to prepare a Communication on progress towards Digital Switchover in the first half of 2003, as part of the continuing support of the implementation of digital TV. Member State governments can also play a co-development role with industry by engaging in public-private partnerships⁴⁸.

6.2.6. *Government as facilitator*

The Commission report on its public consultation on the Green Paper on Convergence in 1999 highlighted the contradictory demands of content providers, who sought the right to have their content delivered over any infrastructure, and infrastructure providers who sought to retain their commercial freedom⁴⁹. The new regulatory framework for electronic communications recognises that such conflicting demands have to be addressed case-by-case, based on actual market conditions, under the control of the national regulatory authority. In situations where the commercial interests of different parties may prevent spontaneous collaboration, government and regulators can facilitate useful discussion.

⁴⁷ Open source policy is also a part of the UK e-government interoperability framework, see: <http://www.govtalk.gov.uk/interoperability/egif.asp>, and the German government procurement policy, see: <http://www.bund.de/Service/English/News/Open-Source-for-Administration-.6482.htm>.

⁴⁸ About 2 billion euros were allocated by the Swedish government for broadband infrastructure roll-out. http://www.regeringen.se/galactica/service=irnews/action=obj_show?c_obj_id=32477

⁴⁹ COM(1999) 108 final.

6.3. Follow-up action – the European Commission

This document has noted that many factors other than the openness of the 3G mobile or the DTV platforms are relevant to determining whether Information Society services will be accessible by all citizens and businesses. The actions mentioned below present several pre-existing initiatives of the Commission as well as some possible new priorities:

- examine, by end 2002, the need to adjust the second eContent Work Programme with a view to eEurope objectives and, if necessary, will make an appropriate proposal (Section 3.5 of the eEurope 2005 Action Plan);
- make a proposal, by end 2003, for a follow-up programme to the eContent programme (Section 3.5 of the eEurope 2005 Action Plan);
- publish in the first part of 2003 a Communication on progress towards Digital TV switchover;
- issue by end 2003 an agreed interoperability framework to support the delivery of pan-European e-government services to citizens and enterprises, addressing information content and recommending technical policies and specifications for joining up public administration information systems across the EU; it will be based on open standards and encourage the use of open source software (Section 3.1.1 of the eEurope 2005 Action Plan);
- support the development by the private sector of interoperable e-business solutions for transactions, security, signatures, procurement and payments to facilitate seamless, secure and easy cross-border electronic business and mobile commerce (Section 3.1.2 of the eEurope 2005 Action Plan);
- in accordance with article 18 of the Framework Directive, undertake a public consultation to examine, by no later than July 2004, whether interoperability and freedom of choice for users have been adequately achieved in the Member States with particular reference to interactive digital television;
- take into account new interactive TV services in the review of the “TV without Frontiers” Directive during the course of 2003;
- work closely with the relevant regulators (e.g., the European Regulators Group, the European Platform Regulatory Authorities) to ensure consistent application of the rules, in particular those concerning interactive digital TV services;
- seek adoption of the proposed directives on access to public sector information and on patenting of computer-implemented inventions (in which the latter’s effects on innovation and competition, both within Europe and internationally, and on European business, including electronic commerce will subsequently be reviewed after experience therewith);
- examine by end 2003 whether the application to the payment services offered by mobile operators of relevant Community legislation on payments, such as the EMI directive, requires clarification;

- continue to support demonstration and research projects aimed at fostering the availability of services and content on different technological platforms, such as interactive digital TV and 3G;
- evaluate regulatory measures adopted by public authorities that unintentionally distort markets; examine how to remove these barriers through appropriate measures seeking technologically neutral treatment of different platforms;
- promote the principles of openness and interoperability at the international level in its relations with third countries and regions, and in particular in the context of the World Summit on Information Society to be held at the end of 2003 in Geneva.

The Barcelona European Summit pointed to the key role that digital television and third-generation mobile communications (3G) will play in providing widespread access to interactive and Information Society services. The analysis presented in this document supports these conclusions.

The access to Information Society services over digital TV (DTV) is complicated by the existence throughout the EU of millions of users with TV receivers and set-top boxes that run on proprietary standards allowing no third party access to their equipment without prior technical and commercial agreements between the parties.

To reach the point where services on DTV are inter-operable on a widespread basis, thus enabling users to enjoy widespread access to Information Society services, the new Community regulatory framework: (1) requires Member States to encourage the use of an open API for all interactive digital TV platforms (whatever their technology); (2) requires Member States to encourage manufacturers of digital TV equipment to use an open API for interactive services; (3) encourages the use of the open standard (MHP) for interactive DTV applications; (4) creates the power for regulators to mandate access to technical interfaces, protocols or other key technologies that are indispensable for the interoperability of services; and (5) grants access on fair, reasonable and non-discriminatory terms by any broadcaster to any conditional access system transmitting digital radio and TV broadcasts.

Third generation mobile and DTV are platforms for potential delivery of Information Society services whereas the Internet is the major current delivery platform for these services. TV receivers are already more pervasive than PCs and are likely to remain so. Co-ordinated pan-European DTV roll-out could transform this platform into a major delivery mechanism for Information Society services. The potential for 3G mobile to become a major platform in its own right could also be realised provided industry succeeds in achieving interoperability of services. Developments in these platforms are areas that the Commission services intend to follow closely. Other issues that affect access to Information Society services, such as creating consumer confidence, putting government services and public information on-line, creating successful business models for content producers and infrastructure operators and creating secure transmission environments are being tackled elsewhere (e.g., the eEurope 2005 Action Plan).

This document has described how future development and deployment of new services over the 3G and DTV platforms will be shaped by the technical, regulatory and commercial features of these platforms. The major barriers inherent in creating open platforms for 3G mobile and DTV – primarily those related to APIs - are actively being addressed by industry and public authorities. Other barriers, not related to open platforms, also need to be tackled and have been addressed in national and Community initiatives. Successful creation of an

Information Society for all will depend on the effectiveness of the measures designed not just to address the problems with openness but also those that address non-technical barriers, such as consumer reluctance, security issues and commercial challenges in creating attractive services and sound business models. Developments in all these areas will be carefully monitored.

ANNEX

Figure 1: Convergence of platforms

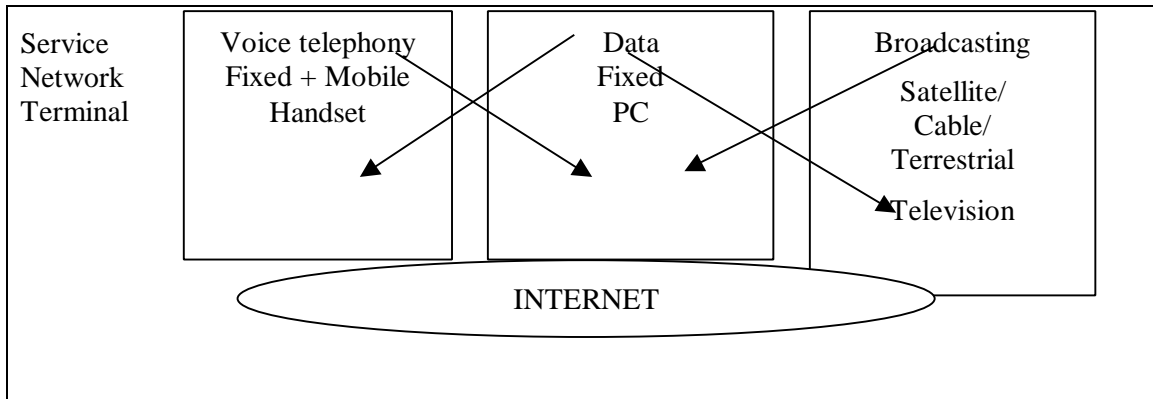


Figure 2: Application Program Interfaces

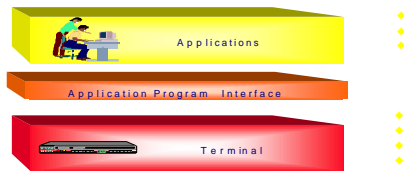
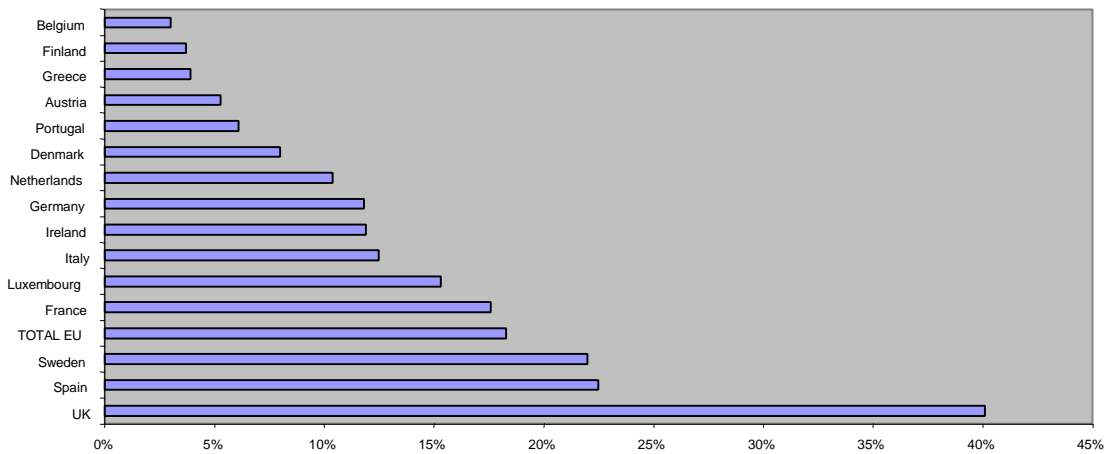


Figure 3: Penetration of Digital TV in the EU



Source: Strategy Analytics, Interactive Digital Television, February 2001 Market Forecast. Except Denmark, Gallup Annual survey week 31-48 2001 and Luxembourg, Jupiter MMXI DTV Forecasts, 2/02 (Western Europe Only).

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