

HLSG

**High Level Strategy Group
for ICT Standards**

HLSG Report No. 3

Home Information Services

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Executive Summary

The High Level Strategy Group (HLSG) has set up three initial projects:

- Barriers to Broadband Information Networking
- Barriers to Electronic Commerce in support of SME's
- Home Information Services

which address the needs and requirements for establishing the European Information Infrastructure and the Information Society in a complementary manner. The first two projects are focusing on the requirements of professional users. Home Information Services are dedicated primarily to the private end-user at home and therefore the requirements of this user group form the essential part of project.

The scope of the project covers any type of multimedia services for information and entertainment to the home together with the business chain and the underlying infrastructure (networks, equipment). The main task consists of identifying technical and non-technical barriers, and based on these setting priorities and requirements for standardization, political, legal and economical actions.

Services and applications form the core element of the project, but are still in an early and immature phase. Although firm answers from the market are still pending, the group identified nine priority areas as basis for the further steps of work. Moreover, the market has to be continuously explored to identify commercially viable services.

The business chain, including as major parts content, service and network providers and the end-user, has been analysed. Interfaces are the most critical path for getting a service from the content provider to the home terminals. Critical interfaces have to be identified and potential solutions be proposed.

All services depend on sufficient and attractive content. The group identified several requirements for content coding and copyright protection. In particular the present lack of effective copyright protection forms a major barrier to the development of the Information Society. It is still necessary to resolve and harmonize copyright legislation on a European level. Standardized or publicly defined copyright protection systems supported by legal enforcement have to be developed.

The carriers for data transport can be subdivided in on-line and off-line. Although off-line is as important as on-line, the main emphasis in this project is on on-line. The networked carriers (e.g. telephone, cable, broadcasting, Internet) should be 2-way, switched and provide a high bandwidth. However, the broadband residential network infrastructure is still rather incomplete. Therefore, measures have to be taken to extend it to all households as soon as possible. Networks generally need to be transparent for all services and special care has to be taken to provide the appropriate interfaces and the necessary interoperability.

The Multimedia Home Terminal, which will combine the technologies of telephone, computer and television has not to provide all functionalities, but only those necessary for the services available or selected. General purpose equipment will become too expensive. Hence it is necessary to identify generic functionalities of multimedia home terminals and to standardize these building blocks of functionalities together with their interfaces. The evolution for future use has to be taken into account. Such a modular approach is the only way to come to a widely applied standard which supports optimally the different types of services and applications.

In the non-technical domain the group has identified several generic user requirements. The most essential refers to ease of use and user friendly hardware and software. Other generic requirements are affordability, user confidence of being in control and predictability (cost /

billing). A unified billing procedure for all services should be developed and protection of privacy be provided by making all transactions traceable.

In total 13 requirements have been identified, addressed to HLSG, ICT Standards Board, Service Providers, Network Operators, Equipment Manufacturers, EU Commission and National Governments. Most of the requirements show interdependencies and are even in conflict with each other.

Home Information Services are still in an early and immature phase. Therefore it is recommended to continue the project for some time (e.g. one year). In the meantime HLSG should seek close contacts to Broadcasters, Content Providers and Service Providers. As many of the requirements are interdependent or even conflicting, it should be considered whether a platform needs to be established to guide and support the development of the Information Society with due regard to interdependencies and possible conflicts.

1. Introduction

The High Level Strategy Group (HLSG) has set up three initial projects:

- Barriers to Broadband Information Networking HLSG Report No. 1 [1]
- Barriers to Electronic Commerce in support of SME's HLSG Report No. 2 [2]
- Home Information Services

These projects have been selected from the so-called Bangemann and G7 applications and address the needs and requirements for building up the European Information Infrastructure (EII) and the Information Society (IS) in a complementary manner. The first two projects are focusing on the requirements of professional users, i.e. operators of an application of the information infrastructure and SME's. In contrast, Home Information Services are dedicated primarily to the private end-user at home and therefore the requirements of this user group form the essential part of the project.

Besides addressing the end-user at home, Home Information Services provide also a link to the content industry, which so far is not represented in HLSG but forms another essential group in the Information Society.

Home Information Services have a horizontal nature and encompass a broad range of applications including entertainment and business. They are covering several other Bangemann and G7 applications, e.g. teleworking, distance learning, healthcare applications and networks, public administration networks etc. Various programmes and pilot projects on EU and national level try to attract the end-users at home to the City Information Highways and explore their needs and wishes concerning services and applications. Without the involvement of the private end-user the Information Society will never become a success. Therefore, it has to go hand in hand with entertainment to finance the system.

Thus the aspects to be covered by the Home Information Services project are providing a large basis for the Information Society and its evolution. This justifies why the project has been chosen as one of the initial ones of HLSG and it explains also why this project has a long-term nature and has to be pursued for some time.

2. Description of the Project

2.1 Scope

The project is closely related to application no.10 of the Bangemann Report "City Information Highways - Bringing the information society to the home" [3]. The scope of the project covers the following main elements:

- any type of multimedia services for information and entertainment to the home
- on-line and off-line delivery
- a business chain ranging from content providers up to end-users
- the underlying infrastructure, i.e. networks and other carriers, equipment (particularly home terminals), interfaces and interoperability.

The focus is on the development of new services and applications. The enabling technologies and infrastructures are supporting elements. Only missing critical elements are concerned.

Consequently, the main task consists of

- identifying technical and non-technical barriers, and based on these

- setting priorities and requirements for standardization, political, legal and economical actions.

As already mentioned, these barriers and the resulting priorities and requirements for actions are derived from the needs and wishes of the end-users at home. Without their active involvement and satisfaction and, consequently, their willingness to spend time and money, the business will never evolve and achieve a critical mass.

The project is by nature horizontal and covers a broad variety of services and applications together with their underlying infrastructure. Insofar it is not only complementary to both other HLSG projects but also partly common. Therefore, it is quite logical that similar and partly the same requirements have been identified.

2.2 Uncertainties, Impediments

Home Information Services (or Highways) have only recently gained considerable attention and, therefore, are in an early and immature phase. Pilot projects have been set up with more or less success at many places in Europe and elsewhere to explore end-user needs and wishes, to test the viability of services and applications together with the appropriate infrastructure, and to establish a business chain. Many pilot projects are intended to be transferred into regular business with the necessary critical mass, but so far the exploratory phase is not yet completed and thus

- services and applications are not yet really known
- end-user wishes and needs have not been fully explored
- business chains are still not existing or incomplete.

Results from successful pilot projects will hopefully become increasingly available and provide a sound basis for business decisions and developments. However, so far firm answers on priorities for services and applications, user requirements and associated needs for standards etc. remain largely open. If answers have to be provided, they have to be based on well-established assumptions rather than facts.

3. Services / Applications: Priority Areas

Successful services and applications form the core element of the project and need to be identified first prior to drawing any further conclusions. As firm answers from the pilot projects are still pending, the project group members were forced to anticipate priority areas. Based on various inputs available so far, the following priority areas were identified:

1. **Entertainment, broadcasting** (e.g. TV and radio; video, music and games on demand)
2. **Internet connectivity** (With the fast growing interest in the internet, access to the internet is regarded as a must.)
3. **Public information access** (e.g. emergency service, tourist information, local government information, social service)
4. **Teleworking**
5. **Education, edutainment** (e.g. telelearning, libraries)
6. **Healthcare** (e.g. healthcare information, teleconsulting, healthcare ordering)
7. **Transactional services** (e.g. homebanking, electronic commerce)
8. **Electronic retail** (e.g. teleshopping, electronic catalogues)
9. **Non-real time access and local storage** (e.g. downloading of information, off-line delivery)

The order of this list implies no ranking. Each area contains a group of content-orientated services / applications with similar requirements from the content and equipment side. Not all areas must be necessarily available for a particular end-user, and the composition of an area will vary depending on the user's needs. (The areas may be grouped differently, e.g. according to the type of communication, as done in the following section.)

The nine priority areas, as anticipated above, form the basis for the subsequent considerations. However, as the services are not really known yet, it will be necessary to monitor the available network infrastructure and the market continuously to identify potentially commercial viable services. Appropriate market research programmes with support of the Commission should be initiated. *This is a requirement.*

Requirement No. 1:

The market has to be continuously explored to identify commercially viable services. Appropriate market research programmes with support of the Commission should be initiated.

Addressed to: HLSG in cooperation with Service and Content Providers and EU Commission

4. The Business Chain

The business chain for bringing the services to the end-user at home is illustrated in fig.1. It shows the logical chain and provides a coarse picture of the interfaces between the different elements and layers of the infrastructure from the content provider up to the end-user. The services are grouped according to the type of communication rather than the type of content, because the type of communication largely determines the interface.

The business chain consists of the following major parts:

- The Content Provider
- The Service Provider
- The Network Provider
- The User

The network comprises on-line and off-line delivery as well. Content, network and terminal will be treated in separate sections afterwards.

The **Interfaces** are the most critical path and are the base for getting the service from the content provider to the terminal. Generally it can be said that the technology is mostly available, but not all parts in the chain are able to work with each other.

Therefore it is of vital importance to identify the critical interfaces, to specify them and to develop standards where standards are missing. The reports of ETSI SRC 6 [4] and EPII [5] have to be considered. The task has to take into account that some interfaces may be incompatible or even conflicting with each other. *This is a requirement.*

Requirement No. 2:

The critical interfaces have to be identified, specified and potential solutions be proposed taking into account existing standards.

Addressed to: HLSG, ICT SB, in cooperation with Service Providers and Network Operators

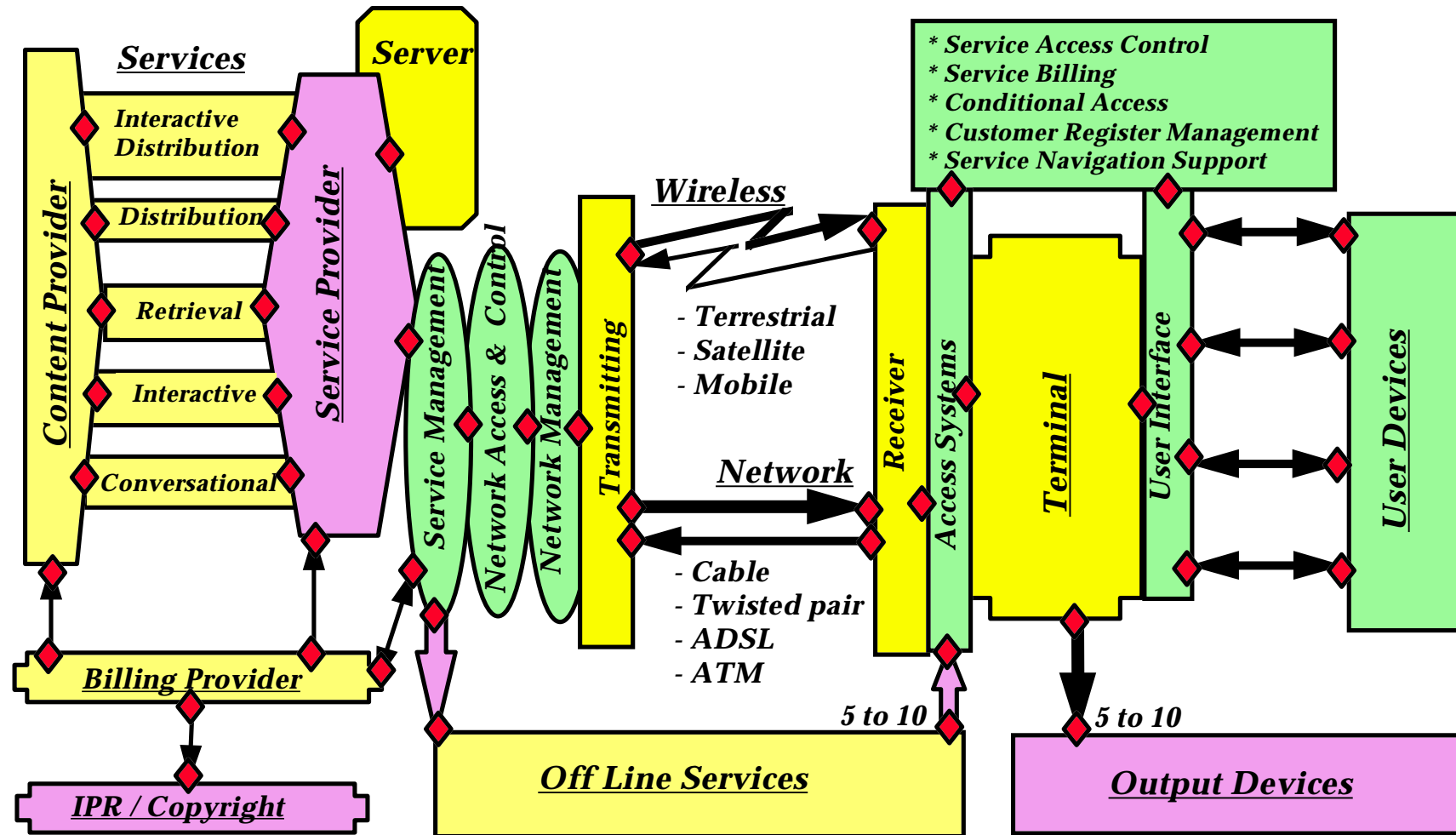


Fig. 1 The Business Chain
Logical Chain and the Critical Interfaces

5. The Content

All Services depend on sufficient and attractive content. Content providers will only then be able and willing to supply enough material, if the following conditions are fulfilled:

- appropriate methods for content coding and delivery
- protection of copyright.

5.1 Content Coding and Delivery

In the project on Barriers to Broadband Information Networking, which also covered the content issue, it was already concluded that

- ICT SB should ensure that standards are developed for content creation and content encoding that are applicable in the content provider domain
- ICT SB should agree standards for content meta-data that are also usable for applications involving a large number of short files.

Details can be found in section 3.5 of the report [1] and therefore are not treated here again. *The requirements apply fully also for Home Information Services.*

Requirements

No. 3: To ensure that standards are developed for content creation and encoding that are applicable within the content provider domain.

No. 4: To agree standards for content meta-data that are usable for applications involving a large number of short files.

Addressed to: ICT SB

5.2 Copyright Protection

New technologies have historically proven to be very beneficial to copyright owners, consumers and industry. Major markets of intellectual property goods are established by these technologies. On-going innovation is potentially effecting such markets. In combination with an increasing risk of copyright damage caused by the improving ease to transfer digital content from one system to the other, a significant resistance with copyright owners to support the information society initiatives can be understood.

The issue of effective Copyright Protection is therefore fundamental to ensure availability of (attractive) content. Resolution will require the combination of technical systems and matching legislation, subject to reasonable exclusions for copying which does not unreasonable prejudice right holders and the normal exploitation of copyrighted works (e.g. time shifting).

Despite this urgency, legislation and technical protection systems shall not undermine or obstruct new technology.

Technical Copyright Protection systems are to facilitate a number of tasks such as

- copyright tracking
- regulating private copying
- prevention to re-introduce into circulation copies made for private use
- prevention of piracy
- prevention of counterfeiting.

It can be expected that a reasonable compromise could be reached between at one hand restricting (consumers) capacity to privately copy but simultaneously keeping sufficient possibilities for private registration essential to the applications. An example of such a compromise is the agreement made on digital music between music industries and CE industries, or more recently, between the American movie studio's and the CE industry.

However, copyright legislation **greatly differs in the various EU member states**, which makes it not possible to define a desired copy protection situation for all of Europe. This implies that no common target on restriction, and therefore no common technical systems for copyright protection can be designed.

HLSG should treat the copyright matter with urgency. Therefore the Home Information Services Group is going to look at it with high priority, in conjunction with appropriate experts from the Associations.

Requirements

No. 5: To resolve and harmonize copyright legislation specifically in relation to the reproduction rights, lending rights, moral rights in combination with eventual levy systems in place or under preparation.

Addressed to: HLSG, EU Commission, Governments

No. 6: To develop standardized or publicly defined copyright protection systems supported by legal enforcement for application and matching anticircumvention laws, protecting these generally agreed protection solutions from being by-passed.

Addressed to: HLSG, ICT SB

6. Networks and Equipment

6.1 The Data Transport Carriers

The data transport carriers can be subdivided into two main groups:

- on-line (networks) and
- off-line (tapes, discs, etc.)

Off-line carriers may transport the same content as on-line services and are used on the same terminal equipment at home. From a present business point of view it can be said that

off-line is as important as on-line

and is a fast developing business in particular with the new developments of mass storage carriers for consumer applications. However, in the context of this project the main emphasis is on on-line, i.e. on services via network carriers. But in future special attention should be paid to the combined on-line and off-line business opportunities.

On-line networks except of broadcasting are equipped with a return path which must not necessarily use the same carrier. In fig.1 the network comprises all possible carriers grouped into wired and wireless. However, for Home Information Services only a selection will be used per city.

The **Home Information Architecture** of the near future will be based on combinations of the following carrier elements:

- the off-line carriers
- the telephone network
- the cable network
- the broadcasting network (terrestrial, satellite, cable)
- the Internet

The networked carriers should provide the following basic characteristics:

- 2-way

- switched
- high bandwidth
- network and service management (i.e. billing)

Today only the telephone network is available everywhere, but cannot provide the high bandwidth for many services with fast data rate requirements. Only broadband carriers can provide access to all services. However the broadband residential network infrastructure is still rather incomplete. Therefore measures have to be taken to extend the broadband residential network infrastructure to all households as soon as possible. *This is a requirement.*

Requirement No. 7:

The broadband residential infrastructure has to be completed as soon as possible to provide access to all information services.

Addressed to: Network Operators, Local and National Governments

Networks generally may consist of a variety of network types through which a service finds its way from the server or studio to the end-user's terminal. To enable this, it is absolutely necessary that the networks are transparent for all services. Therefore special care has to be taken to provide the appropriate interfaces and the necessary interoperability. *This is a requirement.*

Requirement No. 8:

Networks need to be transparent for all services.

Addressed to: Network Operators , ICT SB

6.2 The Multimedia Home Terminal

The Multimedia Home Terminal will be based on the technologies of telephone, computer and television. However it has not to provide all functionalities, but only those necessary for the services available or selected. General purpose equipment will become too expensive and too difficult to handle due to its versatility. On the other hand the end-user will also not like too many pieces of single purpose equipment. Consequently, it should be possible to customise the terminal based on building blocks of functionalities according to the services.

Therefore it is necessary to identify generic functionalities of multimedia home terminals, and to standardize these building blocks of functionalities together with their interfaces. Thereby the evolution for future use has to be taken into account and an appropriate migration path to be considered. *This is a requirement.*

Such a modular approach is the only way to come to a widely applied standard, which supports optimally the different types of services and applications. This standard or set of standards should be developed as soon as possible to prevent further fragmentation of the market. However, the standard should not aim at an harmonisation of the present first generation of TV set-top-boxes in the market, it should only focus on the next generation of terminals for a broader range of applications. In this context the development of access networks will play a decisive role.

The need for a „consistent set of standards for broadband terminals commensurate with the range of services they offer“ was also identified by the project on Barriers to Broadband Information Networking [1].

Requirement No 9:

To develop standards for multimedia home terminals following a modular approach by defining building blocks of functionalites with their interfaces.

Addressed to: HLSG, ICT SB

7. Generic User Requirements (non-technical)

In the non-technical domain the group has identified several generic requirements which also need attention. These requirements have been split into two sections as follows:

- Essential User Requirements: Ease of Use
- Generic User Requirements: Affordability, Billing, Protection of Privacy, User Confidence, Predictability

7.1 Essential User Requirements

It is an essential requirement that the operation of the hardware when used with the provided Entertainment and Information Services are user friendly. The use of the final terminals together with their associated software services should conform to some general standards. The key point is that a person using the service for the first time should be able to achieve the basic operation of services within a very short period of time. In addition if an individual has experience of one service then the person should be able, relatively quickly, to transfer this knowledge to enable access to another basic services without referring to complex manuals or help menus.

The example the group discussed was the motor car. If a European driver hires a motor car he is able to operate the normal functions of the vehicle relatively easily. Operation of the more advanced features may need the use of the car handbook etc. But basic operation is achieved almost automatically. In this sense the operation of any Home Information Services require a similar level of conformity. This type of approach encourages use and helps to promote a successful service. *This is a requirement.*

Requirement No. 10:

Generic user requirements, in particular

- **Ease of use and user friendly hardware and software**

Addressed to: Service Providers, Equipment Manufacturers, ICT SB

7.2 Other User Requirements

Other Generic user requirements also have to be considered from the beginning in order to avoid the risk of a business failure. These requirements relate to both the services and to the home equipment. Several aspects have to be taken into account. The issues highlighted are:

- Affordability
- User confidence of being in control
- Predictability (cost / billing)

Multimedia services, if not needed professionally are in competition with other service providers. The final customer may have only a limited amount of money available for the purchase of the Home Information Services. Therefore affordability of services and the necessity of suitable equipment is a *conditio sine qua non*.

There is a requirement that affordability must be taken into account in the standards making process.

User confidence of being in control and predictability concerning cost and billing have to be provided as core functions by all services. This is an absolute must in establishing a good long standing customer relationship. *This is a requirement.*

Requirement No. 11:**Generic user requirements, in particular**

- **Affordability**
- **User confidence of being in control**
- **Predictability (cost / billing)**

Addressed to: Service Providers, Equipment Manufacturers, ICT SB

In close relationship with the afore-mentioned is the billing procedure for the various services, to which a single customer has subscribed. It certainly will be prohibitive for the growth of services if each requires a different billing procedure. Therefore a Unified Billing Procedure has to be offered to the customer by the service providers, e.g. by means of a special billing provider. *This is a requirement.*

Requirement No. 12:**Unified billing procedure should be developed and offered to the customer by the service providers, e.g. by means of a billing provider.****Addressed to: Service Providers, Governments**

As potentially everyone can gain access to the Home Information Services and their underlying infrastructure, Protection of Privacy is a must. Special measures of control have to be developed and provided on a legal and neutral basis. Preferably all transactions should be traceable by a third party legal entity. *This is a requirement.*

Requirement No. 13:**Protection of privacy should be provided through all transactions to be traceable by a third party legal entity.****Addressed to: Service Providers, Equipment Manufacturers, ICT SB**

8. List of Requirements

Table 1: Short-term specific requirements

No.	Addressed to:	Requirements	Section	Interdependence or possible Conflicts with No.:
2	HLSG ICT SB	To identify and specify critical interfaces and to propose potential solutions taking existing standards into account	4	1, 8, 9
3	ICT SB	To ensure that standards are developed for content creation and encoding that are applicable in the content provider domain see BB I NW* No. 4	5	4, 5, 6
4	ICT SB	To agree standards for content meta-data that are usable for applications involving a large number of short files see BB I NW* No. 5	5	3, 5, 6
6	HLSG ICT SB	To develop standardized or publicly defined copyright protection systems supported by legal enforcement	5	5
9	HLSG ICT SB	To develop standards for multimedia home terminals following a modular approach by defining building blocks of functionalities with their interfaces see BB I NW* No. 3	6.2	1, 2, 6

Table 2: Long-term basic requirements

No.	Addressed to:	Requirements	Section	Interdependence or possible Conflicts with No.:
1	HLSG	To explore the market continuously to identify commercially viable services	3	2, 5, 7, 8, 10
5	HLSG EU Commission Governments	To resolve and harmonize copyright legislation in combination with eventual levy systems see BB I NW* No. 2	5	6
7	Network Op. Local & National Governments	To complete the broadband residential infrastructure to provide access to all information services	6.1	1
8	Network Op. ICT SB	Networks to be transparent for all services	6.1	1, 2
10	Service Prov. Equipm. Manuf. ICT SB	Generic user requirements, in particular ease of use, and user friendly hardware and software	7	1, 11, 12
11	Service Prov. Equipm. Manuf. ICT SB	Generic user requirements, in particular affordability, user confidence of being in control, predictability (cost/billing)	7	1, 11, 12
12	Service Prov. Governments	To develop a unified billing procedure to be offered to the customer by the service providers	7	1, 10
13	EU Commission Governments	Protection of privacy through all transactions to be traceable by a third party legal entity	7	1, 2, 8, 10

*) BB I NW No. ... refers to the requirements of the project on Barriers to Broadband Information Networking

9. Recommendations

Home Information Services are still in an early and immature phase. The recommendations in this report are based on anticipated priority areas for services, which still have to be confirmed. Only if the viability of the different services is better known, final recommendations can be given. Therefore the project should be continued for some time (e.g. one year). In the meantime the market should be monitored continuously and the following main actions be carried out on a regular basis:

- identifying the services
- identifying the network and equipment needed
- identifying the standardization work including target settings and time schedule
- identifying legal requirements and other non-technical issues and initiating actions

These activities should be carried out in close cooperation with market players, i.e. content and service providers, network operators and the manufacturing industry. Experiences gained in the pilot projects should be collected and taken into account. In particular HLSG should seek close contacts to

- Broadcasters (EBU, ACT)
- Content Providers (IFPI, . . .)
- Service Providers (ICRT).

Many of the requirements identified so far show interdependencies or are even in conflict with each other. Therefore HLSG should consider, whether a platform needs to be established to guide and support the development of the Information Society in particular with due regard to interdependencies and possible conflicts.

10. Abbreviations

ACT	Association of Commercial Television
ADSL	Asynchronous Digital Subscriber Line
ATM	Asynchronous Transfer Mode
CE	Consumer Electronics
EACEM	European Association of Consumer Electronics Manufacturers
EBU	European Broadcasting Union
ECTEL	European Telecommunications and Professional Electronics Industry
EII	European Information Infrastructure
EPII	(ETSI) European Project on Information Infrastructure
ETNO	European Public Telecommunications Network Operators' Association
ETSI	European Telecommunications Standards Institute
EU	European Union
EUROBIT	European Association of Manufacturers of Business Machines and Information Technology Industry
HLSG	High Level Strategy Group
ICRT	International Communications Round Table
ICT	Information and Communication Technology
ICT SB	ICT Standards Board
IFPI	International Federation of the Phonographic Industry
IPR	Intellectual Property Rights
IS	Information Society
SME	Small and medium enterprise
SRC 6	(ETSI) Strategic Review Committee No. 6

11. References

- [1] HLSG Report No. 1 "Barriers to Broadband Information Networking"
Author: T. Rowbotham, Issue 1A, 20 September 1996
- [2] HLSG Report No. 2 "Barriers to Electronic Commerce in support of SMEs"
Author: C. Boulle, Edition 1.0 - Nov. 1996
- [3] "Europe and the global information society",
Recommendations to the European Council,
prepared by the High-Level Group on the Information Society.
So-called Bangemann Report, Brussels, 26 May 1994
- [4] Report of the Sixth Strategic Review Committee on European Information Infrastructure.
European Telecommunications Standards Institute, Sophia Antipolis, 21 June 1995
- [5] EPII Starter Group Final Report.
European Telecommunications Standards Institute. Sophia Antipolis, March 1996

12. Members of the Project Team

This report has been prepared by the "Home Information Systems" Project Team consisting of members from the 4 associations represented in HLSG:

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13. History of Document

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