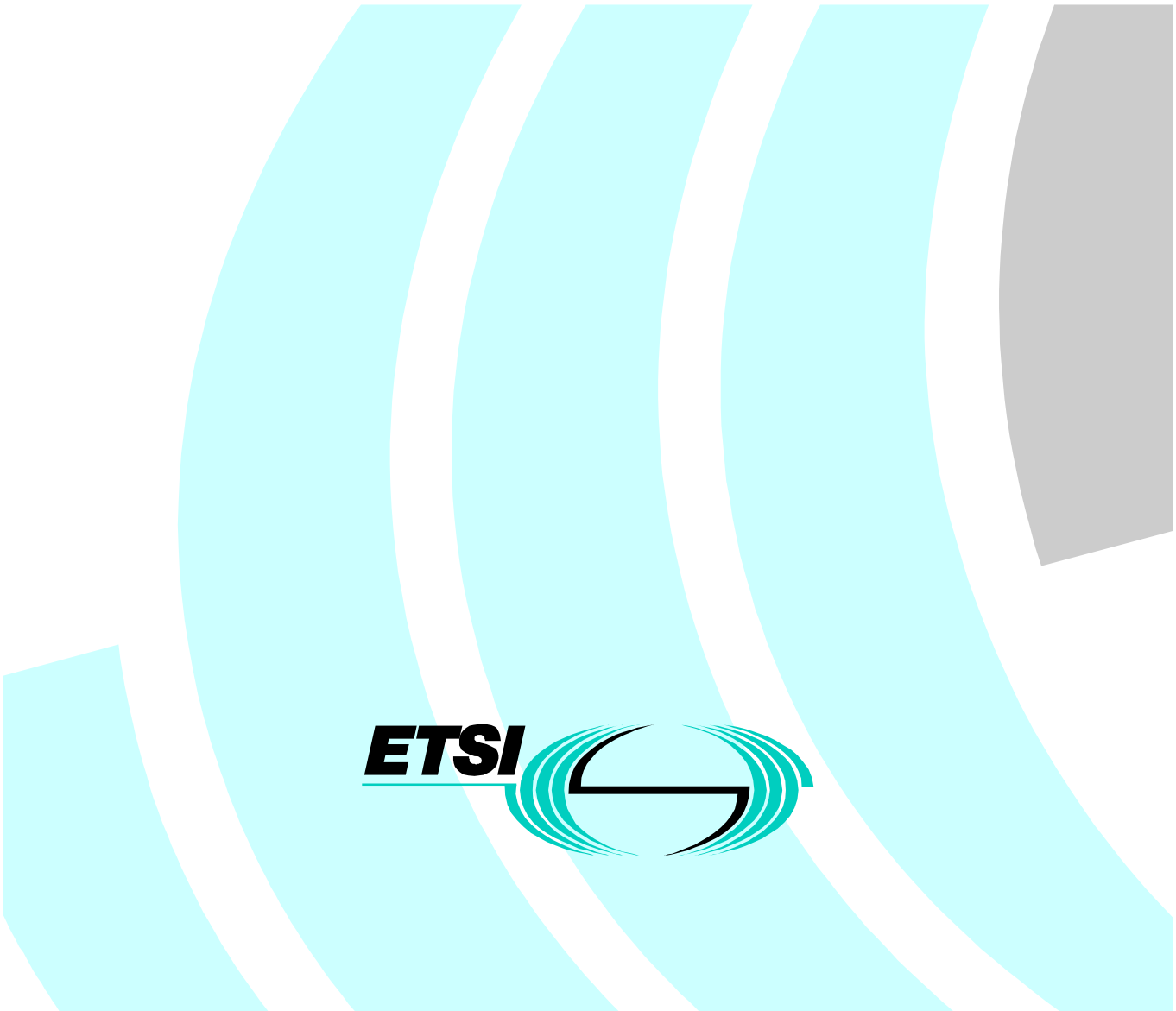
# SR 001 687 V1.1.1 (1999-06)

*Special Report*

# Global Multimedia Mobility (GMM); Seamless service offering



Reference
DSR/GA-00002 (fmc00ict.PDF)

Keywords
GMM

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# Contents

# Foreword

This Special Report (SR) has been produced by the Architecture Framework Group (AFG) of the ETSI Global Multimedia Mobility Co-ordination Group (GMM CG).

# 1 Scope

The original Global Multimedia Mobility (GMM) report was published by ETSI in 1996 and as a result a GMM Co-ordination Group (GMMCG) and GMM Architecture Framework Group (GMMAFG) were set up.

The editorial process was handled by Specialist Task Force (STF) 131.

This report from the GMMAFG was approved by the ETSI Board#18 (23-25 March 1999) and subsequently by the 32nd ETSI General Assembly (22-23 April 1999).

## 1.1 GMM AFG - the background

GMM AFG has been in existence since June 1997 and has held ten meetings up to February 1999. The decision to update the existing GMM Report was aimed at aiding understanding of the report and the manner in which it could be applied to existing and future scenarios. A companion document was felt to be the most appropriate publication.

It was decided that the focus of this companion document would be on a user/service perspective, with the seamless provision of services as a main objective. The enterprise model which had been developed within the GMM report would be retained, and due account would be taken of the fixed-mobile convergence (FMC) studies then being undertaken in ETSI.

The main work on the Companion Document started in July 1998 and has occupied five meetings of the GMM AFG (each 1 to 1½ days) plus several 'side meetings' and one teleconference.

Various member companies have supported the work (see figure 1), with the main contributions coming from BT, Ericsson, Italtel, Lucent, Marconi Communications, Nokia and Telia.


**Figure 1**

## 1.2 MM AFG - the results

The initial output was a very large compendium (approximately 120 pages) of relevant or potentially relevant information and source material. This was intended to be the basis of the Companion Document and was supplemented by a bibliography of well over 100 references. However, as management of these resources was proving difficult as their size grew, the GMM AFG decided to freeze the compendium as a "repository document" and produce from it a slimmer, more concise and focussed version as the eventual Companion Document. That new draft permitted the GMM AFG to take a fresh look at the task, which led to a better identification of key "drivers" for GMM and a more objective assessment of the GMM model.

Even this has proved to be difficult to manage, as new facets of GMM were explored. It was concluded that the final deliverable to the General Assembly should be this presentation which embodies all the key messages concerning the updating of the ETSI GMM concepts. The other material, including the bibliography, has been collected in the Companion Document SR 001 677 [2].

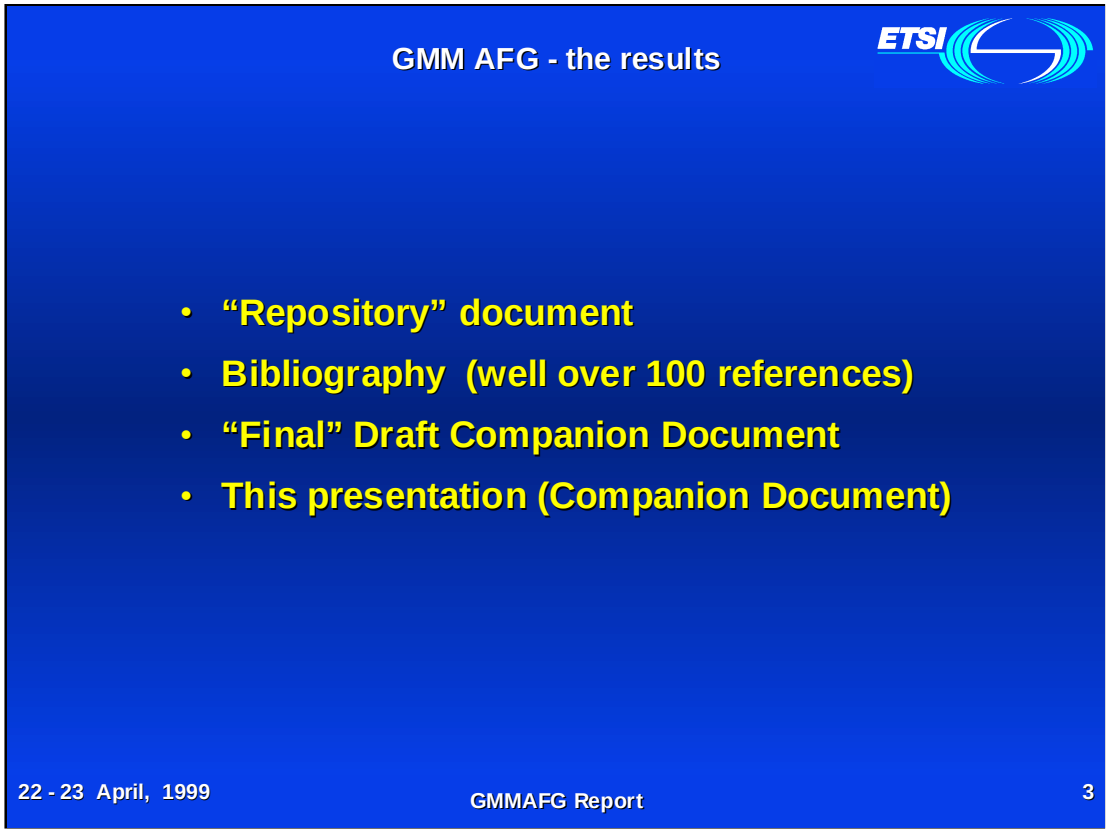


**Figure 2**

## 1.3 Select Bibliography

The complete bibliography of nearly 120 references includes various communications (such as e-mails and meetings contributions), extracts from certain documents, different versions of documents and some material not easily accessible. Although all of that material has been valuable for the compilation of the Companion Document (in its various forms), not all of is likely to be helpful for subsequent studies.

As a result, a "select bibliography" has been produced and the contents classified as indicated in figure 3.

This bibliography is included in the Companion Document (SR 001 677 [2]) and is also accessible on the GMM server.

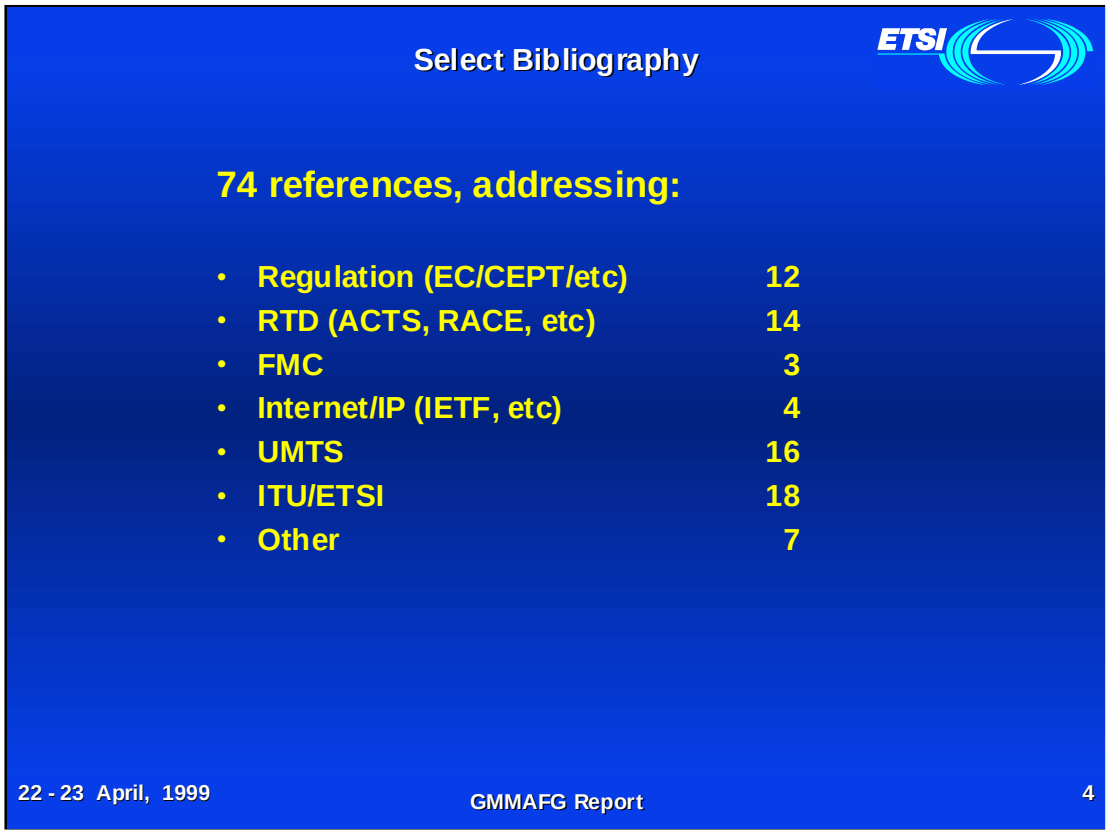


**Figure 3**

## 1.4 Introduction

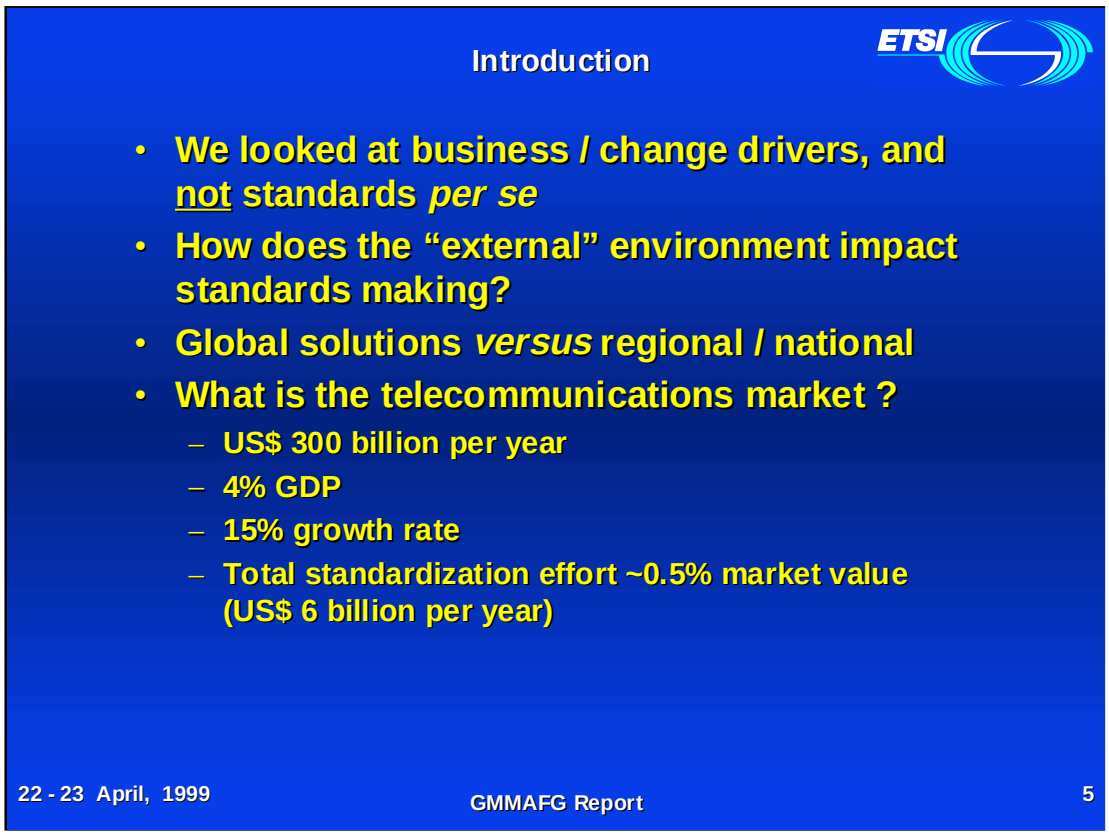


**Figure 4**

The latest GMM studies took some time to stabilize, as many factors were found which impact upon Global Multimedia Mobility. However, after a time it became possible to regain a focus that recognized the hard fact that standards are only a tool for achieving business success.

Standardization thus has to be put in the context of business dynamics, and many of these are not at all technical. Most markets in the world (not just the telecommunications market) are being increasingly dominated by a small number of large, global players, in many instances consortia of former market leaders. Economies of scale are now perceived as only being realizable in markets, which have global dimensions - what place now for national, or even regional, standards?

The telecommunications business is huge, and investments are enormous. Technical solutions have to be right, but politics, regulation, geography, culture, economics, all have a part to play in the market decision-making, and standards-oriented decision makers will do well to remember that!

The high cost of standardization leads to inevitable questions:

- Is this spending wisely applied?
- Can we be smarter still at spending on standardization?

# 2 References

The following documents contain provisions, which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ITU-T Recommendation Y.100: "General overview of the Global Information Infrastructure standards development".

[2] SR 001 677: "Seamless service offering; Giving users consistent access to application/service portfolios independent of access network and core network; Companion document".

# 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| API | Application Programming Interface |
| ATM | Asynchronous Transfer Mode |
| FMC | Fixed Mobile Convergence |
| FR | Frame Relay |
| GMM | Global Multimedia Mobility |
| GMMAFG | Global Multimedia Mobility Architecture Framework Group |
| GMMCG | Global Multimedia Mobility Co-ordination Group |
| GSM | Group Special Mobile |
| IP | Internet Protocol |
| IPR | Intellectual Property right |
| ISDN | Integrated Services Digital Network |
| NAFTA | North American Free Trade Agreement |
| PSTN | Public Switched Telephone Network |
| QoS | Quality of Service |
| STF | Specialist Task Force |
| TABD | Trans-Atlantic Business Dialogue |
| WTO | World Trade Organization |

# 4 Corporate Cultural Change Drivers

With the global networked economy, corporate culture is changing rapidly towards short-term "share-holder" value - as pointed out in the original GMM report. These changes result in an environment of mega mergers so as to have a big enough presence to compete globally.

This is also leading towards a "Knowledge Based" economy, where knowledge (IPRs) are leveraged to obtain competitive advantage.

Access to information - anytime, anywhere - is also becoming a key competitive factor and is again introducing a cultural shift towards a "web based" digital world.

With WTO, harmonized EU market, TABD, NAFTA and other (regional / global) trade agreements, it is no longer a requirement to have national "champions" to do trade; thus causing rationalization of the manufacturing base - it is more cost effective to have one big efficient factory then several small ones in each country.

These changes are not sector specific: the telecommunications sector also has to face the same challenges of liberalization, (de)regulation, increased competition and so on.

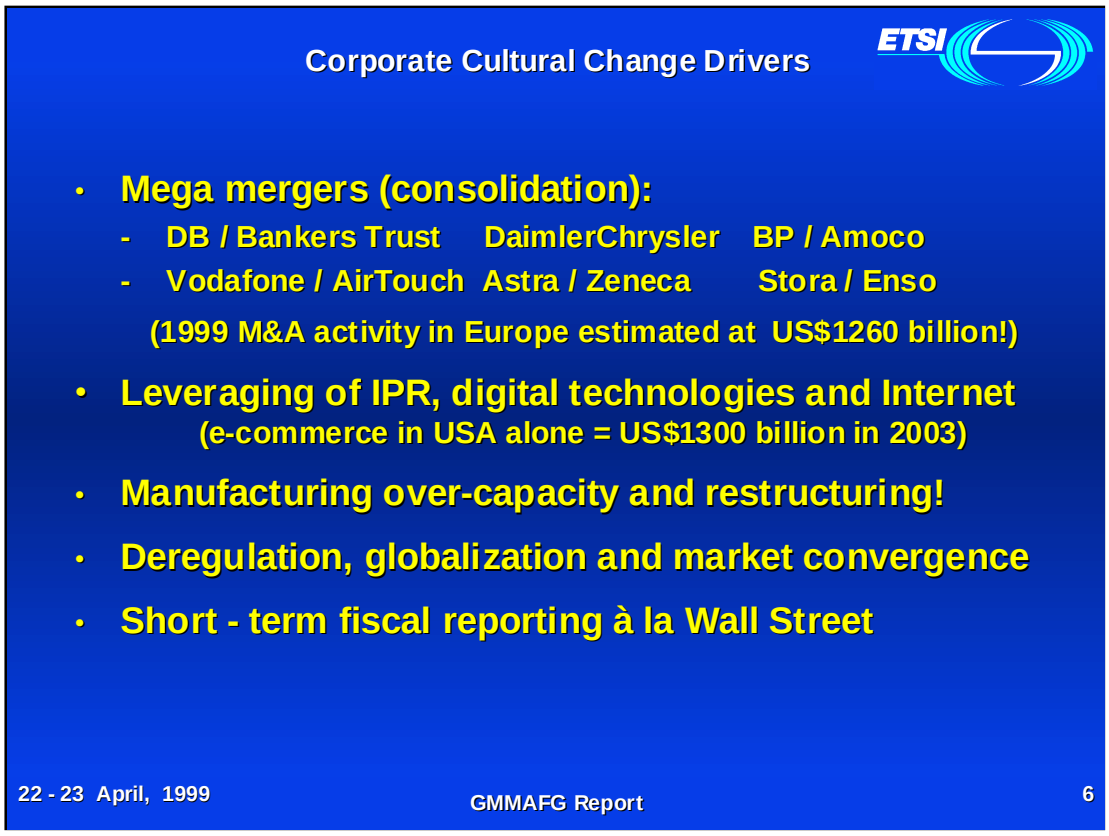


**Figure 5**

# 5 Telecommunications business environment

The basic trends in the telecommunications business are well known: liberalization, regulation (in some sectors, not in others), increased competition, consolidation of existing players, emergence of new ones, convergence of telecommunications, IT, broadcasting and entertainment, convergence of voice/data, fixed/mobile, business/residential, shortening of development times and payback periods, changed user expectations, challenges to traditional standardization, rapid growth in mobile use, impact of the Internet, and so on.

Such changes will certainly have their effect on GMM and the studies have tried to take account of them - including trying to determine which are the most important for GMM.

Several observations (see figure 6) serve to show that the interpretation of trends and their impacts is a tricky task:

1) In Sweden, PCs are now being offered at special low prices when taken with an (18 month) ISP subscription. This appears to be following the "give-away" philosophy for mobile phones and consolidates the view of PCs (and mobiles) as consumer products.

2) Currently price caps are applied only to the fixed networks, not to mobile networks. This creates differences in the commercial environments between fixed and mobile.

3) The regulatory environment in Europe needs harmonized standards, but competition between standards may be provoked by the World Trade Organization or arise from bilateral agreements.

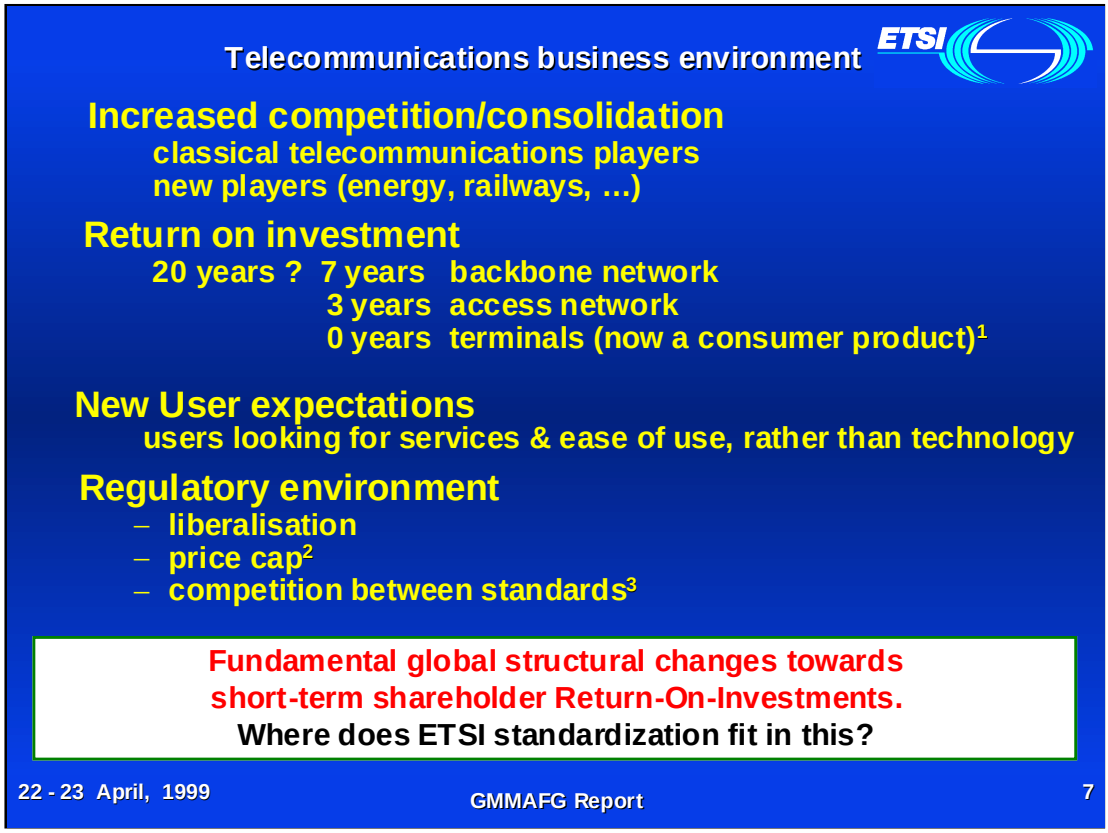


**Figure 6**

# 6 Telecommunications Standardization Needs

Even in a cut-throat business environment, the need for standardization in the four areas mentioned below remains:

**1) Economic Benefits:**

Standardization as a business tool to lower the level of market "uncertainties" and lower the production and transaction costs. Standardization provides the possibilities of interconnection and interactions - which is needed for the complex telecommunications systems to provide seamless services.

**2) Trade & Treaty Obligations:**

Standardization is required to lower the barriers to trade and allow free flow of goods and services as enshrined in the EU directives, WTO and bi-lateral trade agreements.

**3) Societal Needs:**

The societal needs of consumers, aged / disabled, health / safety, environment protection, and so on cannot be ignored. These also require standards to ensure a certain level of conformity by the market players.

**4) Quality Management:**

The ISO 9000 series, "conformance testing", "certification", etc. all lead to a certain level guarantee of Quality-of-Service. Without a doubt, a certain level of standards is needed to ensure a "guaranteed" levels of Quality-of-Service; however, are we creating a new "business" of "certifiers" (via the certification laboratories and some NSOs) via regulation or should the self-declaration of conformity by Manufacturers, Operators and Service Providers be sufficient?

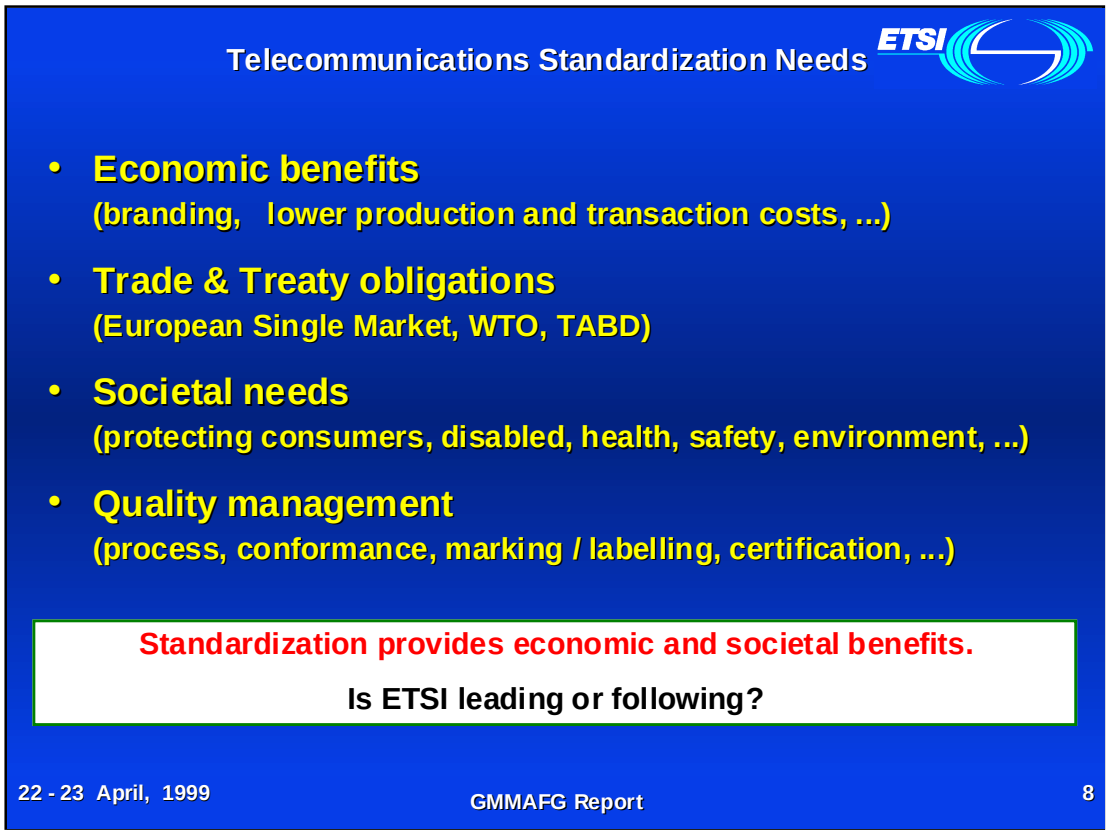


**Figure 7**

# 7 Telecommunications Standardization Areas

1) ***Timeliness of information*** is now seen as an important source of competitive advantage in all sectors. Access to data and information services (including the Internet) whilst on the move is being demanded increasingly.

2) ***Convergence encourages network-independent service platforms*** but leads to an increased need for service management. Different network types and technologies offer different intrinsic Quality of Service (QoS) expectations/requirements.

3) ***There would appear to be little need for standardization of services***, although standards may be needed for the mechanisms that support them. Care is needed that as the necessary tools and processes evolve, they do so in a consistent and compatible manner, perhaps aided by standardization. This is particularly significant when considering the increasing mobility of users, who may be confronted with different ways of presenting various services.

4) Future architectures are likely to exhibit a clear separation between the service layer and the connectivity network layer. In the case of the service layer, three functions may be identified: service access (the user service interface), service operation (information resource, network resource and service administration) and service components (data relative to the user subscription, service itself, and the content). These three processes of the service operation, service access and service components form the basis for end-to-end service management.

5) IPRs are becoming embedded in products and services. In many instances specific IPRs are declared too late or simply declared without any further information about licensing. This can jeopardise or waste standardization efforts.
The attitude of the IPR holders can make or break particular markets.

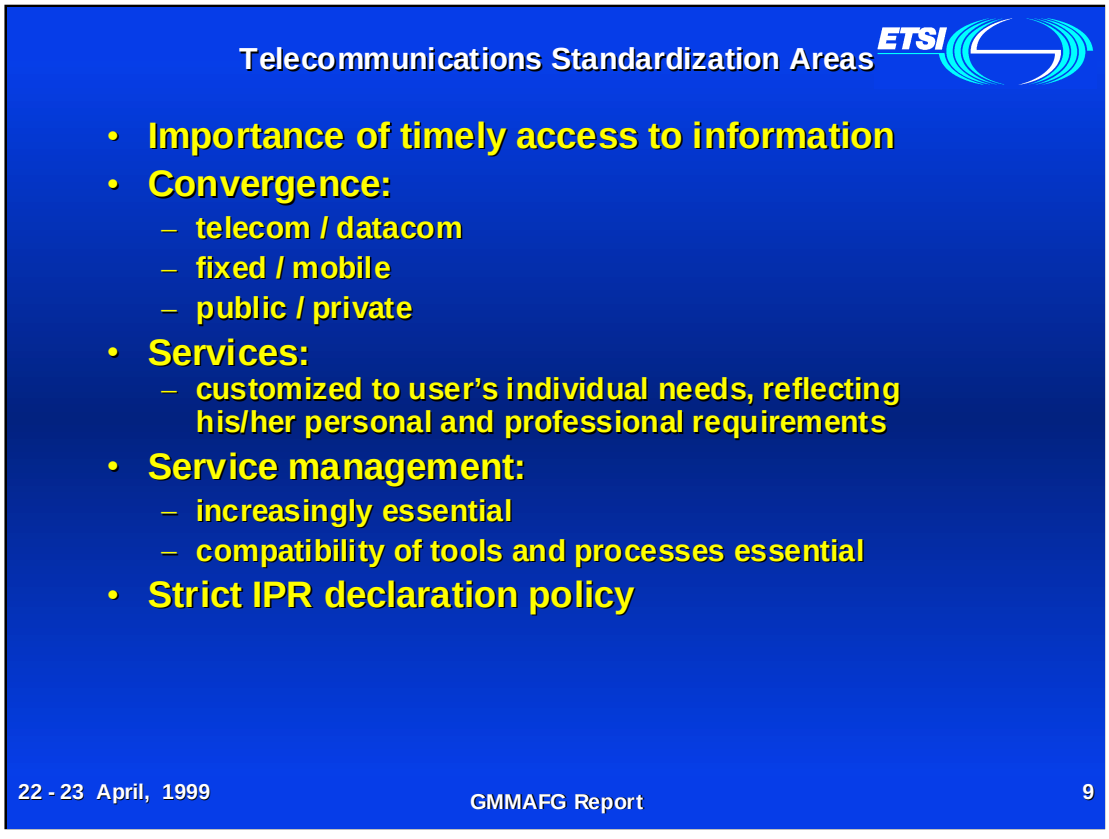


**Figure 8**

# 8 EU Subscriber growth

Figure 9 shows a continued and dramatic growth in the number of mobile subscribers (in the 15 European Union countries). It predicts that, by the year 2010, around 65% of mobile subscribers will still expect to use mobile communications only for speech or low-speed data, whilst about 35% of mobile subscribers will be demanding the ability to access multimedia information via some type of high-speed data access.

***The figures should be treated with care: "fixed" simple voice based telephony services will move to "mobile" while the take-up and growth of the high-speed mobile datacom services will depend on the rate of introduction of 3G (UMTS) mobile networks and the cost of high-feature mobile user terminals (used more as consumer communications appliances).***

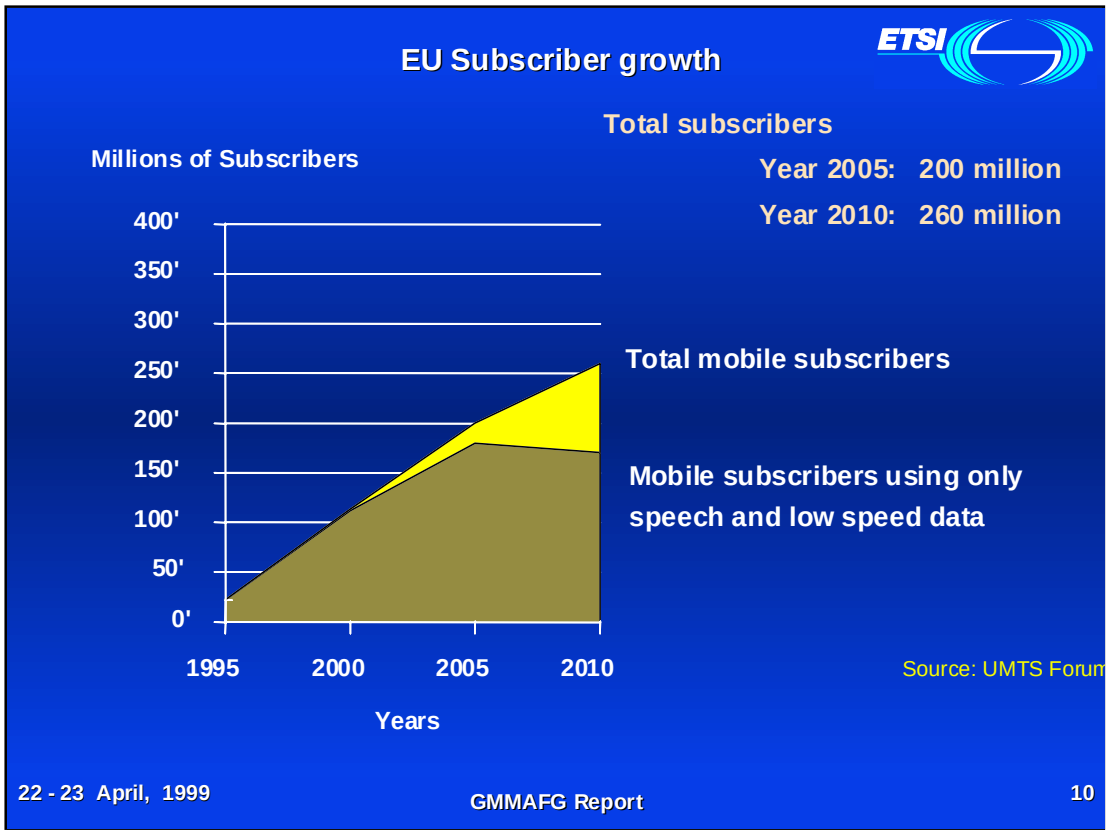


**Figure 9**

# 9 Global Subscriber growth

Figure 10 is derived from multiple sources. Although the source figures differed somewhat the implications are quite clear: continued strong growth in mobile, Internet and mobile Internet, with an eventual "cross-over" between fixed and mobile. It should be noted that mobile figures have been consistently underestimated!

**Internet growth:** The growth in the use of (and reliance upon) the Internet is an obvious trend, and correlates with the increasing value placed on the timely access to information. There will be an ever-increasing demand for Internet services from mobile and fixed users (bearing in mind also that the distinctions between "mobile" and "fixed" are disappearing).

**Use of Mobile networks increasing for voice services:** Rapid growth in the number of mobile subscribers is expected to continue for the foreseeable future. The main use remains voice communication, with many users opting for mobile services simply for the convenience they offer. These users may not be highly mobile but ***the ability to move and retain familiar services is proving a big attraction and UMTS (3G) networks will bring "Mobile Internet".***

**Mobile terminals are now treated as consumer products**. For some poorer and developing countries it is cheaper to bypass the fixed network (which is often in a dilapidated condition) by installing wireless networks. This is especially the case for access networks whereby "instant" deployment of services becomes feasible. The immediacy of many other of the world's consumer markets leads to such expectations in the telecommunications market.

**Use of Fixed networks increasing for datacom:** The recent trend for increasing use of the fixed network for data (Internet) communications traffic is also expected to continue. As new transport networks are installed, or existing ones upgraded, this phenomenon ensures that their capabilities will be optimized for datacom: ***more and more fibre optics and packet/cell-based transport mechanisms; i.e. (ATM / IP based networks)***.

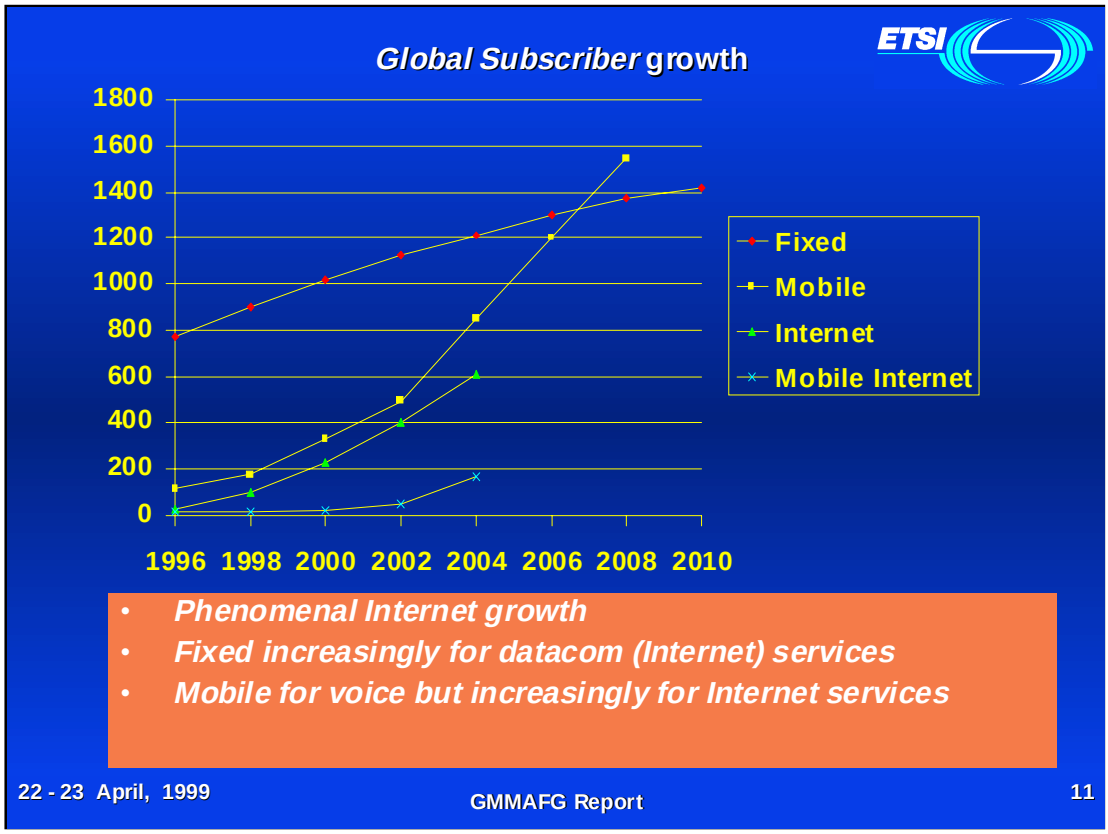


**Figure 10**

# 10 "Internet" - things are changing fast!

1) The ability to "be informed", anytime/anyway is a very significant market driver. There is a tremendous business need to have timely information to ensure "competitive edge".

2) However, Internet is not limited to "business applications" - which have created secure Extranets and Intranets to allow their workers and suppliers to work together in a team to improve gross profit margins. There is also a large residential market for web based e-commerce which is estimated to grow exponentially as people purchase such diverse things as pizzas to books to cars over the net (and not forgetting the home banking). These will present an opportunity for standardization: standards for electronic signatures and business-related secure communications in general.

3) Within Europe - at least within the "Euro-zone" - there is a need for harmonization of security and payment systems. Studies into standardized Information Systems have been running for many years, in the belief that such standardization is imperative for global trading; however, this has led to question whether "standardizers" will be able to "deliver the goods". If there is no specific initiative, then proprietary solution(s) will prevail in the market-place - as is shown by the stock market value of "Internet" stocks. This phenomenon will run counter to the standardization efforts.

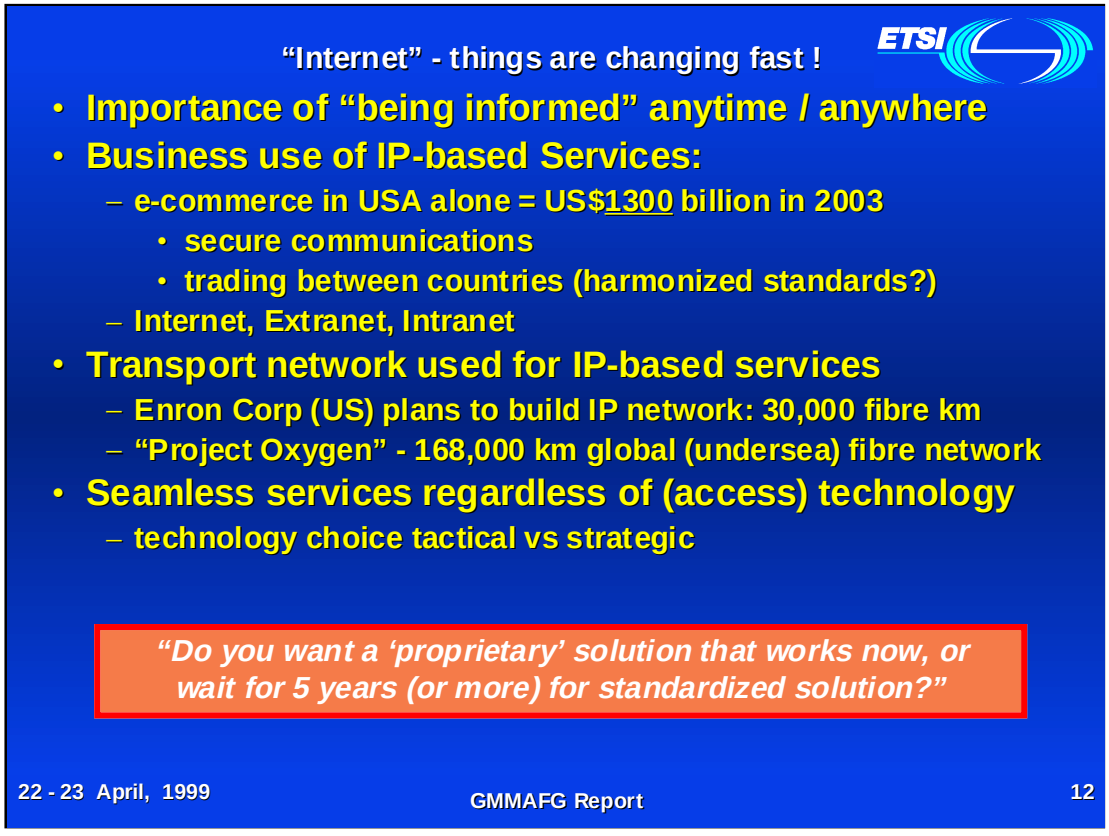


**Figure 11**

# 11 Electronic commerce

An article in the International Herald Tribune of 20 April 1999 (from which figure 12 is derived) stated that, in 1998, $43 billion business-to-business sales were conducted between American companies over the Internet. This figure was expected to reach $1.3 trillion by the year 2003, representing 9.4% of corporate purchases in America.

Companies such as BOC Gases, Harley-Davidson Inc., and Mobil Oil Corp., already make extensive use of the Internet for business e-commerce, citing major savings in ordering costs and an almost total elimination of errors. Added benefits were claimed because of the automation of the entire ordering, shipping and stocking processes.

The business-to-business activity already outstrips the more visible retailing of consumer products, such as books, CD-ROMs, computers and the like on the Internet, and, as can be seen in the chart, will far exceed the consumer retail activity in coming years.

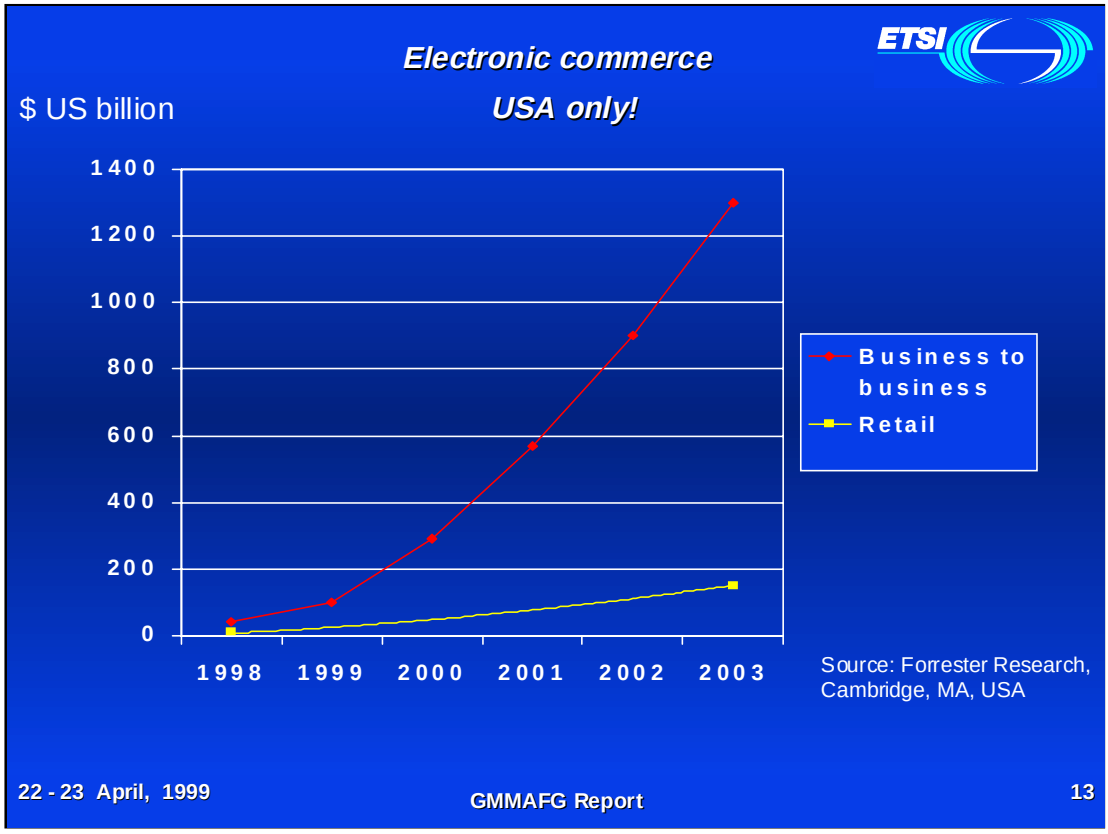


**Figure 12**

# 12 Technology Drivers - Digital World

Many of the technologies (see figure 13) were reported in the original GMM Report. They are still developing at the same fast speed and can be expected to continue for foreseeable future.

1) ***Digital wireless access technologies (not just radio) will work in co-operation with other access mechanisms***, including cable modems, xDSL, ISDN and premises wiring ("smart" house or office). In the future, direct opto-electronic access is foreseen.

2) As the demands for all forms of multimedia continue to grow, ***data compression techniques will increasingly be used*** to overcome the natural limitations of transport networks. An example here is JPEG2000 which will allow greater compression with high image quality. In addition, users will have control over what they view, whilst the owner of the material will be able to control access, copying and re-use of the contents.

3) ***Optical switching is not at a stage whereby it can replace electronic switching***. In the meantime, the need for opto to electronic conversion and back to optical continues for switching and transmission purposes. Technological enhancements in this area ***will enable PCs to be directly connected into the optical stream***.

4) The trends on processor power, memory size, and so on discussed in the original GMM Report can be expected to continue, hence enabling ***powerful multimedia applications to be brought to every desktop*** rather than specialized work-stations.

5) ***Digital speech processing will have significant impact for users***, for instance:

   - terminals which will accept only simple voice commands; and

   - on-line language and text- to-speech and speech-to-text translations.

6) ***Choice of technology becomes tactical and strategic!*** With what was seen as an adequate tool (Minitel), France was late in adopting Internet and is now having to catch-up. However, many countries are now adopting "web-phones" as a means of accessing Internet directly from the telephone: the phones are themselves described as being "inspired by the last generation on Minitel".

***It is clear that more than ever before technological choices will be market-driven.***

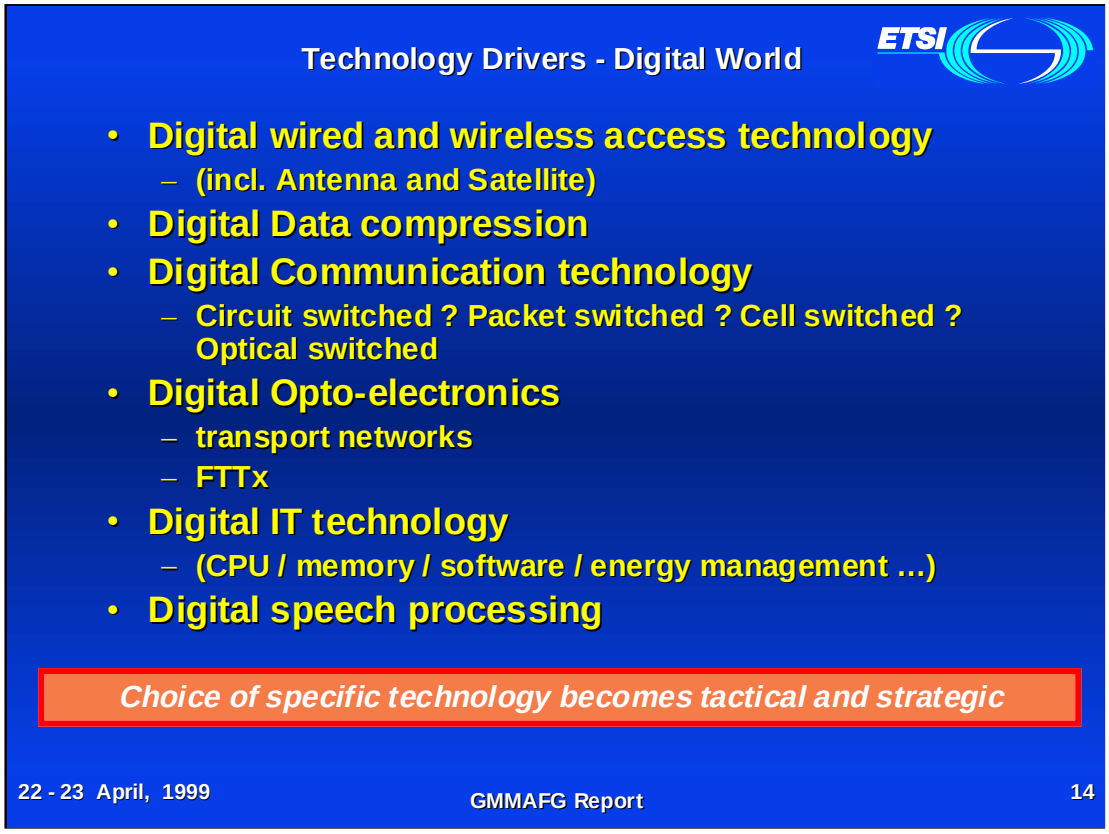
Technology Drivers - Digital World
ETSI
• Digital wired and wireless access technology
– (incl. Antenna and Satellite)
• Digital Data compression
• Digital Communication technology
– Circuit switched ? Packet switched ? Cell switched ? Optical switched
• Digital Opto-electronics
– transport networks
– FTTx
• Digital IT technology
– (CPU / memory / software / energy management ...)
• Digital speech processing
Choice of specific technology becomes tactical and strategic
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**Figure 13**

# 13 User mobility

This chart provides a useful illustration of different types of users and the mobility they exhibit.

The "slow mobility" users are those at the lower left of the diagram, and represent a strongly growing market.

Private Mobile Radio (PMR) systems serve many of the needs of the vehicular professional users (trucks, emergency and security services, taxis, etc).

***The majority of the requirements (see figure 14) will be met by terrestrial systems.***

The truly global users (towards the top right) need to be able to access services even where there is no mobile or fixed access available. ***Their needs may be met by satellite systems***. Such users would be prepared to pay a premium for services and would be willing to have multi-standard terminals.

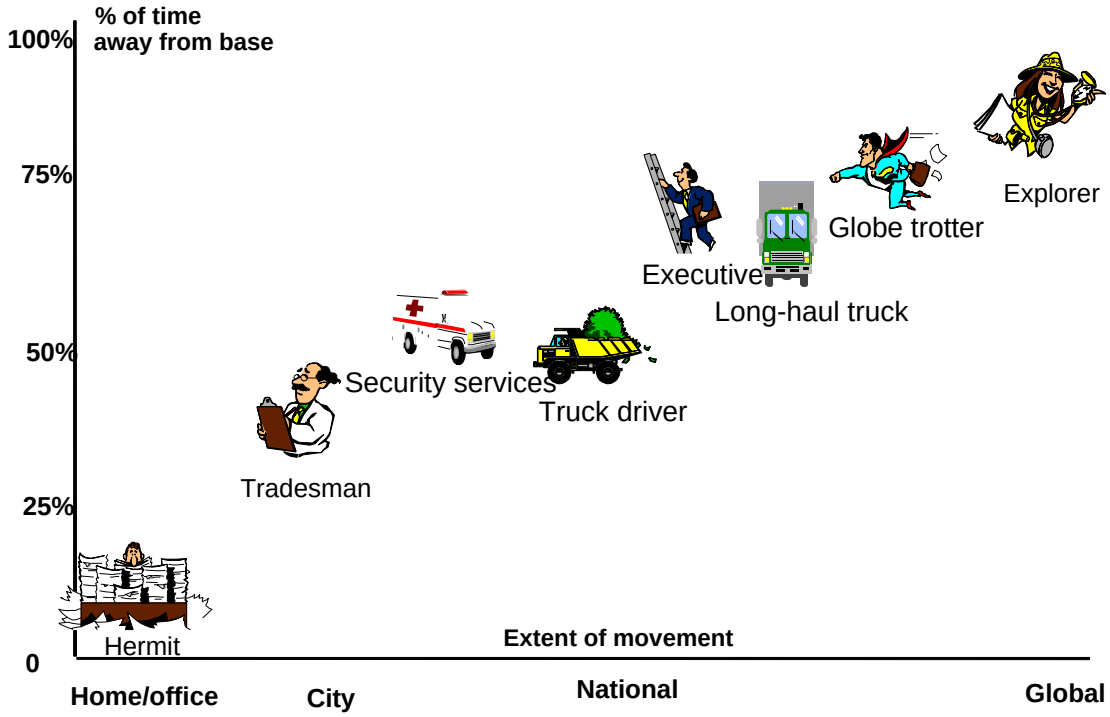


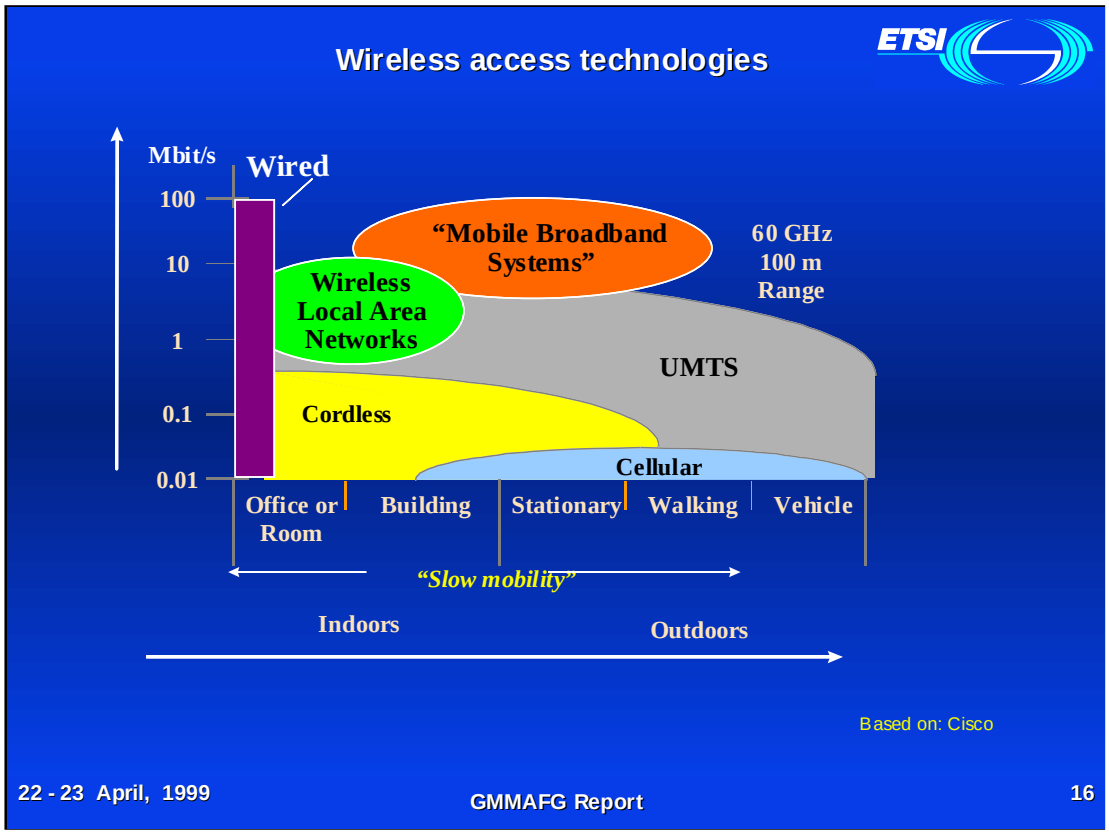

**Figure 14**

# 14 Wireless access technologies

The (generalized) capabilities and possible applications of various wireless access technologies are illustrated in figure 15. It will be seen that a large element of predicted use will be users who are either static or moving at low speeds (typically walking pace).

**"Slow mobility"** is a definition adopted by the ETSI GMM groups and refers to mobility from static to walking pace.

***The number of users with "slow mobility" is believed to be growing rapidly***, and in significantly greater proportions than the growth in more rapidly-moving users. It also appears that since "slow mobility" is generally more convenient than "fast mobility" when accessing complex multimedia material, users in that sector will have higher bandwidth requirements. ***A substantial growth market in high-bandwidth, slow mobility services is therefore foreseen***.




NOTE: The figure is illustrative only. For instance, DECT can support bit-rates of up to 2,88 Mbit/s per carrier, and HIPERLAN will provide up to 36 Mbit/s at walking speeds.

**Figure 15**

# 15 Demand for "slow mobility"

Simple observation reveals that many people are opting for mobile services solely for the added convenience they bring (such as accessibility to networks from anywhere) - not because those people really need to communicate whilst on the move. At the same time, the requirements (or at least the expectations) of a rapidly growing sector of the user community are for multimedia services, which tends to imply a demand for greater bandwidth.

It is thus believed that growth is likely to be strongest in this "slow mobility" market, typified by: mobile access; static or low speed movement in use; continued demand for increased bandwidth and innovative services.

It is also a recognized fact that users do not - and should not - expect to be concerned about the technologies they use to satisfy their communications needs. "Seamlessness" implies, ultimately, a complete freedom from the constraints of a particular network type and type of terminal. Thus, for instance, different access networks should each offer a similar "feel", whilst fixed networks and terminals should support the concept of mobility and, again, give users the "feel" that their mobility remains available to them.

A further factor is that of ease of use: as the number of options grows, users will expect to discover some degree of consistency in the ways services are presented and selected, connections established and ceased, and so on. Naturally, within such a requirement, liberty must still be preserved for manufacturers, service providers, etc., to differentiate their offerings.

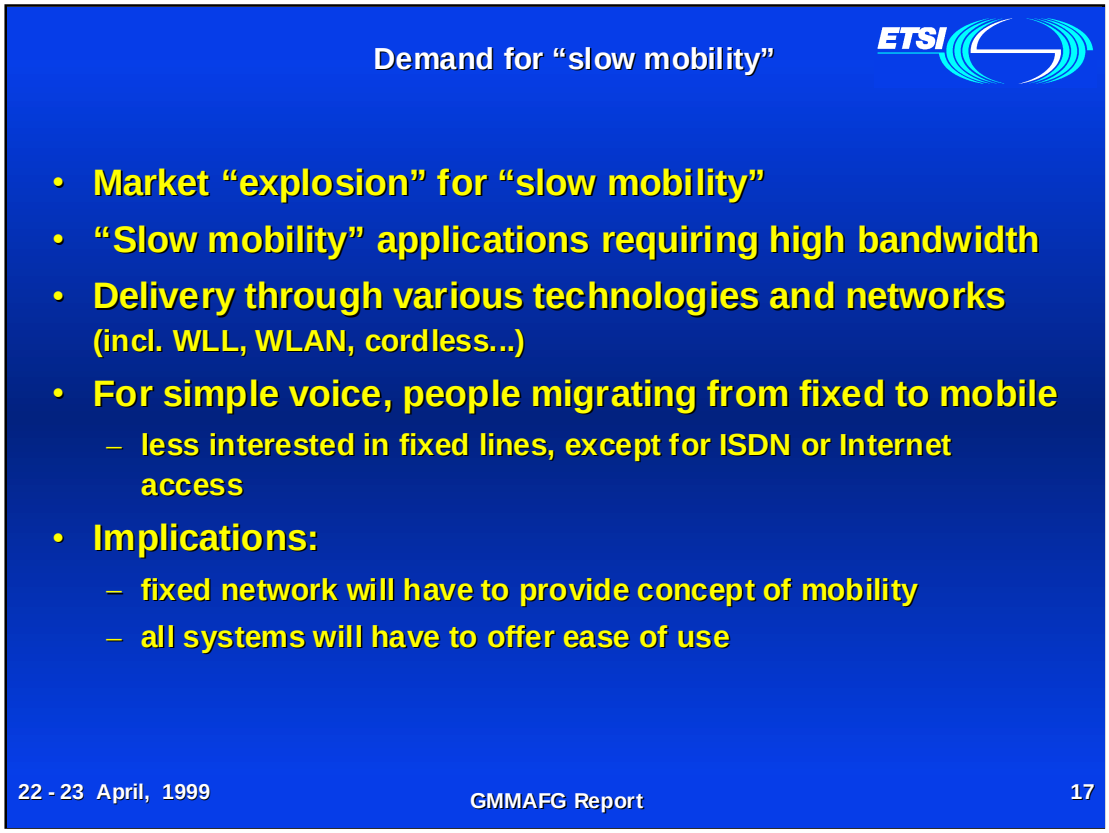



**Figure 16**

# 16 The original GMM model

The conclusion of the ETSI GMM groups is that the basic ideas and key messages behind the GMM model are still valid. The model as it stands supports a multiservice environment and convergence aspects. It has been widely accepted (in ETSI, ITU and elsewhere) and, for instance, the basic philosophy for the UMTS architecture.

In the GMM model the following have been identified:

- independence within the terminal equipment domain (both for fixed and mobile users);
- a multiple access domain (which accommodates both for public and private network solutions);
- a core domain containing different kinds of services networks (including network intelligence needed to support specific service offerings in the core).

Looking at the model from that perspective it can be seen that it covers even the FMC (fixed-mobile convergence) issue, because the model states that, for example, UTRAN must include the ability to connect to any type of feasible backbone network.

In addition to these three infrastructural domains the model contains a fourth domain that is related to applications, content and end user services. The horizontal arrows in the model reflect interworking protocols between the three infrastructural domains. The vertical arrows between the application services cloud and the transport network domain indicates the dependency between how an application is implemented and the services network that supports it (specific Frame Relay services, specific B-ISDN service, etc.).

As the application service domain will be dominated more and more by Internet services using the Internet Protocol (IP) as a transport mechanism independent of the underlying infrastructure, and more and more multiple service networks will be installed, this relation will be of less importance in the future. Users are not (and should not need to be) concerned about the mechanisms of the infrastructure which supports a particular service or application.

NOTE: The arrow spanning the core transport network domain indicates that these networks are and will continue to be interconnected to each other. Intelligence residing in one network can and will be accessible to the intelligence residing in other networks.

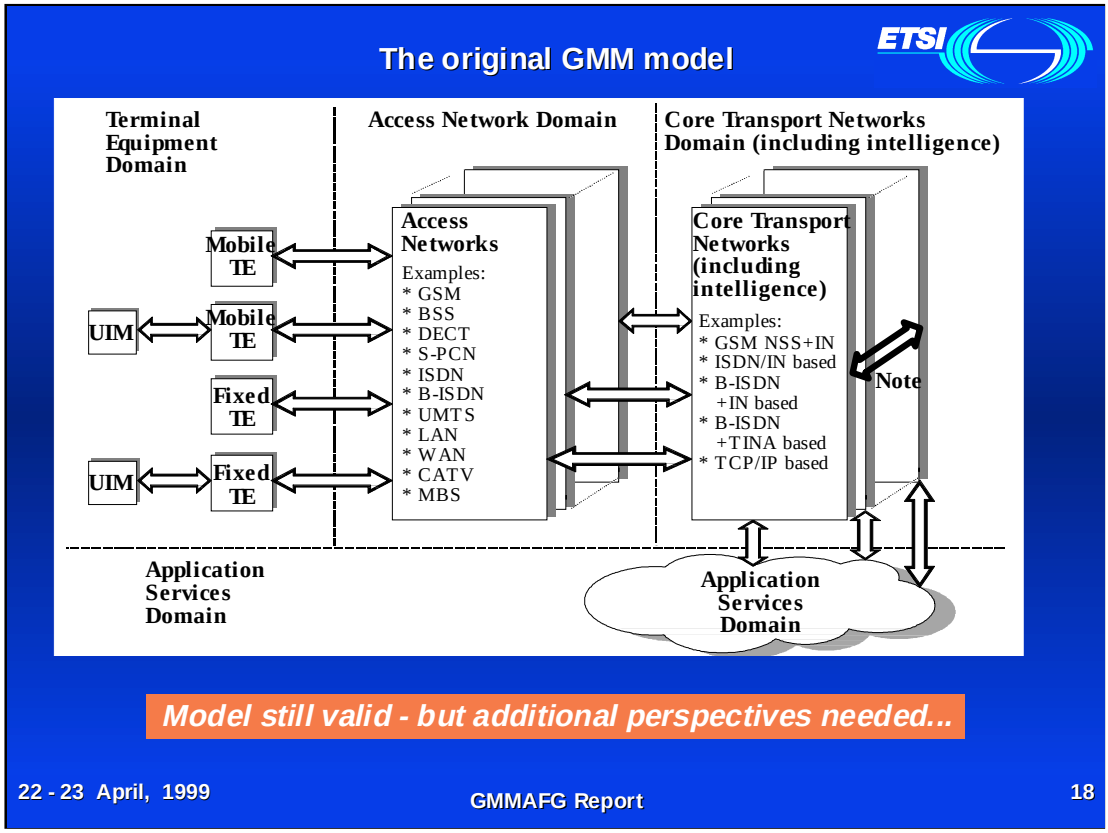



**Figure 17**

# 17 The refined GMM model

Increasingly, it is necessary to recognize a service-provisioning domain, which is only implicitly imbedded in the terminal domain. The original GMM model has thus to be unfolded around the core transport domain to reveal the role of the access networks domain in providing the connection to the "distant end" of the communication. This opens up the model to visualize a variety of traffic cases, since the initiation of a communication need not just be from the left hand side of the diagram.

The distant end may consist of services, as shown in the figure, but it may equally be another user and the result *may* be a "conventional" communication, such as a telephone call. In such a case the right-most domain in the figure (shown as a Service Provisioning Domain) would be replaced by another Terminal Equipment (User) Domain, as at the left of the figure.

On the other hand (and especially taking account of the growing trend towards "information push" rather than the traditional "information pull"), the origination of a communication may be from the right hand side of the figure. Indeed, origination could be from almost any part of the model where the necessary "intelligence" resides. Various other scenarios can be constructed, based on this model, such as communication between two Service Provider Domains (where no conventional user may be involved).

NOTE 1: As in the original GMM model, the arrow spanning the core transport network domain indicates that these networks are and will continue to be interconnected to each other. Intelligence residing in one network can and will be accessible to the intelligence residing in other networks.

NOTE 2: According to ITU-T Recommendation Y.100 [1], network management and service and transport functions, as well as Core Network supported applications and services, are internal to the Core Transport Domain and are not shown separately in the model in figure 18.

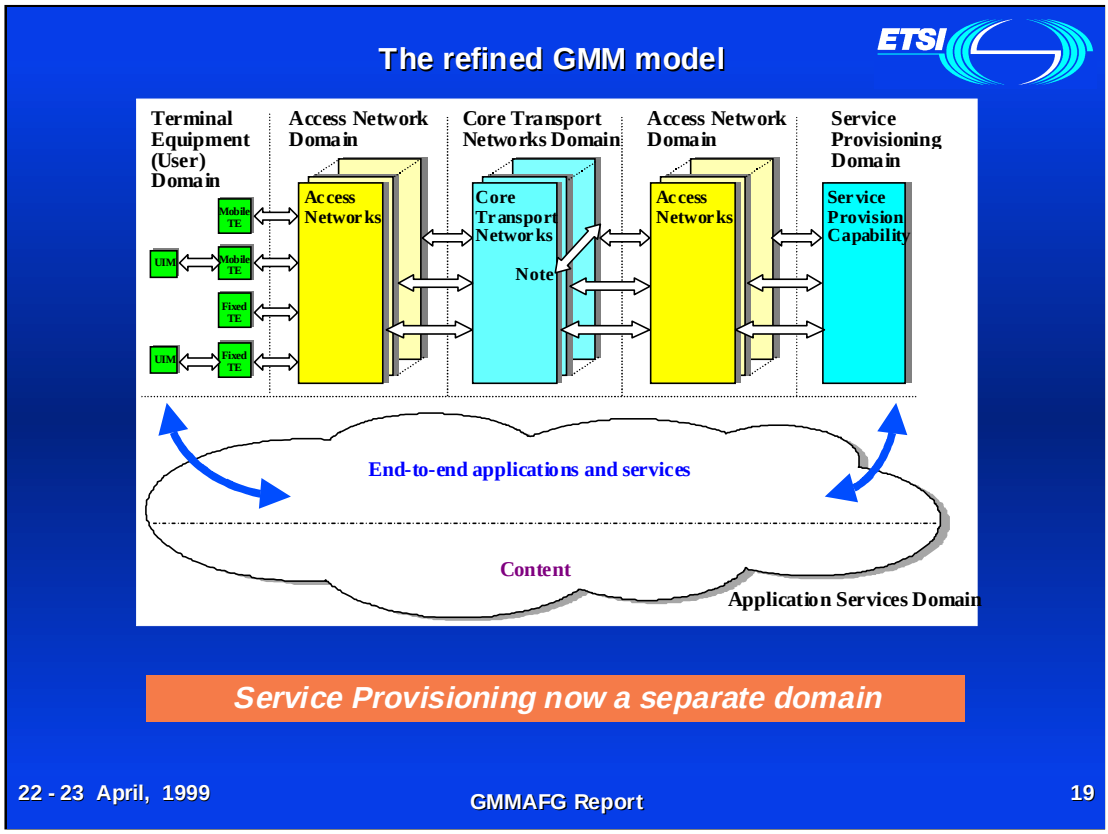



**Figure 18**

The second major significance of the unfolded GMM model is a clear separation of the applications and services elements from the basic connectivity components. This reflects a limited trend of at least two decades, but the Internet is the first network implementation which has fully adopted this principle. One of the consequences of this is the connectivity part - the "network" in traditional terms - becomes transparent to the different types of information carried.

Since various information types each place different requirements on the communication channel, this transparency largely eliminates the need for different types of network, thereby easing interconnectivity of services and giving the end user much greater flexibility and choice. The concept of multiservice networks that is supported by the Internet Protocol (IP) contributes to this transparency as it helps to unify many of the main interfaces within the model.

It should be noted that, in practice, the "intelligence" and the connectivity *may* still reside in the same item of equipment. The difference now is that they *need* not, and that, in a growing number of instances, each could be substituted independently as networks and applications evolve at different rates.

The decoupling of elements also allows for independent service providers (i.e. independent of the transport functions and network-based services) to offer service without being an owner of the infrastructure. It allows equally for independent content providers.

Finally, it should be noted that actual implementations need not appear to have the same form of domain structure.

# 18 Seamless Service Offering

In general, today's service providers still have separate networks to support individual services, such as PSTN/ISDN, FR, ATM, GSM, IP and so on. In order to be able to handle the exploding market there is a need to unbundle the service/applications offerings from the underlying network infrastructure. Competition is driving the service providers to reduce cost as revenues per individual service are reducing. But the existing approach of separate networks for specific service offering cannot support such pressures. To be able to compete with new market entrants a much more radical approach is needed.

Service providers need to design a new public network based on a multiservice platform, independent of the service/application layer. The new network has to co-exist with existing legacy systems for as long as they remain. This combination will give users the ability to chose between different service offerings (not only different services but also different Qualities of Service for the same/similar service) and decide which suits them best. A consequence of this is that the user and the competition will determine the length of time for which service can continue to be offered on today's legacy systems.

Standards-makers have to recognize that today's technology is moving very fast, both in the terminal area and the network area. Service and application implementations are the drivers for that development. Standards have to focus on open interfaces (such as Application Program Interfaces - APIs) for a fully-converged telecommunication environment.

APIs as illustrated in figure 19 are simply one commonly-accepted way of achieving seamlessness.

NOTE: This is *not* an OSI-like stack: the APIs are independent of each other.

There are other similar solutions, such as those being pursued in the MSF and IETF where virtual interfaces are being created for telecommunications and non-telecommunications functions.

For ETSI the challenge is to look to the future, rather than seeking to perfect existing standards. ETSI's primary aim should not be to protect investments in legacy systems. This has implications for ETSI's work programme and its choice of strategic partnerships.

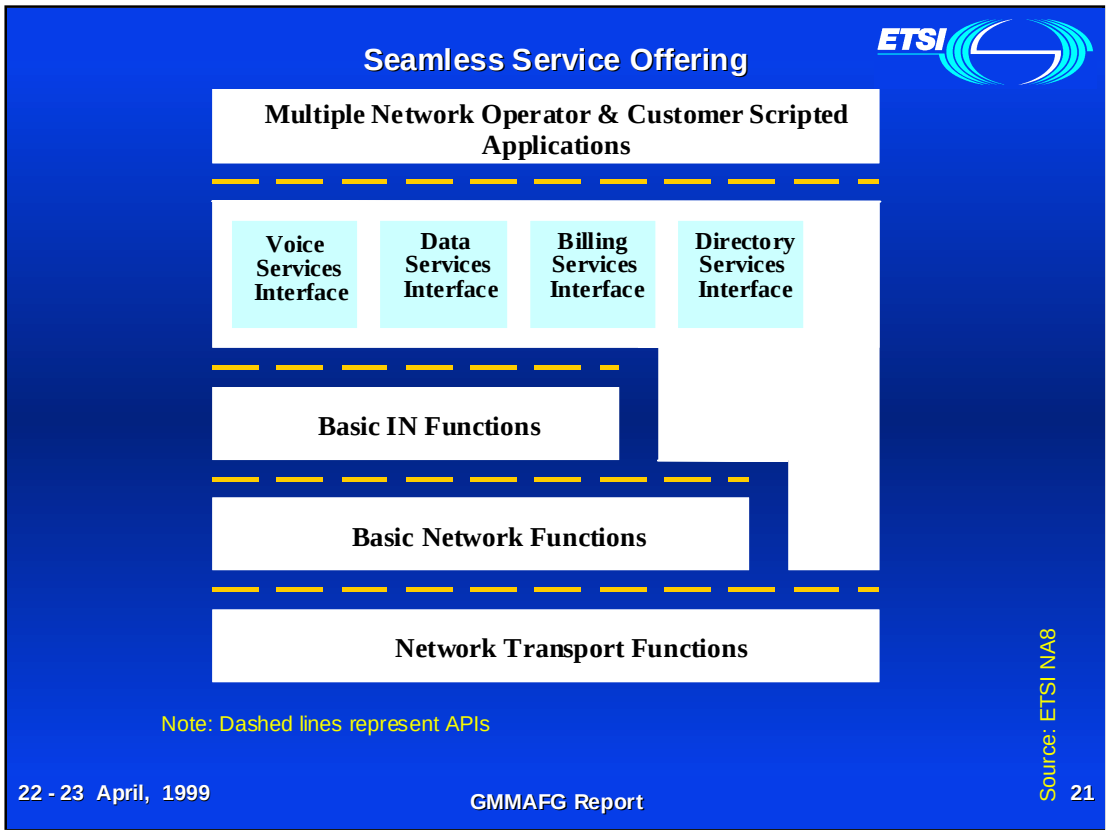



**Figure 19**

# 19 Wired and wireless access

This focus on the terminal from the original GMM Report is still valid, and illustrates several different ways in which a terminal may access the networks. However, new issues have to be taken into consideration. The original version described the terminal as a "Multimedia PC/workstation". Experience has already revealed that it is now possible to have hand held mobile terminals with these types of functionality.

Nevertheless, the concepts outlined in the original report are still valid: single- or multi-mode terminals capable of accessing one or several different types of access networks. The UIM (or equivalent) identifies the user and supports personal mobility related services (and, possibly, additional functions) in the different GMM domains.

Also, the recognition in the original report that technological developments are crucial to the production of multiple-mode terminals is being borne out in practice, and it seems probable that most multi-mode terminals will be made available at prices customers will be willing to pay. Volume will affect price, of course, raising some questions about certain multi-mode combinations (e.g. where satellite communication is included).

In addition to such considerations, there are potential regulatory barriers to the use of mobile terminals, which may affect their free circulation and use globally, as well as commercial obstacles such the absence of roaming agreements.

Terminal design and internal functionality is an area outside normal standardization and provides a potential basis for competition between manufacturers/suppliers. Trends such as colour displays, limited web functionality (and other such limitations typically aimed at minimizing price, size, complexity, etc.), specific character sets and the like are current examples of how differentiation of products (and services) may be achieved. Even here, there may be scope for some measure of standardization, most probably outside traditional standards bodies (for instance, the GSM Association has described requirements for the support of man-machine interface functions in a UMTS terminal, although in general they are not proposed for standardization). A de facto standards war over terminal aspects is a real possibility.

ETSI needs to consider whether it should be seeking a role in this possible standardization opportunity.

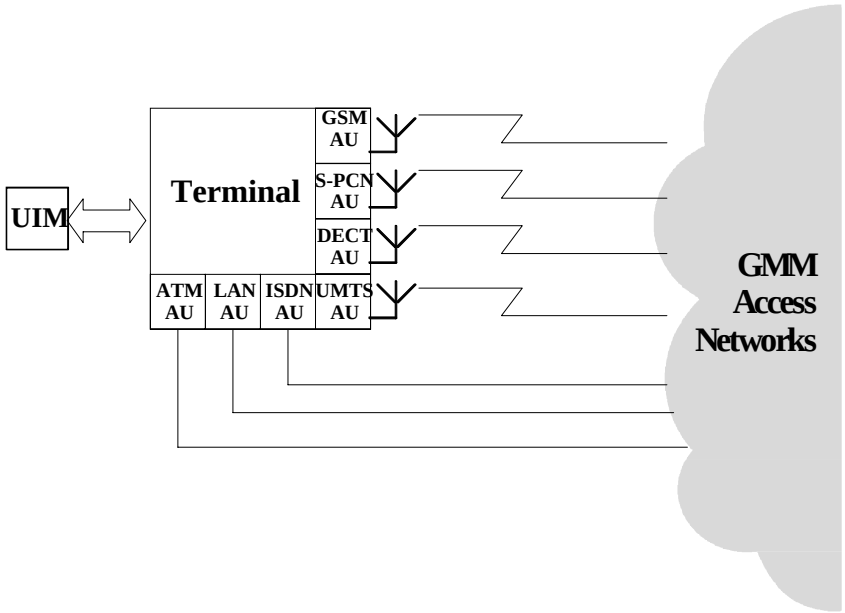



**Figure 20**

# 20 Conclusions

At present, individual services such as PSTN/ISDN, FR, ATM, GSM, IP, etc., generally require separate networks to support them. There is a need to unbundle the service/applications offered to the user from the underlying network infrastructure, in order to be able to handle the demands of an exploding market. Competition is driving the service providers to reduce costs as revenues per individual service fall. But this reduction can no longer be achieved within the framework of existing networks supporting specific service offerings. Newcomers to the telecommunications marketplace frequently come without the "baggage" of established infrastructures: moreover, their perspective - conditioned by their backgrounds outside ‘old-style’ telecommunications - is often markedly different from the traditional players. To be able to compete with new market entrants, existing players need to adopt a much more radical approach.

Service providers need to take a commitment to design a new public network based on a multiservice platform which is independent of the service/application layer, and which will stand in parallel to existing legacy systems. User choice and competition will then determine the remaining lifetime of those legacy systems.

Convergence is also demonstrating the need for "seamlessness" - the removal of traditional boundaries between fixed/mobile, private/public, business/residential. This is already happening, of course, but needs to be followed up and managed in a coherent and future-oriented fashion. The probable outcome will be modular solutions, but these have to be totally interoperable and (again) future-proof.

There is a clear role here for standardization, which also has to adapt to the fact that technology is moving incredibly fast in both the terminal and network areas, driven by service and application implementations. Standards have to focus on open interfaces (APIs) for the whole converged communication arena. For ETSI the challenge is to look into the future and focus on what the industry believes will be needed, rather than trying to perfect existing standards or preserve legacy systems.

This study concludes specifically that ETSI should address in particular the impact of IP technology and of mobility in its various forms. The members of ETSI have to decide whether and how best ETSI can contribute to this changing world.


**Figure 21**

# 21 Questions

The questions in figure 22 may be a helpful "way in" to determining ETSI's response to the challenges identified by the GMM studies.

If it is accepted that separation of services/applications from physical network structures is inevitable, and that modularity will be adopted increasingly as part of the solution, then there must be some doubt about the relevance of pursuing architectural and end-to-end standards. Surely the focus should be increasingly on interface standards and other solutions that ensure effective and flexible interworking.

Moreover, if the future for obtaining competitive advantage lies in the service area, what standardization effort, if any, is needed - or justified - for this area. Assuming that standardization *is* needed, can it be assumed that ETSI is the best body to perform it? If it is decided that ETSI *does* have a role, will that be alone or through strategic alliances? Does ETSI need to consider new alliances?

Finally, the (alleged) deficiencies of formal standardization are well known. Although ETSI has made remarkable progress in accelerating its processes and ensuring its products are "fit for the market", perceptions of slowness and lack of timeliness in standardization still remain. Further attention may be necessary to ensure that ETSI retains it position at the front of the field, producing standards that consistently meet the needs of the market.

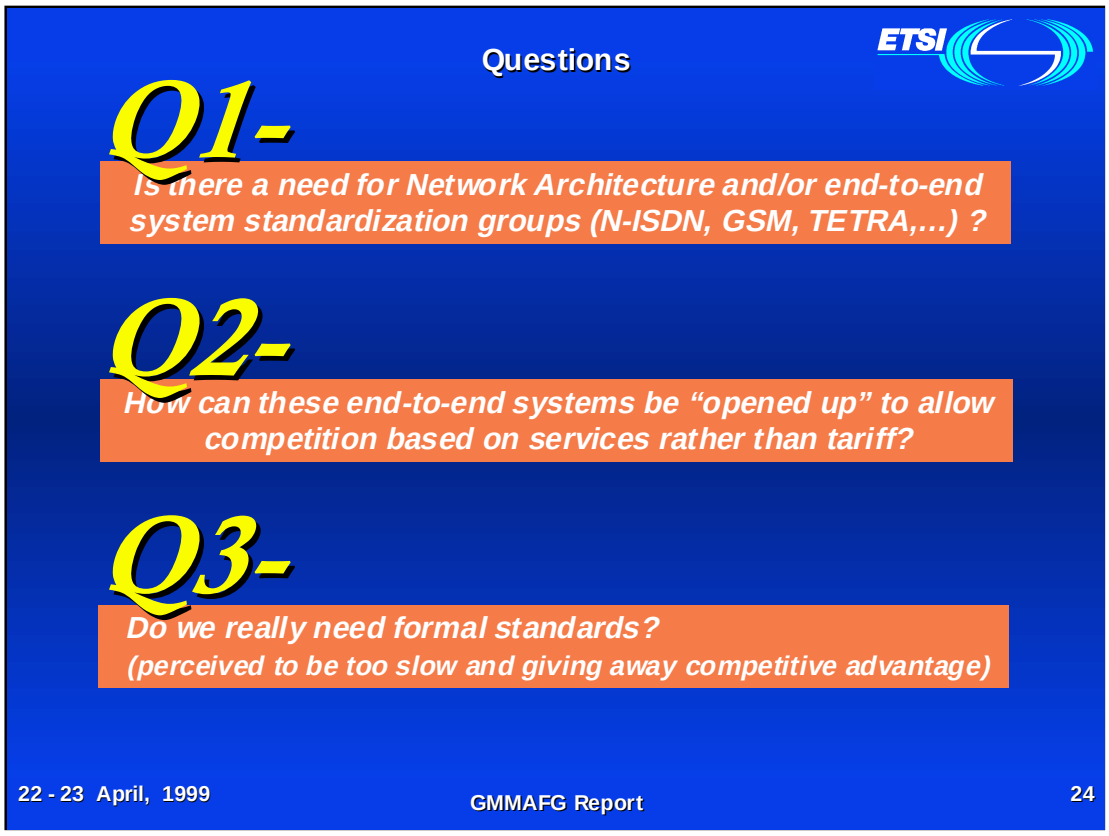



**Figure 22**

# 22 Strategic thinking

The ETSI Business Plan makes it clear that the Institute's role is not restricted to writing standards. ETSI is here to serve the telecommunications industry (manufacturers, equipment suppliers, operators and service providers), users, telecommunications administrations and regulators. Many facets of that responsibility will be served by solutions other than standards - strategic relationships, information services, expert advice and so on.

In considering GMM it is important that this fact is not forgotten. Consequently the GMM studies have concluded that various "non-standards-writing" issues need to be addressed by ETSI, in parallel with specific standards-oriented actions. These issues relate to matters of a (mostly) non-technical nature, such as continued efforts by ETSI to establish strategic partnerships, effective marketing standards and the Institute's other "products" (including its expertise and services), and careful attention to the standards-making processes.

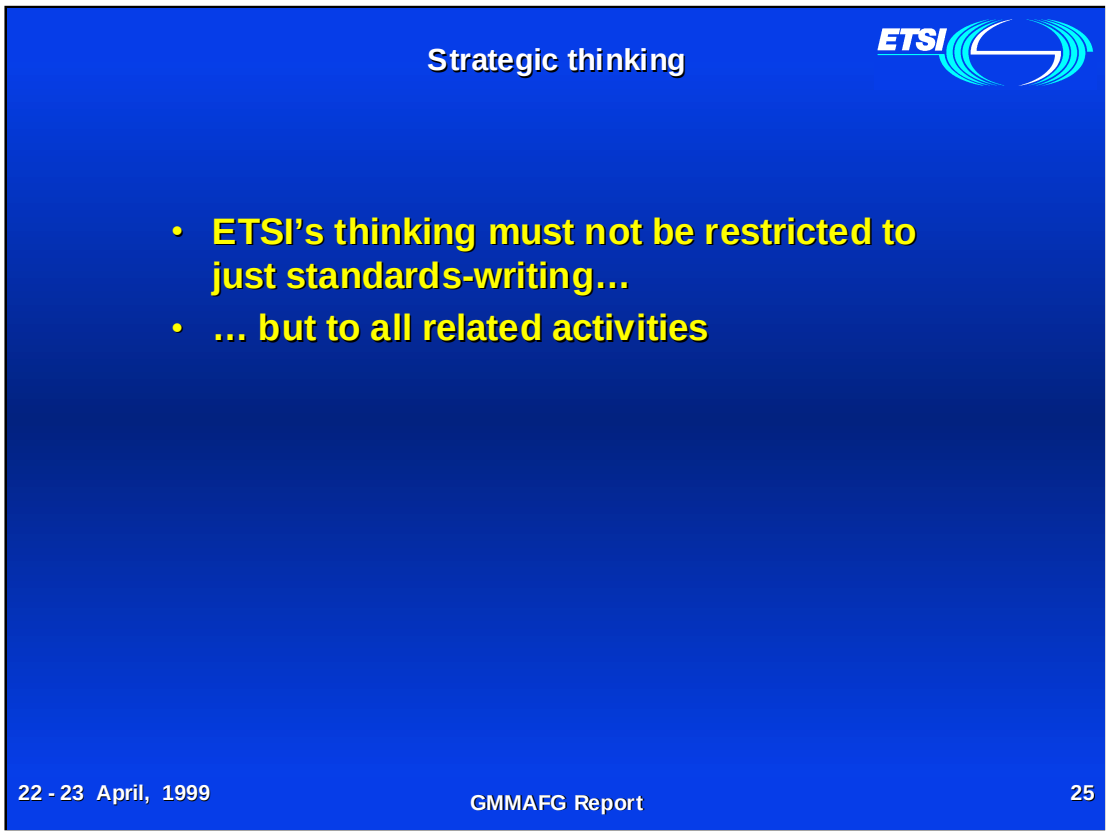



**Figure 23**

# 23 Standards-writing issues (short term)

Table 1 lists broad areas in which it is believed ETSI must play a leading role. Some of the items mentioned are already very much part of ETSI's work programme, but most still need to be integrated into it and given appropriate status.

The GMM groups are convinced that these activities are essential if ETSI is to continue to have a valid role in the GMM domain and meet the future needs of industry and users. That in turn generates the expectation that the Institute's members "buy in" to this vision and make the necessary commitment: the studies on GMM will have been largely wasted if that is not the case.

This challenge would appear a matter for the ETSI Board to consider in the first instance.

**ETSI's work should include:**

**Table 1**

| | |
|---|---|
| API | - API-based architectures |
| Core transport | - totally-optical core networks |
| Access | - high-speed access for copper, fibre & radio |
| Radio access | - compliant with the GMM framework<br>- BRAN activity should continue |
| IP-based work | - TIPHON<br>- Mobile-IP, IP services, security |
| Core network | - separation of switching and service platform<br>- move from circuit to packet / cell |
| Service | - QoS, management of services, customization of services (VHE) |

# 24 Non-standards-writing issues

Many of the conclusions of the GMM study relate to matters that are not directly concerned with standards-writing. They are nevertheless extremely important (perhaps more so than some of the technical (standards-writing) issues). They include encouraging ETSI to continue to pursue strategic alliances, maintaining the delicate balance associated with "depth of standardization", easing the task of accommodating the IPR interests of members and others, and ensuring that customers (notably ETSI members) are supported in their own ambitions for standards that serve their purposes.

Marketing of standards also remains a matter of high importance, and one in which the efforts cannot be allowed to flag. Finally, the study exposed some concerns about the adequacy of the existing ETSI Technical Organization for future needs, and suggested that some re-thinking may be needed, particularly around work on architectural issues.

For these recommended actions, the GMM CG believes that the ETSI Secretariat (in discussion with the ETSI Board) should take primary responsibility.


NOTE 1: As noted earlier, standardization of services and user interfaces should be the minimum necessary. To the extent that standardization of these aspects *is* required, ETSI should consider what part it may play. There may, for example, be scope for involvement in the area of terminal standards, even if just to provide a federating function for the other interested parties.

**Figure 24**

# 25 Future of ETSI GMM activities

The main task of the GMM AFG has been the updating of the GMM Report. Therefore the GMM CG and GMM AFG have both recommended that, upon approval of this report, the GMM AFG be closed.

However, much of the value of these studies will be lost if various implications of a technical and organizational nature, highlighted on the previous pages, are not followed up. It is therefore suggested that a small study group be convened to examine these issues in further detail and to make recommendations to the General Assembly and Board about required changes to the ETSI Work Programme, working structure, etc., in response to those issues.

As far as the GMM CG is concerned, one of its responsibilities has been to maintain the 'tagging' of work items, which have a GMM relationship. The GMM CG has proposed that once that process has been completed that responsibility, along with the others assigned to GMM CG, could be passed to OCG and the GMM CG could then be closed.

These proposals were accepted by the 32nd General Assembly.

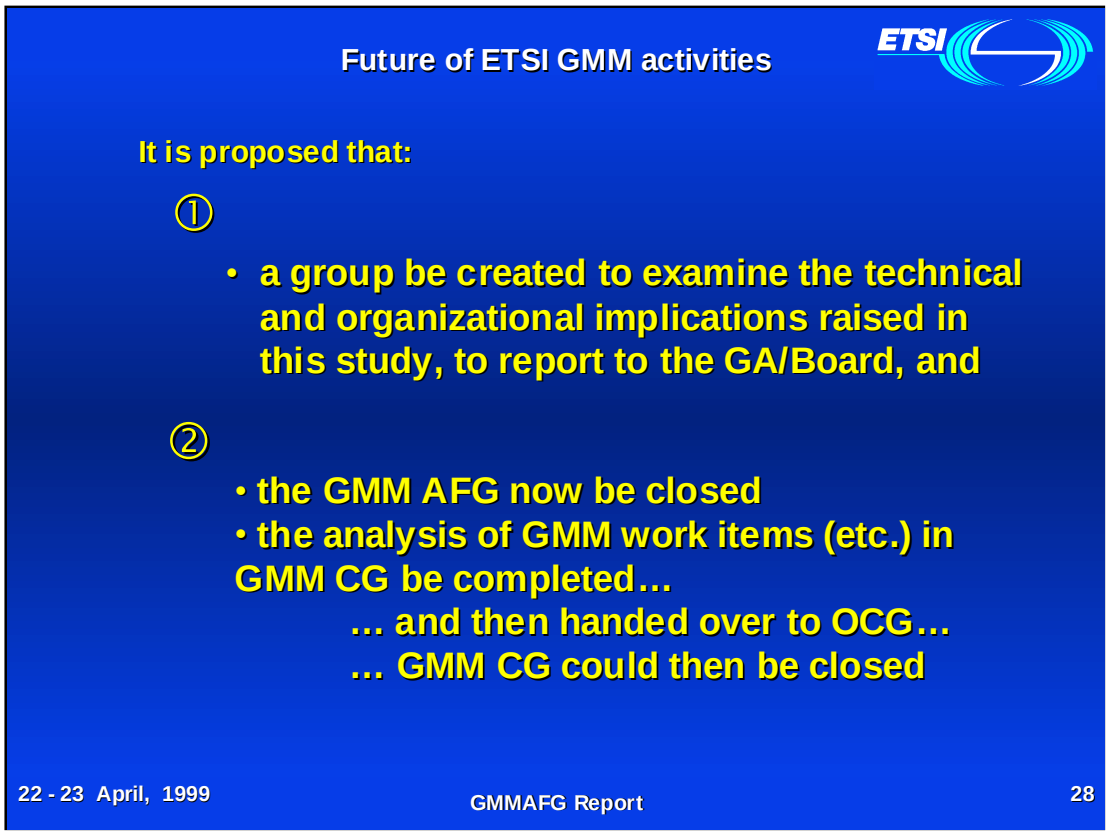



**Figure 25**


ETSI
The mind is a strange machine, which can combine the materials offered to it in the most astonishing way.
Bertrand Russell
Vision is not enough, it must be combined with venture.
Vaclav Havel
22 - 23 April, 1999
GMMAFG Report
29

**Figure 26**

# History

| Document history | | |
|---|---|---|
| V1.1.1 | June 1999 | Publication |
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ISBN 2-7437-3145-1
Dépôt légal : Juin 1999