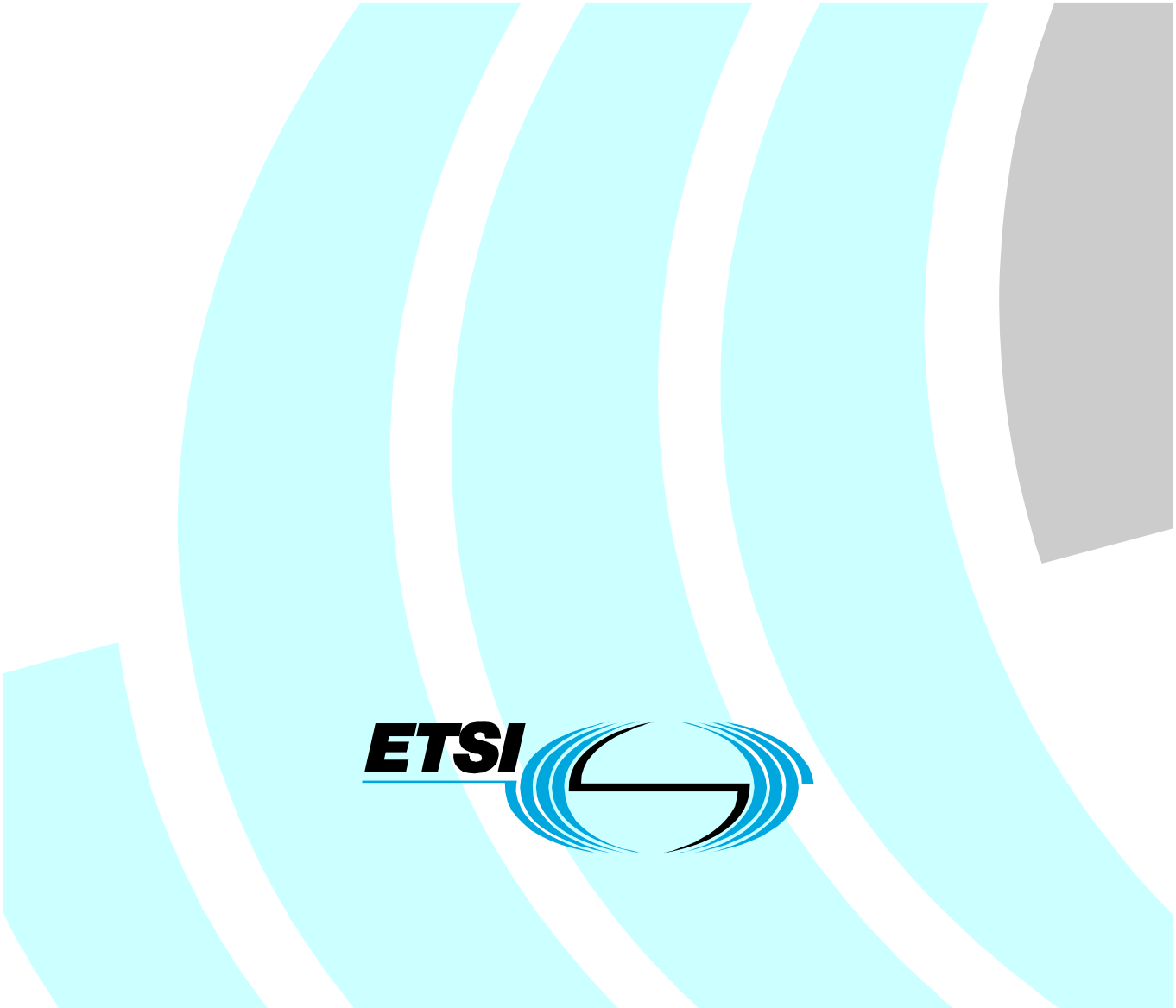
# ETSI SR 002 761 V1.1.1 (2008-09)

*Special Report*

**User Group;**
**Consideration for selecting suitable telecommunication services and for comparing and benchmarking different service offers from the user's perspective**



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***ETSI***

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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# Foreword

This Special Report (SR) has been produced by ETSI User Group (USER).

# Introduction

Guidance for users on the choice and comparison of telecommunication service offers is needed since due to the on-going migration from circuit-switched towards packet-switched networks and the deregulation of the telecommunication market, the user finds himself in a far more complex situation compared to the monolistic environment with standardized service offers.

From a technical point of view the most important changes are that there will be in future all-purpose networks that are used to deliver all kind of services and that there will be a separation of transport and services. There will be no longer specific networks for dedicated services. Also there will a number of different service providers offering different services offered most probably based on different business models. The user might chose separate access (transport) network providers and services providers and also subscribe to several services in order to create his own service bundle that will fulfill his needs. Hence the user would be expected to have some basic knowledge on how the telecommunication infrastructure functions and what implications have to be considered.

In the present document a structured overview is produced listing the implications having an influence on the users' ability to chose suitable telecommunication services and performing comparisons and benchmarks. The intention is to provide a basis for further work that could result into the elaboration of a methodology the can be applied by users to make an informed choice.

# 1 Scope

The present document provides an overview on aspects that need to be considered by users when comparing various telecommunication service offers and selecting telecommunication service offers that fulfill their needs. Since for legacy telephone networks offering voice telephony service QoS aspects are well documented and QoS parameters for comparison of different service offers have already been elaborated, the focus of the present document lies on the emerging all-purpose networks based on IP.

The present document was produced based on the following considerations:

- The user first needs to identify the services and service aspects that are relevant to him.
- The user needs to have a basic understanding of implications due to interoperability issues of networks and services in multi-provider environment (for both networks and services) of modern telecommunications infrastructure.
- This stipulates that the user has to be aware of how a telecommunication service works and what the relationship between terminal equipment, network and service aspects (service elements) are.
- An important condition for this is the availability of complete and understandable information.
- A list of relevant information in standardization to assist further work on this matter is helpful (especially standards with performance and quality objectives for basic telecommunication services and network accesses).

This information given in the present document is applicable to any kind of telecommunication service.

The intention of the present document is to provide a source of information that can be used to elaborate on a methodology for guiding the user through the process of chosing, comparing and benchmarking suitable telecommunication services that fulfill his needs.

# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

## 2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

Not applicable.

## 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] ETSI EG 201 219: "User requirements; Guidelines on the consideration of user requirements when managing the standardization process".

[i.2] ITU-T Recommendation E.800: "Terms and definitions related to quality of service and network performance including dependability".

[i.3] ITU-T Recommendation G.1000: "Communications Quality of Service: A framework and definitions".

[i.4] ITU-T Recommendation I.350: "General aspects of quality of service and network performance in digital networks, including ISDNs".

[i.5] ETSI EG 202 009-1: "User Group; Quality of telecom services; Part 1: Methodology for identification of parameters relevant to the Users".

[i.6] ETSI EG 202 009-2: "User Group; Quality of telecom services; Part 2: User related parameters on a service specific basis".

[i.7] ETSI TS 102 250-1: "Speech Processing, Transmission and Quality Aspects (STQ); QoS aspects for popular services in GSM and 3G networks; Part 1: Identification of Quality of Service criteria".

[i.8] ITU-T Recommendation E.802: "Framework and methodologies for the determination and application of QoS parameters".

[i.9] ETSI EG 202 009-3: "User Group; Quality of telecom services; Part 3: Template for Service Level Agreements (SLA)".

[i.10] ITU-T Recommendation E.801: "Framework for service quality agreement".

[i.11] ETSI TR 102 521: "Speech Processing, Transmission and Quality aspects (STQ); Support to TC EMTEL for QoS and Transmission Quality aspects for end-to-end services".

[i.12] ETSI TR 102 430: "Speech Processing, Transmission and Quality Aspects (STQ); Basic Issues concerning the Quality of Speech over Packet Technology (both Internet and Next Generation Networks)".

[i.13] ITU-T Recommendation E.360.1: "Framework for QoS routing and related traffic engineering methods for IP-, ATM-, and TDM-based multiservice networks".

[i.14] ITU-T Recommendation E.470: "Operational considerations for QoS of voice over IP-based networks with PSTN-IP-PSTN architecture".

[i.15] ITU-T Recommendation G.101: "The transmission plan".

[i.16] ETSI EG 201 769: "Speech Processing, Transmission and Quality Aspects (STQ); QoS parameter definitions and measurements; Parameters for voice telephony service required under the ONP Voice Telephony Directive 98/10/EC".

[i.17] ETSI TR 102 126: "Speech Processing, Transmission and Quality Aspects (STQ); Implementation of QoS parameter measurements according to ETSI EG 201 769".

[i.18] ETSI EG 202 057-1: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 1: General".

[i.19] ETSI EG 202 057-2: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 2: Voice telephony, Group 3 fax, modem data services and SMS".

[i.20] ETSI EG 202 057-3: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 3: QoS parameters specific to Public Land Mobile Networks (PLMN)".

[i.21] ETSI EG 202 057-4: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 4: Internet access".

[i.22] ETSI TS 102 250-2: "Speech Processing, Transmission and Quality Aspects (STQ); QoS aspects for popular services in GSM and 3G networks; Part 2: Definition of Quality of Service parameters and their computation".

[i.23] ETSI EG 202 534: "Human Factors (HF); Guidelines for real-time person-to-person communication services".

[i.24] ETSI TR 102 535: "Human Factors (HF); Guidelines for real-time person-to-person communication services; Future requirements".

[i.25] ETSI ETR 160: "Human Factors (HF); Human Factors aspects of multimedia telecommunications".

[i.26] ETSI EG 202 086: "Speech Processing, Transmission and Quality Aspects (STQ); Objectives and principles for the transmission performance of multiple interconnected networks that aim to provide "traditional quality" telephony services".

[i.27] ITU-T Recommendation G.109: "Definition of categories of speech transmission quality".

[i.28] ITU-T Recommendation G.1010: "End-user multimedia QoS categories".

[i.29] ITU-T Recommendation P.1010: "Fundamental voice transmission objectives for VoIP terminals and gateways".

[i.30] ITU-T Recommendation Y.1541: "Network performance objectives for IP-based services".

[i.31] ITU-T Recommendation Y.1542: "Framework for achieving end-to-end IP performance objectives".

[i.32] ITU-T Handbook on Quality of Service and Network Performance.

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**interoperability:** ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged

**interconnectivity:** circumstance that a network access or a service access enables a user to set-up calls to any other user that can be identified by a national or international numbering, naming and addressing resource

**Quality of Service (QoS):** collective effect of service performance which determines the degree of satisfaction of a user of the service

NOTE 1: The quality of service is characterized by the combined aspects of service support performance, service operability performance, serve ability performance, service security performance and other factors specific to each service.

NOTE 2: The term "quality of service" is not used to express a degree of excellence in a comparative sense nor is it used in a quantitative sense for technical evaluations. In these cases a qualifying adjective (modifier) should be used.

NOTE 3: See ITU-T Recommendation E.800 [i.2] and G.1000 [i.3].

NOTE 4: This may contain additional information.

**user:** individuals, including consumers, or organizations using or requesting telecommunications services available on public or private networks

NOTE 1: The user may or may not be the person who has subscribed to the provision of the service. Without any specific addition this word is used to identify the telecommunication user community in general, e.g. end-users and IT&T managers who use products and services possibly conforming to standards.

NOTE 2: See EG 201 219 [i.1].

NOTE 3: Taking into account the current developing automation, a machine has to be considered as a disembodied "user".

**telecommunications:** technical process of sending, transmitting and receiving any kind of message in the form of signs, voice, images or sounds by means of telecommunications systems

**telecommunication services:** provision of telecommunications and the provision of other additional services that are closely related to the provision of telecommunications

**telecommunications systems:** technical equipment or systems capable of sending, transmitting, switching, receiving, steering or controlling as messages identifiable electromagnetic signals

## 3.2 Abbreviations

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

| | |
|---|---|
| IP | Internet Protocol |
| QoS | Quality of Service |

# 4 Overview

In the following clauses the considerations as listed in the scope are further explained. It is obvious that the identification of the user's need is prequisite to any comparison and subsequent benchmarking. This is further explained in clause 5.

The whole process of identifaction is an iterative one since the user when being confronted with technical issues, chains of responsibilities in provisioning a service and different business and implementation models, he will inevitable be force to reconsider his initial choice because of not considered implications. Therefore the user will have to pass through the process (and taking into account clauses 6 to 7) several times before reaching a stable state.

Clause 8 provides consideration for the availability of information. This is an important aspect since after identifying his needs the user has to get hold of detailed information on the service offers available at the market. Without this information he cannot compare and benchmark.

Clause 9 provides references where useful information can be found for further eleboration on the matter of chosing suitable telecommunication services from a user's perspective.

In annex A the whole process and its implications as discussed in the present document is presented as a flow chart.

# 5 Identification of users' needs

The first step in order to chose among various telecommunication service offers is to identify the own needs, i.e. to produce a shopping list. Depending on the needs and basic knowledge of the user and the thoroughness of investigation the result may vary from a simple need like being able to make nationwide telephone call to anybody up to multimedia demands with support of supplementary functions and specific applications.

Since the needs of single users differ from each other and since there is not fixed and limited set of standard service offers to choose from, a standard procedure cannot be given.The single user will have to go through the process of identifying his needs, extracting technical parameters and ranking services offers in an iterative way. Also it has to be considered that the telecommunication needs of a user will propably not be met by a single service offer or bundled offer of serveral services of a single provider. It might happen that a user has to put together a set of different service offers of different providers to fulfill all his needs. This of course increases the amount of complexity and the number of iterative steps of the whole process when choosing a service.

In standardization existing methodologies for the identification of user needs are written for the use of service providers. However, they can be also be used in order to elaborate on generic methodology that will guide the user through this process and makes him aware of important considerations influences and interactions. By providing such an methodology the user could identify more practically and efficiently. Also the methodology could be used to pre-produce "shopping lists" for typical groups of users.

A good starting point are the EG 202 009-1 [i.5] and the ITU-T Recommendation E.802. The former one provides a matrix for determining QoS criteria. It enables to consider and hence to capture a comprehensive range of QoS requirements for a specific service. The latter one gives three different models: The universal model grouping QoS criteria under four categories, performance, aesthetic, presentational and ethical. The performance model for determining the performance criteria of a telecommunication service. The four-market model that is especially suited for multimedia services since the separation between the transport and service layer is taken into account. The purpose of all models is to identify the criteria that are most relevant to the user and to subsequently transform them into technical parameters that are needed when choosing among different service offers and ranking them.

With the material available in both standards is very suitable for further developing a structured approach on the identification of user needs and methodology to guide the user through the process.

# 6 Interoperability issues in a multi-service/provider environment

In a multi-network and multi-service provider environment interoperability and interconnectivity are aspects that need to be considered. In a monopolistic environment there was only one network that interconnected all users. With the liberalization of the telecommunication market the publicly available telecommunication network is more and more formed by several interconnected networks. In such a situation an any-to-any connectivity between all users might not be assured. Also in IP-based networks the availability of end-to-end connections with guaranteed transmission characteristics over multiple networks might be reduced. But this is an important aspect when using a service.

In legacy networks there was only one service - the voice telephony service - of importance. This service was standardized, since it was based on circuit switched PCM connections and using a well defined signalling system. Therefore there was hardly no risk of service interoperability. In an IP-based environment a new service can easily be implemented compared to legacy networks, since most service functions are located in the terminals or servers connected to network like terminal equipment. Therefore there is for example no longer a standard voice telephony service but many varieties of that service. Also the service is no longer based on end-to-end connections with pre-defined transmission characteristics. Additionally, due to deregulation there is no longer a strict national transmission or service plan as it used to be available in the past times.

If one consider all these aspects it becomes evident that a service interoperability is not automatically available. The reason for this is mainly that when a service is provided over multiple connected networks of different operators there might be no continuous chain of responsibility for the end-to-end connection. Therefore the user has to check with his service provider under which conditions a service interoperability is still maintained. A service provider who allows for interconnection with a service of another service provider should have interconnection agreements and therefore should be aware of any technical limitations (e.g. restrictions in the use of specific codecs for a voice telephony service) when using an interconnected service. This information can only be made available by the service provider.

Also for some services there may be predefined and harmonized conditions on a national or European level, e.g. the universal service. These services are generally available and interoperability is guaranteed due to standardized procedures. Users should check the availability of such services with the Regulatory Authority.

# 7 Basic concept of telecommunication services

When using a telecommunication service a user is normally not interested in the underlying technical elements and requirements that are necessary in order to provide the service. In legacy networks only when interacting with terminal equipment some basic technical understanding and training was required by the user.

Due to liberalization of the telecommunication market and the migration towards IP based networks and services it is more and more common that a user will use networks and servies of multiple operators and providers at the same time in order to satisfy his telecommunication needs. Also the terminal equipment is often bought and maintained by the user. Therefore in order to be able to make informed choices and to compare different service offers the basic concept of telecommunication services and the interrelation between the technical instances that are invoked in the proccess of generating a service should be understood by the user.

The following clause provides basic guidance on this matter. For more detailed background information references are given in clause 9 that can be used for elaborating user understandable guidance.

## 7.1 Telecommunications infrastructure

From a user's perspective the telecomunications infrastructure consists of a network that is accessable by the user via respective interfaces and of terminals that are attached to those interfaces. From this general perspective networks can be seen as means for providing any-to-any connections and transportation/exchange of information. The terminals are used to provide the man-machine-interface and to access the network and services.

In legacy networks the situaion was quite simple for the user since these networks were especially designed to provide a specific service, e.g. voice telephony service in legacy telephone networks. Only designated terminals were allowed to be attached to the network. The technical specifications and attributes of networks and terminals were pre-set and could not be influenced by the user. In a liberalized market situation with several service providers all offering the same (voice telephony) service the user's choice consisted only in chosing between various terminals and contracts offering different extra service features.

In modern telecommunications the situation becomes more complex. With the migration towards packet-switched networks all-purpose networks are created that can carry all kind of services. So the user will need first an access to a telecommunication network that will enable him to communicate with the network, establish connections to any other user. This access should capable of supporting the services the user wants to use from a transmission performance point of view. What is new is that the access is no longer designated to a specific service, i.e. the provision of services is decoupled from the provision of the network infrastructure. Once having an access the user can subscribe to various (multiple) service offers. Of course access and service can also be offered in bundles by the providers.

Additionally it should be noted that there will be a lot of network and service providers with different offers on the market that might not be directly comparable. Each provider might follow different philosophies and business models. Thus accesses and services might be designed individually and not following standardized and strict implementation rules.

When considering all theses aspects it is obvious that the selection of telecommunication services becomes - compared to the situation in legacy networks - a process with multi-dimensional relationships.

From the user's perspective the most important implication is that the services are no longer linked to a specific network infrastructure. There is a separate transport and service layer. For each layer different providers may be responsible and thus multiple combinations are possible. Therefore the user is well aware of his needs and choose a suitable combination that will support the services the user wants to make use of in the end.

## 7.2 Service generation

From a technical point of view a telecommunication service can be separateted into the following elements (phases): availability, connection set-up, information transfer and connection release.

Availability is the ability of the system to be in a state to perform adequately at a given instant of time within a given time interval. The term availabilty is commonly used by service providers in technical and operational contexts in order to assess the performance of a system or sections of it. From a user's perspective, however, the combined effect of the availability of all technical items resulting in the overall availability of a service is better expressed by the term accessibility. This is a measure for the circumstance that a service is accessible to the user when the user wants to use it. The availability is mainly influenced by operational rather than technical aspects. Connection set-up and release and information transfer are the elements that are representing the actual use of a service from a user's perspective whereat the information transfer is the core element.

For the connection set-up/release and the information transfer specific quality objectives will apply depending on the kind of end-to-end service under consideration. For all three functions the speed (call set-up and release times, information transfer rate) and the accuracy (connection to the correct destination, transmission error, information loss) are important QoS criteria. For each service under consideration the quality criteria have to be identified and objectives set individually.

Due to separation of transport and service the service may be totally decoupled from the access network provider. Normally the user is only interested in the access to and usage of end-to-end services. However, the user has to be aware of interrelations between the transport (infrastructure) and the service layer. In an IP-based network in principle any service can be supported given that the respective transmission objectives are fulfilled and protocols are supported. So the user has to ensure that his network access and the transmission network is capable of supporting the required transmission and signalling objectives of the desired services. Another important aspect of IP-based networks and accesses is that multiple services can be used simultaneously. All service will of course consume a certain amount of the available bandwidth ressources and thus there can be some interaction with respect to the performance of each service. In most cases however a standard broadband access should be sufficient for most services.

Not only the separation between transport and service layer needs to be considered but also the multi-network environment. In order to provide any-to-any connectivity the different networks need to be interconnected. Whether a service will show the desired performance under these conditions depends on how well interconnection arrangements are working.

There is a relationship between the quality criteria and their objectives and the network performance of the telecommunication infrastructure used. The quality objectives can be mapped to network performance parameters. Thus quality objectives for specific services will result in minimum requirements for the transmission characteristics of the network. Therefore it should be cross-checked whether quality objectives will require minimum levels of network performance and whether the network is capable of supporting the service.

Each kind of service will react differently on impairments in the functions. For example, real-time services like telephony will be very sensitive to delay and information loss as this will result in a decrease of speech quality and interactiveness. For each service under consideration the quality criteria have to be identified and objectives set individually.

In modern IP based networks different kind of service models are possible as compared to services in legacy networks. There can be different solutions for interaction of the service with network and supplementary features even though the service is interoperable to similar services. When selecting and comparing services these differences can be important.

Another aspect that should be considered is that when services are provided via IP-based networks the influence of the terminals on the performance and quality of the service as experienced by the user is significant. In legacy circuit-switched networks terminals did not have much functionalities and thus had little influence on the service quality. Also a terminal (like e.g. an analogue telephone) could be used with different service providers. This is not the case in IP-based networks where terminal equipment can be set by default that it only can interact with a specific service/access. The user should consider this when choosing specific terminal equipment.

# 8 Collection and availability of needed information

A crucial point in the process of selecting a telecommunication service is the availability of information. Without detailed information on the services and networks it is impossible for a user to make an informed choice. This is especially valid for interoperability and interconnectivity aspects of services and networks.

There are various sources of information a user can make use of:

- Service descriptions and terms of use of the service providers themselves and/or third parties.
- Describtions of technical interfaces and accesses including ther performance objectives of the network provider themselves and/or third parties.
- Hotlines and web sites of service providers.
- Technical specifications and product descriptions of the service providers.
- Technical background information and technical analyses published by telcommunication magazines.
- QoS reports and surveys published by the service providers, third parties and regulatory authorities.
- User organized internet fora.
- Technical background information given in standards and literature.

It is very important that from the above given list information sufficiently detailed and complete can be obtained in order to allow for choosing, comparing and benchmarking telecommunication services. Otherwise the user is forced to make assumptions and to take riscs when ordering a service. From a user's point of view the service provider's contractual commitments (first bullet point) are the most important aspects since only the service provider himself is able to provide detailed information on all aspects of a service. Also this information is needed in order to allow users to monitor whether the service quality is complying to the contractual commitments.

Since the most part of the needed information can only be obtained by the respective service and access providers. this of course raises the question of trustiness, completeness and understandability of information and willingness of the providers to inter-act with the users. Therefore third-party-proved information from user organizations, independent test houses and regulatory authorities should be also available.

Concerning aspects of interoperability and integrity of services and networks in a multi-provider environment it is unlikely that suffcient information will be available if not arrange and supervised by independent associations or regulatory authorities.

The single residential user has to rely on the availability of sources of information as listed above and on mechanisms to prove the validity of the information, otherwise an informed choice will be impossible.

# 9 Useful references

**General Information on QoS:**

ITU-T Recommendation E.800 [i.2]: "Terms and definitions related to quality of service and network performance including dependability".

ITU-T Recommendation G.1000 [i.3]: "Communications Quality of Service: A framework and definitions".

ITU-T Recommendation I.350 [i.4]: "General aspects of quality of service and network performance in digital networks, including ISDNs".

ITU-T Handbook on Quality of Service and Network Performance [i.32].

**Identification of user QoS criteria:**

ETSI EG 202 009-1 [i.5]: "User Group (USER); Quality of Telecom Services; Part 1: Methodology for Identification of Parameters relevant to the Users".

ETSI EG 202 009-2 [i.6]: "User Group (USER); Quality of Telecom Services; Part 2: User related parameters on a service specific basis".

ETSI TS 102 250-1 [i.7]: "Speech Processing, Transmission and Quality Aspects (STQ);QoS aspects for popular services in GSM and 3G networks;Part 1: Identification of Quality of Service criteria".

ITU-T Recommendation E.802 [i.8]: "Framework and methodologies for the determination and application of QoS parameters".

**Service level agreements:**

ETSI EG 202 009-3 [i.9]: "User Group (USER); Quality of Telecom Services; Part 3: Service Level Agreements Template"

ITU-T Recommendation E.801 [i.10]: "Framework for service quality agreement".

**Technical background information:**

ETSI TR 102 521 [i.11]: "Speech Processing, Transmission and Quality aspects (STQ); Support to TC EMTEL for QoS and Transmission Quality aspects for end-to-end services".

ETSI TR 102 430 [i.12]: "Speech Processing, Transmission and Quality Aspects (STQ); Basic Issues concerning the Quality of Speech over Packet Technology (both Internet and Next Generation Networks)".

ITU-T Recommendation E.360.1 [i.13]: "Framework for QoS routing and related traffic engineering methods for IP-, ATM-, and TDM-based multiservice networks".

ITU-T Recommendation E.470 [i.14]: "Operational considerations for QoS of voice over IP-based networks with PSTN-IP-PSTN architecture".

ITU-T Recommendation G.101 [i.15]: "The transmission plan".

**QoS Parameters:**

ETSI EG 201 769 [i.16]: "Speech Processing, Transmission and Quality Aspects (STQ); QoS parameter definitions and measurements; Parameters for voice telephony service required under the ONP Voice Telephony Directive 98/10/EC".

ETSI TR 102 126 [i.17]: "Speech processing, Transmission and Quality aspects (STQ); Implementation of QoS parameter measurements according to ETSI EG 201 769 "

ETSI EG 202 057-1 [i.18]: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 1: General".

ETSI EG 202 057-2 [i.19]: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 2: Voice telephony, Group 3 fax, modem data services and SMS".

ETSI EG 202 057-3 [i.20]: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 3: QoS parameters specific to Public Land Mobile Networks (PLMN)".

ETSI EG 202 057-4 [i.21]: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 4: Internet access".

ETSI TS 102 250-2 [i.22]: "Speech Processing, Transmission and Quality Aspects (STQ);QoS aspects for popular services in GSM and 3G networks; Part 2: Definition of Quality of Service parameters and their computation".

**Quality and performance objectives:**

ETSI EG 202 534 [i.23]: "Human Factors (HF); Guidelines for real-time person-to-person communication services"

ETSI TR 102 535 [i.24]: "Human Factors (HF); Guidelines for real-time person-to-person communication services; Future requirements"

ETSI ETR 160 [i.25]: "Human Factors (HF); Human Factors aspects of multimedia telecommunications"

ETSI EG 202 086 [i.26]: "Speech Processing, Transmission and Quality Aspects (STQ); Objectives and principles for the transmission performance of multiple interconnected networks that aim to provide "traditional quality" telephony services".

ITU-T Recommendation G.109 [i.27]: "Definition of categories of speech transmission quality".

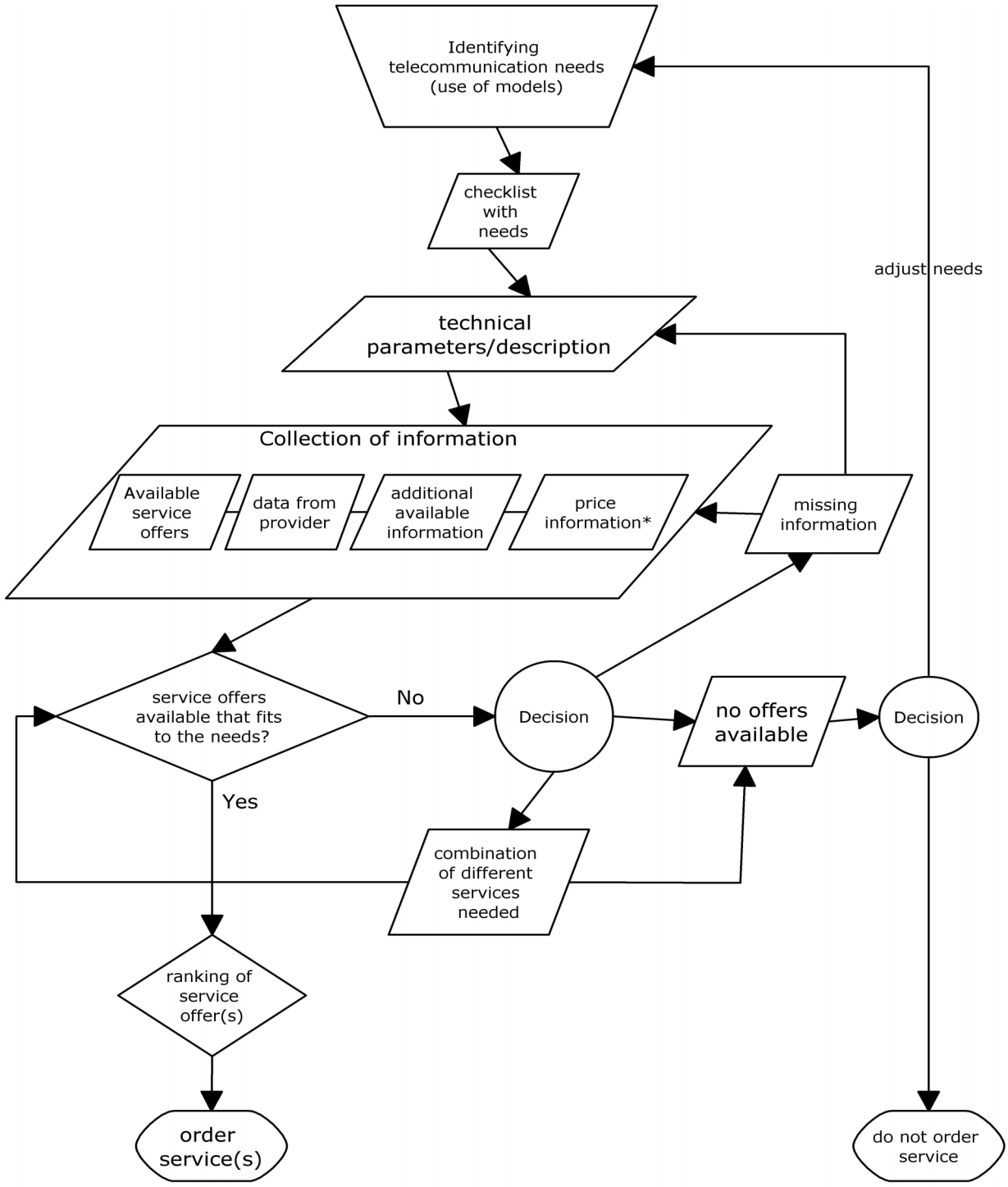
ITU-T Recommendation G.1010 [i.28]: "End-user multimedia QoS categories".

ITU-T Recommendation P.1010 [i.29]: "Fundamental voice transmission objectives for VoIP terminals and gateways".

ITU-T Recommendation Y.1541 [i.30]: "Network Performance Objectives for IP-based Services".

ITU-T Recommendation Y.1542 [i.31]: "Framework for achieving end-to-end IP performance objectives".

# Annex A:
# Process of selecting a service




* The term "price information" relates to all aspects of payment and costs of a service and its provision (like e.g. fixed costs, method of billing, tariff models, metering, duration of contract)

# History

| Document history | | |
|---|---|---|
| V1.1.1 | September 2008 | Publication |
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