



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

E.803

(12/2011)

SERIES E: OVERALL NETWORK OPERATION,
TELEPHONE SERVICE, SERVICE OPERATION AND
HUMAN FACTORS

Quality of telecommunication services: concepts, models,
objectives and dependability planning – Terms and
definitions related to the quality of telecommunication
services

**Quality of Service parameters of non-utilisation
stages of ICT services**

CAUTION !

PREPUBLISHED RECOMMENDATION

This prepublication is an unedited version of a recently approved Recommendation. It will be replaced by the published version after editing. Therefore, there will be differences between this prepublication and the published version.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU [had/had not] received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2011

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Recommendation ITU-T E.803

Quality of Service parameters of non-utilisation stages of ICT services

Summary

To enable customers choose a Service Provider (SP) most suited to meet their specific QoS requirements performance data on the non-utilisation stages of services, in addition to the service specific performance usually dealing with in use performance, are necessary. This Recommendation lists 88 generic parameters over the product life cycle of ICT services which will enable a regulator, stakeholder or any interested party to select a pertinent number of parameters for the SP to report delivered performance data on.

QoS performance on non-utilisation stages can benefit customers, regulators, stakeholders and SPs to monitor performance levels for the benefit of the customers and ICT industry. The essential information to be obtained for measurement and reporting of performance levels is illustrated on a selection of parameters. Guidance on presentation of performance results is also provided. Reporting of delivered performance by the SPs to a recommended procedure will enable comparability among providers.

Keywords

QoS

Non-utilisation stages of services

Recommendation ITU-T E.803

Quality of Service parameters of non-utilisation stages of ICT services

1 Scope

This Recommendation deals with the QoS parameters that could be of primary interest and concern to the customers and users of ICT services who wish to compare performances of service providers of ICT services during the non utilisation stages of such services and secondarily to regulators and service providers.

Recommendations that cover service specific performances usually deal with the in-service performance of a service. Such Recommendations cover the service performance while the service is in use. However the service surround of ICT services offered by service providers that are outside the actual usage of services would be of interest and concern to the users. Quality and content of information on a service and its features, the contractual conditions offered by the service provider, provisioning facilities, documentation, and service support after contract with customers are examples of non-utilisation stages of ICT services that could be of concern to the users. This Recommendation identifies non-utilisation stages and lists a number of QoS parameters from which a selection may be made for the customer to assess the performance of the provider.

2 References

The following ITU-T Recommendations and other references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T G.1000] ITU-T Recommendation G.1000 (11/01), *Communications quality of service: A framework and definitions*
- [ITU-T E. 800] ITU-T Recommendation E 800 (09/08), *Definitions of terms related to quality of service*
- [ITU-T E.802] ITU-T Recommendation E.802 (02/07), *Framework and methodologies for the determination and application of QoS*
- [ETSI EG 202 843] ETSI Guide 202 843 (07/11), *User Group; Quality of ICT Services; Definitions and Methods for Assessing the QoS parameters of the Customer Relationship Stages other than utilization*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined in

- [ITU-T E. 800] ITU-T Recommendation E 800 (09/08), *Definitions of terms related to quality of service*

Cessation
Charging
Confidence level
Customer
Measure
Parameter
QoS
Service Provider
User

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 Opinion Rating

OR is a quantitative value (a number) assigned to a qualitative performance criterion on a predefined rating scale to reflect the merit of that criterion to a user or customer. (Refer also to Annex C of this document).

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CDF	Cumulative distribution Function
OR	Opinion Rating
PDF	Probability Distribution Function
PI	Preliminary Information
QoSAP	QoS Assessment Party
SP	Service Provider
SME	Small and Medium Enterprise

5 Conventions

Annex C of this document shows time line sequences of the progress of a criterion (expressed as a parameter) to illustrate the events significant for the identification and measurement of the parameter performance value(s).

6 Identification of QoS parameters for stages other than utilisation of a service

Identification of QoS criteria for non-utilisation stages of ICT services may be facilitated by the use of frameworks in [ITU-T G.1000] and [ITU-T E.802].

The QoS parameters defined in Annexes A, B and C are based on the contents of [ETSI EG 202 843]. Additional materials to implement these parameters may be found in [b-ETSI TS 102 844] and [b-ETSI TS 102 852].

The criteria have been defined as parameters and care has been taken to ensure that different viewpoints are covered. The range of parameters was intended to cater for different requirements of various customer segments of the population. When selecting a set of QoS parameters to compare

SPs performance it is only necessary to focus on those of relevance and may be restricted to as few as 5-15. Parameters identified are in Annex A.

7 Selection of parameters for the comparison of Service Provider's performance by customers

The following considerations ought to be applied in the selection of parameters for use by customers of the Service Provider's performance:

- a) Comparison of performance of SPs is more likely to be relevant for the providers in a region or a country rather than on a global basis. A recognised stakeholder, e.g. regulator may select QoS parameters for the comparison of SPs. This selection could reflect the local market characteristics, customer's preferences and requirements.
- b) The number of parameters may be chosen to be manageable both for reporting and for practical application.
- c) Where local market characteristics require different sets of parameters for different customer sectors this may be reflected in the choice of parameters.

8 Reporting of QoS performance levels for the benefit of customers

Performance levels may be estimated from one or more of the following sources;

- Data held in the SP's systems,
- Customer surveys
- Opinion rating by expert panels.

The stakeholder/regulator of a region/country may recommend a method of presenting the performance values to enable customers to make easy comparison between SPs. The process of obtaining performance values ought to be audited to international standards.

Annex B gives more details on the procedures for measuring and reporting performance values on a selection of parameters and Annex C gives some guidance to ensure comparability of performance values.

Annex A

List of QoS parameters

(This annex forms an integral part of this Recommendation)

The following QoS parameters have been identified as being potentially useful for comparison of SP's performance levels.

Preliminary Information on ICT Services:

Parameter 1: Integrity of Preliminary Information

Integrity of Preliminary Information (PI) is characterised by a true and fair view of the main points of an ICT service provided to the potential customers by the SP.

Measure: Opinion Rating

Parameter 2: Pricing transparency

Pricing transparency of an ICT service is characterised by clarity, conciseness and unambiguity in every tariff structure for all usage conditions for every service provided by the SP.

Measure: Opinion Rating

Parameter 3: Availability of PI

Ratio of the number of requests from potential users and customers for PI which have been delivered to the total number of requests within a pre-defined time interval.

Measure: Fraction or percentage

Parameter 4: Response time for the provision of PI

Time taken from the instant a request for PI was sent to the SP to the instant all requested information was delivered to the customer requesting the information.

Measure: Time.

Contractual matters between ICT Service Providers and Customers

Parameter 5: Integrity of contract information

True and fair view of pertinent information on supply, maintenance and cessation for a telecommunications service provided by a SP.

NOTE 1: A contractual document describing the supply, maintenance and cessation for a telecommunication service by a SP is clear, accurate, complete, understandable and unambiguous.

NOTE 2: The language, phrasing and expressions chosen are aimed at maximum understanding for the target customer segment.

Measure: Opinion Rating.

Parameters 6: Compliance of contractual terms with Preliminary Information

Degree of concurrence of the contents of the contractual document to the PI. This comparison between contractual terms and PI should be based on the PI in force during the period of the contract. Contractual document could have detailed terms which were implicit in the PI. Where differences exist these are not to be considered as errors as long as additional and not contradictory information is provided.

Measure: Ratio or percentage.

Parameter 7: Flexibility for customisation before contract

The scope and boundary to meet individual customer's specific requirements of service feature/s, service performance/s and terms and conditions before formal signature on the contract.

NOTE: These specific requirements would be departures from the standard service features, performance and terms and conditions normally offered by the SP.

Measure: Opinion Rating.

Parameter 8: Ease and flexibility to amend terms after formal contract

The scope and boundary of the amendments that could be accommodated to contractual terms to satisfy the post contractual amendments sought by a customer.

This excludes contracts which the provider has specifically stated as not considered for amendments.

Measure: Opinion Rating.

Provision of Services

Parameter 9: Meeting promised provisioning date

Successful completion of provisioning of service on the date promised in the contract in relation to the total number of signed contracts with promised service provisioning dates.

Measure: Ratio or percentage.

Parameter 10: Time for provisioning

Period of time between the scheduled provisioning time and the actual provisioning time

Measure: Time.

Parameter 11: Successful provisioning within specified period

Number of successful service provisioning events in relation to all expected provision events within a pre-defined period of time.

Measure: Ratio or percentage.

Parameter 12: Contract cancelled due to non fulfilment

Contracts cancelled due to the ongoing non-fulfilment and considered unreasonable to wait any longer to the total number of signed contracts within a given assessment period.

Measure: Ratio or percentage.

Parameter 13: Completeness of fulfilment of contractual specification in the provision of a service

Contracts with all network and/or service features specified in the contract fulfilled (after its provisioning) in relation to the number of contracts that have been considered fulfilled for provisioning.

Measure: Ratio or percentage.

Parameter 14: Punctuality of service provisioning

Time difference between the actual service provisioning and that contractually specified.

Measure: Time.

Parameter 15: Punctuality of equipment delivery of service provisioning

Time difference between the actual equipment delivery and the scheduled delivery announced by the service provider for the service provisioning.

Measure: Time.

Parameter 16: Provisioning not complete and correct first time

Ratio of service provisioning which are either not completely carried out or not correctly carried out in the first attempt to the total number of contracts where the provisioning is deemed completed.

NOTE: The indicator for this parameter provides how well the SP has performed in complete and correct provisioning at the first attempt.

Measure: Ratio or percentage.

Service Alteration**Parameter 17: Time for alteration of service**

Time elapsed from the instant alteration notification is received by the user to the instant the alteration is completed.

Measure: Time.

Parameter 18: Successful service alteration within specified period

Ratio (percentage) of the number of contracts (or services) with successful service alteration to the total number of contracts (or services) with announced service alteration within the contractual specified period of time

Measure: Ratio or percentage.

Parameter 19: Completeness of fulfilment of contractual specification in the alteration of a service

The ratio of all contracts where all specifications related to the service alteration contractually agreed are met or completed to the total number of contracts where alteration has been requested.

Measure: Ratio or percentage.

Parameter 20: Punctuality of appointments for service alteration

Time difference between the actual service alteration and the scheduled alteration time announced by the SP.

Measure: Time.

Parameter 21: Punctuality of equipment delivery for service alteration

Time difference between the actual equipment delivery and the scheduled delivery announced by the SP.

Measure: Time.

Parameter 22: Service alteration not complete and correct first time

Ratio (percentage) of service alteration which were either not completely or not correctly carried out in the first attempt to the total number of contracts where alteration has been requested.

Measure: Ratio or percentage.

Parameter 23: Conformity and success of service alteration

Ratio of the number of contracts where service alteration were not according to specification and therefore requiring reworking or further service alteration to the total number of contracts where alteration was requested.

Measure: Ratio or percentage.

Parameter 24: Technical reliability of service within an agreed period after alteration

Number of observation phases after service alteration without any limitation to the total number of service alteration carried out.

Measure: Ratio or percentage.

Parameter 25: Organisational efficiency of service provider to carry out service alteration

Organisational and hardware resource availability to carry out service alterations to meet the needs of the customer and/or to meet contractual promises.

Measure: Opinion Rating.

Technical upgrade of ICT services

Parameter 26: Time for technical upgrade of a service

Time elapsed from the instant the technical upgrade period was announced to the user to the instant the technical upgrade was carried out.

Measure: Time.

Parameter 27: Successful technical upgrade within a specified period of time

Ratio of successful service technical upgrades carried out in a specified timeout interval to the total number of technical upgrades carried out within the same period.

Measure: Ratio or percentage.

Parameter 28: Completeness of fulfilment of specification in the technical upgrade of a service

Ratio of the number of successful upgrades where all specification requirements were met to the total number of contracts with such upgrades scheduled in a specified period.

Measure: Ratio or percentage.

Parameter 29: Punctuality of appointments for technical upgrade

Time difference between the actual technical upgrade and the scheduled upgrade time announced by the SP.

Measure: Time.

Parameter 30: Outage time due to technical upgrade

Duration when the service in part or in full is unavailable to the customer for use due to the technical upgrade process.

Measure: Time.

Parameter 31: Technical upgrade not complete and correct first time

Ratio (percentage) of the number of contracts not completely carried out or not correctly carried out in the first attempt to the total number of contracts.

NOTE: The indicator for this parameter provides how well the SP has performed in complete and correct technical upgrade at the first attempt.

Measure: Ratio or percentage.

Parameter 32: Conformity and success of technical upgrade

Ratio of technical upgrade not according to specification and therefore requiring reworking or further service upgrade processes and resources to get it right to the total number of contracts upgraded.

Measure: Ratio or percentage.

Parameter 33: Technical reliability of service within an agreed period after technical upgrade

Ratio of the upgrades that perform satisfactorily for a specified period after the upgrade to the total number of upgrades carried out.

Measure: Ratio or percentage.

Parameter 34: Organisational efficiency of service provider to carry out technical upgrade

Organisational and hardware resource availability on the part of the SP to carry out technical upgrades to meet the needs of the customer and/or to meet contractual promises.

Measure: Opinion Rating

Parameter 35: Competence and preparedness of service provider for technical upgrade

Degree of ability (competence) and willingness (preparedness) to incorporate technical upgrade relevant to the service for the benefit of users.

Measure: Opinion Rating

Documentation of services (operational instructions)

Parameter 36: Documentation delivery time

Time taken from the instant a service is provided to the instant documentation for the commissioning and use of the service is delivered to the customer.

NOTE: Documentation not delivered before a specified timeout will be considered as not delivered in time.

Measure: Time.

Parameter 37: Availability of documentation within specified period of time

Number of contracts where documentation was supplied within a specified period of time to the total number of contracts where documentation was expected.

Measure: Ratio or percentage.

Parameter 38: Integrity (correctness and completeness) of documentation

Correctness, completeness and user friendliness of pertinent information associated with the use of all features of a service and its maintenance.

Measure: Opinion Rating.

Parameter 39: Modes of documentation

Number of modes in which documentation is made available to the customer or user of a service.

Measure: Number.

Parameter 40: Legibility of documentation

Visual clarity, language, understandability and layout of the information in the medium in which it is presented.

Measure: Opinion Rating.

Parameter 41: Overall reliability of documentation services

Consistent availability, integrity, speed of provisioning of the documentation and associated support activities provided by the SP for a given service.

Measure: Opinion Rating.

Technical support provided by service provider**Parameter 42: Accessibility of the technical support**

Ratio of the number of successful attempts to technical support to the total number of attempts to reach this support.

Measure: Ratio or percentage.

Parameter 43: Technical solutions achieved within a specified period

Ratio of the number of contracts with successful technical solutions applied, to the total number of contracts where solutions were sought and applied within the specified period.

Measure: Ratio or percentage.

Parameter 44: Number of attempts before successful solutions

Number of attempts before the technical request was successfully resolved.

Measure: Number.

Parameter 45: Integrity of technical solutions

Proportion of successful solutions with respect to the total number of requests within a specified period of time.

Measure: Opinion Rating.

Parameter 46: Reliability of technical solutions achieved

Ratio of number of services that were trouble-free for a specified period of time after the technical solution was resolved to the total number of services where the technical support was requested and implemented.

Measure: Ratio or percentage.

Parameter 47: Modes of technical support

Number of modes in which technical support is available to the customer or user of a service.

Measure: Number.

Commercial support provided by service provider**Parameter 48: Accessibility of the commercial support**

Ratio of the number of successful access attempts to the commercial support to the total number of attempts to reach this support.

Measure: Ratio or percentage.

Parameter 49: Commercial solution delivery time

Time elapsed from the instant the customer raised a problem with commercial support to the instant a solution was achieved.

Measure: Time.

Parameter 50: Commercial solutions achieved within a specified period of time

Ratio of the number of contracts with successful commercial solutions achieved, to the total number of contracts where solutions were sought within a specified period.

Measure: Ratio or percentage.

Parameter 51: Integrity of commercial solutions achieved by service provider

Ratio of successful solutions achieved within the specified period of time to the total number of commercial support requests.

Measure: Opinion Rating.

Parameter 52: Modes of commercial support

Number of modes in which commercial support is available to the customer or user of a service.

Measure: Number.

Parameter 53: Organisational efficiency of commercial support

Availability of organisational resource to fulfil customer needs on commercial support.

Measure: Opinion Rating.

Complaint Management**Parameter 54: Accessibility of the complaint management**

Ratio of the number of successful attempts to the total number of attempts to reach complaint management in a specified period.

Measure: Ratio or percentage.

Parameter 55: Recognition of the customer complaints

Ratio of the customer claims recognised by the SP as genuine complaints to the total number of potential complaints.

Measure: Ratio or percentage.

Parameter 56: Complaint solutions not complete and correct first time

Ratio of the number of complaints not successfully resolved at the first attempt to the total number of complaints received by the SP.

NOTE: The indicator for this parameter provides how well the SP has performed in complete and correct handling the customer complaint at the first attempt.

Measure: Ratio or percentage.

Parameter 57: Integrity of complaint resolution

Ratio of the number of complete and professional resolution of the contributory causes of a complaint to the total number of accepted user complaints accepted.

Measure: Ratio or percentage.

Parameter 58: Customer perception of the complaint management

"Customer perception of the complaint management" is characterised by the exhibition by the SP of combination of Assurance, Empathy and Responsiveness in dealing with the complaints from its reporting to its satisfactory resolution.

Measure: Opinion Rating.

Parameter 59: Overall quality of the complaint management process

"Overall quality of the complaint management process" of a SP is characterised by the combined effect of accessibility of the CM service, correct solutions at the first attempt, speed of resolution and the organisational capability to carry out these.

Measure: Opinion Rating.

Parameter 60: Organisational efficiency of complaint management system

"Organisational efficiency of the complaint management system" is characterised by the availability and deployment of organisational and hardware resources on the part of the SP to resolve user's complaints.

Measure: Opinion Rating.

Repair Services

Parameter 61: Accessibility of repair services

Availability of hardware, software and staff resources necessary to restore a service (and its features) to its specified level of performance.

Measure: Ratio or percentage.

Parameter 62: Successful repairs carried out within a specified period of time

Ratio of the number of repairs successfully carried out to the total number of repair requests accepted by the SP within a specified period.

Measure: Ratio or percentage.

Parameter 63: Repairs not complete and correct first time

Ratio of the number of repairs which were not successfully carried out at the first (and only) attempt to the total number of repairs carried out during the specified period.

Measure: Ratio or percentage.

Parameter 64: Punctuality of appointments for repairs

Record of attendance of a SP agent to carry out repair at the specified time (allowing, if necessary, a grace period for lateness). It may also be expressed as an opinion rating of customers.

Measure: Opinion Rating and/or Time.

Parameter 65: Efficiency of the repair services

"Efficiency of the repair service" (mainly technical) of a SP is characterised by the combined performances of

- accessibility
- the number of repairs in a specified period of time
- repairs carried out successfully first time , and

- punctuality.

Measure: Opinion Rating.

Parameter 66: Organizational efficiency of repair services

"Organisational (or operational) efficiency of repair service" is characterised by the combined performances of:

- punctuality,
- time to repair
- provision of resources (human, hardware and software) and
- the organisational logistics to provide an effective repair service.

Measure: Opinion Rating.

Parameter 67: Notification of root cause of outage

Ratio of the number of repairs which were informed their root cause to the customer to the total number of repairs carried out.

Measure: Ratio or percentage

Charging and billing

Parameter 68: Accessibility of the tariff information

Ratio of the number of successful attempts to the total number of attempts to reach this facility located as indicated in the contract or regulations (Access details to this facility to be provided by the SP).

Measure: Ratio or percentage.

Parameter 69: Successful notification of exceeding billing budget

Ratio of the number of successful notifications by the SP of exceeding the customer's billing budget to the total number of exceeding customer's billing budget events.

Measure: Ratio or percentage.

Parameter 70: Notification time (delay) of exceeding billing budget

Time from the instant of billing budget overrun to the instant of the reception by the customer of this notification from the SP.

Measure: Time.

Parameter 71: Accessibility of the account management

Ratio of the number of successful attempts to the total number of attempts to reach the account management.

Measure: Ratio or percentage.

Parameter 72: Time to update charging information

The time between the use of service and the instant the related charging information is available on the account.

Measure: Time.