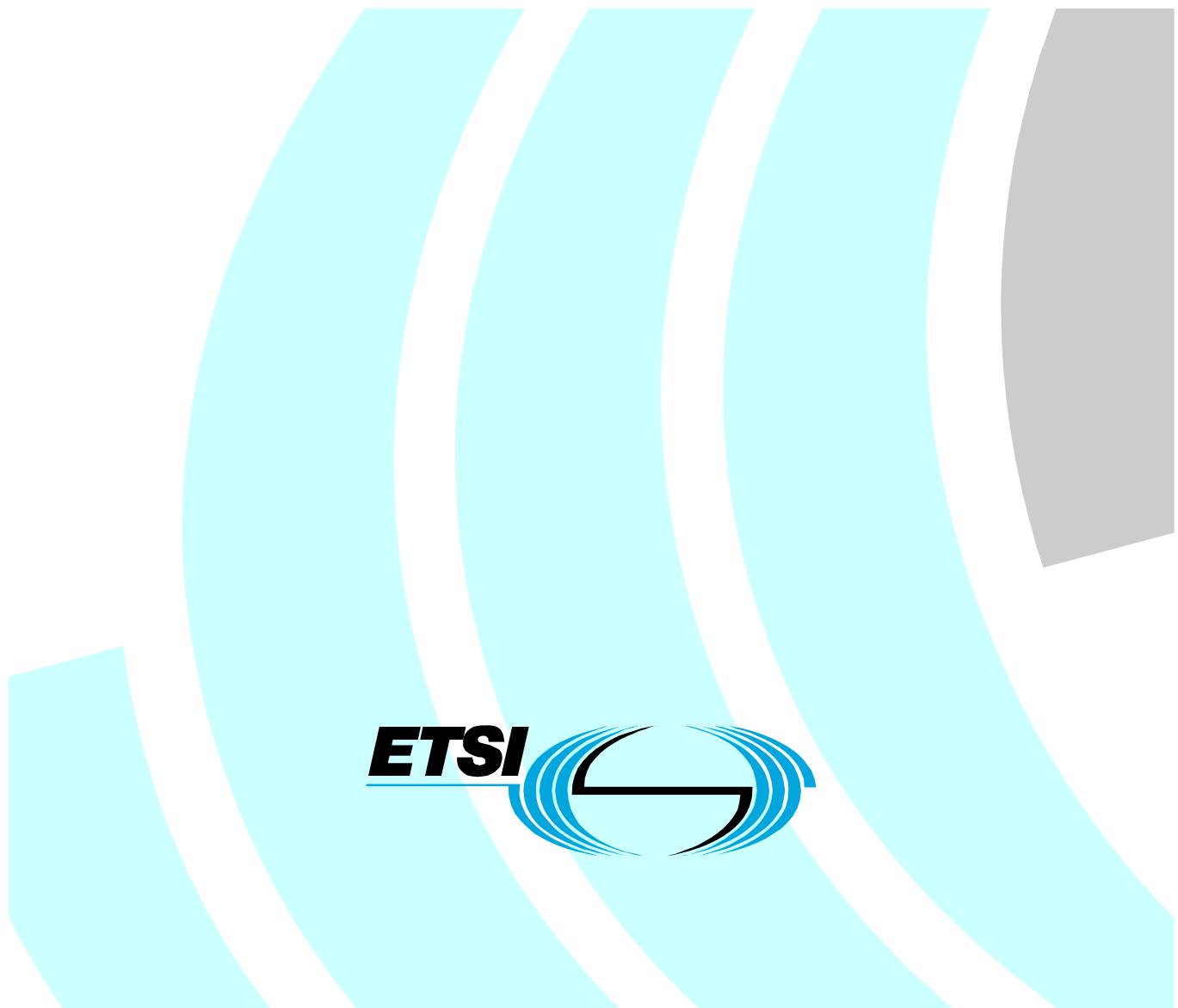


ETSI TS 102 852 V1.1.2 (2011-07)

Technical Specification

**User Group;
Quality of ICT Services;
Assessment process of the QoS parameters of
the customer relationship stages**



Reference
RTS/USER-0036
Keywords
CTS, performance, QoS, user

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Foreword

This Technical Specification (TS) has been produced by ETSI User Group (USER).

Introduction

The present document provides the requirements needed to ensure that QoS information is assessed according to the best practices as detailed in EG 202 843 [i.1]. It is closely linked to:

- EG 202 843 [i.1] that defines parameters and basic information which are universally applicable to QoS assessment. One aim here is to keep the parameter definitions stable and complete for any kind of application.
- TS 102 844 [1] that defines when, how and by whom a conformity assessment audit of the QoS assessment shall be conducted, if such conformity assessment is desired.

1 Scope

The present document defines a common set of test sequences that are applicable by any stakeholder in order to provide results that are objective, reproducible and comparable.

It details - in a generic way - the assessment sequences for the 4 types of parameters: Time, Percentage, Number and Opinion Ratings as given in EG 202 843 [i.1].

The present document also provides examples of a set of dedicated assessment sequences for parameters of selected stages of the customer relationship course (QoS Assessment process).

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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

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 necessary for the application of the present document.

- [1] ETSI TS 102 844: "User Group; Quality of Telecom Services; Conformity assessment; Requirements for bodies providing QoS assessments and surveys".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI EG 202 843: "User Group; Quality of ICT Services; Definitions and Methods for Assessing the QoS parameters of the Customer Relationship Stages other than utilization".
- [i.2] ITU-T Recommendation P.832: "Subjective performance evaluation of hands-free terminals".
- [i.3] ETSI EG 202 057: "Speech and multimedia Transmission Quality (STQ); User related QoS parameter definitions and measurements".
- [i.4] ETSI EG 202 009: "User Group; Quality of telecom services".

3 Definitions and abbreviations

3.1 Definitions

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

test method: assessment method of QoS parameters carried out by a Quality of Service Assessment Party (QoSAP) providing QoS audits and surveys based the assessment of parameters described in EG 202 843 [i.1]

test sequence: detailed procedure of the **test method** applying to the types of parameters as described in EG 202 843 [i.1]

NOTE: Test in the context of the present document and EG 202 843 [i.1] has a different meaning from compliance or interoperability testing.

3.2 Abbreviations

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

ADSL	Asymmetric Digital Subscriber Line
CS	Customer Survey
DSL	Digital Subscriber Line
EP	Expert Panel
FTTH	Fiber To The Home
IPTV	Internet Protocol Television
ISDN	Integrated Services Digital Network
KPI	Key Performance Indicator
OR	Opinion Rating
PDA	Personal Digital Assistant
PI	Preliminary Information
PSTN	Public Switched Telephone Network
QoS	Quality of Service
QoSAP	Quality of Service Assessment Party
SMS	Short Message Service
SP	Service Provider
SPDA	Service Provider Data Analysis
SPO	Service Provider Oriented (parameter)
TMF	Telemanagement Forum
VoD	Video on Demand
VoIP	Voice over IP

4 Definition of a QoS assessment campaign, aims and purposes

Prior to executing a campaign, the concrete aim of the campaign shall be defined and documented. The campaign may be initiated by any stakeholder (SP, Consumer association, regulatory bodies, etc.). The design of the campaign could depend on the specific objectives of a stakeholder. The next clauses define generic principles to design a campaign. The QoS parameters shall be implemented according to EG 202 843 [i.1].

4.1 General

The EG 202 843 [i.1] defines the different stages of the customer relationship, the parameters and the preferred methods to assess them. Table A.1 summarizes the main information and recommends the preferred approaches detailed in EG 202 843 [i.1]: Customer Survey, Expert Panel and SP Data Analysis.

Defining the aim of a campaign means that several choices and decisions have to be carried out. One of the important initial tasks is to define the perimeter of the campaign and to define the profile of the panels to participate to the campaign.

4.2 Questions to be answered when designing a QoS assessment campaign

When designing a QoS assessment campaign, a set of questions has to be answered, which determine the elements to be taken into account within the assessment campaign.

Several Service Providers may be involved in the assessment campaign. For each of them the following questions shall be answered:

- What are the selected stages of the customer relationship lifecycle, as defined in EG 202 843 [i.1]?
- What is the list of services within the SP offers that will be assessed?
- Phases can be used as modules; different modules building the complete interrogation.
- How many Service Providers will be involved in the assessment campaign?
- Is the assessment campaign defined as a Benchmarking? -Direct comparison of different providers (e.g. comparison of success rates or comparison of time parameters across different providers).
- Will the assessment campaign be a "one shot" or be made periodically?
- What type of approach has to be implemented: customer survey, expert panel, SP Data, Analysis or a mix of them?
- What customer group has to be involved (For customer survey and expert panel, the profiles and the number of participants have to be specified).

4.3 Tasks for the campaign

A table defining a set of tasks to be done by the Expert Panel is provided in informative annex E.

- For the **expert panel** the tasks are designed specifically in order to ensure all the providers and/or services are treated in a similar way and to reduce as much as possible the time spent in collaborative works between the experts.

The customers involved in the customer survey shall be currently using the services and they have to answer a set of questions.

- For **customer survey** real example of a customer survey campaign including several customer relationship stages is provided in annex D and could be used as an informative reference when defining a campaign.
- For the approach based on SP Data Analysis the design of the test should take into account the type of data made available by each service provider.

5 Boundary conditions for campaign

For recurrent and benchmarking campaigns the conditions have to be clearly defined in order to make results comparable and reproducible. This includes in particular the selection of expert panels or customers participating in the surveys, the test duration, the media to access participants, etc.

When preparing an assessment campaign related to the customer relationship course all the variables that may influence the assessment outcomes shall be defined. One main reason for detailing all the parameters is to give the possibility for other parties to reproduce comparable assessments. As soon as one of the variables is changed, the campaign might characterise a different assessment with deviations in the results.

All the parameters that define an assessment campaign have to be checked carefully and listed in the assessment plan, in particular:

- The parameters that are retained within each stage have to be defined for each stage of the customer relationship life cycle. This could include dedicated part of customer relationship cycle, e.g. only DSL clients, only roaming issues of business users, etc.
- As EG 202 843 [i.1] defines three types of approaches, "Expert panel", "Customer panel" or "Service Provider data Analysis", the most appropriate type must be chosen for the different parameters (see annex A). For each parameter included in the campaign, the option chosen has to be defined and justified.

- If the campaign includes Customer surveys, the appropriate customer groups to be involved in the assessment shall be determined. In particular it shall be defined if there is a focus on private and/or business customers. The number of customers involved in the campaign shall also be established to ensure statistically valid results. It shall be checked that the customers involved in the assessment sessions will not participate in more than 2 sessions per year.
- If the campaign includes expert panels, the characteristics/profiles of the experts to be involved shall be defined.
- The assessment plan shall also define the media that will be used to address the attendees and the media that are foreseen for the feedback of the attendees.
- The assessment plan shall define the campaign duration, and if the campaign is carried out on a periodical basis and the periodicity of the sessions.
- If questionnaires are addressed to customers, it shall be defined if and when reminder messages could be sent during the runtime of the assessment.
- It shall be checked if there is a special geographical area of interest, e.g. handling of DSL contracts in rural areas where no broadband data service is available due to physical constraints.
- For customer surveys, it shall be defined what kind of methods will be used: e.g. telephone interview, mailing activity, online questionnaire, direct interview in a shopping mall.
- For expert panel it shall be defined if the experts will be questioned in-situ or at distance, and if they will do it individually or all together (in such a case, preferably a physical meeting).
- The operational team (QoSAP) that will design and run the assessment shall be defined and documented. This shall be defined for customer surveys, expert panels and analysis of SP Data.
- It shall be checked if the operational team (QoSAP) needs to involve other companies or departments, e.g. call centres for phone interrogations, companies for recruiting panels, companies for campaign execution.

For Expert panel and Customer survey even if the approaches may be different, the questionnaires/measurement methods may be rather similar.

In particular, questionnaires shall be designed to select customers and experts to be involved in the assessment sessions. These questionnaires should be based on the contents of annex C.

It shall be taken into account that the customers may only reply for services or providers they have actually experienced.

For experts (or experienced/trained users) it is needed to design the tasks so that all the service providers are assessed in similar/equal conditions and equal footing. The experts are participating in the assessment session for a limited period of time and they shall complete the tasks which are defined within the assessment sequences.

5.1 Customer survey

To get a broader basis of feedback, customer surveys (panels) can be used. A customer panel consists of common customers of products or services. The customers should be familiar with the topic they are surveyed for, but without reaching an expert level. The selection should be based on replies to the relevant questions defined in annex C. The selection may also be done by Service providers, customers groups, etc.

In many cases, specialized institutes are engaged to deal with the panel recruitment. This is based on the fact that either a well-defined part of the population should be taken into consideration (e.g. only females aged 25 to 35 years with a certain net household income) or that the selected group of customers should be representative for the complete population of this country or for the complete population of customers of a service provider.

When selecting the customer panel it may be needed to ask questions related to the user's background, such as defined in annex C.

To ensure relevant statistical results, the number of customers shall be important. The level of customer attendance to ensure the desired level of statistical relevance of data is defined in EG 202 843 [i.1] and copied in clause 5.4 of the present document.

When designing the assessment event it is needed to take into account that additional expenses are generated by the involvement of market research institutions.

Customer survey interrogations need currently a longer period of time than for the expert panel (up to several weeks).

When Opinion Rating (OR) is sought via both a customer survey and an expert panel, there may be discrepancy between the findings of these differing means. Where the difference is significant, reason for this discrepancy should be investigated and any necessary changes incorporated either to the panel's ratings or the way the customer survey is carried out.

When questionnaires are sent to an email list of customers (or by postal mail) or when customers are asked by phone calls, the percentage of replies may be very low compared to the whole customer list. This has to be taken into account to ensure a high level of statistical relevance of the results.

5.2 Expert panel

An expert panel is defined as a group of experts, who are very familiar (or professional) with the topic of interest. The expert panel evaluates the topic of interest and gives expert opinion on it.

For some experiments, experts may be replaced by experienced or trained customers/users. To distinguish experts and experienced/trained users, the following definitions have been adapted from ITU-T Recommendation P.832 [i.2]:

- **Experienced/trained users:** Experienced/trained users (for the purpose of customer relationship QoS evaluation) are experienced in QoS testing and analysing the quality of some stages of the customer relationship, are not individuals who routinely conduct such assessments. Experienced/trained users are able to describe their subjective impressions on the different stages in detail. However, experienced/trained users neither have a background in technical implementations of customer relationship stages covered by EG 202 843 [i.1] nor do they have detailed knowledge of the influence of the parameters on the quality perceived by the customers.
- **Experts:** Experts (for the purpose of customer relationship QoS evaluation) are experienced in QoS testing and analysing the quality of the different stages of the customer relationship. Experts are able to describe all the events, tasks and deliverables of the customer relationship in detail and are able to implement the assessment methods or to analyse the results as described in EG 202 843 [i.1] and to analyse the specific impairments in the processes. They are able to describe their impressions in detail. They have a background in technical implementations of the customer relationship stages and/or do have detailed knowledge of the influence of customer relationship implementations on QoS perceived by the customers. Experts may be used for all types of assessments defined in EG 202 843 [i.1]. Typically the expert's judgement is validated by untrained users representing the average user group the set is intended to be used for.

In case where the number of experts cannot be reached, experienced/trained users may complete the team or the group. However, if experts and experienced/trained users are mixed within an experiment care should be taken to avoid experts masking the feedbacks from experienced/trained users, in particular when all the participants meet together.

Ideally, the selected experts bring a broad theoretical background and practical experience as well as a longer period of personal knowledge with them. Besides that the selection of experts should take into consideration that all relevant aspects of the examined topic are covered by the combination of experts within the panel.

The number of experts required to address a certain topic should be limited (currently between 10 and 20).

A questionnaire to select expert panel is defined in annex C:

- Selection process and criteria for selection are very important because the quality of the experts may influence severely the quality of the results.
- It is also important that all required experts may be together at the same place and time (or over a short period of time), or by high quality conference systems.

NOTE: It is needed to plan for expenses generated by the involvement of experts.

For the expert panel, two different approaches can be undertaken, depending of the relationship stage:

- In a first step each expert realises specific tasks individually and provides replies to questionnaires and comments based on their own knowledge and perceptions; in a second step they meet together to exchange on the results or observations obtained.
- The task is done collectively on the basis of materials made available to all the experts during a specific meeting. In such a case feedback to one specific subject can be collected rather quickly (during an experts' meeting).

As Experts are used as highly-trained customers they may reflect customers' point of view and may also comment together on the results.

Studies carried out on particular QoS aspects like assessment of call centre QoS made using "mystery calls" or QoS of mobile communications by human operators belongs to this category of data source. The experts involved in the "mystery calls" should act as normal customers but shall ask pertinent questions to obtain detailed answers.

5.3 Service Provider Data Analysis

For certain customer relevant processes, service providers (SPs) may have available customer records for their own purposes or due to regulatory requirements. In these cases such data may be used for the determination of customer relevant parameters as well but in a well controlled process.

NOTE: It appears that some parameters defined by Telemanagement Forum (TMF) may be used for such approaches. Some further investigations will be needed to achieve this.

Before using SP Data for an analysis, it shall be checked that the parameters and measurement methods defined in EG 202 843 [i.1] apply for the data collected. If the measurement conditions implemented by the Service Providers differ from those available in EG 202 843 [i.1], it should be checked that the data may be used without any trouble. The service provider shall document the measurement conditions for the data collection and shall ensure that the purpose and conditions are compliant with the principles defined EG 202 843 [i.1]. Prior to implementing such a process it will be checked that the SP Data are well correlated with parameters defined in EG 202 843 [i.1].

It could be expected that such an approach should reduce the data generation since the data is available from the usual day-to-day business. It could also be associated to customer surveys or expert panels.

A large amount of data sets may be available (mass data), depending on the number of customers contracted by the SP and depending on their activity.

For such an approach the service providers will be an active actor of the process.

5.4 Samples sizes and examples (excerpt from EG 202 843)

Besides the different nature of the mentioned data sources, the number of available samples for each of these data sources may also differ heavily, as indicated in EG 202 843 [i.1].

- To assess a special topic, only a few but highly trained experts are required. This leads to a high quality feedback, but includes also very limited number of information.

EXAMPLE 1: 15 experts are requested to assess the "Integrity of Complaint Resolution". The outcome will be 15 different opinions on corresponding scale.

- The assessment of topics which are more common to all customers and which do not require special expertise allows the involvement of a higher number of customers.

EXAMPLE 2: Replies from 150 customers of SP A who complained about a certain matter are selected to give their feedback on the "Customer Perception of the Complaint Management".

Here, the quality of the feedback will not be on expert level, but represents the customer perception very clearly. Furthermore, the number of samples is higher than in the first case which improves the data basis for statistical operations.

- Finally, if mass data from service provider's internal processes can be assessed, there are two advantages: The weight of each data set on the overall result is negligible, and most of the data will be measured objectively.

EXAMPLE 3: SP B delivers 10 000 data sets which allow to determine the parameter "Time for alteration" on a very broad basis.

6 Preparation of the campaign

After defining the basis of the assessment by fixing the basic boundary conditions, the operational phase should be prepared, depending on the assessment approaches chosen.

The following should be born in mind when planning surveys.

Basically there are three methods of carrying out a customer survey:

- 1) questionnaire posted to the interviewees;
- 2) questionnaire administered by an interviewer over telephone; and
- 3) administering questionnaire on a face to face basis between the interviewer and the interviewee.

Each method has its merits and disadvantages. These are outlined briefly here.

Questionnaire posted to the interviewee

Respondents are asked to fill in the quality ratings for the performance parameters.

Advantages:

Questionnaire is a powerful tool to capture customers' performance ratings. This method of administering a survey is also the cheapest as very little manpower is involved.

Disadvantages:

In filling in questionnaires, the respondent does not usually have the means to seek clarification on questions they do not understand. This could result in vague answers. Some parts of the questionnaires may be left blank. There may also be some questions the respondents may have misunderstood.

The response rate is low. In general these vary from below 5 % to upper 30's % for user club members. This means a very large sample size has to be sent the questionnaire to obtain a statistically valid number of responses. Additionally the answers should be carefully analysed to ensure that the replies provided clearly indicate that the customer has understood the question. It must be borne in mind that some customers fill in the form without much thought. Indeed in certain psychological questionnaires it is common to insert a "lie detector" question to ensure that the answers provided are consistent to the person's beliefs in providing answers.

Questionnaire administered by an interviewer over telephone

Advantages:

Telephone questionnaires are a compromise between postal questionnaire and face to face interview. The interviewer can ensure to a greater extent than the postal survey that the customer has understood the question. There is scope for the customer to clarify points she/he is unsure of. The response rate is also much higher than those of postal survey.

Disadvantages:

The principal shortcoming of this type of interview is the absence of body language of the respondent. This limits the understanding of the questioner of the respondent's concerns.

Cost of administering telephone interviews are higher due to the manpower costs comprising overhead and training costs.

Administering questionnaire on a face to face basis between the interviewer and the interviewee

Advantages:

Face to face interviews, with a questionnaire, should provide the ideal alternative to the postal and telephone questionnaire. Some of the shortcomings mentioned in the previous methods can be eliminated.

Face to face interviews provide the most credible answers and therefore the confidence in their accuracy and relevance is very high. This type of survey is usually kept aside for large organisations.

Disadvantages:

Face to face interviews are time consuming and make a high demand on resources:

NOTE: The sample size required for postal questionnaire is the highest, with telephone interviews requiring fewer samples and the method of personal interviews requiring least samples for a given level of confidence.

6.1 Customer Survey

When the area of the campaign has been defined and the questionnaire built up it is important to prepare all the materials that will be addressed to the potential participants (by post, e mail, phone call, etc.).

As indicated in annex B, the questionnaire will be addressed to the selected participants. Care should be taken when defining the messages associated or preceding the questionnaire. These messages shall provide confidence and show the professionalism of the process.

It should also take care of security matters, in particular when using online questionnaires.

A pre-test shall be organised to ensure or improve the overall quality of the activity:

- Prior to official assessment campaign the pre-test phase shall be organised in the exact same way as the real test but with reduced number of participants. All the comments and issues received during this pretest phase shall be considered to finalise the assessment campaign.

To save cost and time it is preferable to prepare automated evaluation routines that can be applied during the evaluation phase and after the evaluation phase has finished.

During the experiment it is strongly recommended to monitor the development of the results; this may prevent issues from only being discovered after finishing the assessment campaign, e.g. if certain data is entered by the customers but does not reach the database due to minor errors in scripting.

The QoSAP shall inform the participants on the availability of an hotline that may be reached by phone or mail and to indicate the delay expected for replies to messages addressed to the hot line.

Care shall be taken to ensure the availability of all required resources, e.g. agents in the call center, mailing and computer systems for sending out invitation emails and for collecting feedback information.

The QoSAP shall prepare a monitoring of all relevant activities within the evaluation process, at least:

- To set up a quick reaction team to allow last minute changes within the assessment if this scenario might be useful.
- To monitor all kind of user activity on the system (mainly for online questionnaires):
 - To prevent running into overload situations (processor power, storage capacity of database, data links, etc.).
 - To prevent participants from misusing the system. In particular the injection of query statements to databases and the addition of remotely controlled frames to web applications should be checked in advance.

The QoSAP shall define a backup strategy to prevent from data loss.

6.2 Expert panel

For Expert panel and Customer survey the approaches are different. The expert panel works on a task-oriented process, as defined in annex E. However, some questions addressed to experts may be similar or based on examples available in annex D.

Due to the reduced number of experts compared to customers involved in a survey, the process may be simplified. However processes similar to customer surveys may be used for communications with the experts and to collect the data.

When experts are invited to meet physically or through high quality teleconference systems, the scenario of the meeting shall be defined very precisely, in particular the tasks to be done collectively and it shall be needed to ensure that all the experts are placed in similar conditions and on equal footing (all the experts have to express themselves; it shall be avoided that one or some experts take the lead of the discussions and impose their views). For additional analysis, the meeting may be recorded (audio and/or video).

6.3 Analysis of SP data

After having checked that the SP data may be used to assess some parameters defined in EG 202 843 [i.1], the service provider shall provide data in formats that are defined by the QoSAP.

7 Execution of the campaign

The execution of the campaign includes:

- The execution of the monitoring (see annex B).
- The activation of the hotline team for competent and quick resolution of issues.

7.1 Customer survey

It is not intended to invite customers to any meeting to discuss the comments or the additional information.

After the questionnaire has been sent to the participants, they have to reply before the defined deadline (usually two weeks). It may be relevant to send a reminder after one week to the potential participants who did not already answer.

When sending the questionnaires by email, several preventive actions have to be taken to avoid unsecure exchanges. In particular when using online questionnaire, the access to this questionnaire should be given in a two step process including email exchanges. An example is given in annex D.

It is also important during the campaign execution to ensure a daily hotline to reply to questions or remarks from the participants. The media used for the hotline should be as close as possible to the media used for the questionnaire.

7.2 Expert panel

The experts will be invited to a meeting to discuss the results they individually obtained or to work all together in a collaborative way.

If experts have to work individually before the meeting, they shall have to complete these actions prior to the meeting. The duration of these preliminary actions will be defined according to the tasks themselves. Prior to these actions the QoSAP shall have prepared all the materials needed by the experts. During these periods the QoSAP shall be able to answer quickly to questions or messages from the experts and to do all the relevant actions to solve potential issues.

The date and duration of the meeting will be known sufficiently in advance and all the experts shall participate.

The chair of the meeting shall be experienced in this kind of meeting.

7.3 Analysis of SP data

The tables provided by the QoSAP have to be filled by the service provider.

8 Data filtering

After the operation phase has been concluded, all data should be validated before doing computational assessments. This comprises different tasks like:

- Removing all unrealistic data, e.g. fake users who want to disturb your assessment.
- Removing data which was entered due to system problems, e.g. values out of range.

Before doing any manipulations on the data basis, all available data should be stored in a safe backup. If one of the following steps destroys data or manipulates data in an unintended manner, there is still a chance to recover from these situations.

If data has to be removed from the data basis, this should be done by setting an invalid marker to the data instead of physically deleting the data. The ratio of invalidated and validated data sets can be interpreted as an additional quality measure for the evaluation.

9 Aggregation of results

According to the pre-specified rules, data now can be aggregated. The aim of this activity is to transform the retrieved data to key performance indicators (KPIs) which give a highly condensed view of the underlying data.

Typical aggregation dimensions are time, location, addressed customer group, related provider, etc.

Besides the mean value of some statistically distributed data further methods should be taken into consideration:

- Calculation of minimum and maximum values.
- Quantile values, typically 5 % and 95 % quantiles which give some outlier related information.
- Compressed footprints of collected data by giving a set of quantile values, e.g. 5 %, 10 %, 50 % (median), 90 % and 95 % quantiles, extended by the mean value.

Great differences between mean and median value should be examined in detail. This scenario often represents large outlier values with a non-negligible influence on the mean value (whereas the median value is not influenced by these outliers due to its robustness).

10 Analysis of the results of the assessment campaign

To combine stand-alone KPIs to an integrated judgement, it should be appropriate to have a closer look at it to focus on root causes and their effects. This phase is necessary to establish a link to further optimisation activities to improve the overall situation for the customer.

This phase has to be conducted by QoSAP with an in-depth knowledge. They add their interpretation of the observed data to the KPIs. These additional comments allow an easier understanding of single issues as well as a more complete overall picture. In the end, KPIs with comments will give a readable report for non-expert readers.

However the statistics could be treated taking into account the differences in the numbers of participants (few for experts, a lot of for customers).

When several assessment methods (SP Data Analysis, EP, CS) are implemented, the different results should be crosschecked. If potential coherences/incoherencies between results obtained by different assessment methods for some parameters are identified, these should be analyzed and reported.

When the assessment campaigns are conducted on a periodical basis, the evolution of the KPIs shall be checked and documented.

11 Report

The assessment steps and all the factors/conditions of the assessment campaign shall be reported in detail.

In particular the report shall provide:

- the list of customer relationship stages assessed by the campaign;
- the list of parameters assessed and for each of them:
 - the assessment method(s) implemented;
 - the number and the profiles (see annex C) of customers or experts involved in the assessment campaign. It shall include the process to define the panel or the participants for the customer survey;
 - the list of the questions defined in the questionnaires;
 - the list of tasks for the participants and in particular for the experts;
 - the duration of the campaign.
- if meetings are organised, the report shall detail the different steps and other organisational information;
- for customer surveys, the percentage of attendees compared with the initially defined customers. It shall be reported if the answering customers are representative of the expected spread of participants;
- the list of actions done by QoSAP to contact the participants, to conduct the experiment, to collect the results, to store and secure the data and communications;
- for SP data analysis the tables of data in formats as defined by the QoSAP;
- the process implemented for statistical analysis of the results, including explanations about withdrawn (or not used) data;
- the results displayed (and when needed aggregated) according to EG 202 843 [i.1].

The KPIs, as defined in clause 10, are characteristic for the dedicated assessment and represent the outcome of the overall activity. They should be reported in an easy understandable format and should point out the key findings for each relevant constellation, e.g. for each question and also for each provider.

Lots of different schemes can be applied to visualise the determined KPI sets. Since in many cases the readers of such reports are used to have a certain representation, changes in the reporting format should be applied carefully.

Finally, the report including some analysis and visual representations should be distributed to the stakeholders.

Annex A (normative): Parameter overview

The table A.1 provides a parameter overview of the customer relationship stages. It includes the list of stages, the list of parameters, the parameter number, the type of parameter and the assessment principle (by a customer survey, an expert panel or an analysis of SP data).

This table summarizes the parameters defined in EG 202 843 [i.1] where the details on the assessment methods and parameter computation are available.

Table A.1

Stage	Parameter name	Parameter type	Parameter number	Assessment process	Expert panel	Customer survey	SP data
Preliminary information (PI)	Integrity of preliminary information (PI)	OR	101	EP	Y		
	Pricing transparency	OR	102	CS-EP	Y	Y	
	Availability of preliminary information (PI)	%	103	CS-SPDA		Y	Y
	Response time for the provision of preliminary information (PI)	t	104	EP	Y		
	Response time of the commercial desk	t & %	105				
	Overall rating of the responsiveness of the service desk	OR	106				
	User friendliness of the Internet user interface	OR	107				
	User friendliness of the service desk operators	OR	108				
Contract establishment	Integrity of the contract information	OR	201	EP	Y		
	Compliance of contractual terms with preliminary information (PI)	%	202	EP	Y		
	Flexibility for customization before contract	OR	203	CS-EP	Y	Y	
	Ease and flexibility to amend terms after formal contract	OR	204	CS		Y	
	Response time of the commercial desk	t & %	205				
	Delay to settle a contract	t &%	206				
	Delay for a contract acknowledgement	t &%	207				
	Overall rating of the responsiveness of the sales desk	OR	208				
	Ease of the subscription process	OR	209				
	Vendors empathy and responsiveness	OR	210				
Service provisioning	Meeting promised provisioning date	%	301	CS-SPDA		Y	Y
	Time for provisioning	t	302	CS-SPDA		Y	Y
	Successful provisioning within specified period	%	303	CS-SPDA		Y	Y
	Contract cancelled due to non fulfilment	%	304	EP	Y		
	Completeness of fulfilment of contractual specification in the provision of a service	%	305	CS-EP	Y	Y	
	Punctuality of service provisioning	t	306	CS-EP	Y	Y	
	Punctuality of equipment delivery for service provisioning	t	307	CS-SPDA		Y	Y
	Provisioning not complete and correct first time	%	308	CS-EP-SPDA	Y	Y	Y
	Provisioning time	t & %	309				
	Overall quality of the provisioning process including the reception desk	OR	310				
	Provider ability to match the customer's wishes for conditions of achievement	OR	311				
	User friendliness of the means available to the customer for the operations he has to perform	OR	312				
	Portage delay (when applicable)	t & %	313				
	Proportion of problems with number portability procedures	%	314				

Stage	Parameter name	Parameter type	Parameter number	Assessment process	Expert panel	Customer survey	SP data
Service alteration	Time for alteration	t	401	CS-SPDA		Y	Y
	Successful service alteration within specified period	%	402	CS-SPDA		Y	Y
	Completeness of fulfilment of contractual specification in the alteration of a service	%	403	CS-SPDA		Y	Y
	Punctuality of appointments for service alteration	t	404	CS-SPDA		Y	Y
	Punctuality of equipment delivery for service alteration [Time]	t	405	CS-SPDA		Y	Y
	Service alteration not complete and correct first time	%	406	CS-SPDA		Y	Y
	Conformity and success of service alteration	%	407	based on P402 & 403		Y	Y
	Technical reliability of service within an agreed period after alteration	%	408	CS-EP-SPDA	Y	Y	Y
	Response time of the alteration service	t & %	409	CS-EP-SPDA	Y	Y	Y
	Overall quality of the alteration process	OR	410				
	User friendliness of the means available to the customer for the operations he has to perform	OR	411				
	Organisational efficiency of service provider to carry out service alteration (SPO)	OR	412	CS-EP-SPDA	Y	Y	Y
Technical upgrade	Time for technical upgrade of a service	t	501	CS-SPDA		Y	Y
	Successful technical upgrade within specified period	%	502	CS-SPDA		Y	Y
	Completeness of fulfilment of specification in the technical upgrade of a service	%	503	CS-SPDA		Y	Y
	Punctuality of appointments for technical upgrade	t	504	CS-SPDA		Y	Y
	Outage time due to technical upgrade	t	505	CS-SPDA		Y	Y
	Technical upgrade not complete and correct first time	%	506	CS-SPDA		Y	Y
	Conformity and success of technical upgrade	%	507	Based on P502 & P503		Y	Y
	Technical reliability of service within an agreed period after technical upgrade	%	508	CS-SPDA		Y	Y
	Overall quality of the technical upgrade process	OR	509				
	Provider ability to match the customer's wishes for conditions of achievement	OR	510				
	User friendliness of the means available to the customer for the operations he has to perform	OR	511				
	Organisational efficiency of service provider (SP) to carry out technical upgrade (SPO)	OR	512	CS-EP-SPDA	Y	Y	Y
	Competence and preparedness of Service provider (SP) for technical upgrade (SPO)	OR	513	EP-SPDA	Y	Y	
Service Support - Documentation	Documentation delivery time	t	611	CS-SPDA		Y	Y
	Availability of documentation within specified period of time	%	612	CS-SPDA		Y	Y
	Integrity (correctness and completeness) of documentation	OR	613	CS-EP	Y	Y	
	Modes of documentation	N	614	EP-SPDA	Y		Y
	Legibility of documentation	OR	615	EP	Y		
	Overall reliability of documentation services	OR	616	EP-CS	Y	Y	

Stage	Parameter name	Parameter type	Parameter number	Assessment process	Expert panel	Customer survey	SP data
Service Support - Technical support	Accessibility of the technical support	%	621	CS-EP-SPDA	Y	Y	Y
	Technical solutions achieved within a specified period	%	622	CS-EP-SPDA	Y	Y	Y
	Number of attempts before successful solution	N	623	CS-SPDA		Y	Y
	Integrity of technical solutions	OR	624	CS-EP	Y	Y	
	Reliability of technical solutions achieved	%	625	CS-SPDA		Y	Y
	Modes of technical support	N	626	SPDA-EP	Y		Y
	Recognition of the customer technical request	%	627				
	Response time of the technical support	t & %	628				
	Request to technical support resolution time	t & %	629				
	Frequency of customer requests to technical support	N/t	630				
Service Support - Commercial support	User friendliness of the technical support	OR	631				
	Accessibility of the commercial support	%	641	CS-EP-SPDA	Y	Y	Y
	Commercial solutions delivery time	t	642	CS-SPDA		Y	Y
	Commercial solutions achieved within a specified period	%	643	CS-SPDA		Y	Y
	Integrity of solution achieved by the SP	OR	644	CS-SPDA		Y	Y
	Modes of commercial support	N	645	SPDA			Y
	Recognition of the customer commercial request	%	646				
	Response time of the commercial support	t, %	647				
	Request to commercial support resolution time	t, %	648				
	Frequency of customer requests to commercial support	N/t	649				
Service Support - Complaint management	Quality of the commercial support	OR	650				
	User friendliness of the commercial support	OR	651				
	Organisational efficiency of commercial support (SPO)	OR	652	CS-SPDA		Y	Y
	Accessibility of the complaint management desk	%	661	CS-EP-SPDA	Y	Y	Y
	Recognition of the customer complaints	%	662	CS-SPDA		Y	Y
	Complaint solutions not complete and correct first time	%	663	CS-SPDA		Y	Y
	Integrity of complaint resolution	%	664	CS-SPDA		Y	Y
	Customer perception of the complaint management	OR	665	CS-EP	Y	Y	
	Overall quality of the complaint management process	OR	666	CS-EP	Y	Y	
	Response time of the complaint management desk	t & %	667				

Stage	Parameter name	Parameter type	Parameter number	Assessment process	Expert panel	SP data	Customer survey
Repair services	Accessibility of repair services	%	701	SPDA		Y	
	Successful repairs carried out within a specified period	%	702	CS-SPDA		Y	Y
	Repairs not complete and correct first time	%	703	CS-SPDA		Y	Y
	Punctuality of appointments for repairs(a)	OR	704a	CS-SPDA		Y	Y
	Punctuality of appointments for repairs(b)	t	704b	CS-SPDA		Y	Y
	Efficiency of the repair service	OR	705	CS		Y	
	Fault repair time	t & %	706				
	Frequency of customer complaints related to repair services	N/t	707				
	Professionalism of the repair staff	OR	708				
	Provider ability to match the customer's wishes for conditions of achievement	OR	709				
	User friendliness of the repair service	OR	710				
	Organisational efficiency of repair service (SPO)	OR	711	CS		Y	
Metering, Charging, Billing	Accessibility of the tariff information	%	801	CS-SPDA		Y	Y
	Successful notification of exceeding billing budget	%	802	CS-SPDA		Y	Y
	Notification time (delay) of exceeding billing budget	t	803	CS-SPDA		Y	Y
	Accessibility of the account management	%	804	CS-SPDA		Y	Y
	Time to update charging information	t	805	CS-SPDA		Y	Y
	Timeless of bill delivery	%	806	CS-SPDA		Y	Y
	Bill delivery delay	t	807	CS-SPDA		Y	Y
	Late notification of amount due	%	808	CS-SPDA		Y	Y
	Modes of billing information transfer	N	809	SPDA		Y	
	Bill correctness complaints	%	810				
	Prepaid account credit correctness complaints	%	811				
	Provider ability to match the customer's wishes for charging/billing conditions	OR	812				
	User friendliness of the desk in charge of billing issues	OR	813				
	Bill presentation quality	OR	814				
	Organisational efficiency of the billing service (SPO)	OR	815	CS-SPDA		Y	Y

Stage	Parameter name	Parameter type	Parameter number	Assessment process	Expert panel	SP data	Customer survey			
Network / Service Management by the customer	Outage duration	t	901	SPDA		Y				
	Frequency of outages	N/t	902	SPDA-EP	Y	Y				
	Response time for reply to requests	t	903	SPDA		Y				
	Successful request response	%	904	CS-SPDA		Y	Y			
	Overall reliability of network / service management service	OR	905	CS-EP	Y	Y				
	Accessibility of the network/service management facility	t, %	906							
	Response time of the operator of the network/service management facility	t, %	907							
	Network/Service (N/S) Management access time	t	908							
	Frequency of customer complaints related to network / service management by the customer	N	909							
	Overall quality of the network/service management process	OR	910							
	Provider ability to match the customer's wishes for network/service management conditions	OR	911							
	User friendliness of the means available to the customer for the operations he has to perform	OR	912							
	Organisational efficiency of network / service management service	OR	913	CS-EP	Y	Y				
Cessation	Cessation acknowledgement time	t	1001	CS-SPDA		Y	Y			
	Cessation request acknowledgement	%	1002	CS-SPDA		Y	Y			
	Accessibility of the cessation facility	%	1003	CS-SPDA		Y	Y			
	Contractual cessation achieved	%	1004	CS-SPDA		Y	Y			
	Correctness and completeness in taking the customer request into account	N & %	1005							
	Response time of the cessation facility	t, %	1006							
	Overall quality of the cessation process	OR	1007							
	Frequency of customer complaints related to cessation	N	1008							
	Ease of the cessation process	OR	1009							
Explanation of the different colours used to identify the various parameter categories				CS	Consumer survey					
				EP	Expert Panel					
				Trained C	Trained Consumer Panel					
				SPDA	SP Data Analysis					
				In bold the preferred scenario where appropriate						

Annex B (normative): Questionnaires for customer survey and expert panel

This annex applies only for customer survey and expert panel. It does not apply for analysis of SP Data.

In general, most of the parameters to be assessed can be covered by four types of parameters:

- Opinion Rating (OR).
- Rate (%).
- Time (t).
- Number (N).

All the texts and questions that will be provided in a questionnaire shall be checked carefully since the chosen wording might have a biasing influence on the outcome of the assessment. The questions in the questionnaire shall reflect the definition and the objective of the parameters described in EG 202 843 [i.1].

The questionnaires may be similar for the expert and customer, even if some complementary (more technical) questions may be added for experts.

B.1 Opinion Rating (OR)

Different types of scales may be used by customers or experts asked to give their opinion. As indicated in EG 202 843 [i.1] it is recommended to implement unipolar scales with 7 discrete ratings (preferably from 0 to 6).

All the possible selections shall be associated with textual description, and preferably for the terms associated to minimum rating (0) and maximum rating (6). Some examples of such terms are listed below.

For the most of "OR" parameter the question could be defined as follows:

- "How do you rate <the question based on the definition of the parameter>?"

When needed an additional information can be added as follows "Take into consideration ...", or "e.g. ...".

Some examples may be found in informative annex D.

Table B.1: Example of terms associated to minimum rating (0) and maximum rating (6)

Term for minimum rating (0)	Term for maximum rating (6)	Applicable parameters
No information	All relevant information to make an informed judgement	P101, P102
Confusing, ambiguous and unclear representation of the terms of contract	True and fair view of all relevant terms of contract	P201
Not comprehensible / Unclear and confusing	Comprehensible and clear	P615
Inefficient and disorganised	Professionally managed to meet needs of the customer	P412, P512, P616, P652, P667, P672, P711, P815, P905, P913
No scope/inflexible	Flexible to meet customer's need	P203, P204
No assurance	High level of assurance	P666
No empathy	High level of empathy	P666
No responsiveness	High level of responsiveness	P666
No sign of competence	Competence at professional level	P513
Quite unprepared	Fully prepared	P513
Never fulfils solution first time. Long drawn out affair to fulfil solution.	Fulfilment of solution every time first time	P624, P644
Incorrectness in documentation	Documentation correct and trustworthy	P613
Documentation incomplete	Documentation has covered all relevant topics and is complete	P613
Never on time. Totally unreliable	Always on time and can be relied	P704
Unorganised and chaotic	Professionally organised and reliable	P705

B.2 Rate (%)

The rate is expressed as a percentage calculated over the whole data. The individual answers are currently bipolar as YES or NO.

The question asked shall be derived from the parameter definition as available in EG 202 843 [i.1].

The context of the question has to be defined and expressed as "Concerning your latest ...".

B.3 Time (t)

The context (conditional) of the action is firstly defined; the customer or the expert is asked to define the time corresponding to the definition of the parameter.

To avoid misunderstanding or mistakes the start and stop points of time shall be defined clearly.

It is also needed to define the timeout condition for each time parameter. It should be taken into account that the error rate increases significantly if timeout values are chosen.

When different time domains are defined in the questionnaire, it shall be needed to define clearly the way to aggregate the data across these different time domains (e.g. order of building averages per day, week, month, year).

The questions may begin as:

- "How many (Months/Days/hours/Minutes)... <action from the SP>..."

Alternative could be:

- "How much time did pass between...", "What was the delay..."; "what was the delay between..."

For the reply several boxes may be provided, each defining a time slot. Such an approach simplifies the data input and analysis. However, it is also possible to leave the possibility for the participants to give the exact value (see clause B.6).

The number of "answering boxes" should be as limited as possible.

B.4 Number (N)

Each Customer or expert has to provide a number. So the question will begin as "How many..."

EXAMPLE: "How many ways are currently used to transfer some kind of information?"

It may be useful to ask supplementary open questions that are needed for a detailed report. An example of such questions is provided as:

- "Which ways are used by service providers?
- Which ways are usual for a private / business customer?"

For the reply several "boxes" may be provided, each defining a number or a range of numbers.

Such an approach simplifies the data analysis.

However, it is also possible to leave the possibility for the participant to give the exact value (see informative annex D).

The number of "answering boxes" should be as limited as possible.

B.5 Other elements to be added in the questionnaires

B.5.1 Pre-conditions

Some parameters concern services that customers might not have used. Then customers should skip the question concerning the assessment of such parameters. Unfortunately, the experience shows that the customers usually rate the service they did not use.

In order to avoid this, it is recommended for questionnaires dedicated to customer panels, to ask first if the service to be rated, was used at least once by the customer. This initial question forms a pre-condition to apply then the questions related to the parameters to be rated.

For instance, parameters P661 to P667 concerning the complaint management, apply only if the customer has used the complaint management at least once. Thus the following question shall be asked during a customer survey:

- Did you already use the complaint management desk?
- Answering "yes" is the required pre-condition to proceed further with the P661 to P667 rating.

In table D.1, a column indicates, if a pre-condition is required. It also proposes a text for the question.

B.5.2 Open questions

As indicated in the previous clauses, it may be useful to ask open questions to the customers or experts for further analysis.

Such open questions or comment fields are useful:

- Wherever the customers might have additional experience on specific topics.
- Whenever a short description of some situation has more value than just a pure rating.

It can be also useful to give the possibility to the participant to quote "no opinion".

It may also be useful to leave the possibility to the participants to provide more details or comments (a special box to be provided), e.g. "Do you have comments on this?"

B.6 Validation of the questionnaire

Before beginning the campaign the questionnaire shall be validated by an expert team (at least 3 experts) to ensure that the questions are unambiguous, fully comprehensible, relevant in the context and for the objectives of the campaign and that the questionnaire is well balanced.

B.7 Questionnaires addressed to attendees

When the questionnaires have been validated according to clause B.6, the questionnaires are made available to the attendees, through on line questionnaires, telephone calls, post mails or direct contact e.g. in commercial areas.

It shall be checked that the questionnaires are replied by the attendees that have been identified by the selection process and not other people.

B.8 Examples from the experiment made by STF 374

To check the process described in the present document, STF 374 has organised a customer survey on a set of customer relationship stages and on the four types of parameters. The details of this experiment are available in annex D.

The selected stages for these experiments are:

- Preliminary information.
- Contract establishment.
- Complaint management.
- Metering/Charging/Billing.

Even if EG 202 843 [i.1] does not recommend to assess all the parameters of these stages through a Customer Survey, a questionnaire has been designed including all the parameters of the four stages. The selected set of parameters is highly representative of the questions to be asked for all the parameters defined in EG 202 843 [i.1]. They can be used as references when developing future assessment campaigns.

Annex C (informative): Questions related to the user's background

It is very important to ensure that the information collected in this aspect during the survey is kept confidential.

C.1 Questions related to the user's background

C.1.1 Personal data

Gender: Female Male

Age: <20 years 21 - 30 years 31 - 40 years 41 - 50 years 51 - 60 years 61 - 70 years >70 years

Language (s) _____ (native) _____ learnt

Profession/Education: _____

Current residence: _____

Incomes/Year (euros): <10k 10k - 25k 25k - 50k 50k - 100k >100k

How many years of using telecommunications services do you have?

<1 year 1 - 3 years 3 - 10 years >10 years

Do you have any disability: visual auditory tactile

Phone number: Fixed_____ Mobile_____

Email address_____

C.1.2 How often do you use ICT services on an average (several possible answers)?

Phone calls

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

SMS

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

IPTV or Mobile TV

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

VoD

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

Audio/Video Streaming

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

Email communication

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

Audio/video calls/conferences

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

Web browsing

almost all the time 1 to 3 times a day almost every day 1 to 5 times a week less than 5 times a month

C.2 What kind of ICT are you contracted with your Service Providers - (several possible answers)?

Fixed line (PSTN or ISDN)	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>
Fixed line (VoIP)	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>
Mobile phone	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>
Internet access	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>
IPTV/Mobile TV/VoD	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	less than 1 month	<input type="checkbox"/>	1 year	<input type="checkbox"/>	more than 3 years	<input type="checkbox"/>

C.3 What are the terminals you are currently using (several possible answers)?

Fixed phone (PSTN, VoIP or ISDN)-including DECT	<input type="checkbox"/>
Mobile phone	<input type="checkbox"/>
PDA	<input type="checkbox"/>
TV set	<input type="checkbox"/>
Personal computer	<input type="checkbox"/>
Public internet terminal	<input type="checkbox"/>
Game console	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>

C.4 What kind of access (several possible answers) for internet, if you know them?

Ethernet	<input type="checkbox"/>
ADSL	<input type="checkbox"/>
Mobile	<input type="checkbox"/>
DSL	<input type="checkbox"/>
Wimax	<input type="checkbox"/>
PSTN	<input type="checkbox"/>
Cable	<input type="checkbox"/>
FTTH	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>

C.5 Service providers

C.5.1 With how many service providers do you have contracts for your services?

- 1 Name _____
2 Names _____
3 Names _____

More than 3: Names _____

C.5.2 Have you moved at least once from a service Provider to another one?

For what reason(s)? _____

C.5.3 Do you use ICT for

Private usage Business Both

C.6 Do you have any additional information to provide?

Annex D (informative): Example of a campaign performed by STF 374

Context of the questionnaire defined by the STF 374:

- The experiment did not address any specific service but was intended to receive a global feedback from members of a customer association on the perceived QoS from their service providers for several customer relationship stages.
- The questions developed for this specific experiment may only be considered as examples that can be adapted when developing a questionnaire in another environment and with another purpose:
 - The following questions have been asked to the participants to the experiment conducted by the STF 374. They may be used as example to create new questionnaires in particular for parameters that are not defined in the following tables.

Table D.1: Opinion Rating

Parameter	Type	Title	Precondition: Yes/No	Question
P101 Part 1	OR	Preliminary Information (PI) Integrity of preliminary information: Content	No	Content: Were all the relevant information provided as you expected?
P101 Part 2	OR	Preliminary Information (PI) Integrity of preliminary information: Language	No	Language: Was the information provided clear and understandable without any ambiguity?
P101 Part 3	OR	Preliminary Information (PI) Integrity of preliminary information: Style	No	Style: How would you rate the overall style, presentation and professionalism of the preliminary information provided? (Take into consideration issues like typeface, background colours, contrast, acoustics, display choreography etc.)
P102	OR	Pricing transparency	No	Did you find the pricing information comprehensible? (see note)
P201	OR	Integrity of contract information	No	How would you rate the integrity of the contractual document? (Take into consideration issues like maintenance, performance levels, invoicing, warranty conditions, compensation schemes, cancellation procedures, cessation, etc.)
P203	OR	Flexibility for contract customization before contract	No	How would you rate the flexibility of your service provider to customise the contract before signature e.g. by applying options?
P204	OR	Ease and flexibility to amend terms after formal contract	No	How would you rate the flexibility of your service provider to further adapt the contract after signature e.g. by applying options?
P664	OR	Integrity of complaint resolution	Yes: Did you already use the complaint management desk?	Concerning your latest accepted complaint; Was your complaint resolved correctly?
P665 Part 1	OR	Customer perception of complaint management: Assurance	Yes: Did you already use the complaint management desk?	How would you rate the service provider's complaint management related to assurance at all? (Take into consideration characteristics like competence, engagement, credibility and trust.)
P665 Part 2	OR	Customer perception of complaint management: Empathy	Yes: Did you already use the complaint management desk?	How would you rate the service provider's complaint management related to empathy at all? (Take into consideration characteristics like ease of contact, market awareness, listening to customers and keeping the customer relation.)
P665 Part 3	OR	Customer perception of complaint management: Responsiveness	Yes: Did you already use the complaint management desk?	How would you rate the service provider's complaint management related to responsiveness at all? (Take into consideration characteristics like willingness, promptness of reaction, estimation of realistic timeframes and follow-up contacts where necessary.)
P666	OR	Overall quality of the complaint management process	Yes: Did you already use the complaint management desk?	How would you rate the overall handling of the complaint management process? (Take into consideration the accessibility to the service, the correct resolution at the first attempt, the speed of resolution and the organisational competence of your service provider.)

NOTE: For further assessment campaign, it should be changed as "How would you rate the pricing information comprehension?"

Table D.2: Percentage

Parameter	Type	Title	Precondition: Yes/No	Question
P103	%	Availability of Preliminary Information (PI)	No	Could you retrieve the preliminary information easily? (Take into consideration different information sources like web, email, flyers, phone calls and combinations of them.)
P202	%	Compliance of contractual terms with preliminary information (PI)	No	Was the contract document compliant to the previously provided preliminary information?
P661	%	Accessibility of the complaint management desk	Yes: Did you already use the complaint management desk?	Concerning your latest attempt to access the complaint management desk of your service provider: Did you succeed in accessing it?
P662	%	Recognition of the customer complaints	Yes: Did you already use the complaint management desk?	Concerning your latest complaint to the complaint management desk of your service provider; Was your complaint accepted?
P663	%	Complaint solutions not complete and correct first time	Yes: Did you already use the complaint management desk?	Concerning your latest accepted complaint; Was the complaint solved to your satisfaction at the first attempt by the service provider?
P664	%	Integrity of Complaint resolution	Yes: Did you already use the complaint management desk?	Concerning your latest accepted complaint; Was the complaint finally solved to your satisfaction by the service provider?
P801	%	Accessibility of the tariff information		Concerning your latest attempt to access your provider's tariff information; Were you able to access the tariff information?
P802	%	Successful notification of exceeding billing budget	Yes: Did you subscribe the notification of exceeding the billing budget?	Concerning your latest exceeding of budget; Were you notified accordingly when you exceeded your budget?
P804	%	Accessibility of the account management	No	Concerning your latest attempt to access the account status at your service provider: Did you succeed in accessing it?
P806	%	Timeless of bill delivery	No	Were all the bills throughout the last 6 months, available at the expected time? (availability is as applicable per post mail, email or uploaded on your web account). Did you receive all the expected bills throughout the last 6 months? (see note)
P808	%	Late notification of amount due	No	Considering your latest direct debit payment; Has the bill been received before the direct debit was executed?

NOTE: Please indicate the expected time (e.g.: number of days before direct debit occurs, number of days before the payment).

Table D.3: Time and number

Parameter	Type	Title	Precondition: Yes/No	Question
P104	t	Response time for the provision of Preliminary Information (PI)	No	FOR EXPERTS ONLY: Please answer only if you retrieved the preliminary information via web access; How much time did pass between the request and the delivery of preliminary information? (Please express in minutes, hours or days.)
P803	t	Notification time (delay) of exceeding billing budget	No	FOR EXPERTS ONLY: If you are using a notification service when you reach a predefined budget level; What was the period of time between exceeding the billing budget and the reception of the according notification?
P805	t	Time to update charging information	No	FOR EXPERTS ONLY: What was the delay of the charging information on your account?
P807	t	Bill delivery delay	Yes: Did you experienced delays in the availability of bills?	How many days was the availability of the bill delayed? (availability is as applicable per post mail, email or uploaded on your web account)
P809	N	Modes of billing information transfer	No	How many ways do you have to access your accounting information?

Table D.4: Open additional question

Parameter	Type	Title	Question
PGeneral		General question	Do you consider the four parameters above deal with most, if not all of the pertinent features of PI from the customer perspective? If not what additional parameter would you like to see included?

Annex E (informative): Examples of tasks for Expert panels

The table E.1 defines the parameters that are intended to be checked by the Expert Panel.

NOTE: For information, the different means defined for assessment campaigns are kept in the table: "CS" stands for "Customer Survey", "EP" stands for "Expert Panel" and "SPDA" stands for "SP Data Analysis".

In the table E.1 the fifth column (Assessment process.) lists all the assessment methods but the last column applies only to expert and trained customer panels.

For the experts, two approaches are described in the table E.1:

T1 When possible the experts act as an anonymous customer (e.g. request Preliminary information, contact the service desk,...), but without needing any contract with the SPs.

For parameters based on assessment of SP services or of SP data, the experts have to plan appointments with SP representatives or managers and are clearly identified as the experts in charge of QoS testing. In such cases or in complement they should have access to some data stored by the SP and have to sign confidentiality agreements.

T2 The experts subscribe to different contracts (with the SP involved in the assessment campaign and for the services defined in the scope of the campaign). In this case, financial provision should be planned for the expenses due to these contracts. The experts will act as real customers, for the different stages of the relationship: in such a case, the campaign should be long enough to provide significant results for the parameters defined for the campaign (at least three months). The experts could report periodically (e.g. every month).

Whatever the approach implemented, each expert reports individually the results or opinions for each parameter, for each medium used and each SP under test.

All the experts involved in an experiment are invited for a common meeting, during which each expert reports on the results and comments and discuss them in order to produce a global value for the parameters defined in the campaign.

Table E.1: Parameters intended to be checked by the Expert Panel

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Preliminary information	Integrity of preliminary information (PI)	OR	101	EP	<p>For T1 and T2 approaches, the experts should consider the PI provided (or available) by each service provider through one selected mode (e.g. Web page, flyer, contact with the service desk). This task could be repeated for each of the available mode.</p> <p>The expert provides a rating for each of the three parameters qualifying the integrity of the preliminary information as described in EG 202 843 [i.1]. Each expert reports individually for each of them (for each mode and each SP).</p> <p>An "aggregated" OR may be provided by an experts' meeting as an additional result (associated to comments from the experts).</p>
	Pricing transparency	OR	102	CS-EP	<p>For T1 and T2 approaches, the experts should analyze all the tariffs for the services currently offered (or for a selected part of them, e.g. mobile including flat rate, roaming) and have to give an opinion on their perception of pricing transparency.</p> <p>During an expert meeting the results and comments provided by the experts are discussed.</p> <p>An "aggregated" OR may be a result of the experts' meeting.</p>
	Response time for the provision of PI	t	104	CS-EP	Experts have to record the time to provide PI for each mode.
Contract establishment	Integrity of the contract information	OR	201	Trained C-EP	<p>For T1 approach, the experts should consider the contract documentation provided by each Service provider through one medium (e.g. Web page, flyer, contact with the service desk).</p> <p>To achieve that the experts have to receive from the different SPs the draft contract for the services under assessment.</p> <p>An "aggregated" OR may be a result of an expert meeting (see note 1).</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
	Compliance of contractual terms with PI	%	202	Trained C-EP	The expert may look specifically for compliance in the PI with the information provided in the contract. The expert panel will have an insight into the legal aspects of the use of this service or family of services to enable them to critically evaluate the legal aspects and from the customer's and SP's point of view.
	Flexibility for customization before contract	OR	203	Trained C-EP	For T1 approach, the experts should contact the service desk of the different SPs under assessment and collect answers to a set of predefined questions (e.g. about additional service features, service performance, specific conditions/prices).
Service provisioning	Contract cancelled due to non fulfilment	%	304	EP	For T1 approach, the experts should collect the data from the SPs under assessment. As it may be a sensitive issue, the expert should not use "mystery call" but be identified and should contact the relevant SP Managers or Teams in charge of these issues.
	Completeness of fulfilment of contractual specification in the provision of a service	%	305	CS-EP	"CS" should be the preferred method. However if an expert panel is used, the best approach for this parameter should be T2. The experts should sign all the needed contracts and should check the provisioning as defined in the contract. (as indicated above, this approach may be expensive because the experts have to subscribe to offers. The type of contract to be signed should be defined in advance (e.g. for the most popular services offered by the different SPs).
	Punctuality of service provisioning	t	306	CS-EP	Alternative task: The experts should contact the SP service desks, to ask for relevant managers and to ask for replies to dedicated questions about service provisioning.
	Provisioning not complete and correct first time	%	308	CS-EP	For T2 approach, the experts, after having subscribed to offers should report on the actual provisioning for each contract, For T1 approach, the experts should collect data from the SP and report on this collection (see note 2).

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Service alteration	Technical reliability of service within an agreed period after alteration	%	408	SPDA-CS-EP	For T1 approach, the experts should contact the service desk management and ask about the number of cases treated during a dedicated period and about the possible failures. Each expert reports on the results collected.
	Response time of the alteration service	T&%	409	SPDA-CS-EP	For T1 approach, this task should be coupled with P408. During the interview described for P408 the experts should ask questions about the response time stored by SP.
	Organisational efficiency of service provider to carry out service alteration	OR	412	SPDA-EP	Experts should obtain relevant data, where available, from the SP and make an informed judgement in other cases to arrive at an OR value.
Technical upgrade	Organisational efficiency of service provider to carry out technical upgrade	OR	512	SPDA-CS-EP	For T2 approach, the experts should report on actual experiments they conducted (relevant scenarios should be defined, based on recent upgrades offered by the SPs). If they have subscribed to SP offers the upgrades will be based on the contracts effectively subscribed. For T1 approach, the experts should also contact the SP management to ask for a detailed presentation of the process implemented to carry out technical upgrade. Questions about the number of cases to be treated, the time needed to carry out technical upgrades may be also asked. Each expert provides the effective (for T2 approach) or collected (for T1 approach) results.
	Competence and preparedness of service provider for technical upgrade	OR	513	SPDA-EP	This parameter will be assessed in a similar way as P512 and preferably at the same time and with the same process.

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Service Support - Documentation	Integrity (correctness and completeness) of documentation	OR	613	CS-EP	<p>For T1 and T2 approaches, the experts should consider the documentation provided by each service provider through one medium (e.g. Web page, flyer, contact with the service desk). This task could be repeated for all the other modes. The expert will consider the different parameters described in EG 202 843 [i.1] for integrity of documentation and will report on each of them, for each mode and each SP.</p> <p>During an expert meeting the data are discussed and an aggregated OR may be a result (associated to comments from the experts).</p> <p>An aggregated OR may be an additional result obtained after discussion during experts meeting.</p>
	Modes of documentation	N	614	SPDA-EP	For T1 and T2 approaches the experts should collect all the available documentations and report the number.
	Legibility of documentation	OR	615	EP	<p>For T1 and T2 approaches, the experts should give their opinion on the legibility of each documentation they have collected in P614.</p> <p>An aggregated OR may be a result obtained after discussion during experts meeting.</p>
	Overall reliability of documentation services	OR	616	EP-CS	<p>For T1 and T2 approaches, the experts should give their opinion on the overall reliability of all the documentation collected in P614 (SPs may also be asked for complementary information when needed).</p> <p>An aggregated OR may be an additional result obtained after discussion during experts meeting.</p>
Service Support - Technical support					<p>For an expert panel the best approach should be to have an appointment with the technical support of each SP. The expert will also provide personal views based on the answers received from the SP and possibly by analysing data available by SP.</p> <p>For T2, personal observations linked with the contracts subscribed could also be taken into account (see note 3).</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
	Accessibility to the technical support	%	621	SPDA-CS-EP	<p>For such a parameter a Customer Survey should be preferred. (The Expert Panel may not be the better approach).</p> <p>The experts are invited to contact the technical support of all the SPs under assessment and to report about the accessibility to it. The experts should take benefit of these contacts to ask all relevant questions.</p>
	Technical solutions achieved within a specified period	%	622	SPDA-CS-EP	<p>During the interview of the SP (or analysis of Data stored by SP), as described for P621 the expert should collect relevant data on this parameter.</p>
	Integrity of technical solutions	OR	624	CS-EP-SPDA	<p>Based on answers received from SP to questions raised during the interview(s) described for P621 and after crosschecking with the data made available by SP, the Experts should provide a rating.</p> <p>For T2 approach, the experts could also take into account the actual situations met within the contracts subscribed with the different SPs. The experts will meet to provide a consolidated rate.</p>
	Reliability of technical solutions achieved	%	625	SPDA-CS-EP	<p>After interview as defined for P621 the experts should provide a result based on data provided by the SP.</p> <p>For T2 approach, if the experts need to request technical solutions for the subscribed contracts, they may also provide actual comments.</p>
	Modes of technical support	N	626	SPDA-EP	<p>For T1 and T2 approaches the experts should look for the different modes and report.</p> <p>During the interview of the SP (or analysis of Data stored by SP), as described for P641 the experts should collect relevant data on this parameter. Each expert is intended to look for the different modes and provides the results of this analysis.</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Service Support - Commercial support					<p>The process described for Technical support applies for commercial support.</p> <p>For an expert panel, the best approach should be to have an appointment (interview) with the commercial support of each SP. The expert will also provide his personal view based on the answers received from the SP and possibly by analysing data available by SP.</p> <p>For T2, personal observations linked with the contracts subscribed could also be taken into account.</p> <p>Each expert provides the results and data are discussed within an experts meeting (see note 4).</p>
	Accessibility of the commercial support	%	641	SPDA-CS-EP	<p>For such a parameter, a Customer Survey should be preferred (the Expert Panel may not be the better approach).</p> <p>For T1 approach the experts should contact the commercial support of all the SPs under assessment and to report about the accessibility to it.</p>
	Commercial solutions achieved within a specified period	%	643	SPDA-CS-EP	<p>During the interview of the SP (or analysis of Data stored by SP), as described for P641 the expert should collect relevant data on this parameter.</p>
	Integrity of solution achieved by SP	OR	644	CS-EP-SPDA	<p>Based on answers received from SP to questions raised during the interview(s) described for P641, and after cross checking with the data made available by SP, the Experts should provide a rating.</p> <p>For T2 approach, the experts could also take into account the actual situations met within the contracts subscribed with the different SPs. The experts will meet to provide a consolidated rate.</p>
	Modes of commercial support	N	645	SPDA-EP	<p>For T1 and T2 approaches, the experts should look for the different modes of technical supports and report. During the interview of the SP (or analysis of Data stored by SP), as described for P641 the experts should collect relevant data on this parameter. Each expert is intended to look for the different modes and provides the results of this analysis.</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
	Organisational efficiency of commercial support	OR	652	SPDA-CS-EP	After having conducted the interviews defined above and having analysed the data provided by the SPs, experts may provide a personal opinion rating about the organisational efficiency. The rating is explained by objective results or observations done by the experts.
Service Support - Complaint management					For an expert panel the best approach should be to have an appointment (interview) with the complaint management department of each SP under assessment. The experts should also provide personal views based on the answers received from the SP and possibly by analysing data made available by the SP (see note 5). For T2 approach, if the experts face such problems they may report on these actual observations.
	Accessibility of the complaint management desk	%	661	SPDA-CS-EP	The Expert Panel may not be the better approach and a Customer Survey should be preferred. However, for experts involved in the assessment process, the task for each expert to contact the complaint management (and if possible a manager of this department) of the SP and to report about the accessibility (in particular the waiting time, the number of calls,...). The experts should take benefit of accessing the complaint management desk to ask a set of questions (interviews) as defined for other parameters.
	Recognition of the customer complaints	%	662	SPDA-CS-EP	For T1 and T2 approaches, the experts should analyze the data made available by the SPs under assessment and the information collected during interviews. For T2 approach, the experts having contacted the complaint management desk could also report on these actual observations.

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
	Integrity of complaint resolution	%	664	SPDA-CS-EP	<p>Based on answers received from SP to questions raised during the interview(s) conducted by the expert, as defined for P661 and after crosschecking with the data made available by SP, the experts should provide a ratio.</p> <p>The experts have to provide a consolidated rating (by explaining the ratio with objective observations).</p> <p>For T2 approach, if the experts contacted the complaint management desk for issues linked with some subscribed contracts they could also report on these actual observations.</p>
	Customer perception of the complaint management	OR	665	CS-EP	<p>For this parameter, the preferred method is a Customer Survey. However, the experts, as very experienced customers (and in particular those involved in T2 approach) they may provide a rating, based on the results and observations done during interviews or actual cases, as defined for P661.</p>
	Overall quality of the complaint management process	OR	666	CS-EP	<p>Experts provide a rating based on:</p> <ul style="list-style-type: none"> - the answers provided by SP during interviews, as defined for P661 - Analysis of data provided by SP - and when available their personal opinion when contracts have been subscribed for the assessment campaign.
	Organisational efficiency of complaint management system	OR	671	SPDA-CS-EP	<p>After having conducted the interviews defined for P661 and having analysed the data provided by the SPs, experts may provide a personal opinion rating about the organisational efficiency.</p> <p>The rating is explained by objective results or observations done by the experts.</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Metering, Charging, Billing					<p>The best approach is a "Customer survey".</p> <p>For T2 approach, each expert having subscribed contracts with different SPs is invited to report on the actual situations observed during several months. With such an approach the experts are intended to act in a similar way as any customer (but using their high level knowledge to ask pertinent questions).</p> <p>Due to the low number of results from each Expert, results and data are discussed within an experts meeting.</p> <p>For T1 approach, experts should organize an appointment with the SPs and collect relevant data.</p>
	Accessibility to the tariff information	%	801	SPDA-CS-EP	For T1 and T2 approaches, experts should collect tariff information available by different means (web, flyer, phone call, etc.) for each SP and for the most popular services currently offered.
	Successful notification of exceeding billing budget	%	802	SPDA-CS-EP	<p>For T2 approach, experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach, experts should report about the data provided by SPs on this parameter.</p>
	Notification time (delay) of exceeding billing budget	t	803	SPDA-CS-EP	<p>This parameter should be better assessed by a customer survey.</p> <p>However, if an expert panel is involved in the assessment, the tasks to be done are similar to those defined for P802:</p> <p>For T2 approach, experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach, experts should report about the data provided by SPs on this parameter.</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
	Accessibility to the account management	%	804	SPDA-CS-EP	<p>This parameter should be better assessed by a customer survey.</p> <p>However, if an expert panel is involved in the assessment, the tasks to be done are similar to those defined for P802:</p> <p>For T2 approach, experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach, experts should report about the data provided by SPs on this parameter.</p>
	Time to update charging information	t	805	SPDA-CS-EP	<p>This parameter should be better assessed by a customer survey.</p> <p>However, if an expert panel is involved in the assessment, the tasks to be done are similar to those defined for P802:</p> <p>For T2 approach, experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach, experts should report about the data provided by SPs on this parameter.</p>
	Late notification of amount due	%	808	SPDA-CS-EP	<p>This parameter should be better assessed by a customer survey.</p> <p>However, if an expert panel is involved in the assessment, the tasks to be done are similar to those defined for P802:</p> <p>For T2 approach, experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach, experts should report about the data provided by SPs on this parameter.</p>
	Modes of billing information transfer	N	809	SPDA-EP	<p>The tasks to be done are similar to those defined for P802:</p> <p>For T2 approach experts should report about the actual observations concerning successful notifications.</p> <p>For T1 approach experts should report about the data provided by SPs on this parameter.</p>
	Organisational efficiency of the billing service	OR	815	SPDA CS-EP	<p>After having conducted the interviews defined above and having analysed the data provided by the SPs, experts may provide a personal opinion rating about the organisational efficiency.</p> <p>The rating is explained by objective results or observations done by the experts.</p>

Stage	Parameter name	Type of parameter	Parameter number	Assessment process	Proposed Task for Expert or trained customer Panels
Network/Service Management by the customer					A specific task could be given to each expert of the expert Panel, for each SP. Due to the low number of results from each Expert, results and data are discussed within an experts meeting.
	Frequency of outages	%	902	SPDA-EP	For T1 approach experts should report about the data provided by SPs on this parameter.
	Overall reliability of network/service management service	OR	905	CS-EP	This parameter should be better assessed by a customer survey. However for T2 approach experts should report about the actual observations concerning the overall reliability.
	Organisational efficiency of network/service management service	OR	913	CS-EP	After having conducted the interviews defined above and having analysed the data provided by the SPs, Experts may provide a personal opinion rating about the organisational efficiency. The rating is explained by objective results or observations done by the experts.
Cessation					To question SPs on cessation, results and data are discussed within an experts meeting.
	Cessation request acknowledgement	%	1002	CS-SPDA-EP	For T2 approach, the experts should act as real customers, on the basis of the contractual terms of the contract they subscribed. For a T1 approach, experts should analyze the data stored by SP.
	Accessibility of the cessation facility	%	1003	CS-SPDA-EP	For T2 approach, the experts should act as real customers, on the basis of the contractual terms of the contract they subscribed. For a T1 approach, experts should analyze the data stored by SP.
	Contractual cessation achieved	%	1004	CS-SPDA-EP	For T2 approach, the experts should act as real customers, on the basis of the contractual terms of the contract they subscribed. This task may only be done after the time period dedicated to the whole experiment. For a T1 approach experts should analyze the data stored by SP.
<p>NOTE 1: The contract has to be asked. For some experiments the contract will not be signed and only analysed by the experts. For T2 approach the experts should sign the contracts and check carefully all the relationships with the SPs.</p> <p>NOTE 2: "CS" is a better method than "EP".</p> <p>NOTE 3: It could be useful to define some scenarios (e.g. by defining a set of services or configurations).</p> <p>NOTE 4: It could be useful to define some scenarios (e.g. by defining a set of services or configurations).</p> <p>NOTE 5: It could be useful to define some scenarios (e.g. by defining a set of services or configurations).</p>					

Annex F (informative): Bibliography

ITU-T Recommendation P.851: "Subjective quality evaluation of telephone services based on spoken dialogue systems".

History

Document history		
V1.1.1	October 2010	Publication
V1.1.2	July 2011	Publication