EUROPEAN COMMISSION
Information Society and Media Directorate-General

STUDY ON USER SATISFACTION AND IMPACT IN EU27

Draft Final Report
– Annex Part 1 –

TABLE OF CONTENTS

1 Survey Instrument Manual

1.1 Introduction

This manual provides a how-to guide to use the standardized instrument for measuring eGovernment user satisfaction and impact. The manual is directed at eGovernment officials and representatives of public sector agencies in all the EU Member States. It presents the survey framework, tools and questionnaires, and offers practical guidelines on how-to-proceed in a step-by-step approach.

The overall aim of this EC-commissioned study was to develop a standardized yet customizable measurement tool to be used by public agencies in all of the European Member States. The purpose of the tool would be to measure user satisfaction with specific eGovernment services. The study was also intended to prepare the ground for a demand-side eGovernment benchmarking exercise across the EU27.

As a result, the instrument was developed with these two perspectives or objectives in mind:

(1) the demand-side benchmarking of eGovernment user satisfaction across the EU27;
(2) the development of a standardized yet customizable instrument that can be re-used by public agencies throughout the EU27 to measure user satisfaction with the specific public eServices they provide.

Two separate tools were designed:

(1) User Satisfaction Benchmark (USB) tool;
(2) eService Evaluation Tool (eSET).

Both tools have been adapted for surveying citizens and business respectively. The tools will help evaluate customers' use of, and customer satisfaction with, eGovernment applications.

Based on the evaluation undertaken of the tools, policies and strategies can be developed for increasing take-up and improving the quality of electronic public service delivery. Applying the tools to measure user satisfaction should not be an end in itself, but a means to explore

the ways in which customer relationships within the public sector can be optimized through eGovernment.

In relation to the tools, the following three elements are to be emphasized:

- The instrument is designed to measure use of and satisfaction with eGovernment within a representative sample of the Internet population, i.e., that part of the total population that has access to the Internet. The instrument can be used to measure the level of satisfaction of actual users of specific eGovernment services. It may also offer insight in the profiles and opinions of individuals and companies who do not use these services, despite the fact that they have Internet access to them. If public agencies decide to conduct a survey using their own customer database, they should acknowledge that no relevant information can be gathered about the non-use(rs) of their eServices. Therefore, the instrument focuses on Internet use but is not limited to it.
- The instrument is standardized yet customizable. The instrument proposes different question modules within a logically structured sequence, but public agencies can adapt specific modules and tailor questions to the specific aims, objects and scope of their measurement projects. The instrument has been set up with a broad "holistic" focus on user types and different aspects of eGovernment use and satisfaction, but public agencies may integrate only those aspects that fall within the scope of their measurement designs. Hence, the instrument is very flexible.
- A standardized approach is necessary for the continuous measurement or monitoring of user satisfaction. In the longer term, this enables the observation of trends, the evaluation of the effects of policy initiatives and service improvements, and the measurement of eGovernment impact.

We believe firmly that future measurement initiatives in the EU27 will benefit substantially from adopting this survey framework, its most central features, and its tools. The main elements of the survey framework are that it constitutes: (1) a broad, holistic approach to eGovernment measurement; (2) a strong focus on user profiling; and it adopts (3) a life-event based approach. We outline here, however, the full list of ten principles that have guided the design of this standardized framework:

Guiding principles for a standardized framework
1. Standardized measurement framework 2. Customizable modular structure 3. Holistic approach 4. A life event based model 5. User types and target groups 6. Multi-channel perspective 7. Non-use of eGovernment 8. Dimensions of user satisfaction 9. Measurement of user impact 10. Control for preconceptions

1.2 Question modules and tools

In this chapter we present the user satisfaction benchmark instrument and the tools that provide public agencies with the necessary building blocks to conduct surveys on user satisfaction with their eGovernment services:

- The concepts and indicators measured;
- The general modular structure of the survey tools created around this model.

The standardized question modules adaptable in citizen- and business-specific questionnaires are presented in annex to this manual.

The standardized framework consists of four, different, consecutive parts or layers:

- User profiling;
- Use of eGovernment;
- Satisfaction with eGovernment;
- Perceived benefits of eGovernment.

As there are substantial differences in scope and structure between the User Satisfaction Benchmark (USB) instrument and the eService Evaluation Tool (eSET), these tools are presented separately.

1.2.1 User Satisfaction Benchmark (USB)

The USB is an instrument to measure eGovernment user satisfaction within a comparative, cross-national framework. The following graphic illustrates the general structure of the USB instrument.

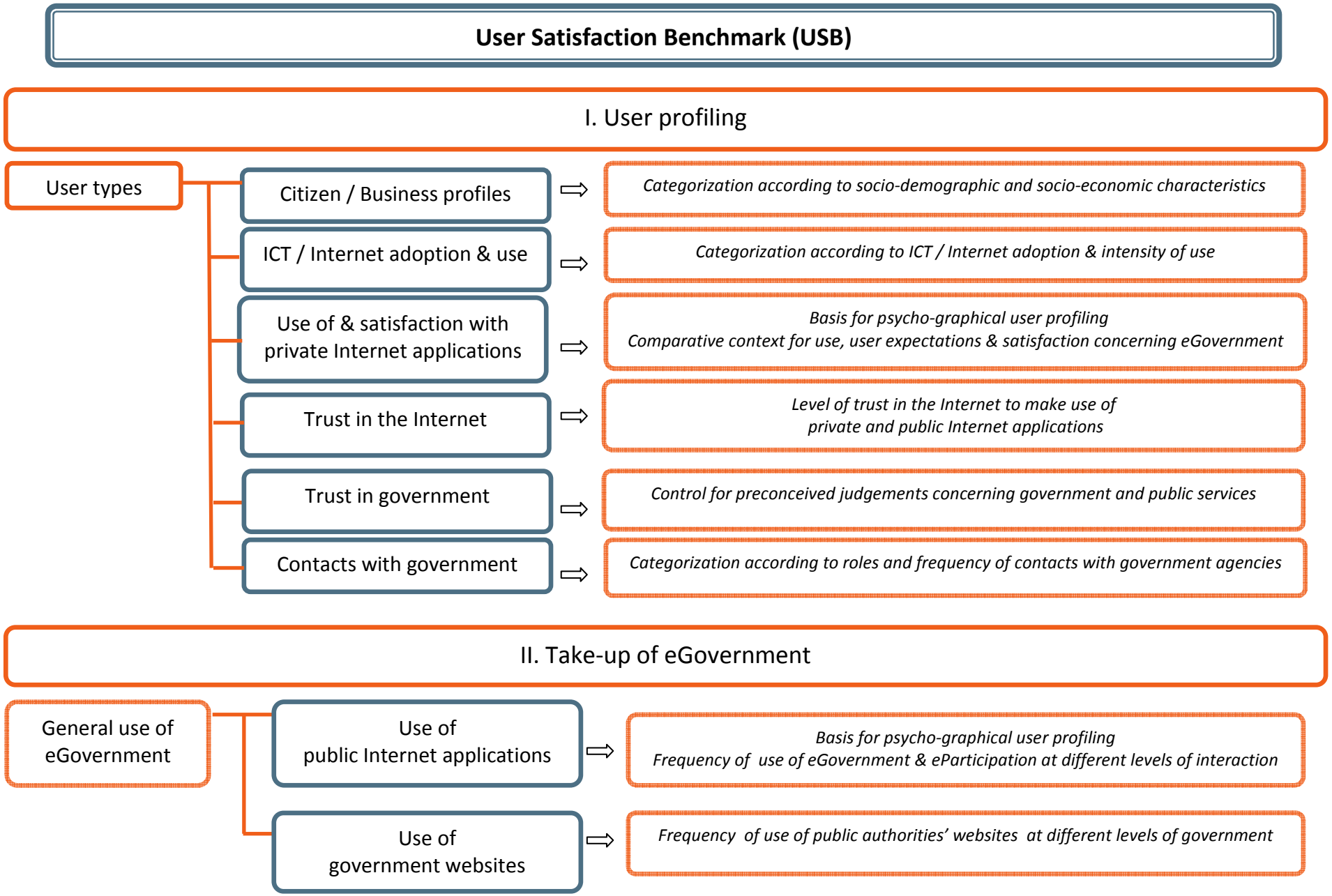
1.2.1.1 User profiling

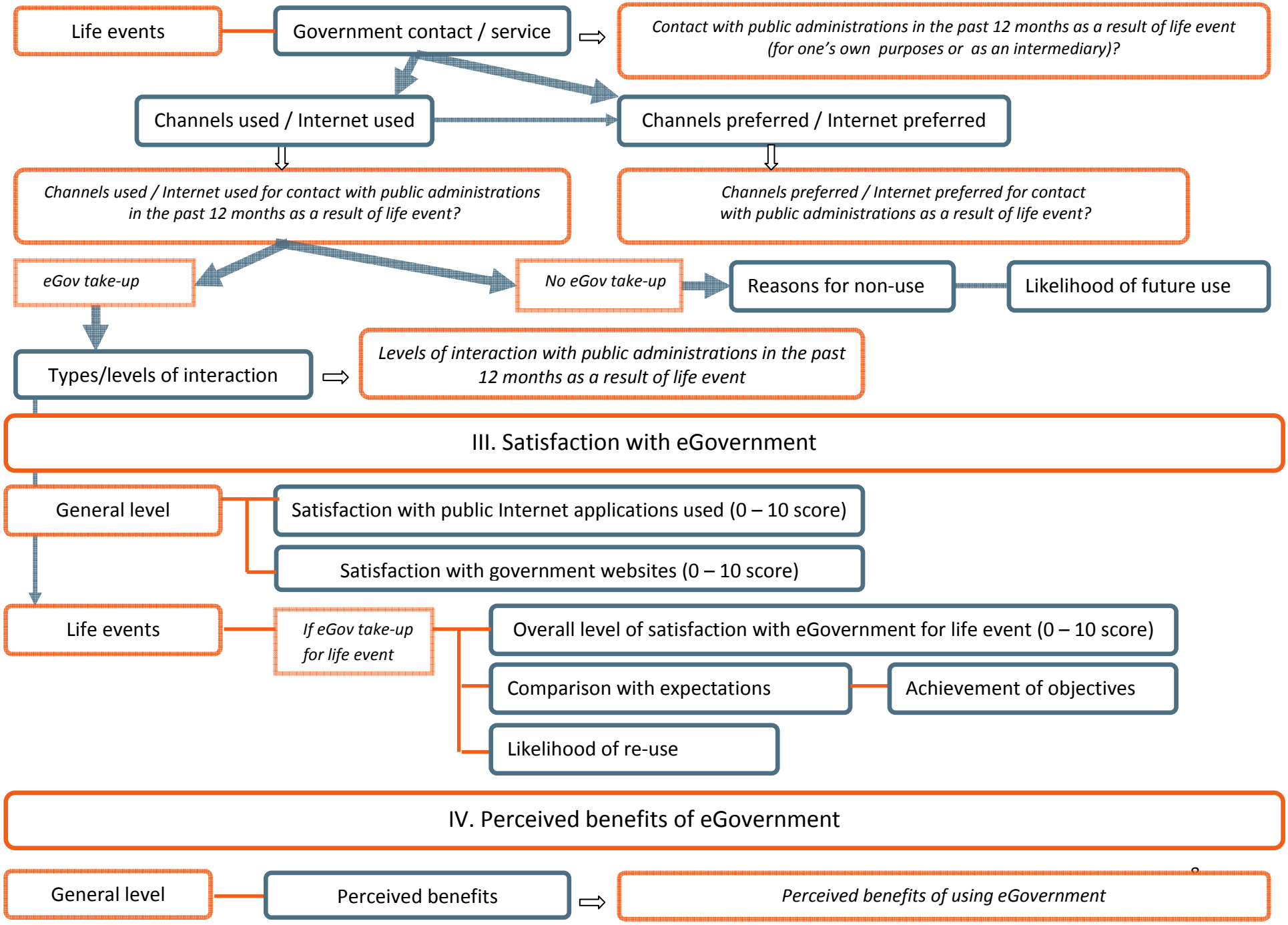
The first part of the survey instrument consists of six question modules which address the profiling and categorization of Internet/eGovernment users:

- Socio-demographic and -economic citizen/business profiles;
- ICT/Internet adoption and intensity of use;
- Use of and satisfaction with non-governmental Internet applications;
- Trust in the Internet (citizens);
- Trust in government (citizens);
- Contacts with government (citizens).

The basic logic that underlies these modules is the intention to do the following six tasks:

- Identify user types and profiles along different relevant axes (socio-demographic, psycho-graphical, relationships with Internet and with government);
- Categorize citizens and businesses into customer target groups, for example: students, retired persons, self-employed persons, and SMEs;
- Differentiate users according to levels of use and experience with Internet in general and with Internet-based services in particular;
- Compare use of and satisfaction with eGovernment to user experiences with other non-governmental Internet-based services;
- Control for preconceived judgements concerning government and public services by taking into account general attitudes, perceptions of the quality of public service provision, and levels of trust;
- Take into account the frequency of contacts and dealings with government in general in different roles (such as private person versus professional; acting for one's own purposes or as an intermediary on behalf of others; acting personally or through an intermediary).


User Satisfaction Benchmark (USB)
I. User profiling
User types
Citizen / Business profiles
Categorization according to socio-demographic and socio-economic characteristics
ICT / Internet adoption & use
Categorization according to ICT / Internet adoption & intensity of use
Use of & satisfaction with private Internet applications
Basis for psycho-graphical user profiling
Comparative context for use, user expectations & satisfaction concerning eGovernment
Trust in the Internet
Level of trust in the Internet to make use of private and public Internet applications
Trust in government
Control for preconceived judgements concerning government and public services
Contacts with government
Categorization according to roles and frequency of contacts with government agencies
II. Take-up of eGovernment
General use of eGovernment
Use of public Internet applications
Basis for psycho-graphical user profiling
Frequency of use of eGovernment & eParticipation at different levels of interaction
Use of government websites
Frequency of use of public authorities' websites at different levels of government

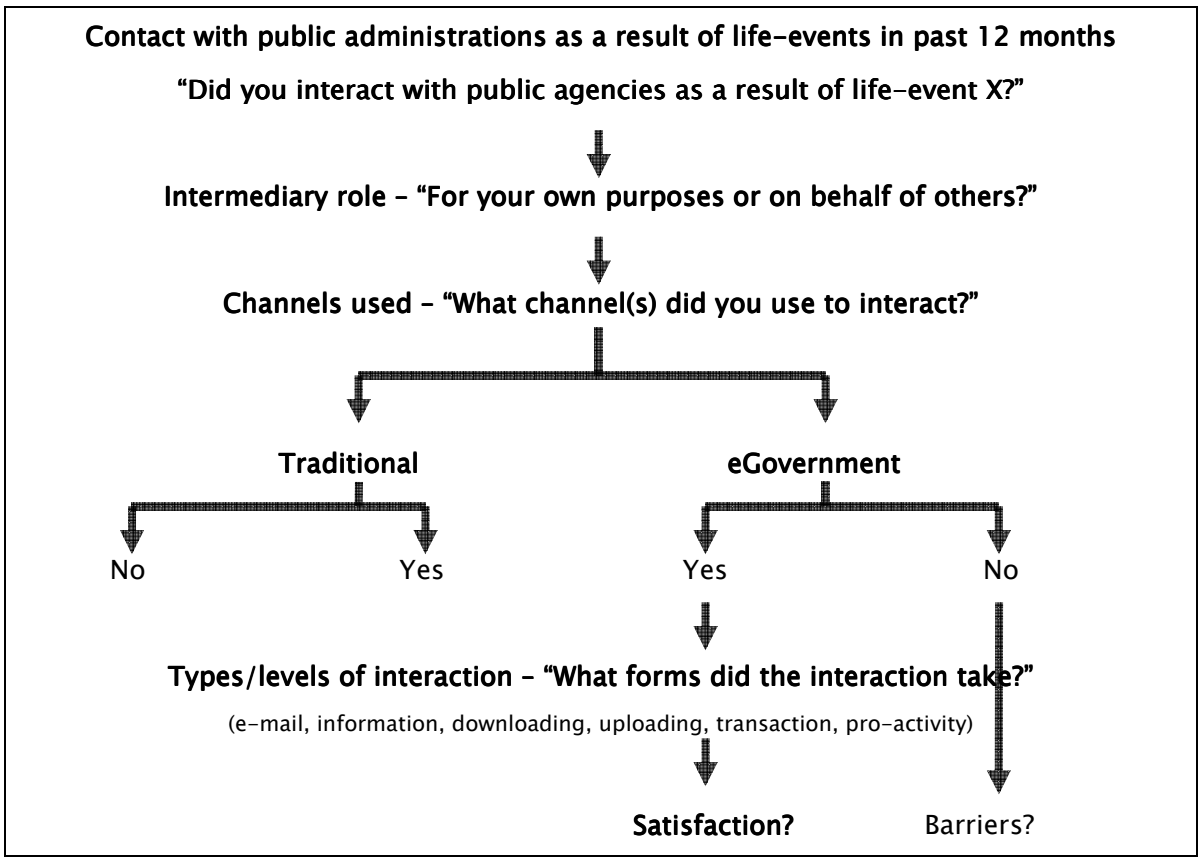

Life events
Government contact / service
Contact with public administrations in the past 12 months as a result of life event (for one's own purposes or as an intermediary)?
Channels used / Internet used
Channels preferred / Internet preferred
Channels used / Internet used for contact with public administrations in the past 12 months as a result of life event?
Channels preferred / Internet preferred for contact with public administrations as a result of life event?
eGov take-up
No eGov take-up
Reasons for non-use
Likelihood of future use
Types/levels of interaction
Levels of interaction with public administrations in the past 12 months as a result of life event
III. Satisfaction with eGovernment
General level
Satisfaction with public Internet applications used (0 – 10 score)
Satisfaction with government websites (0 – 10 score)
Life events
If eGov take-up for life event
Overall level of satisfaction with eGovernment for life event (0 – 10 score)
Comparison with expectations
Achievement of objectives
Likelihood of re-use
IV. Perceived benefits of eGovernment
General level
Perceived benefits
Perceived benefits of using eGovernment

1.2.1.2 Use of eGovernment

This part of the instrument measures the take-up of eGovernment prior to the measurement of customer satisfaction with the eGovernment applications that are actually used.

The use of eGovernment at the general level is measured by presenting a basic list of eGovernment and eParticipation applications, differentiated by the type or level of interaction (from e-mail communication to online service application and participation in policy-making processes), and of government portal websites at the local, regional and national levels.

The USB instrument further adopts a life-event based approach. It presents to both citizen or business respondents a series of customer life-event processes. Here, "eGovernment" channels may be used for certain types or levels of interaction (such as seeking information, communicating with public servants, or applying for a particular service). The set of citizen and business life-events proposed includes the issue of citizen and business mobility within the EU, represents different types of public services (from "obligations" to "opportunities"), and captures a very broad range of target groups.



In order to produce a realistic and accurate view of eGovernment take-up and satisfaction, the instrument also adopts a two-stage questionnaire process. Respondents are asked, first, for which life events they came into contact with government in general in the last 12 months and, then, for which of these they used the Internet (or other electronic channels).

Such an approach produces a more reliable picture of take-up that is weighted towards actual use and need for use. For instance: of those who in the last 12 months had to notify local government authorities about changing their residence, how many did so online? The baseline is, then, not the entire population of Internet users, but the sub-sample of those people who did need to contact government about this specific life event. As a result, the percentage figure produced is a much more valid measure of uptake. Additionally, when the questionnaire asks about satisfaction, respondents can be singled out who actually did use the services, and whose answers are likely to be based on their actual experience rather than on generic, pre-formed judgements.

As a result, the approach to measure take-up of eGovernment in the context of a list of 20 citizen and 15 business life-events includes the following sequence of elements:

- Contacts with public administrations in the past 12 months as a result of customer life-events, for citizens' or companies' own purposes or as an intermediary for friends, relatives or professional clients;
- Channels used/Internet used for interaction with public administrations in the context of life-events that apply;
- Channels preferred/Internet preferred for interaction with public administrations in the context of life-events that apply;
- Levels of interaction with public administrations in the context of life-events that apply and for which the Internet is used.

The level of overall satisfaction with the use of the Internet for interaction with public administrations will be measured in the context of those life-events that apply. As these satisfaction scores are more directly related to particular "experiences", there are reasons to believe that they offer more reliable indicators of actual satisfaction with eGovernment.

Note that the following elements are included in the measurement of take-up:

- A respondent's potential role as an intermediary: probing e.g., whether the contact was made for one's own purposes or on behalf of friends/relatives or clients;
- Different ways of interaction including traditional and "eGovernment" channels:
    - In-person, face-to-face
    - Mail, posted letter, fax
    - Telephone (fixed line or mobile)
    - E-mail/Internet (websites).
- Different levels of interaction that are characterized by increasing sophistication:
    - E-mail communication
    - Searching/obtaining information
    - Downloading official forms
    - Uploading filled-in forms
    - Transaction (full electronic case handling)
    - Pro-active service delivery.

Note that the survey focuses on the use of the Internet – broadly defined, including e-mail – as an eGovernment channel. This channels is contrasted with traditional channels of communication (such as face-to-face, mail, and telephone). The survey instrument, however, can be easily extended to other "eGovernment" channels of communication (for example: mobile technologies, interactive digital TV).

Furthermore, it is important to juxtapose channels used and channels preferred. Such a juxtaposition offers, for example, the possibility of differentiating between types/reasons of non-use (for example, why do individuals not make use of the Internet for eGovernment purposes, although they may say that they prefer to interact that way).

Specific attention is devoted to non-users of eGovernment, focusing on:

- Non-user profiles;
- Reasons for non-use;
- Non-users' channel preferences;
- Non-users' likelihood of future use of electronic channels.

1.2.1.3 Satisfaction with eGovernment

This area of questioning is central to the whole instrument design. It provides the basic conceptual standard for measuring user satisfaction.

First, satisfaction with eGovernment at the general level is measured by asking respondents to evaluate their experiences with the general eGovernment and eParticipation applications and the government portal websites presented earlier (see: use of eGovernment).

Satisfaction with the eGovernment processes in the context of specific citizen and business life-events is measured by the following components:

- Overall level of satisfaction;
- Comparison with expectations;
- Achievement of objectives;
- Likelihood of re-use.

A 10-point scale (0-10) is used to measure the overall level of satisfaction of both the general use of "public" Internet applications, and each of the 20 citizens'/15 business life-events that apply. The average score for the total set of life-events can be produced.

Overall satisfaction should be related or compared with prior user expectations. At the same time, it is clear that the extent to which citizens or companies achieved their actual objectives through eGovernment processes will affect their final opinion of eGovernment. Questions about the likelihood of re-use completes this evaluation of using the Internet/electronic channels for interaction with public administrations.

1.2.1.4 Perceived benefits of eGovernment

Within this survey concept, the perceived benefits of eGovernment are measured for eGovernment in general, and not for each life-event. Citizen and business respondents are asked whether they agree or disagree with eight statements about the potential benefits of using eGovernment.

1.2.2 eService Evaluation Tool (eSET)

The eService Evaluation Tool (eSET) is a framework that can be used by public agencies to measure user take-up and satisfaction with specific services which they deliver electronically. On the next page a graphic illustrates the general structure of the eSET instrument.

1.2.2.1 User profiling

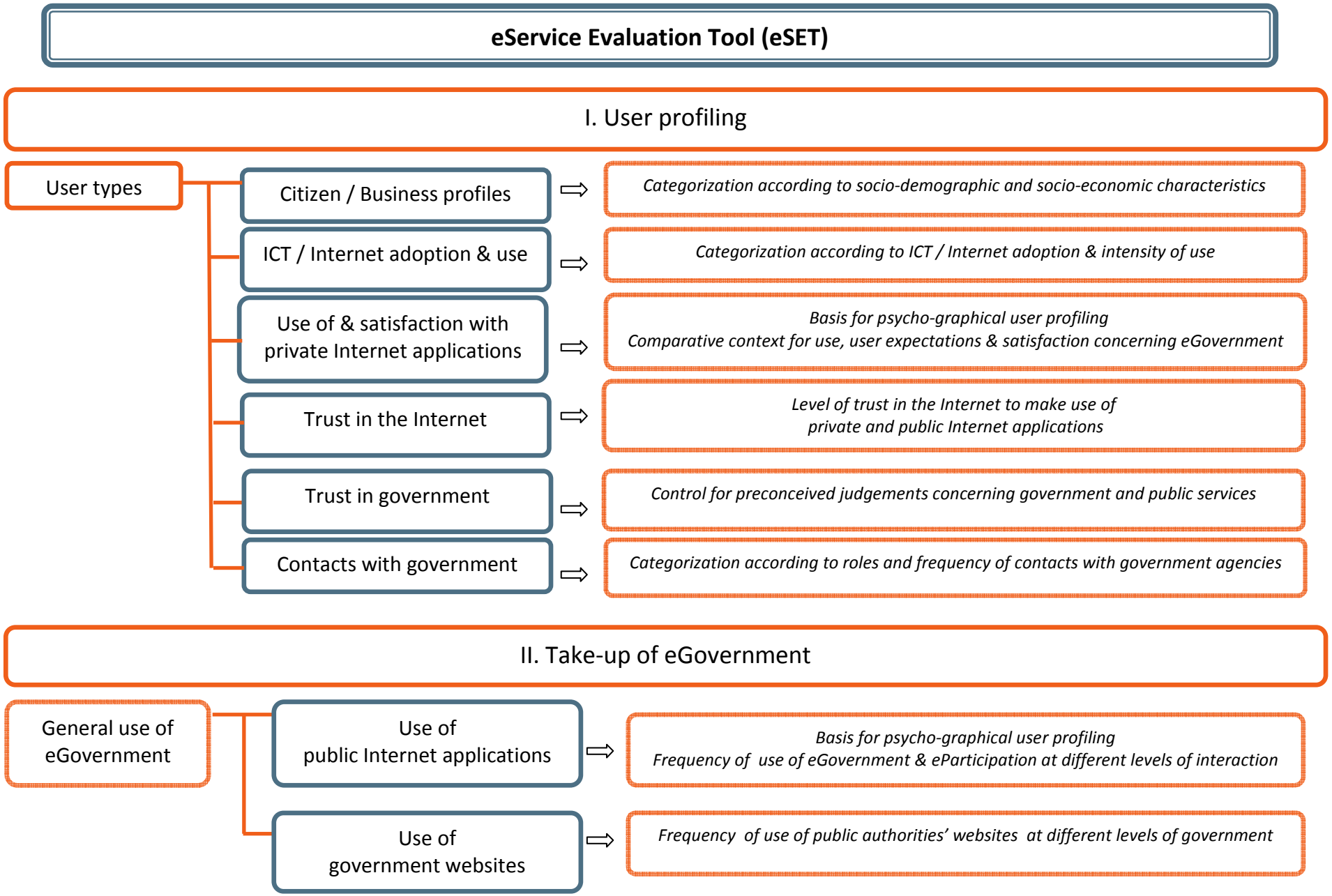
The same elements that are used in the user satisfaction benchmark instrument are also used to profile users and non-users of specific eGovernment processes, services and applications.

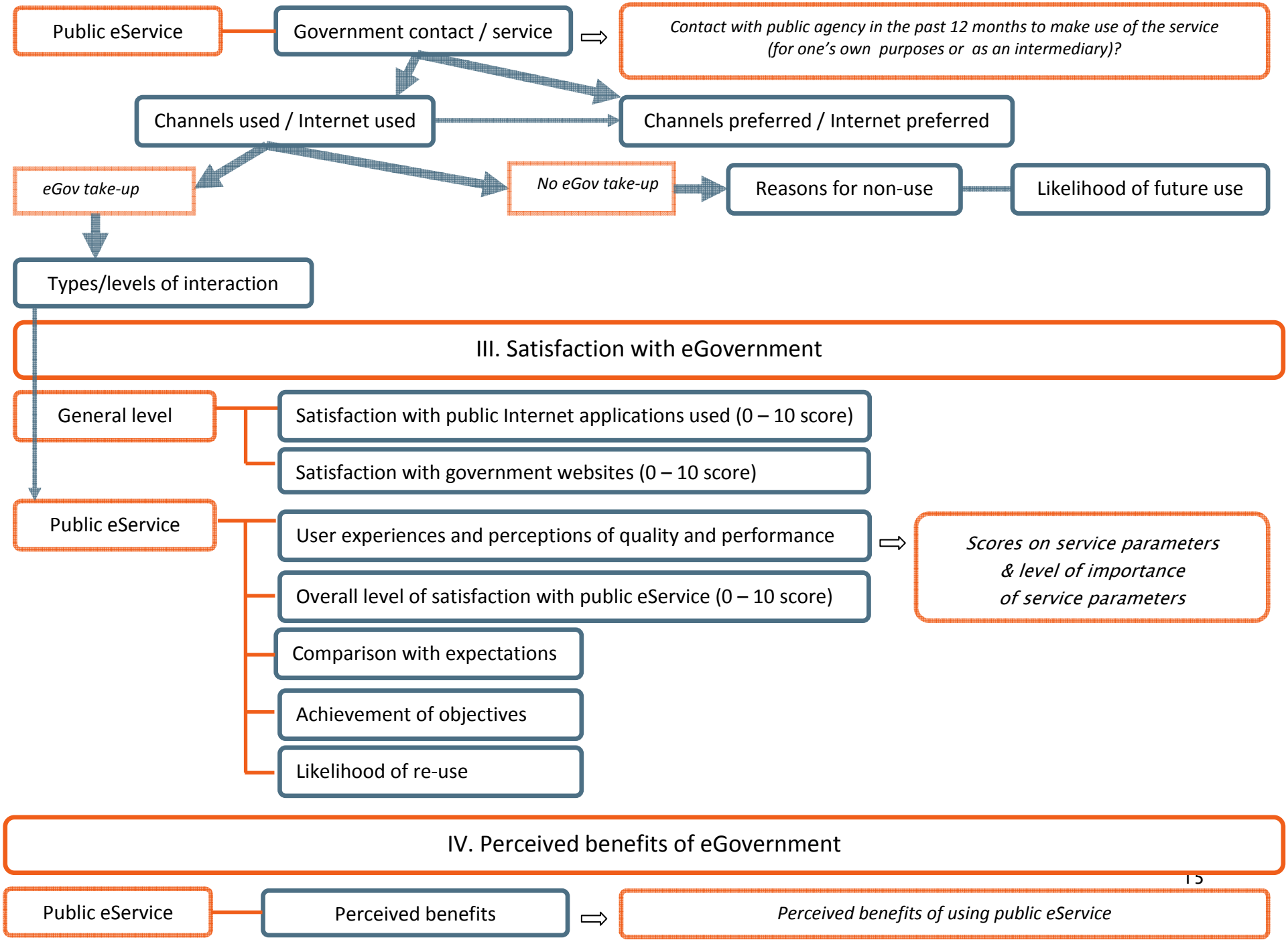
The first part of the survey instrument consists of the following six question modules which address the profiling and categorization of Internet/eGovernment users:

- Socio-demographic and -economic citizen/business profiles;
- ICT/Internet adoption and intensity of use;
- Use of and satisfaction with non-governmental Internet applications;
- Trust in the Internet (citizens);
- Trust in government (citizens);
- Contacts with government (citizens).

The basic logic that underlies these modules is the intention to undertake the following six tasks:

- Identify user types and profiles along different relevant axes (socio-demographic, psycho-graphical, relationships with Internet and with government);
- Categorize citizens and businesses into customer target groups, for example: students, retired persons, self-employed persons, and SMEs;
- Differentiate users according to levels of use and experience with Internet in general and with Internet-based services in particular;
- Compare use of and satisfaction with eGovernment to user experiences with other non-governmental Internet-based services;
- Control for preconceived judgements concerning government and public services by taking into account general attitudes, perceptions of the quality of public service provision and levels of trust;


eService Evaluation Tool (eSET)
I. User profiling
User types
Citizen / Business profiles
Categorization according to socio-demographic and socio-economic characteristics
ICT / Internet adoption & use
Categorization according to ICT / Internet adoption & intensity of use
Use of & satisfaction with private Internet applications
Basis for psycho-graphical user profiling
Comparative context for use, user expectations & satisfaction concerning eGovernment
Trust in the Internet
Level of trust in the Internet to make use of private and public Internet applications
Trust in government
Control for preconceived judgements concerning government and public services
Contacts with government
Categorization according to roles and frequency of contacts with government agencies
II. Take-up of eGovernment
General use of eGovernment
Use of public Internet applications
Basis for psycho-graphical user profiling
Frequency of use of eGovernment & eParticipation at different levels of interaction
Use of government websites
Frequency of use of public authorities' websites at different levels of government


Public eService
Government contact / service
Contact with public agency in the past 12 months to make use of the service (for one's own purposes or as an intermediary)?
Channels used / Internet used
Channels preferred / Internet preferred
eGov take-up
No eGov take-up
Reasons for non-use
Likelihood of future use
Types/levels of interaction
III. Satisfaction with eGovernment
General level
Satisfaction with public Internet applications used (0 – 10 score)
Satisfaction with government websites (0 – 10 score)
Public eService
User experiences and perceptions of quality and performance
Scores on service parameters & level of importance of service parameters
Overall level of satisfaction with public eService (0 – 10 score)
Comparison with expectations
Achievement of objectives
Likelihood of re-use
IV. Perceived benefits of eGovernment
Public eService
Perceived benefits
Perceived benefits of using public eService

- Take into account the frequency of contacts and dealings with government in general in different roles (such as private person versus professional; acting for one's own purposes or as an intermediary on behalf of others; acting personally or through an intermediary).

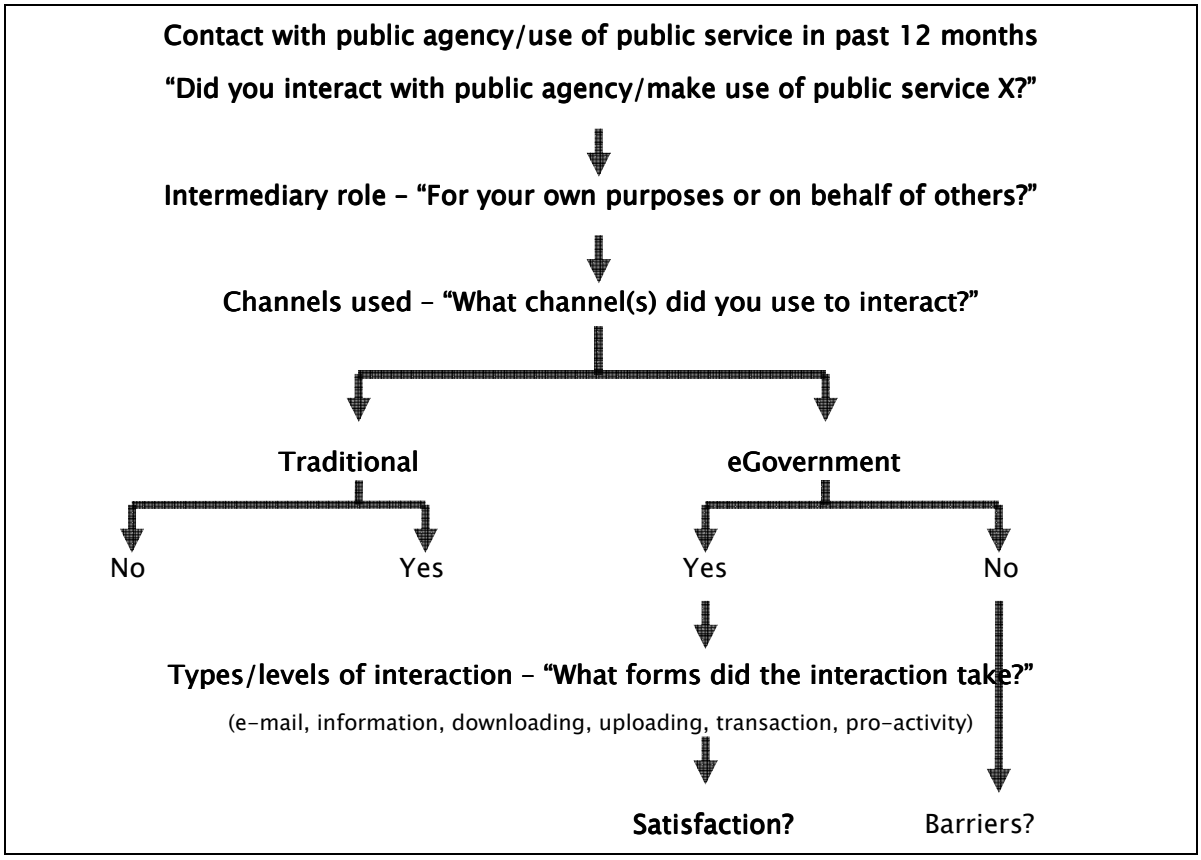
We wish to emphasize that, based on this part of the survey instrument, user profiling and the identification of user segments that are or are not reached can provide a public agency with vital information about the composition of its actual and/or potential eService customers.

1.2.2.2 Use of eGovernment

This part of the instrument measures the take-up of a specific public eService prior to the measurement of customer satisfaction.

The use of eGovernment at the general level is measured by presenting a basic list of eGovernment and eParticipation applications. These are differentiated by the type or level of interaction (from e-mail communication to online service application and participation in policy-making processes). Use of government portal websites at the local, regional and national levels are also assessed. The question module concerning the use of government websites incorporates the specific public agency that is involved.

The eSET instrument then focuses on the specific public eService that forms the object of measuring customer satisfaction. To produce a realistic and accurate view of eGovernment take-up and satisfaction, a two-stage questionnaire process is again adopted. Respondents are asked, first, whether they came into contact with the public agency/service under consideration in the last 12 months and, then, whether they used the Internet (or other electronic channels) in this respect or not.



The approach to measure use of the service includes the following sequence of four elements:

- Contacts with the public agency/use of the public service in the past 12 months, for citizens' or companies' own purposes or as an intermediary for friends, relatives or professional clients;
- Channels used / Internet used to make use of the public service;
- Channels preferred / Internet preferred to make use of the public service;
- Levels of interaction with the public agency in the context of the eService used.

Note that the following three elements are included in the measurement of take-up:

- Respondent's potential role as an intermediary: probing e.g., whether the contact was made for one's own purposes or on behalf of friends/relatives or clients;
- Different ways of interaction including traditional and "eGovernment" channels:
    - In-person, face-to-face
    - Mail, posted letter, fax
    - Telephone (fixed line or mobile)
    - E-mail/Internet (websites).
- Different levels of interaction, characterized by increasing sophistication:

- E-mail communication
- Searching/obtaining information
- Downloading official forms
- Uploading filled-in forms
- Transaction (full electronic case handling)
- Pro-active service delivery.

The focus is on the use of the Internet – broadly defined, including e-mail – as an eGovernment channel. It is contrasted to traditional channels of communication (such as face-to-face, mail, and telephone). The survey instrument, however, can be easily extended to other "eGovernment" channels of communication (for example: mobile technologies, interactive digital TV).

The channels used and the channels preferred are juxtaposed in order to, for example, differentiate between types/reasons of non-use (for example, why do individuals not make use of the service online, although they may say that they prefer to interact that way).

Specific attention is devoted to non-users of the service supplied, focusing on:

- Non-user profiles;
- Reasons for non-use;
- Non-users' channel preferences;
- Non-users' likelihood of future use of electronic channels.

1.2.2.3 Satisfaction with eGovernment

This is the central part of the whole instrument design. It provides the basic conceptual standard for measuring user satisfaction, applicable to any public agency in the EU Member States which wishes to use it to measure customer satisfaction with a particular service/product supplied to citizens/businesses in an electronic way.

First, satisfaction with eGovernment at the general level is measured by asking respondents to evaluate their experiences with the general eGovernment and eParticipation applications and the government portal websites presented earlier (see: use of eGovernment).

The overall level of satisfaction with the specific public eService is measured on a 10-point scale (0-10).

In-depth analysis is based on user experiences and perceptions of quality and performance. This concerns evaluations of a standard set of service parameters (factors or drivers of either dissatisfaction or satisfaction), including accessibility, usability, the quality of the actual information available and its content, and a range of more specific criteria that include more esoteric elements, to aspects of privacy/security, and the critical elements of time and cost.

This in-depth analysis may form the basis for the construction of a *strategic priority matrix for improvement of the public service online*. This matrix crosses the scores for a series of 12 service performance parameters with the levels of importance of these factors. Correlations of the parameter scores with the overall level of satisfaction give an indication of the extent to which each parameter contributes to the overall level of satisfaction of the respondents with the service, and, hence, of the importance of the parameter. These indications of the importance of each service parameter are needed in order to cross-analyze satisfaction and importance. They provide a key to identify priorities for service improvement (i.e., what needs mainly to be done to improve service delivery?).

Measurement of satisfaction further includes:

- Comparison with expectations;
- Achievement of objectives;
- Likelihood of re-use.

Overall satisfaction should be related or compared with prior user expectations. At the same time, it is clear that the extent to which citizens or companies achieved their objectives through using a particular service online will affect their final judgment. The likelihood of re-use completes this evaluation of the use of the Internet/electronic channels.

1.2.2.4 Perceived benefits of eGovernment

Finally, the perceived benefits of using the Internet/eGovernment channels to make use of the service are measured by asking citizen and business respondents whether they agree or disagree with eight statements about the potential benefits they actually experienced.

1.3 Step-by-step approach

To apply in an effective way the tools presented in the previous chapter, we suggest that eGovernment officials and public agencies follow the step-by-step approach to the survey process which is introduced here.

The step-by-step approach consists of five parts. These parts are to do with: rationale and scope; methods; good survey design; data gathering and analysis; and communication of the results.

First of all, there needs to be a clear definition of the objectives, subject or focus, and scope of any initiative that is undertaken to measure eGovernment user satisfaction and impact (whether that would be the level of government, the kind of service/application supplied, or the types of user groups targeted/involved).

Second, decisions need to be made concerning sampling and data gathering techniques to be used, the data analysis and interpretation, and the reporting of the results. Obviously these decisions are influenced by practical considerations, most notably with relation to:

- Cost (budget);
- Time (scheduling);
- Available "in-house" human resources and expertise vs. external support (through outsourcing or contractual arrangements).

Third, a step-by-step approach also means integrating into the research design an involvement of the community and stakeholders in the particular Member State: ways of using the results for improving public (e)Service delivery and wider eGovernment strategies, and communicating clearly both the study findings and their policy implications.

In the following sections, we explain the different steps in the set-up and execution of citizens' and business surveys on eGovernment user satisfaction and impact, using the tools presented earlier.

1.3.1 Define clearly the scope of the survey

Before taking the initiative to measure user satisfaction and impact of eService applications, public agencies should first answer the central question: "Why should we conduct a user satisfaction survey, and what do we want to learn from it?"

Different objectives may apply in each case. The underlying reasons could include that a public agency would want to: detect deficiencies in public service delivery, analyze reasons and causes of dissatisfaction, benchmark data and monitor progress, look for ways to improve the quality or user-centricity of services provided online, or try to understand why people do not make use of its services.

Clear formulation of these objectives is required to delineate, from the start, the precise object/focus, target groups and scope of the measurement project undertaken.

1.3.2 Designing the survey questionnaire

Customization of the survey instrument is needed according to the aim, focus and scope of the measurement initiative.

A user-friendly questionnaire design is required. This is related to the data gathering method used, for example: an Internet-specific questionnaire design when using Computer Assisted Web Interviewing (CAWI) techniques.

If a questionnaire is too long and too complex, it will jeopardize the rate of full responses obtained. In turn, this weakens the statistical robustness of the results.

In many cases, questionnaires need to be translated. Make sure to test translations, wordings, and question formulations through small qualitative and/or quantitative end-user tests.

1.3.3 Gathering data

The data gathering process implies deciding on the method used, defining the research sample, and organizing the fieldwork.

1.3.3.1 Data gathering techniques

The scope of this survey instrument is "user satisfaction with and impact of eGovernment". As a prime target group, the focus of the instrument is quite clearly on "eReady" citizens and businesses. By "eReady" is meant citizens and companies that have access to the Internet and, as a result, can be considered as actual or potential users of eGovernment. The instrument pays attention to non-use of eGovernment among the Internet population, but its main objective is to measure the extent to which actual users are satisfied with eGovernment.

Given this scope, application of the instrument implies that the survey is conducted on a representative sample of the Internet population. Different methods can be used for data gathering, most notably Computer Assisted Web Interviewing (CAWI) and Computer Assisted Telephone Interviewing (CATI).

Since the survey is aimed at users of eGovernment services within the Internet population, it is recommended to use an online panel survey approach. Panels of online Internet users show a large advantage when compared to respondents of offline surveys, even when the latter panels or samples include large numbers of individuals who use the Internet. This advantage lies in the validity of the approach, that is, the degree to which the answers and indicators extracted from them really reflect the phenomenon under study. It is clearly different to ask a) a question by telephone of a respondent who might have used the Internet three months ago about his/her experience with several services and b) a question of a respondent who is part of an online panel and who, thus, uses the medium of the Internet much more frequently. In the latter case, the respondent's answer is more likely to reflect real experience and not prejudgement or expectation.

On the other hand, public administrations should take into account that the reliability of the results of a survey based on an online panel is limited to similar surveys that also use an online panel. (Reliability means the likelihood that similar results are produced at a different time and by other researchers using the same instrument.) Furthermore, we wish to emphasize that online panels tend to include fewer sporadic users of the Internet.

Despite these considerations, the benefits of an online panel survey method are several; they are spelled out in detail here.

The online panel data gathering method in general:

- monitors actively a representative subset of online respondents, citizens and (people working in) businesses:
    - This method facilitates a number of respondents to be re-contacted easily for research purposes.
    - The method makes it easy to set up a standard that can be re-used afterwards.
- can be undertaken at low cost:
    - Online panel research is one of the cheapest forms of interaction to take place with a representative subset of Internet users. Follow-up can be organised easily (for example, through reminder e-mails), there are no paper- or postal or interviewer-related costs. Scale advantages are achieved for large populations.
    - Every survey has field costs which are spent in order to contact respondents. By using existing permission-based online panels for a survey of respondents, recruited in various offline and online ways, the field cost of finding and contacting respondents can be set very low. The relatively high cost of recruiting respondents can be spread over several, different surveys.
- emphasises validity and reliability:
    - Panel members are recruited based on intake questionnaires. These intake questionnaires contain a set of socio-demographic, attitudinal and behavioural variables. To become a member of online research panels, respondents have to fill in intake questionnaires. Based on this information the representativeness of a sample can be monitored.
    - Online panel research offers the possibility of setting up rich sets of complex interlaced questions. Building on previous answers within the same questionnaire, very complex but to-the-point routings can be set-up. In this way, questions can be very precisely targeted towards certain user profiles.
    - Online research requires a limited field time. Thus, it stimulates the accuracy of the data gathered.
- respects the time pressures on respondents:
    - Respondents can fill in questionnaires at convenient moments. The panels are permission-based. Respondents are not disturbed at inappropriate times by being asked to participate, and their privacy is respected.
    - The usability of online questionnaires can be tested by means of route path analysis and the analysis of response rates.
- emphasises representativeness and scientific approved methods:
    - Based on data gathered in intake questionnaires it is possible to:
        - Guarantee the representativeness of the survey. After the field work has ended, very precise statistical control of the response achieved can take place. The sample obtained can be compared with the population figures, and interlaced weight factors can be calculated.
        - Target very precisely certain groups and populations because this information is gathered in intake questionnaires.

        - Achieve a very broad reach which is controlled and monitored through a single online back-office.
    - Furthermore it is possible to:
        - Randomize response categories. This is methodologically important, since respondents have a tendency to make more use of the first answer categories that are presented to them. By randomizing the response categories, this effect is neutralized.
        - Enable real-time monitoring of the data gathered. This makes it possible to correct the data collection even during the fieldwork rather than waiting till the very end of the process.
        - Offer a very large range of possibilities for choice in terms of question types, look-and-feel, intelligent routing flexibilities, and other kinds of usability-increasing features.

For all these reasons, the online panel survey method is highly suited to the USB application. It can be aimed at cross-national benchmarking through representative samples of the online population within the EU Member States. It is the most cost-efficient way to undertake such an exercise regularly, make use of direct access to online research panels throughout the EU countries, and coordinate a research survey from one central online back-office.

The use of the eService Evaluation Tool does not always require a representative sample of the Internet population. Public agencies can decide to use their own databases and information they possess on actual users of their services. In that case, however, they should be aware of some limitations and drawbacks of the technique. For example, no information can be gathered about actual service take-up and about non-user profiles and barriers. Such information may be vital for service improvement and it may prove a serious oversight to ignore it. The online panel approach can provide data on the reasons for non-use of eGovernment by people who, nevertheless, do have access to the Internet and Internet-based services. Furthermore, with an online panel survey approach, the Internet user population as a whole is addressed and not solely visitors to specific websites or users of particular services within a given period of time.

Nevertheless, depending on the specific requirements for measurement objectives, eServices under consideration, or user target groups, other data gathering techniques may seem appropriate, either in their own right or as a complement to the survey instrument proposed. Alternative options may include qualitative approaches, focus groups, website visitor evaluations, mystery shopping (testing of the service delivery process by a trained but

anonymous person), and analysis of service processes and/or customer complaints. In any case, integration of these approaches is needed to obtain effective results in an efficient way.

A final data gathering consideration concerns the measurement of the impact of eGovernment. When using surveys of the kind that we present, only "subjective" perceptions can be measured of the extent to which eGovernment makes a difference to the respondent in terms of costs and benefits. Impact, however, primarily has to do with relative changes in attitudes, behaviours, and their outcomes. We do emphasize, therefore, the value that can be created by integrating the eService Evaluation Tool in a longitudinal research design. Periodical Systematic, periodically repeated monitoring of the take-up by users, and users' satisfaction with online public service delivery, is recommended. This will facilitate evaluation of policies for eGovernment development and improvement within a longer time horizon. Furthermore, it is far more cost-efficient than setting up sample surveys that stand alone or are repeated only twice.

1.3.3.2 Defining the research sample

A good survey stands or falls by a good sample. To create a good sample, one should consider three questions:

1. What size should the sample be to ensure appropriate reliability?
2. Are the costs of the sample in an acceptable relation with the potential profits?
3. Are the respondents selected in a methodologically acceptable way?

The first two questions relate to the size of the sample, the last to the selection of the respondents.

Within the general general step-by-step approach prescribed here, we indicate six very concrete steps for deciding on sample size.

Step 1. Deciding on the sample size

The first question is: **What size should the sample be to ensure appropriate reliability?**

To answer this question appropriately, we have to make use of the concept of "confidence interval[1]".

Here two questions should be answered:

1. How wide or narrow must our confidence interval be? In other words, what is the maximum difference in percentage terms that the result of a particular survey may differ from the actual population value? Confidence intervals are the most prevalent form of interval estimation.
2. What risk will we allow ourselves of a less than optimal confidence interval? In other words: how certain do we want to be that the given confidence interval is correct?

We recommend applying severe scientific criteria, to these questions: use of a confidence interval of +3,10%/-3,10% with a reliability of 95% is recommended. This means that a maximum difference of +3,10%/-3,10% is allowed between the results obtained and the population results. On a statistical level, the survey organizer is, thus, 95% certain that the score (frequency) of a population parameter lies between a maximum range of +3,10% / -3,10% of the observed result. Based on these severe criteria, a minimum realized sample of 1,000 respondents (per country), i.e., for the citizen target group, is needed. This sample permits reliable conclusions to be obtained based on a reliability of 95% that the obtained results differ a maximum of ± 3,10% from the (mostly immeasurable) population figures.

The second question is: **Are the costs of the sample in an acceptable relation with the potential profits?**

The sample size is also influenced by the cost of obtaining the sample. This can be understood very easily. The best possible sample is that of a total population (i.e., interviews of a total target population). This would, of course, require a huge budget and, moreover, the impact on the confidence interval and the reliability percentage would most often be limited

[1] A confidence interval is a statistical range with a specified probability that a given parameter lies within the range. More precisely, a confidence interval for a population parameter is an interval with an associated probability p that is generated from a random sample of an underlying population. Thus, if the sampling were to be repeated numerous times and the confidence interval recalculated from each sample according to the same method, a proportion p of the confidence intervals would contain the population parameter in question.

An example can clarify this case. For instance, given a reliability of 95%, the impact of an increase in sample size (given an endless population) is the following:

N = 1,000 => confidence interval (CI) = ±3.10

N = 2,000 => confidence interval = ±2.19 (increase of CI 0.9%)

N = 10,000 => confidence interval = ±0.98% (increase of CI 1.2%)

N = 100,000 => confidence interval = ±0.31% (increase of CI 0.7%)

While the estimated impact on the budget for a sample of online citizens would be:

N = 1,000 => budget = 100%

N = 2,000 => budget increase estimated between 160% and 180%

N = 10,000 => budget increase estimated between 500% and 750%

N = 100,000 => budget increase estimated between 3000% and 4000%

We can easily conclude that a bigger sample of a particular target group will take a larger budget for fieldwork than a smaller sample for the same target group.

Not only is the size of the sample important, so too is the type of target group. Some target groups respond more easily to a survey questionnaire than others (e.g., citizens are more easy to approach than businesses). From a demographic point of view within the same target population, some respondents respond more easily (e.g., women aged between 25 and 45 participate respond easier when compared with older women (aged over 65 years) or compared with the higher or top management members of a firm. Thus, if it is more difficult to obtain a certain number of validated, filled-in questionnaires from a given category of respondents within a specific target group, this will have an impact on the survey price (i.e., it will cost more to obtain these completed questionnaires).

A distinction must certainly therefore be drawn between the target group citizens and the target group businesses. It is easier to obtain a representative sample of citizens than a representative sample of companies. Based on current market prices for online panel surveys, for example, to obtain responses from businesses costs more than double the price per completed questionnaire when compared with citizens. Due to the widely-differing costs of the data gathering for the two target groups, a distinction can be made in sample sizes between the target group citizens and the target group companies. These kind of cost

distinctions can be considered as being particularly important for public administrations/authorities.

In the pilot survey that was intended to test this survey instrument, decisions of this sort were made based on both methodological and budget considerations. For example, with regard to the citizens' questionnaire, a sample size was defined of 1,000 respondents/citizens per country (N= 1,000; 95% reliability, maximal theoretical confidence interval = +/-3.10). For business customers, a sample size was defined of 400 respondents/companies per country (N= 400; 95% reliability, maximal theoretical confidence interval = +/-4.90).

Therefore, both methodological and budget considerations play a role in survey and sample design, and must be taken into account. Note also that sample size is important because it may or may not allow the survey organizers to undertake more detailed analysis of certain subgroups (e.g., males versus females, different age categories or different types of users).

Step 2. Selecting the individual respondents

The third question is: **Are the respondents selected in a methodologically acceptable way?**

This question concerns the representativeness of survey research based on the recruitment of the respondents.

To guarantee a good representativeness and reliability, two elements are of importance: the size of the sample (in other words the number of respondents), and the way in which the number of respondents is recruited and reached. It is important to select a sample from a population database that has both an appropriate size and a good distribution of population parameters.

Based on such a database, a proportionally interlaced, stratified sample can be drawn that is representative for the population of Internet users in a country. A proportional interlaced stratified sample implies that the sampling is based on a quota for socio-demographic variables (for example, gender: 50% men, 50% women) that reflects the actual proportion of men and women in the total population of a given country, and – in this case – represents the Internet-using population. Uncrossed quota sampling based on several socio-

demographic variables, however, would be not exact or would be less exact, because there would be no composition control (for example, it might mean that men are over-represented in a certain age category). To avoid this kind of distortion, the quota are crossed, i.e., interlaced. In a crossed scenario, the sample is made up of a balanced stratified proportion of each combination of relevant variables. If, for example, 5% of the total Internet-using population consists of women older than 55 years, a representative sample of 1,000 citizens should include 50 women over the age of 55.

For citizen samples, proportional interlaced stratification should be based on gender, age, and education. For business samples, professional category/function, economic activity/sector and company size (that includes both SMEs and large companies) are the most relevant parameters. In this way, correct samples are drawn that are a reflection of the composition of the Internet population and of the universe of companies in a given country.

1.3.3.3 Executing the survey - organizing the fieldwork

When using the online panel survey method, the fieldwork process consists of the following six steps. They relate to the questionnaire programming, selection of panel members, contact, reminder, follow-up, and formal wrap-up of the questionnaire.

Step 1. Programming the questionnaires

The survey instrument is input using a chosen template (lay-out, colour, logos etc.). After programming, the questionnaires are "published" i.e., they go "live".

Step 2. Selecting the panel members

The selection of members of the online research panels that are invited to participate is based on the principle of a proportional interlaced stratified sample as described above. A sufficient number of respondents should be selected/invited in order to ensure the final target response.

Step 3. Contacting the panel respondents by e-mail invitation

The respondents are invited by a personal introduction sent by e-mail to participate in the survey. This e-mail invitation contains a personal link to the questionnaire. To ensure the best response possible, a research design should be adopted that is based on Dillman's Tailored Design Method (Dillman, 2000). When working with an online questionnaire, it is very important to design the methodology, timing, content, and layout in such a way that the respondent is invited in a friendly, approachable way to participate.

Step 4. E-mail reminder

After a week an e-mail reminder can be sent. In this e-mail, the respondents who did not yet fill in the questionnaire are reminded to participate. In practice, this leads to a higher response rate.

Step 5. Following-up and controlling the fieldwork

The progress of the online fieldwork and the response can and should be monitored in real-time. Monitoring can or should include: the number of e-mails sent, received, opened/read, number of questionnaires completed, identification of problematic drop-out points, etc. Whenever necessary, it is possible to react to difficulties in the following ways: e-mail reminders; recruitment of extra respondents; follow-up of feedback given by respondents; and use of real-time statistical reporting tools (for example to control who filled in the survey, whether particular quota for different socio-demographic subgroups are being met, etc.).

Step 6. Ending the "live" fieldwork/data-gathering

When the quota set for completed interviews are met, the data-gathering process ends.

1.3.4 Analysing and reporting data

Before data analysis can take place, a statistical validation of the results is required. To control the representativeness of the samples obtained, the distributions indicated in the survey should be statistically controlled by comparing them with the corresponding population figures. This can be based on the figures of EUROSTAT (the agency possesses

statistics on the use of the Internet for each European Member State). Based on this validation, interlaced weight factors can be calculated to correct for the possible skewness of the realised sample in terms of distributions according to gender, age, and education.

Depending on the study objectives and the information public agencies want to extract from the research for policy objectives, a range of statistics can be considered advantageous. Data analysis, which would use SPSS or some other well-known and sound form of statistical software, can range from the basic descriptive level to more advanced statistical analysis. The basic descriptive level uses frequency tables and cross-tabulations. More advanced statistical analysis would use, for example, latent class cluster analysis to look for similar groups or types of users. If continuous monitoring is planned, setting-up a dashboard may help to report results in a meaningful, visually appealing, and interactive manner.

1.3.5 Making and communication policy recommendations

The final step of the survey concerns the translation of the measurement findings into strategic policies and scenarios for service improvement. As already indicated, measuring eGovernment use and satisfaction should not be an end in itself, but a means to explore the ways in which customer relationships within the public sector can be optimized.

Communication of research-based information and of strategies built upon this kind of information should be considered as an integral part of the research design. Efficient communication is necessary for successful implementation of these eGovernment strategies.

2 Questionnaires (see Annex Part 2)

2.1 User Satisfaction Benchmark (USB)

2.1.1 Citizens
2.1.2 Business

2.2 eService Evaluation Tool (eSET)

2.2.1 Citizens
2.2.2 Business