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# Usability Requirements for the Framework for Self-Service Environments

# Table of Contents

# 1   Introduction

The framework for self-service environments is a recommendable functional framework that the providers of public services can use as a basis when designing and realising their customer-focused and convenient self-service environments.

## 1.1   Target Group of the Document

The analysts and developers, who develop the system and who have to ensure that the requirements regarding the usability and accessibility of the system are met, are the target group of the document. The target group of the document include also the testers who check the conformity of a completed development to the mentioned requirements.

## 1.2   Content of the Document

The document describes different requirements facilitating usability and accessibility. Based on this document, the contracting authority of a software solution can draft its own document on requirements that are obligatory for the software implementer. Depending on the specific features of a system to be created, the number of requirements set for the system may change, therefore, the document created, based on this document for that system, may differ from the present document.

# 2   Prototype

**You can access the user interface prototype here:**
https://www.mkm.ee/iseteenindus/#p=projektist

# 3   Usability

Usability is one of the quality attributes that, if paid attention to at the beginning and during the development process, helps the end-user of an IT solution to learn and remember the system more easily, to use it more efficiently, make less mistakes and, thereby, to enhance the end-user experience.

## 3.1   Principles of Usability

**Usability has an effect on a user's positive / negative conduct**:

| Positive conduct | Negative conduct |
|---|---|
| A user completed a process | A user left a process uncompleted |
| A user completed a process quickly | Without a reason, a user used a longer path to achieve the objective |
| A user uses the system quickly | A user does not notice important elements, the user hesitates to move on to the next action |
| A user presses the necessary button or link | A user is not sure which choice to make; the user tries different alternatives and uses much the *Return* button. |
| A user submits more information | A user does not fill in the data fields |
| A user submits data without mistakes | A user receives error notices |
| A user is satisfied with the service and uses it more often | A user avoids using the service |
| A user learns, becomes faster and makes less mistakes | A user repeats earlier made mistakes and hesitates in places that he/she has visited earlier |

**The developers and the owner of the system benefit from the good usability level too**:
• customers are directed to an effective digital channel,

• increasing loyalty of customers,

• increasing number of customers,

• increase in good customer experience,

• quicker implementation period,

• lower burden on the customer support staff.

**The following principles could be observed when assessing and creating the usability:**
• Know your user, but bear in mind that you yourself might not be a typical example of a customer.

• Be consistent in selecting/combining the design and elements.

- o   The things that look similar, must also work in a similar way.

- o   The elements that look different, must also behave in a different way.

- Keep the user interface simple.

  - o   Offer information, if it is of some importance to a customer and they need it.

  - o   Keep the number of steps, necessary for achieving the goal, to the minimum.

  - o   Remove the unnecessary decision points and bring clearly forth the decisions that are necessary to take.

  - o   The more often an action needs to be performed, the easier it must be.

  - o   Do not overwhelm the memory of a user/do not test the limits of a user's memory.

  - o   The less a user has to memorise, the better.

- Do not let a user to lose their way in the system.

  - o   A user must always know where they are and what is happening.

  - o   A user must always find how to make the next step.

  - o   The activities a user does must give them a visible result.

  - o   A user should control the system, not vice versa.

- A user should be able to perform their activities quicker and more effectively, not the system.

- Everybody make mistakes, all mistakes must be repairable.

- A user would want to know about a mistake before any problem arises because of the mistake.

- Error messages must be relevant to a user and contain information how to avoid the particular error message or continue with the unfinished work.

## 3.2   Usability Requirements

### 3.2.1   Simplicity and Focusing on Essential Matters

A user should be displayed **only such** information **that the users have to know.** In case the content of the displayed text or data is important for you, but of no importance to the user, do not put it on.

The simpler and "cleaner" a user interface is, the easier it is for a user to find the necessary information. Therefore, it is not advisable to mix different styles, fonts, colours, put the text on a variegated background, etc.

The simultaneous use of many style elements causes superfluous "noise", irritates the user, and impedes the finding of information.

Different researches have shown that a big majority of people do not notice the flashing bars, for instance. Therefore, it is not recommendable to use such elements to draw attention to important information.

**Wrong:**



Programm "Kodune ja sooline vägivald"

NB! 1. aprillil avati programmi väiketoetusskeemi avatud taotlusvoor. Lisainfot leiab klikates SIIA.

Programmi Operaator: Sotsiaalministeeriumi soolise võrdõiguslikkuse osakond ja finants- ja varahalduse osakond

Programmi Partner: Norra Terviseamet (*Norwegian Directorate of Health*)

Programmi eesmärk: soopõhise vägivalla ja inimkaubanduse vähendamine Eestis

Programmi maksumus kokku: 2 352 941 EUR, sellest:

- Norra kuningriigi toetus: 2 000 000 EUR

- Eesti kaasfinantseering: 352 941 EUR

Programmperioodi lõpp: 30.04.2016.

Figure 1. Many different fonts and styles

### 3.2.2 How People Read Information

Usually, people do not read the information displayed on a screen, but scan it, looking for keywords. People do not have either a wish or time to stop on each word; instead, they hurry through the navigation in order to reach the required information.

In Europe, people read from left to right and beginning from the top, therefore, the information displayed on the user interface is read also from left to right, and beginning from the top. Different researches where the eye tracking method (that monitors the movements of a person's eye) has been used, have shown, that the most noticed is the information located at the upper left-hand corner of a screen. Considerably less is noticed the information at the lower right-hand corner of a page, forming a pattern similar to letter F (see the following picture).

**Figure 2  An example — how people read the web**

**Pursuant to that, one should keep in mind the following:**

- Most people do not read a text word by word.

- The first two paragraphs on a page should contain the most important information.

- Long, shuffling, and unstructured texts do not work.

- A displayed sentence should be readable within the same breath.

- Subtitles, paragraphs and lists should begin with a word carrying the most important information.

- Although people do not like to read long texts, it could be beneficial to add an explanatory sentence to the screen elements with ambiguous titles.

- The most viewed are the upper part and left-hand edge of a screen. Important information should be placed to that area of a screen.

**Wrong:**

The first sentence on the picture is very long, forming a paragraph actually. Attention should also be paid to using the same and similar words in one sentence, as this makes the text more difficult to read (a user has to read the sentence several times, to be sure that each word has been understood correctly).

**Figure 3. An example of a poorly written text**

### 3.2.3 Consistency

The same information and same elements must be located, behave and look similarly all over an environment. They must be in the same colour, same font, named the same way, etc. The same approach to the same elements helps a user to find them quicker. In case they are different, a user would not find them, or would make a conclusion that different things are concerned.

It is equally important, that different elements would look different. The reason for this is to avoid a misunderstanding that the same thing is concerned.

People are able to recognise certain type of information, e.g. pictures, even if they have seen them only for a moment earlier. Therefore, it is recommendable to use similar design elements and icons, as this helps a user to differentiate between the different information.  Thus, a user learns that each time they see besides buttons or links the same icon; they can expect the system to behave in a similar way.

**In conclusion, the following should be kept in mind**:
- Place, name and design the elements with the same content in the same way all over the environment.
- The same function, object and menu title are used in the same way all over the environment.
- The structure of a screen form must not change during the time it is in use. In case some step is skipped, then the skipped step should still be displayed on the screen form as a non-active step, and should not be removed from the screen.

### 3.2.4  Navigation

People do not like to analyse different choices when looking for information, instead, they select the first link or button that looks right. If all the information and elements of a user interface are placed correctly, in accordance with the principles of the usability, then it is most probable that the element, which they choose, is the one they need.

In order to avoid thinking, people prefer to use other, already familiar ways to look for information, even if they know that, most probably, there is existing somewhere also a simpler and quicker way to reach the same result. Learning of new things burdens the short-term memory of people, whereas doing already familiar activities is automatic. In case of activities that people **do not do daily,** they are prepared to take a longer path, if that does not require thinking.

A user should always know where they are in the system, how did they get there, and what should be the next step.

**Considering that, the following should be kept in mind**:

- For ensuring that a user would understand their location in a system, the screen forms that open in the system must have a clear and informative title in the header that would allow telling one screen form from another.

- In order to ensure that a customer would understand how they came to their present location, a path or bread crumbs should be displayed to them, which is recommendable to structure according to the menu hierarchy.



- For recommending a next step to a customer, the command buttons, that direct the customer to successfully complete the process, should be distinguishable from those that take to a byway, or back (the primary and secondary buttons should be visually distinguishable).



- In case a process consists of many screen forms, a user must be offered possibilities to move forth and back, and it must be visualised, on which step the customer is at any moment and how many steps it takes to complete the process.

**Sophisticated application**

| 1. Name of the phase | 2. Name of the phase | 3. Confirmation | 4. Payment | 5. Feedback |
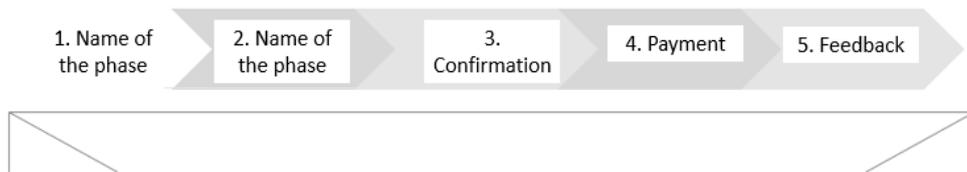
- The *Back* button of the browser must function correctly, or its use must be restricted and intra-system alternatives must be offered on each form.

When directing a customer to another environment, they must be shown, that they enter a different environment (for example, the title of a button or link must have the corresponding wording).

### 3.2.5 Grouping of Elements

The elements that are placed close to each other seem to be belonging to the same group that indicates that they have a connection between them. The elements that are placed far from each other give an impression that they do not have a connection with each other.

**Considering that, the following should be kept in mind**:

- The information with similar content must be grouped together and separated from the rest of the information by subtitles or other separators (e.g. phone number, e-mail address and postal address are grouped together as the contact data).
- The addition of many ungrouped elements to a page must be avoided (a user would find it difficult to understand a screen form, where tens of data fields are laid in random order and ungrouped).
- The grouping of elements and information that are not connected with each other, considering their content, should be avoided.

### 3.2.6 Input Forms

- The input process should, if possible, be designed so that a user would not have to discontinue the data input in order to start looking for the information that the system requires. In case a user is compelled to insert the information they do not know by heart, then guidelines must be displayed on the screen before they begin with the data input, to enable them to look for the information beforehand.
- If it is not possible to prepare a simple input form, then the interim actions must be supported by the system, by allowing discontinuing the input process without requiring filling in all obligatory fields, and by saving the values of the input fields, regardless of validation errors. The possibility

to continue with the unfinished work must be made pleasant and quick for the user, incl. reminders should be provided.
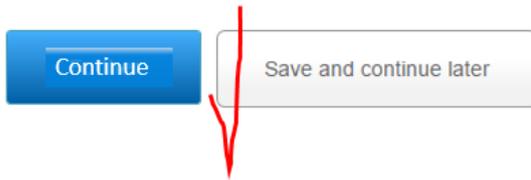


- All forms must be additionally usable with the keyboard only, too.
- If possible, the use of the keyboard by the users should be simplified, by exploiting the key combinations on the keyboard for moving between the different areas on the screen. The possibility to use the different key combinations should be displayed also on the screen, but in a more unobtrusive way than the rest of the information.
- When moving with the tab key from a field to a field, the sequence of putting the focus on the fields must be logical (i.e. one has to pass through the fields with similar content one by one in the first order and then move to the fields with different content; see the next figure). No form field must be skipped. The focused field must stand out visually.



Figure 4. The order of passing the form fields

- When a user moves to a form, the most important field (often the first one) must be focused, so that the user would not have to go through the menu first, using the tab key.
- The title of a field must visually stand out from the content (also on forms that are meant for reading only) and it must be placed close to the field.
- The fields must be named so that a user would understand unambiguously, what kind of information and concerning whom/what must be entered (e.g. if several people are connected with a matter, it has to be clear, whose personal data must be entered).
- The system has to mark out with an asterisk the fields that need to be filled in obligatorily in order to save the form.

E-mail  *    name@authority.ee

- When filling in a form, a user must not be asked the information that, in case of a main process, is not directly needed for filling in the form.

- In case a data field should be filled in according to a rule, then the description of the corresponding rule must be added into the field, or as a tool tip (e.g.: "DD.MM.YYYY").

- In the selection fields, the values can be found quickly by entering characters on the keyboard, in sequence of the characters displayed in the selection field (e.g. if entering *ee* into the countries' selection field, the user will be displayed *Estonia*).

- The lists displayed in the selection fields are sorted in the alphabetical order. If reasonable, the most used options could be set out at the top of a list, however, those options should be available also in their place in the alphabetical sequence.

- The selection fields up to 7 values should be realised with radio buttons or check boxes.

Choose what you like most:
- ◉ Kadakas
- ◯ Kask
- ◯ Kuusk
- ◯ Lepp
- ◯ Mänd

Choose which are conifer:
- ☑ Kadakas
- ☐ Kask
- ☑ Kuusk
- ☐ Lepp
- ☑ Mänd

- The date should be insertable directly into the data field, also by using a calendar. The dates inserted from the calendar, must be changeable also manually, directly in the data input field.

- In case the display of other values of a selection field depends on one selected value, the system must always, when the first selected value is changed, change also the depending values and empty the field by default (e.g. in case the first selection is Raplamaa county and town of Rapla, and thereafter, the county is changed to Harjumaa, then the value related to the town is emptied by default and the respective values corresponding to Harjumaa are offered).

- In case incorrect data is entered, the input fields with correct and incorrect data must not be emptied when saving the form.

- In case of incorrect data input, when saving the form, the user is displayed a conspicuously coloured error message at the upper part of a screen, with reference to the data field into which the data has been entered incorrectly and with information about how to rectify the mistake.

- In addition to the error message displayed at the upper part of the screen, the rule for filling in the field should be displayed, conspicuously coloured, next to the erroneously filled in field, drawing thus attention to the rule that the user did not follow.

E-mail   nimi@asutus@asutus.ee    E-mail must contain only one @

- In case such forms are used in a system where, if making certain selections a user fails to fill in the form, then the user must be informed beforehand of such a possibility (e.g.: at least two of the four optional fields must be filled in).

- The system must be in conformity with the other most widely used software icons and buttons logic. For example, the ENTER key ends activities with a form and sends the form to the server (submits the form), instead of deleting an entry.

- There must be a button on a screen form, connected with pressing the ENTER key, that saves the form, but may not take a user away from the form or empty the form.

- By pressing the combination CTRL+ENTER simultaneously, a user can move to a new row, in case the field allows to enter a longer text.

### 3.2.7   Search

- On a search form, first of all the most important search fields and then the ones of less importance are displayed.

- The search fields could be equipped with hints on possible options. Hints on options are offered, if a user has entered at least two symbols into the field and renewed after addition or removal of each new symbol. The offered options must be displayed to a user within one second at most.

- It must be possible to move from the search results to the detailed view of the entry, and from there, back to the search results so, that the last used entry is visually distinguishable and displayed without using the scroll bar.

### 3.2.8   Tables

- The table entries must be clearly distinguishable from the table header.

- The information about the number of entries in the table could be placed near the table.

- When displaying such numbers in a table, all numbers are aligned to the right and a similar number of decimal places is displayed in the same column.

### 3.2.9   Command Buttons and Menu Options (Call to Action)

- The titles of command and menu option buttons must make it very clear, what will happen if the button is pressed.

- The wording of the titles of menu options and command buttons must be very clear, expressed in two words at most and the first word must be the most important (informative).

- The titles of the command buttons must contain active words, such as: call, buy, register. This should be an action that encourages a user to act.
- It is very important to leave some free space around the button, because, the more there is room around it, the more it attracts attention.
- The button should be in contrasting colour, big and visible.
- Each page should be a kind of *call to action* form.

### 3.2.10 Feedback and Help

- The system must give feedback on successful as well as unsuccessful activities.
- The system must give feedback on a protracted process and allow a user to discontinue.
- The system must provide informative and relevant guiding information.
- The interactive assistance must be available by using a separate icon and be located near the place it concerns.
- The error messages must be understandable to an ordinary user of the system and must not offend them.
- The error messages must contain guidance for continuation and for the next necessary actions.
- If possible, the system should be created so, that a user would be unable to make mistakes (for example, a possibility to add forbidden symbols or to use the input masks should be eliminated).

### 3.2.11 Multilingualism

- It is recommendable to create a self-service environment in three languages — in addition to Estonian, also in Russian and English languages.

### 3.2.12 Capital Letters

Capital letters take 30% more room on a page and slow down the reading speed about 15%.

The use of capital letters in bigger volumes makes reading more difficult and instead of a desired effect — to make a user to read, the opposite effect is achieved — the user does not read the text.

It is not recommendable to use the capital letters also in the titles, instead, for highlighting a title it is better to use *bold* or colour.

It is recommendable to use capital letters only in case of a desire to highlight only one or two words in a text, in a place where a person can expect it, because some texts outside the system are also written in capital letters (e.g. a person's name in the passport or on a credit card).

### 3.2.13 Headings

Each page should start with a heading. All headings must be distinguished from the rest of the page by either the size, colour or thickness of the text. Likewise, it is important to differentiate between the different levels of headings.

The title of a menu or link and the heading of a page that will be opened after pressing on the menu button or link, must always be the same. Different headings/titles might confuse a user, making them think that they are not on the page they wished to go.

Well written and accurate headings/titles help a user to get a quick overview about the information that can be found on that page. The use of subtitles helps to determine the content of subparagraphs, by increasing the speed of scanning a page.

While adding the titles, one should group the contents so that the title and the corresponding text and data fields would form one group, so that it would be clearly distinguishable to which content the title belongs.

**Wrong:**

On the next picture, we can see a view that opens in case one chooses from the menu *Documents to be submitted for applying for the job*. The page heading is missing and the selected menu item is not clearly visible in the menu on the left-hand side.



**Figure 6. An example of a missing heading**

### 3.2.14 Alignment

- Form fields and the titles of the form fields must be horizontally and vertically evenly placed and aligned.

- The screen form elements must form a coherent whole and therefore, they must be similarly aligned all over the system. It is recommendable to design a common alignment grid and use it as a basis when designing each specific screen form.

- When people read quickly, their eyes customarily move horizontally from row to row, back to the same starting point, only a row lower. The screen elements, including the titles of data fields, must be aligned to the left. In case the information is aligned to the right, or to the centre, the eyes move back to a wrong place that slows down the reading speed. The alignment of texts from one edge to another makes the reading more difficult too, because of the emerging spaces that draw the attention to themselves.

### 3.2.15 Vocabulary

- A user must understand the information. The language used by ordinary people and the expressions understandable to the public must be used. The aim is not to make people learn new words. It is easier and quicker to read familiar words, because those are recognised automatically.

- Plain words must be preferred and vague expressions should be avoided. For example, if speaking about money, one should write *money*, not *monetary resources*, *financial resources*, etc.

- The use of terms must be consistent. One must always use the same terms for forwarding the same information or describing the same elements. For describing different things, different terms must be always used.

- If, in order to save space, it is necessary to use abbreviations, the abbreviations must be explained (in Help page, for instance).

- User guides, explanations and error messages must be understandable for an ordinary user and have a meaning for the user (a user must not be displayed the system's error messages).

**Wrong:**

The text displayed on the picture contains an abbreviation *ITK* — a user, not familiar with the content, does not know what the abbreviation means. The meaning of the abbreviation is not explained in the above text. In addition, the text is not aligned correctly and the space left between the rows is irregular.

90 days have not passed yet from the termination of their last registration as an unemployed person, and during the 12 months that preceded to the submission of an application for registering their unemployment status, **the last two registrations of their employment status** were terminated, as they:

- ✓ did not appear, without a reasonable excuse, to a meeting with a consultant at least once during 30 days
- ✓ did not appear for the third time, without a reasonable excuse, to a meeting with a consultant
- ✓ <u>refused to accept the ITK</u>
- ✓ refused for the third time, without a reasonable excuse, <u>to fulfill the ITK</u>
- ✓ refused for the third time, without a reasonable excuse, from a suitable job

Figure 12. An example of incorrect use of abbreviations

### 3.2.16 Texts

When writing texts and helpful information to be displayed for a user of a self-service environment, the following principles must be taken into consideration:
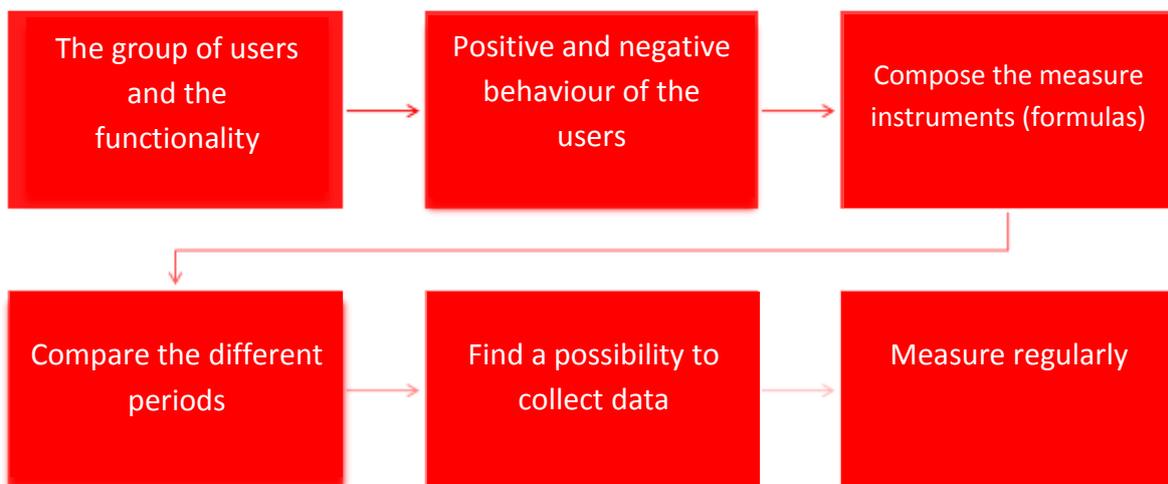
- A long text must be divided into logical parts, the paragraphs. It is easier to read and find information from a structured text.

- The first paragraph gives an overview of the most important. The first paragraph, together with its title, is often the only part of a text that a user reads through — row by row. Therefore, the first paragraph must convey the most important information of the whole text.

- It is possible to find a picture for every text — often one notices a picture before starting to read the heading or first paragraph. In case a picture gives more information, for example like the service process scheme presented within the service description topic, it should be highlighted. The important information that a picture contains, must be given also as a text (important for partially sighted people).

- In a web environment, people presume that every underlined text is a link. Therefore, underlining should not be used to draw attention to important information.

- When drafting a text, one should:
  - o think, what is it that interests a user the most within this topic (what they would ask/have asked) and arrange the sequence of themes accordingly,
  - o avoid long words and an abundance of paragraphs, express oneself with short, simple and unambiguous sentences,
  - o if possible, use bulleted lists instead of text if the sequence of the listed items is not important, or numbered lists if the sequence is important.

# 4    The Measure Instruments of Usability

This chapter explains how to measure the usability of a system.

## 4.1    Principles and Ways of Measurement

### 4.1.1    Principles

| The group of users and the functionality | → | Positive and negative behaviour of the users | → | Compose the measure instruments (formulas) |
|---|---|---|---|---|
| Compare the different periods | → | Find a possibility to collect data | → | Measure regularly |

### 4.1.2    Ways of measurement

- Testing the usability:
    - Quantitative — the test users perform a given task and the success of the performance is measured (e.g. how much time did it take).
    - Qualitative — the test users perform a given task and the actions and comments of the test users are analysed.
- Evaluation from the users — see points 4.2.1 and 4.2.2
- Measurement on the background — see point 4.2.3

## 4.2    Measure Instruments for Self-Service Environments

### 4.2.1    Recommendation Index

In case of a recommendation index, the users of self-service are asked whether they would recommend to other people the e-service. A user replies on a scale 1–10.  This gives us the estimation of the overall customer satisfaction.

In addition, an open question should be asked as to why they would / would not recommend the service. This gives us an essential qualitative input concerning the issues that should be amended by the service.

### 4.2.2  System Usability Scale (SUS)

The SUS is a method that measures the evaluation given by the users, by 10 statements, given to the users for agreement or disagreement:

1. I think that I would often use the system.
2. The system was unreasonably complicated.
3. I think that the system is easy to use.
4. I think that I would need assistance from technically competent people in using the system.
5. In my opinion, many functions of the system were connected well with each other.
6. In my opinion, the behaviour of the system varied too much in different places.
7. I believe that most people would learn to use the system quite quickly.
8. In my opinion, the use of the system is too much time consuming and unhandy.
9. I felt very confident about myself when using the system.
10. I had to learn quite a lot before I could start using the system actually.

For giving responses, a Likert scale is used (that contains 5 steps: Certainly no – Certainly yes)

- http://www.measuringusability.com/sus.php
- http://youtu.be/w_Rul2M1ApY

### 4.2.3  Measurement on the Background

The behaviour of users is measured automatically and the collected data is analysed.

Recommendable measure instruments:

| Title | Explanation | Formula |
|---|---|---|
| **The percentage of channel use / division** | Do the users prefer calling, coming themselves or do they manage their business in the self-service environment themselves? | The applications that came through the self-service / all applications (incl. through self-service) * 100 = % |
| **Pending activities** | How many start an activity and how many finalise it and submit? | Finalised activities / started activities (incl. discontinued activities) * 100  = % (to count only the activities performed via this channel) |
| **Time of performing an activity** | How quickly does a user perform an activity (how much time goes for hesitating)? | Time spent for performing an activity (s) |

| | | |
|---|---|---|
| **Help desk / supporting on-line information** | How often do the users need help and where do they turn for help? | Calls to help desk / all activities * 100 = % The use of supporting on-line information / all activities * 100 = % How many times the link to access the supporting on-line information is pressed / all activities * 100 = % |
| **Validation errors** | Is the preliminary information sufficient for submitting correct data? Could a user enter all necessary data? | The errors discovered at validating the data entered through the input form / data inputs performed * 100 = % Activities performed with defects (additional information has to be asked for providing a service ) / all activities * 100 = % |
| **Finding information** | Does a user find necessary information / necessary service? | Search sessions, in the course of which the search is performed more than once / all search sessions * 100 = % |