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D 3.2.3 – Recommendations for Conducting User Tests

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D 3.2.3 – Recommendations for Conducting User Tests

User involvement – A Toolbox
How to Involve Users in Development Processes in
Europeana



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“Any kind – and number – of user testing is better than none”

“There is no such thing as a user error”

Colophon

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1. Introduction

This is a catalogue of usability methods selected as standard methods for carrying out user testing in the project EuropeanaConnect and Europeana v1.0.

If all you want is help to decide which method to use then go straight to the Decision Tree on page 152.

There are thousands of great ways to conduct user tests of web applications, depending on the purpose and object of the test. As such it is difficult to make general statements about *the* right way to do testing. There is no cook book with perfect recipes. There are, however, several well-known and well-tested methods suitable to get valuable knowledge about the usability of a web application: before the development process actually starts, while the process runs, as well as when it is considered completed. Some of these methods involve users while others do not. Some methods are more suitable for qualitative data and others for quantitative data. Some methods provide you with oceans of ideas of a more brainstorming nature while others are good for the test of a specific product. Which method to choose all depends on the specific case.

The methods described in this catalogue have been selected with the aim of providing Europeana project partners with a whole palette of methods to do usability testing during the development process of new or further developed **web-based product** (called “product”). In our selection process we have attached importance to the fact that:

- The expenses related to the tests should be kept low (limits the use of fancy equipment and time consumption)
- The tests will typically be carried out by non usability professionals (the reason why the method descriptions are very detailed)

This is why we have not included, for instance, eye-tracking as a method. Eye-tracking demands equipment too expensive for most of the project partners.

It is our hope that developer teams will find the test methods described in this catalogue so detailed and usable, that it becomes an everyday thing to integrate the usability tests into every part of the development process – from the very start to the end.

As a general rule, **any kind of user testing is better than none**. You will learn something valuable from even the most informal evaluation – watching a single user, chosen by random, interacting with a system will somehow provide interesting and informative feedback about the design, usability and functionality. If a test user finds something confusing, then it is a safe bet that a certain percentage of your overall visitors will find it equally unclear. **There is no such thing as a “user error”**.

The guideline document works this way:

- You can read it from the beginning, getting some of the basic arguments for why you should test and when.
- You can also go directly to the method descriptions relevant for the particular phase your development process has entered. Then you will not have to bother about the rest of the catalogue.

- If you want to go deeper into the methodological arguments and issues behind the guidelines, you find these in the last part of the catalogue.
- If you just want to decide which method to use, then go straight to the decision tree (appendix 8) which will help you decide on a method.

Notice that the distribution of methods between the different phases in this catalogue should not be considered as “final”. Most of the methods can actually be used with great benefit in all phases. Despite this, we have placed the methods according to where they – based on our experience – benefit the most.

The catalogue is structured the following way:

1. An introduction.
2. A chapter on usability and user involvement – why and when in the process is it important.
3. An overview of the different phases of development and appropriate need for usability activities.
4. Methods relevant for each phase – advantages and disadvantages followed by step-by-step guidelines.
5. General methodological issues, including examples and help to adjust parameters of different methods.
6. A list of literature for more in-depth knowledge about methods mentioned in this document.

2. What is usability?

“A product, service, or process is usable if and only if the people who must (or should or want to) use it can use it to achieve their goals, do their tasks in their own environments and in the time and effort that they think it is worth”.¹

Usability has conventionally been defined as the quality of an application which determines its ease of use. It is of extreme importance because it is one of the key factors for user acceptance of an application. End users view usability as a “holistic” quality connected with the following criteria which contribute greatly to user satisfaction:

- how easy is it to access any type of information (texts, photos, multimedia)
- how easy is it to use interactive functions (i.e. search, registration)
- how easy is it (in general) to navigate within the application

Several criteria can be used to evaluate the usability of any system²:

- **Accessibility** – how easy is it for different kinds of users to use the application (users with special needs, children, etc.) in diverse environments and through diverse channels.
- **Learnability** – how easy is it for users to learn how to use the application.

¹ Janice (Ginny) Redish, Ph.d., (www.redish.net) – Working paper, “Making personas part of your team” (2008)

² As defined in: Calimera – Cultural Applications: Local Institutions Mediating Electronic Resources. Deliverable D18: Usability Guidelines”, (Contract No. 507740). 2005. p. 4-5. And by Jakob Nielsen www.useit.com

- **Memorability** – how easy is it for users to use the system again after a long period of non-use. **Efficiency of use** – how easy is it for users to complete a task within the application.
- **Correctness** – lack of errors, or at least existence of only a few, relatively unimportant errors.
- **User satisfaction** – how pleasant is the user experience.
- **Usefulness** – the ability of the application to provide value to its users through appropriate functionalities, content, structure and form.
- **Appropriateness** – the match between what an application provides the situation it is intended for and the audience it wishes to address.
- **Quality** – the conformance of the application to context-specific excellence criteria, such as high quality design, authenticity of visual resources, and authority of content.

3. Why you should engage in usability activities

“From the user's perspective usability is important because it can make the difference between performing a task accurately and completely or not, and enjoying the process or being frustrated.”
<http://www.usabilityfirst.com/intro/index.txt>

You do not design to yourself

Basically you do not design web pages for yourself. Regardless of how hard the developer team tries to “see it from the users’ perspective”, they will suffer from the “disease of familiarity”³ – meaning they have become so familiar with their product that they are no longer sensitive to users not understanding. The developer team knows exactly how things work and where to find things. The users, on the other hand, do not. Instead, get a fresh perspective. The best way to do this is to talk with the users of your site. One user is 100% better than none.

Learning about the users

By doing tests you will learn a lot about your users. Not only will you understand the users, but also the tasks that users perform with the product and the environment – organizational, social, and physical – in which use takes place. You need to verify or challenge your assumptions about users and to learn about their reality and their:

- need for information
- ways of thinking about grouping, and organizing information
- expectations about your site
- levels of knowledge about the subject matter levels of experience with the Web and similar types of sites
- ways of working with information (how much they want to read, for example)

Increasing efficiency of the site

Research has shown that usability activities can reduce the time users spend on solving a task on

³ See designer Richard Saul Wurman: <http://net.educause.edu/apps/er/review/reviewArticles/32620.html>

your website with more than 83% (average)⁴. This will increase your competitive power compared to other websites offering the same services.

Increasing users' loyalty

If users have a positive experience using your website they will return. A frustrated or confused user will most likely abandon your site. Research has shown that online sale increases 100% if you focus on usability when you develop your site.⁵ This is particularly important if you expect your web product to be a critical part of your market efforts or business concept.

Reduce development costs

By doing tests you reduce development costs. The sooner you identify a problem or a superfluous feature, the cheaper it is to correct or erase it from the product. Usability activities performed in the beginning of the development process will save a lot of time and money in the end of the process, as you do not have to do major changes in a product which was considered almost finished.

Working on the basis of facts

Doing tests will provide you with the exact knowledge needed to supplement working with general usability guidelines. Even though you should take advantage of what is already known about best practices on the web, and these might help you avoid most usability problems, general design guidelines will not cover all problems of all user groups. They might give you a less-than-complete picture of how and why a design helps (or not) real users in real situations reach their real goals, so you must watch users interact with your product.

To this you might add the saving of time because the factual knowledge you get experiencing real users' use your product, will end discussions and conflicting opinions in the developer team based on assumptions and hypotheses.

⁴ Jakobsen <http://www.useit.com/alertbox/roi.html>

⁵ Rose & Sørensen (2004), p. 24

4. Usability test and user involvement – When and how?

There are several different ways to approach this issue. The planning and structuring of the whole development process is important for a successful development process. The most important way to pay attention to the users' views is to involve users in every step of the development lifecycle, as the real goal of usability engineering is to improve design and functionality – not just to document its weaknesses at the end of the process.

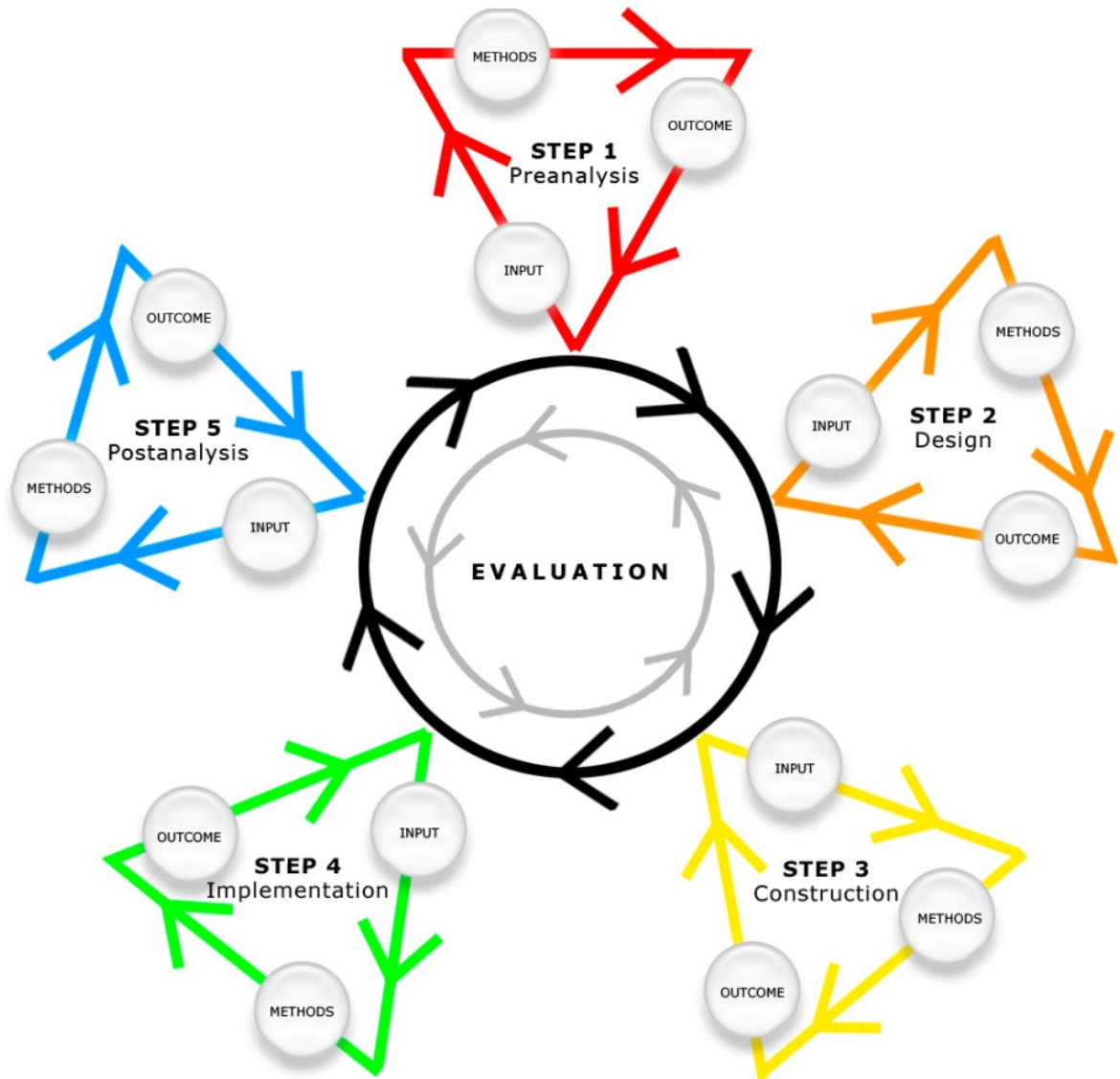
Some evaluation methods are most suitable to help you do the first requirement analysis in the very early stages of design. Using these methods you can, on a non-structural basis, collect basic knowledge by observing users in their daily activities. Other methods can be applied only after the interface design or prototype has been implemented, and let you see, in a well-structured way, how users actually interact with your product. Finally, some methods may be used for different purpose at different stages of the development process.

Each method has its own advantages, disadvantages and requirements, and (generally speaking) different methods reveal different usability problems. Knowing what basically differentiates the methods from one another should help you choose the right method for the right purpose at the right time.

The development process itself can be managed in many ways depending on organizational conditions and traditions. In literature about software engineering you can find an endless number of different ways to split up the process into limited phases, all grounded in different theories. Going into the discussion of the development process itself here would go beyond the scope of this catalogue. Therefore, we have chosen to use a simple, pragmatic and very rough development model, consisting of basically five different phases: The phase of pre-analysis, the phase of design, the phase of construction, the phase of implementation, and finally the phase of post-analysis.

Please notice that this division of the process into separate phases is only analytical, as the development process should be characterized more as an iterative process, where needs are analyzed, ideas developed into first-draft prototypes – tested on users; developed into new prototypes – tested on users; turned into a design and functionality draft – tested on users, etc. etc.

USABILITY ACTIVITIES - DURING DEVELOPMENT PROCESS



4.1. Pre-analysis phase

When you have decided to develop something new – whether completely new or a new feature to an existing product – the development team has to consider:

- Which functionality is needed
- Whom needs it
- Why is it needed

The aim of the pre-analysis phase is to define what should be developed and what the frame is for budget and time. The development group collects information about existing solutions, technical possibilities as well as potential contractors and usability activities will focus on exploring and identifying users' needs, your organization's needs and market research.

All this is analyzed and a project specification is developed, including requirements concerning the usability of the product, technical setup and design.

4.2. Design phase

The knowledge gained in the previous phase is used in this phase to design. The aim of this phase is to make a detailed specification that describes all aspects of the product:

- How should it work in order to satisfy the needs of users?
- How should the interface be designed to make it user friendly, usable, intuitive to work with, logically structured, and have a suitable navigation?
- How should the site be organized?

In this phase lots of prototypes are designed – drafted by hand on paper or in your choice of visualisation software – and tested on project members, colleagues, family or real users, discussed and then redesigned and tested again in continuous iterations.

4.3. Construction phase

In this phase you have made most of your choices and the product is developed from the prototypes and so usability activities are limited. The developers work on the code and technical tests are conducted by the project team to monitor that all technical applications are working according to the specifications. Most of these tests are “pure” technical tests, with the aim to identify and solve technical problems. The main usability activity is to evaluate the (almost) final interfaces to secure the usability. At this stage unpredicted problems might turn up due to, for instance, technical limitations. Continuous inspections and discussions of alternative solutions to secure the fulfilment of usability specifications should be carried out along the way.

4.4. Implementation phase

In this phase the solution is developed and the project team needs to prepare and implement the product, so the target group can start to use it. In this phase usability activities will be even more limited than in the previous phase. If the implementation of the solution in its real environment turns out to be complicated, there might be some technical tests with the aim to identify and solve technical problems. It is advisable that the usability practitioner participates in these activities, but basically usability activities in this phase will be to start the planning of follow-up evaluation when the product has been in use for a while.

4.5. Post-analysis phase

The final product is launched and users have already started using the product. At this point in the process the usability activities are centred on evaluating the product in its real environment and with real users. Is the interaction between the product and the users working satisfactorily? Can users perform their tasks and do they get a good experience using the product? The main usability activity is aimed at:

- Evaluating the product launched.
- Getting ideas from users for further development of the product.
- Prioritizing features that have been postponed until after launch or to the next iteration.

5. Which methods to use in which phases – a graphic

The following figure summarizes at which stages of the development lifecycle the most popular usability engineering methods can be applied. We focus on approaches that play a major role in the field, or are believed to have a strong potential impact.⁶ Again it is worth mentioning that the distribution of methods between the different phases in this catalogue should not be considered “final”. Most of the methods can be used with great benefit in all phases.

Development Phase	Usability Method
Pre-analysis phase	Focus Group Interview Field Observation Cultural Probe Questionnaire Statistical Web Analysis
Design phase	Card Sorting Heuristic Inspection Cognitive Walk-Through Prototype Testing
Construction phase	Heuristic Inspection Cognitive Walk-Through
Implementation phase	(Functionality test) (Acceptance test) (Quality assurance test – QA)
Post-analysis phase	Questionnaire Feedback Box Interview Usability Test Statistical Web Analysis Focus Group

Methods in (...) are not described in this catalogue.

⁶ “Adoption-centric usability engineering – Systematic deployment, assessment and Improvement of Usability Methods in Software Engineering”, by Ahmed Seffah, Eduard Metzker (2009) Springer, London, p.24.

6. Pre-analysis phase

This is the phase of the whole development process where the usability professional have most activities to carry out. The more information collected at this stage, the better chance of developing a product that actually meets the users' needs in the end. All the usability activities in this phase will provide input to the specification – whether this is the development of a completely new website, redesigning – or developing a new feature to – an existing website.

The activities in this phase are centred around the following:

- Collecting basic knowledge (defining the purpose of the product, the basic functionalities as well as the primary and secondary target groups).
- Obtaining knowledge about the situation in which the target groups use the product and their need in relation to this.
- Obtaining knowledge about the target groups by doing user research (use focus groups, interviews and questionnaires).
- Developing user profiles, personas and use cases that describe situations in which the product will be used.
- Prioritizing criteria for usability (consider what is most important if the product is going to be usable for the defined target groups in the situation where they will use the product).
- Define requirements to usability for the specific product.

6.1. Methods of User Involvement – How-To Descriptions

The following methods are relevant in this phase:

6.1.1. Focus Group – advantages and disadvantages

Advantages

- This method is very useful to collect data about social groups' interpretations, interactions and norms as well as get an overall definition of the requirements of a product, alerting the designers to potential usability problems that need to be avoided.
- It is a very flexible method, suitable to discuss a concept, a prototype or a final product, as well as insight into users' attitudes, thoughts and needs.
- It is easy for the informants to raise new issues because of the loose structure of the session.
- The informants stimulate each other's ideas because of the group dynamics, just like it stimulates comparison of individual experiences. There are experiences that can only be accessed by the usability practitioner by being in a social context with the informants.
- The method can (when used in the pre- and post-analysis phases) provide you with an overall understanding of the informants' social and cultural perspectives as well as use of language.

Disadvantages

- The method is less suitable to collect in-depth data about each informant's individual life.
- The issue is not what informants do, but more what they think they do – which may involve estimates, idealization or memory difficulties. Users' opinions about a site or product are rarely consistent with how they behave when they actually interact with it.
- The dynamics of the group may become a problem if one or two informants turn out to be particularly dominant, too retiring, or the group splits up into sub-groups.

6.1.2. Interview – advantages and disadvantages

Advantages

- A very flexible method to collect qualitative data.
- Questions can be re-focused during the interview if needed and the interviewer can easily catch new subjects that the informant might bring up. There is only a minimal risk that the informant misinterprets the questions to which they are replying. First, the facilitator is able to rephrase the question if the informant replies in an un-meaningful way. Secondly, the informant is free to ask the facilitator anything they might be uncertain of.
- The face-to-face meeting is a good way to establish the confidentiality needed for asking the informant more personal questions and is expected to give longer in-depth answers.
- A interview can be used in situations where the interviewer only has a vague idea of what the informant might answer (an open-ended question interview), as well as where the interviewer has a clearer idea of what might turn up to be issues (a semi-structured interview).

Disadvantages

- The work needed for transcription. Handling and analyzing test results is very time consuming.
- The cost of even a small series of interviews is high compared to for instance questionnaires. Especially the transcription of the interviews from tapes is very time consuming.
- Data may be influenced by an investigator/respondent effect, and may end up being unrepresentatively moderate as most informants have a desire to be accommodating and not too negative.
- The informant is not anonymous to the usability practitioner.

6.1.3. Field Observation – advantages and disadvantages

Advantages

- Is usually carried out before the actually design process has been initiated or after the product is finished and been in use for a longer period.
- This method immerses the team in the environment of their informants which allows the team to observe users doing real work in real time, and get a more accurate picture of the informant's actions. They see what informants actually do, instead of what they say or think they do.
- The closest you come to a usability test under “natural” circumstances (in spite of the presence of a usability practitioner, observer and recording equipment).
- You might discover actions or work processes that you did not know about before doing the observations.

Disadvantages

- Field observations cannot be used to test a concept or an early prototype.
- A very time consuming (expensive) method compared to other research methods. The cost and time connected with scheduling the visits, taking team members out of the office

for several days, and finishing the analysis can have a huge impact on a project's resources.

- The amount of data gathered is relatively small compared to the work load related to this research method.
- Requires a clear agreement with the workplace of the informants. After all, having 2-3 usability practitioners hanging around for observation for a week or so might cause some disturbance in work routines.

6.1.4. Cultural Probe – advantages and disadvantages

Advantages

- Unlike other methods (like for instance usability testing or traditional field studies) Cultural Probes allows the informant to report in their own way.
- Cultural Probes can be advantageous in cases where the usability practitioner is unfamiliar with the target group (-s) because it is offering an enlightening real life insight into the culture, lifestyles and opinions of the informants carrying out the probes.
- The method is advantageous in cases and environments in which it is difficult to observe directly.
- A diary captures instant information that may otherwise be forgotten when inquired about later on in an interview, for example. It also aids in addressing personal questions – telling more about feelings and thoughts.
- It secures interactivity and engagement: The unusual method of cultural probes can capture the participant's attention, enthusiasm and curiosity more than would be the case with more traditional methods.
- The usability practitioner has a minimal influence on the user of the probes, which can be important in sensitive inquiries. The tasks in cultural probes are carried out by informants in their own time and away from the usability practitioner's interference.

Disadvantages

- It can be very time consuming to prepare the probes as well as analyze the results from the probes.
- A disadvantage with a diary is that using it may require some literacy skills, but lots of time and engagement to keep updated.

6.1.5. Questionnaire – advantages and disadvantages

Advantages

- A cheap and effective method for gathering data from a large user population.
- It can easily be distributed to an unlimited amount of informants. This will make it possible for the usability practitioner to saying something about the *distribution* of phenomena.
- The usability practitioner will not need to be present while informants are filling in the questionnaires, and the questionnaire will be free of "investigator effect".
- The informants are anonymous.
- The uniform character of the responses makes it easy to handle and communicate the test result using statistical methods.

Disadvantages

- The usability practitioner is far from the informant.
- It is uncertain whether the informants who have taken the time and effort to complete the questionnaire are a representative sample of those investigated. They might represent extreme opinions since they have taken the trouble to respond.
- It is uncertain whether the informants have understood questions the way there were intended. The informants will not be able to ask anyone in case they are uncertain about the meaning of a question.
- Questions need to be very carefully formulated before launching. If the questions are not clear misinterpretation might occur.
- You risk a low response rate – especially if the list of questions is long.

6.1.6. Statistical Web Analysis – advantages and disadvantages

Advantages

- Web statistics provide you with quantitative data, statistics, ratios, and comparisons that might help you improve the overall quality of your web and help you keep track of visit, popularity and traffic trends on your site. With this information you can optimize your web site as well as plan your marketing effort.
- Web statistics is a very efficient tool for decision makers. It is (at least to a certain extent) based on tracking what users actually see instead of what we think they see and most solutions have report and analysis facilities that make it easy to do very convincing presentations.
- Performance does not depend on the time consuming (expensive) active involvement of informants.
- Key Performance Indicators are very effective tools to manage performance as well as motivate the web responsible in an organization. KPIs give everyone in the organization a clear picture of what is important, in which direction they need to go, and what they need to make happen.
- Often, the basic implementation is simple and easily done, though some technical assistance may be needed for the set-up and adjustment of the solution.
- Web statistics can be obtained at low cost as there are some very usable products free on the market. The expensive part of web statistics is not the software – unless it is an outsourced solution – but the manpower to analyze the numbers, devise suitable solutions to erase usability problems and communicate findings to the involved partners.

Disadvantages

- Statistics only tell you what users have done on your web site, not the (qualitative) reasons behind why they did it, what they did or did not gain from their visits, or what kind of experience they had?
- You need to add a page tag to every web page you want to track. This can be a potentially time-consuming problem if your site does not have a header or footer, or if it is a very complex tag you need to implement (depends on the chosen page tag solution)

- There might be some uncertainty related to the “objective” data due to certain technical issues. Page tagging depends heavily on cookies and JavaScript. If the visitor has either of these technologies disabled, the quality of data collection is reduced. Especially the disabling of cookies provides problems as it is used as a unique visitor identifier. Some tracking solutions do not report on non-HTML views (downloadable file types, error pages, redirects, etc.) or has a very opaque procedure for excluding internal traffic from the analysis.
- When using outsourced web analytics solutions the reporting formats might be standardized with little or no possibility to customize them according to your needs.
- Page tags may cause delay in loading and rendering your web pages.
- Because there is cost associated with disk space and database storage page tags vendors do not keep your data forever. They might not provide you with back-up facilities or they might sell your data for other purposes.
- Analytical skills as well as knowledge about the organizations operations are important for analyzing the statistical information. Otherwise the data can easily be misinterpreted and wrong conclusions may be reached.

6.2. Focus Group

6.2.1. Purpose

A Focus group is an interview form involving a group of users brought together to discuss a subject, theme or product determined by the facilitator. Qualitative data is then produced with the help of both the facilitator and the dynamic internal in the group⁷. It is a very suitable method to get empirical data about users' attitudes, thoughts and needs towards a future product, what they (potentially) find relevant and how they imagine it realized. Also their opinion of the organisation behind the product can be illuminated using focus groups.

6.2.2. Method

In focus groups 7-8 persons are guided through a discussion by a facilitator. Before the session a number of subjects for the discussion have been selected – as well as questions to be examined. A focus group for each of the primary target groups should be arranged – unless these are very alike in their use of the product. At least two focus groups should be conducted unless the target group is very narrow. Certainly, one focus group is better than no groups at all.

A focus group discussion typically lasts about two hours.

6.2.3. Before the session – checklist

1. Prepare the focus group at least three weeks before you intend to run the session. Do not underestimate the task of finding informants!
2. Choose the focus for the focus group discussion. Is it explorative or is it an evaluation of ideas, pre-produced prototypes, or a combination?
3. Make a plan for the session. Consider the following:
 - a) Define the purpose of the focus group.
 - b) Decide the main subjects of the discussion.
 - c) Who is suitable as informants and how will they be recruited? Will you or a professional bureau recruit them? 7-8 informants is suitable. If more informants participate you risk that some of them never get the chance to say anything or that the group split into sub-groups.
 - d) Who will run the session? (called the facilitator)
 - e) Who will be observing the session (called the observer) and take notes when something important turns up?
 - f) Where will the focus group take place?
 - g) What kind of equipment is needed for the session and how will you get it?
 - h) What kind of present will you give to the informants after the session?
 - i) How will the session be documented?
 - j) Other practical things like something to drink and eat during the session, materials used during the session etc.
4. Find informants who represent your target groups, and send them an invitation to participate in the focus group.

⁷ A definition from Bente Halkier, "Fokusgrupper" (2005), Samfundslitteratur, p. 11-12.

5. Work out a detailed agenda for the session.
6. Do a “dry run” with a colleague evaluating your agenda and your questions carefully to make sure they work as expected – are they suitable to open up for discussions? Will they help to bring discussions in the right direction without being too guiding?
7. Go through the agenda and the questions with the facilitator and the observer so they know exactly what will happen at the session. Make sure that especially the facilitator is well prepared.
8. Two weeks (approximately) before the session, you write to the informants informing them where to meet for the session and when.
9. Two days (approximately) before the session you send a mail to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.
 - ∅ As a minimum the session should be sound recorded in order to support the following analyzation of data. A preferable alternative would be a video recorder as it will make it possible to review the informants’ expression and emotional state during the session.
 - ∅ Group discussions are harder to organize than individual sessions because you need several informants in the same place at the same time. They are also harder to manage because you have to control not only individual reactions but also group processes. You will want to stimulate some group processes (e.g. opinion disclosure) but at the same time avoid unwanted group effects (e.g. group intimidation).

6.2.4. During the session – checklist

1. Start the session by making the informants feel comfortable with the situation. Small talk while informants get seated around the table and let them have something to drink
2. Introduce yourself and tell them about the part you (the facilitator) and the observer have during the session.
3. Briefly talk about the background for the focus interview, why they have been invited, that it is not a test of a specific product, nor is it a test of their knowledge or qualifications. Explain that it is in the beginning of a development process, that everything is still on the idea level and that their input is crucial for the future development of the project. Tell them not to worry, that other informants are more “clever” than them, as the group has been put together carefully in order to get as many perspectives as possible. Everyone’s opinion is important.
4. Tell them what time the session will end. Ask if this is alright with everyone. Tell them there will be breaks along the way, where to find the lavatory, where they can smoke. Remind them to turn off their mobile phone.
5. Let everyone introduce themselves.
6. Start the discussion with an “easy” question. It is crucial for the further process, that the opening question is neither complicated nor abstract, but something that everybody has an opinion and can talk about.
7. Ask the group the questions you have planned for the discussions, but give them time enough to “finish” one subject before changing to a new one. Ask them to elaborate on their statements and ideas. This session is all about the informants, so give them the necessary space.

8. It is very helpful to let informants solve some tasks during the session, for example evaluating pre-produced prototypes or to let them produce prototypes themselves. This always gives inspiration to interesting discussions among the informants.
9. Help the informants set up a list of requests for the (new) product.
10. The observer will take notes during the session. Let the observer round off the discussion by summing up some of the important “conclusions” the informants agreed upon.
11. If the session has been documented on video, then get their permission to use it for internal purposes. Get their permission on paper.
12. End the session and give the informants their presents.
13. Let the informants know who they can email or phone if they have further comments or questions.

- ∅ *You are testing the developer team’s choice of solutions, not the users!*
- ∅ At all costs avoid the temptation to argue with your tester, or to "explain away" the problems they identified.
- ∅ As a facilitator you must help create balance in the group of informants. Some informants talk more and louder than others. It is the facilitator’s duty to manage the group dynamics. If one of the informants is dominating the conversation, the facilitator should politely acknowledge the informant’s contribution and then pass the question to another informant.
- ∅ If one of the informants is particularly retiring and quiet during the discussion the facilitator can address questions directly to this person.

6.2.5. After the session – checklist

1. Straight after a completed session, write a short summary based on the discussions of the group. It should sum up main issues of the discussion, important observations, informative comments or suggestions for solutions from the informants. Writing the summary right after the focus group session is important as the risk of forgetting observations increases the longer you wait to write your report.
2. Transcribe session recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later).
3. Collect and analyze all the data from all the tests – the transcriptions and the notes from the facilitator and the observer. Use for instance affinity diagramming to analyze the data gathered.
4. Do a short report summing up the findings from all test sessions (read more about how to do a report later). Remember to secure informants’ anonymity – i.e. refer to informants by numbers instead of names.
5. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
6. Make sure all relevant people get your report.

7. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

6.2.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable and free from outside distractions.
- A table big enough and with enough chairs for 7-8 informants and one facilitator.
- A tape recorder, a digital or video camera (recommended not mandatory) to record the informant's responses.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informant with their presence.
- Paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.

6.3. Interview

6.3.1. Purpose

The aim of interviews in the pre-analysis part of the development process is to gain qualitative information about users (or potential users) and their needs, wishes, thoughts and opinions concerning the product before development actually starts. In the interview you can focus on:

- The users' background, what is relevant for them or how they want the product designed.
- The collection of in-depth knowledge about the user as a representative of a target group.
- Letting the users evaluate existing ideas for the future product, or evaluate similar sites already in use.

6.3.2. Method

Individual interview is a method involving a face-to-face dialogue about a specific topic, a website or specific web facilities. When used at this point in the development process, the interview is generally semi-structured, driven by a set of questions or topics provided by the test facilitator. The objective of the interview is to gather information about user's thoughts, needs, expectations and experience in a semi-formal way. As long as you only know little about your target group, you should keep the interview to only a few subjects and instead let the informants themselves give you the information they find important to communicate.

It is recommended to interview six persons from a target group to get the most information, and at the same time avoid hearing too many repetitions. But this is only if the target group is very homogenous. If the target group consists of two (or more) sub-groups – each with their own characteristics – the recommended number of informants will be four from each sub-group, as there will be a certain degree of overlap between the information from the groups. If the number of interviews is small then consider inviting an “extra” in case of a cancellation from one of the informants. But remember – testing with one user is 100% better than testing with no users at all.

An interview should last a maximum of one hour. If longer, the informant will get tired and lose concentration. If shorter, you will not get enough information.

6.3.3. Before the session – checklist

1. Prepare the interview at least three weeks before you intend to run it. Do not underestimate the task of finding informants.
2. Choose the focus for your interview research. Is it explorative – to collect information about the target group or is it an evaluation of ideas, or a combination?
3. Make a plan for the interview. Consider the following:
 - a) Define the purpose of the interviews.
 - b) Decide the main subjects of the interviews.
 - c) Who is suitable as informants and how will they be recruited? Will you or a professional bureau recruit them?
 - d) Who will run the interview? (called the facilitator)
 - e) Who will be observing the interviews (called the observer) and take notes.
 - f) Where will the interviews take place?

- g) What kind of equipment is needed for the interviews and how will you get it?
 - h) What kind of present will you give to the informants after the interview?
 - i) How will the interview be documented?
 - j) Other practical things like something to drink and eat during the session, materials used during the session, etc.
4. Find the informants who represent your expected target groups. Send them an invitation to participate in the interview.
 5. Work out a detailed agenda for the interviews.
 6. Do a “dry run” with a colleague evaluating your agenda and your questions carefully to make sure they work as expected – are they suitable to give you the information you expect from the interviews? Are the questions formulated in an open positive, non-leading and unprejudiced way?
 7. Go through the agenda and the questions with the facilitator and the observer so these will know exactly what will happen at the session. Make sure especially the facilitator is prepared.
 8. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
 9. Two days (approximately) before the session you send a mail to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

6.3.4. During the session – checklist

1. Start the session by making the informant feel comfortable. Small talk while they get seated and offer them something to drink.
2. Introduce yourself and tell them about the role you (the facilitator) and the observer have during the interview.
3. Ask the informant to sign a release form for any video or audio recordings.
4. Briefly talk about the background for the interview, why they have been invited, that it is not a test of a specific product, nor is it a test of their knowledge or qualifications. Let them know that it is in the beginning of a development process, that everything is still on the idea level and that their input is crucial for the future development of the project. Tell them that every opinion is important.
5. Tell the informant what time the session will end. Ask if this is all right. Remind them to turn off the mobile phone.
6. Start the interview with a few easy, factual questions (like for example the informant’s work, use of internet). It is crucial for the further process, that the opening question is neither complicated nor abstract, but something that is very familiar to the informant.
7. Ask the questions you have planned for the interview – using an interview technique suitable for your focus and questions. Do not forget to *listen* to the answers that the informant gives you.
8. It is very helpful to let the informant solve some tasks during the session such as evaluating pre-produced prototypes or to let them produce a prototype themselves. This always gives inspiration to interesting comments and opinions.

9. Help the informant to set up a list of wishes for the new product.
10. The facilitator rounds off the discussion by summing up the most important statements the informant made during the interview.
11. Let the informant know who they can email or phone if they have further comments or questions.
12. End the session and give the informant their gift.

- Ø *You are testing your choice of solutions, not the users!*
- Ø At all costs avoid the temptation to argue with your tester, or to "explain away" the problems they identified.
- Ø Do not forget the best parts of the interview are the ones you did not plan.
- Ø Always schedule a little extra time for each session in case the informant has a lot to say to you.
- Ø Leave time in the schedule for your own breaks.
- Ø Remember a release form with permission to use the audio/video for internal purposes.

6.3.5. After the session – checklist

1. Straight after a completed interview session, write a short summary based on what was discovered from this particular informant. It may include main points from the user's general impression of the product, the user's statement about positive and negative things, as well as the facilitator's own statements about lessons learned from the interview. This is especially important if you have more sessions on the same day. The risk of mixing up your observations increases the longer you wait to write your report.
2. Transcribe the interview recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later)
3. Collect and analyze all the data from all the interviews – the transcriptions and the notes from the facilitator and the observer. Use for instance affinity diagramming to analyze the data gathered.
4. Do a short report summing up the findings from all the interviews (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
5. Do a PowerPoint presentation so you will be ready to communicate the result of the interviews to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
6. Make sure all relevant people get your report.
7. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

6.3.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable, and free from outside distractions.

- A desk with two chairs (one for the informant and one for the facilitator).
- A tape recorder, a digital or video camera to record the informant's responses.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informant with their presence.
- Paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.

6.4. Field Observation

6.4.1. Purpose

Field observation is a semi-structured period of observing users in their natural environment. This is to gather information about workflow processes, user habits, and user “lingo”, as well as gaining an understanding of current limitations for improvement.

If field observation is used in connection with an already existing product, it should be used as a way to evaluate and get input to the enhancement of the product.

The input from the research is used to design the products in such a way that it matches the users’ workflows and needs in effective and usable ways.

6.4.2. Method

The field observation method is about observing a user performing in “the field” – while they perform tasks and work routines relevant in relation to the product – and in an environment where this would normally take place.

There are, basically, two observation methods: "Unobtrusive observation" means you observe what informants do and refrain from interacting with them. With unobtrusive observation you learn whether the system is easy to use, but it will not tell you, what informants think of your design – do they like to use it? Does it answer their needs? You cannot get opinions by just watching informants. For this you will need to interact with the informant observed – i.e. to do "Obtrusive observation" by asking questions. With obtrusive observation you learn more about the usefulness and acceptance of the system. Neither method is right or wrong. Each uncovers different things and you will want to use both methods to learn as much as possible about the usefulness and usability of your design. One way of doing that is to start each usability test with unobtrusive observation: you observe the informant execute their tasks and after that, you reserve some time to ask the informant to elaborate on your observations.

A field study on the location of the user varies according to the complexity of the workflows to be observed and the complexity of the product. Typically a field study takes between one and two hours per informant. If it takes longer the usability practitioner is in risk of losing focus and concentration, and if it is shorter the usability practitioner might not get enough information – unless the product is very narrowly defined. Field observation is often supplemented with interviews on location.

It is most important that the usability practitioner is as unobtrusive as possible while still attempting to gain an understanding of what is going on.

The number of informants you need to observe may vary a lot according to the complexity of the subject researched and the homogeneity of the informants. But generally between 2 and 5 informants will provide you with a lot of information.

6.4.3. Before the session – checklist

1. Prepare the field observation at least three weeks before you intend to do the observation. You need time to find the informants as well as get permission (in case of workplace locations) from the head of the establishment to do the field observation.
2. Choose the focus for your field observation.
3. Make a plan for your field observation. Consider the following:
 - a) Define the purpose of the field observation.

- b) Who will be your informants? How will they be selected – and by whom?
 - c) The duration of the field observation?
 - d) Where will the field observation take place?
 - e) Who needs to give their permission to the field studies?
 - f) Who will carry out the observations?
 - g) What kind of equipment is needed for the field observation and how will you get it?
 - h) What kind of present will you give to the informants after the field observation?
 - i) How will the field observation be documented?
 - j) Other practical things you may need to bring with you in the “field”.
4. Find your informants.
 5. Collect general knowledge about the establishment you are going to visit.
 6. Get permission from the head of the establishment to carry out the field observation.
 7. If the field observation is conducted at a work place you need to arrange day and time of the field study with the department office. All the potentially observed colleagues should be notified in advance and given the option not to be observed.
 8. Generate a list of questions you want to ask the informants.
 9. Work out a detailed agenda for the visit.
 10. Two weeks (approximately) before the session you send a letter of thanks to the head of the establishment where the field study is going to take place, repeating your agreement.
 11. Two days (approximately) before the session you send a mail to the head of the establishment reminding them about the appointment (so they will not get surprised when you “suddenly” turn up with a camera. Add your phone number for last minute contact.

6.4.4. During the session – checklist

1. Start the session by making the informant feel comfortable with the situation.
2. Introduce yourself and tell them about the role you play (in this case research leader).
3. Briefly talk about the background for the field study and why you need to study them. Emphasize that it is not a test of their knowledge or qualifications. Inform them that it is in the beginning of a development process, that everything is still on the idea level and that their input is crucial for the future development of the project.
4. Tell the informant when the session will end. Ask if this is alright.
5. Ask the informant to sign a release form for any video or audio recordings.
6. Start the session with a short interview asking the informant about their daily tasks (without using the system at first). If it is in a work place ask about the tasks of work. If it is somewhere else ask about the task they do in relation to the product.
7. Watch the informant perform these tasks (you may ask the informant to repeat the task latest performed – for instance how data is entered into existing applications. Be careful not to disturb the informant unnecessarily, you are there primarily to observe). Note any habits that seem consistent – especially if the habits are not what you might have expected. Write down the time and location of each observation. It is important that you get insight into the whole

process, not just small glimpses of a lot of work tasks (as you may want to develop a product that includes as much as possible).

8. Ask the informant about their experience with these work routines, what kind of problems they are facing doing them, in what way do they try to overcome these problems and what kind of improvement would help them. There might be differences between what the informants say they do, and what you might see them do during the field study. In these cases you should ask the informant to elaborate.
9. Help the informant set up a list of wishes for a new product.
10. Let the informant know who they can email or phone if they have further comments or questions.
11. End the session and give the informant a (small) gift.

∅ *You are testing your choice of solutions, not the users!*

∅ Avoid the temptation to argue with your informant, or to "explain away" the problems they identified. If an informant finds something confusing, then it is a safe bet that a certain percentage of your overall visitors will find it equally unclear.

∅ Always schedule a little extra time for each session in case the informant has a lot of information to give to you.

∅ If you take pictures for the documentation then do not forget to write down time and location for each picture taken.

∅ You may want to bring an extra person as an observer to support you in memorizing what happens during the field observation. Just remember – the more usability practitioners you are, the more you will interfere with the environment you want to observe.

∅ To see what informants do instead of just listening to what they say they do, is a very good supplement to other more interview based research methods. But remember that informants who know they are being observed tend to behave differently from when they are not observed.

6.4.5. After the session – checklist

1. Straight after finishing an observation, do a short summary together with the observer based on what was discovered from this particular informant. This is especially important if you have more observations on the same day. If you postpone writing the summary till later, you might mix up your observations with other field studies. The summary should include:
 - a. Specific conditions concerning the workplace.
 - b. Relevant workflow processes and routines.
 - c. Specific user habits and user "lingo".
 - d. User needs and current limitations for improvement.
2. Transcribe the interviews and review the recordings. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later)

3. Collect all the main points from the pre- and/or post-interviews: Interesting facts about the informants, the informants' general impression of the product, their statement about positive and negative things, as well as the facilitator's own statements about lessons learned from the interview.
4. Collect and analyze all the data from all the observation sessions, the interviews and the transcriptions. Use for instance affinity diagramming to analyze the data gathered.
5. Do a short report summing up the findings (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
6. Do a PowerPoint presentation so you will be ready to communicate the result of the observation session to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
7. Make sure all relevant people get your report.
8. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

6.4.6. Resources

- One or two usability practitioners (usually someone trained in usability) to do the interviews and observations.
- A tape recorder, a digital or video camera to record the informants' actions and responses.
- For the pre- and post-interview, a quiet room, comfortable, and free from outside distractions.
- For the pre- and post-interview, a desk with two chairs (one for the informant and one for the facilitator).
- Payment to the informants for their effort and time.

6.5. Cultural Probe

6.5.1. Purpose

Cultural probe (known as diary studies) is a very “open” and unstructured research method. It will provide you with valuable information to create personas and prepare effective interview guides.

The purpose of cultural probes is not to get informed about a particular event or to analyze the data precisely in carefully controlled methodologies. Instead, the aim is to get clues (unstructured and fragmented) about informants’ lives, thoughts, emotions and values, what they do, why and with whom. It will help the usability practitioner to get to know the users and their culture better, to build up a pattern of users’ behaviour and identify unrecognized needs and invent new products.

6.5.2. Method

A cultural probe kit is put together by the developer team and handed to the informant at the beginning of the research period. A probe is typically a combination of tools such as maps, postcards, disposable cameras, photo albums and diaries. This package should inspire the informants to collect a diverse set of data about their lives and record specific events, feelings or interactions in their usual environment and end up telling a multi-layered narrative of the informants’ lives.

Cultural probes need to be prepared carefully so they suit the informants. First of all because it relies on a relatively large investment of the informants’ time (at least several hours during the course of the activity), secondly because the probes usually cannot be monitored during the course of activity.

Informants should work with the probes over a specific period of time, usually from 1 week to 3 months. A period of ten days is advisable. If you expand the period you will get too much information to analyze and you risk that the informants get tired of filling out the probes with information.

The number of probe informants depends on the complexity of the field researched. If one purpose of the probe is to prepare interview guides, you need a probe for each person you want to interview. Remember, that one probe is better than no probes at all, but too many probes within a single research round will make your analyzing task overwhelming.

The content of a cultural probe kit depends on what type of information you want to gather, and on the materials with which informants are familiar.

- A diary. Most kits contain a diary for recording comments or impressions. This can be as simple as a pocket-sized diary in which, for a week or so, informants write – on a daily basis – about when, how, and why they interact with a website or service. The diary can be either a blank notebook, or a more closed one with a series of specific writing or drawing tasks.
- Maps. These can be used to explore informants’ attitudes towards their environment. It could be a world map where informants mark where they have been, a local map of their neighbourhood where they mark places where they go to cultural events, where they buy their books, where they would like to go but cannot and so forth.
- Postcards. These are very useful for asking informal questions in a friendly mode. The questions are written on the back of the postcards and may ask things such as, “*Please tell us a piece of advice or insight that has been important to you*”, “*What do you like or dislike about the place you live in*” or “*Tell us about your favourite device*”.

- A disposable camera re-packaged with instructions of photos to take such as their home, their notice board, their favourite cultural place, what pictures they have on their walls, the first person they saw that day etc. However it is also a good idea to leave some of the pictures unassigned to encourage users to take photographs of whatever they want to show.
- The kit may also contain items such as a scrapbook, a voice recorder, cheap digital recorders, list keeping (informants are asked to collect routine lists from their every-day lives such as to do lists, shopping lists, receipts, etc.) pens, post-it notes, staplers and the like – anything that can help the user gather and record information.

6.5.3. Before the session – checklist

1. Select a (small) number of informants. Recruiting is particularly important with cultural probes, since they rely on a large investment of the informants' time. Ensure that you recruit the right informants and that you monitor and support them closely throughout the process.
2. Develop your cultural probe kit. The contents of the kit depend on what type of information you want to gather, and on the materials with which informants are familiar. It is important to provide kits that prompt them for the types of information you want. Give users the choice of how to record their thoughts and feelings – text, photos, and drawings is a good strategy so that they can decide which way of communication they prefer.
3. Brief the informants carefully at a face-to-face interview when the probes are handed to them, and explain about the required probe tasks. This will help them to gather the right information.
4. Make agreements with each informant on how the probes will be returned to the usability practitioners, when the time period expires.
5. Provide a phone number they can call for assistance or advice throughout the data-gathering period.

- ∅ Informants respond positively to attractive kits. Therefore, using good quality materials is worthwhile. A professional finish will help the informants consider the probe as a serious work tool and strengthen their incentive to spend the needed time and fill it in properly.
- ∅ A probe with lots of other tools than the diary is useful, especially when dealing with literacy issues or with groups of informants unfamiliar with the written media.
- ∅ You need to take care not to unduly restrict the information they gather, in order not to miss important insights.
- ∅ Open-ended questions are a great way of encouraging users to write down extra information. Questions such as “What would you do differently in this type of situation?” uncover all sorts of thoughts that may lead to new solutions. Identifying whether an event or situation came up unexpectedly or whether it was triggered by something else (“it was my cat’s birthday”) is useful too.
- ∅ The diary in whatever form can be as small or large as desired. However, size does play a part in how it is perceived by users. In paper form, space for 40 entries can be overwhelming whereas 10 entries might encourage them to complete the book.

- ∅ If the informants are familiar with computers then online blogs and photo diaries on Flickr will work just as well as diaries. Online tools have some advantages compared to the analogue version:
 - The usability practitioner can see what is happening to the informants in real time.
 - Usability practitioners do not have to spend a lot of time afterwards converting the information into digital form.
 - The informants can be asked to collect data about their usage of different media, such as television, radio, mobile-phone, computer etc.

6.5.4. During the session – checklist

1. The informants carry out the tasks over a specific period of time, usually from one week to three months. However a period of ten days is advisable.
2. Send emails to the informants with advice and contact information (mail and phone number) if they need help of any kind.
3. Typically, a follow-up interview is conducted at some point when running the probes. This helps ensure that informants are actively engaged or to verify the quality of task execution. Alternatively, the usability practitioner might ask informants to return probe responses back during the specified period of time.
4. At the end of the period, informants may return the cultural probes by post, or usability practitioners can visit to collect them and discuss some of the responses.
5. A de-briefing session can be conducted in order to supplement, validate and otherwise explore the information gathered by the informant.

- ∅ Consider carefully the period you will run the probes. The length depends on the subject researched. If it is a daily phenomenon you will get lots of information running the probe for just a week. If it is not a daily phenomenon you might not get information enough running it for just one week. However, the longer the period, the heavier the workload connected with the preparation and the post-analyzing of each probe.

6.5.5. After the session – checklist

1. After retrieving the probes from the informants, give each “package” of returned items numbers so you do not mix up items returned by different informants.
2. If your probe included a disposable camera then send it to a photo shop that offers fast development.
3. Go through every probe carefully. Write on Post-Its every time you recognize issues, questions, quotes, statement about positive and negative things, dreams, wishes etc. Be careful that you notice every detail that might be valuable for the “story” you are going to write about the informant – also small things or things not even mentioned directly by the informant themselves might be interesting.
4. Go through the same process with all other items from the package. Keep the Post-Its from each informant separate.
5. Organize all the Post-Its in an affinity diagram to analyze the data gathered.

6. For each informant you can now develop a Cultural Probe Card that points out the most interesting discoveries related to each informant. Make informants' notes and photos available to project team members – this provides a good way to communicate findings.
7. Do a short report summing up the findings from all the probes (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers or artificial names.
9. Do a PowerPoint presentation so you will be ready to communicate the result of the probes to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
10. Make sure all relevant people get your report.
11. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

6.5.6. Resources

- A facilitator (usually someone trained in usability) to introduce the probe to the informants, carry out the follow-up interview as well as be in dialogue with the informants during the probe period.
- Dairies for the probes.
- Whatever tools you may use in your probe – maps, postcards, disposable cameras, photo albums and diaries (if you use a camera for paper pictures in the diary – remember the time and money to develop the pictures), paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.
- At least two usability practitioners (usually someone trained in usability) to analyze the completed probes.

6.6. Questionnaire

6.6.1. Purpose

A questionnaire allows you to gather information from a large number of informants in a systematic and quantitative way. The advantage with a questionnaire is that you can reach more informants and in that way gain greater statistical representativity than would be the case with in-depth interviews with only a few respondents. As the informants in a questionnaire survey all answer the same questions, this research method allows you to conclude on the *dissemination* of the “phenomenon”, you are researching.

You can use questionnaires for several purposes in the phase of pre-analysis: help you redefine your user profiles and personas; to ensure that your test participation selection has given you the informants you need; or to gain knowledge about what they like and dislike about a previous product.

Questionnaires are suitable as a *part of* another test method such as interview research, focus group, field observation or a usability test. When used together with other test methods, a questionnaire is usable to collect information on a more factual basis (sex, experience, age, work area, education, address etc.). If it has been sent to the informants ahead and returned before the session, it can help you control that your test informants fit your criteria, as well as help you save valuable time during the usability tests, because you already have the basic information.

6.6.2. Method

Questionnaires can be made either as a low tech (offline – paper based) or a high tech solution (online web based). However, they all have the same purpose – gathering self reported data from multiple informants who have been asked the same questions.

Questions can be worded for requirements capture, as well as for investigating users’ attitudes to prototypes or finished products. In principle, a questionnaire can contain as many questions as the usability practitioner wants answered. However, experience shows that ***thirty questions are absolute maximum***. The longer the list of questions the shorter the list of respondents that might answer your questionnaire is likely to be. No matter the number of the questions, they should be on a form that makes it easy for the informant to confirm or dis-confirm the hypotheses.

Use one (or more) of the following forms:

- Yes/no – questions: The respondent chooses between the answers: Yes, No, Maybe, Do not know.
- Extend – questions: The respondent chooses how well a certain statement fits to their answer: Very good, Good, Neutral, Bad, Very bad.
- Priority – questions: The respondent prioritizes between a number of possibilities, writing (for instance) 1 for highest priority, 2 for medium priority and 3 for lowest priority.

If you are interested in getting more “open” answers – you can use a form beginning with: What, How, Why, Tell, Write etc. However, open questions will give you a lot of different answers, which will complicate comparisons. If you want answers different from the confirm/dis-confirm ones, then consider a method suitable for collecting qualitative data instead (like focus groups, interviews or field observation). Questionnaires can be used as a supplement to other kinds of usability tests or as an individual study.

The collection of data using offline questionnaires takes much longer than the online method, because you have to do the registering by hand, as well as get in contact with users who want to

be informants. Using online questionnaires the informant themselves do the answering while the software handles the data and reports.

6.6.3. Before the session – checklist

1. Prepare the questionnaire at least three weeks before you intend to run the questionnaire. If part of an interview – prepare the questionnaire when you start preparing the regular user test.
2. Choose the focus for your questionnaire study. Consider carefully what kind of knowledge you want from the questionnaire and what knowledge you want from any following user test. Is it background information about a target group? Is it an evaluation of an existing product? Is it an evaluation of ideas?
3. Make a plan for the questionnaire study. Consider the following:
 - a. Define the aim of the questionnaire.
 - a. Decide the main subjects of the questionnaire.
 - b. Who will do the work with the questionnaire?
 - c. Who are suitable as informants and how will you reach them?
 - d. Will the questionnaire take place offline? Online? In case of an online questionnaire – where will the informant find the questionnaire on the web?
 - e. What kind of equipment is needed for the questionnaire and how will you get it? (Europeana has an online tool you can use).
 - f. Will you give a reward to the informants for completing the questionnaire or do you draw lots for a winner?
4. Find the informants, if your informants belongs to a specific group.
5. Make a draft with all the relevant subjects.
6. (Only if part of an interview) Investigate whether all the informants have the opportunity to answer the questionnaire before the user test. Otherwise they must bring it with them, when the test is carried out.
7. Make the specific wording of the questions. Consider in which order the questions appear in a natural way and finish the questionnaire.
(Only if part of an interview) Make the specific wording of the questions, at the same time as you work on the agenda for the regular test so that questions asked in the two tests supplement each other rather than overlap.
8. Do a “dry run” with a minimum of two users representing your target group to check that questions are understandable and that categories of possible answers are meaningful.
9. Make any necessary corrections to the questionnaire.

- ∅ Developing questions for a survey is not a simple task, so be very careful about possibilities for misinterpretation.
- ∅ The types of questions you ask should be relevant so that you can obtain results that will be useful to you.
- ∅ Be fair and general with your questions and do not lead informants into giving specific answers that are not accurate and truthful: you will only be misleading yourself.
- ∅ Keep the questionnaire short and have a reasonable balance between open and closed questions so that interviewees/recipients will engage their interest and co-operation.
- ∅ There are several ways that questionnaires can be distributed and may be determined by the type of business you are in. Do not shoot blind-folded: target those people in the market that your questionnaire is directed at but at the same time, be sure that your sample is as random as possible in order to obtain an unbiased and varied response.
- ∅ (Only if part of an interview) Remember to reserve one of the questions in the questionnaire to ask for the name of the informants, so you later can relate the questionnaires to the informant.
- ∅ Analyzing the data is a task that requires good analytical skills so the data accumulated from the questionnaire can be interpreted and turn it into a proposed strategy for developing the website.

6.6.4. During the session – checklist

1. (Only if part of an interview) Send a questionnaire to each of the test informants one and a half week before the test.
2. (Only if part of an interview) Together with the questionnaire you send a letter explaining what you want them to do, and – most important – how you want it returned to you. Do you want them to send it to you in advance or to bring it with them to the test?
3. Wait until the research time expires
 - To boost the users' motivation to answer your questionnaire you can establish a competition among the participants with a prize. This presupposes that users supply you with their name and email address.

6.6.5. After the session – checklist

1. Once you have issued your questionnaire and have a number of responses that you are happy with, you need to analyze your data.
2. First step is to accumulate totals for each question answered. You can use plain spreadsheet software or you can use a more specialized software product to systematize the data from your questionnaire survey.
3. Convert all responses into numerical data (for instance: how many answered yes to this question? And how many percent of all the answers is that?).
4. Convert all the numerical data further into diagrams and charts so you get geometric symbolic representation of your data. This will help you analyze the data in which you can draw conclusions on your findings. There are numerous ways to represent your data, where some of the most used are: Bar Charts, Histograms; Pie Charts; Line Graphs;

Frequency Curves, Scatter Graphs etc. Which of these possibilities you should use depends on the specific information need and purpose.

5. You might want to find more patterns by splitting your results into more details like for instance the informants' age groups or location. By doing so, you can identify more precise patterns in the data you have collected.
6. Producing diagrams to help analyze results is ideal for numerical data but questions that are 'open' are harder to interpret as they give unique and diverse answers. There is no common way of analyzing these results and you should use them in a way that you will benefit from. It may be that you use the comments as advice when designing the product/service or to find a link between the comments made and the numerical results.

- ∅ Analyzing data is very intensive and by using analytical tools, you will discover patterns and findings that will help you determine a marketing plan that is accurate and feasible to assist your future success.
- ∅ Take time when analyzing the results as this is where many usability practitioners fail if they do not bother to make detailed conclusions on their findings.
- ∅ On the Internet you will find lots of free statistical software as well as online graph creation tool to help you analyze and represent your data. These tools might be very helpful for usability practitioners with little formal training in statistics because they help you solve the vast majority of quality-related issues: essential data analysis, reporting and charting.

6.6.6. Resources

- The Europeana online tool kit (or alternatively spreadsheet software or another kind of statistical software)
- Money for a prize, if this is part of your inducement plan.
- A usability practitioner (usually someone trained in usability and with some statistical skills) to analyze the data.

6.7. Statistical Web Analyses

6.7.1. Purpose

Web analytics is the assessment of a variety of data including web traffic, web-based transactions, web server performance, usability studies, user submitted information and related sources to help create a generalized understanding of the visitors experience online⁸. It provides internet data that tells you about traffic and popularity trends, as well as how users navigate on your site. Depending on which method used and which technical solution selected, it tracks details like the number of visits, visitors, page views, hits, referrals, MB downloaded, browsers used when visiting your website, search engine and keywords used to find you site, geographic location, etc. Some even track mobile data trends. This data is typically compared against Key Performance Indicators (KPIs) for performance and used to measure progress toward the organisations goals.

With this information you can optimize your web site as well as plan your marketing effort.

6.7.2. Method

There are two categories of web analytics; off-site and on-site web analytics. Off-site web analytics measure a web site's potential audience, visibility and the buzz around the Internet in general. On-site web analytics measures visitor's usage behaviour as they are on your web site. Historically, web analytics has primarily referred to on-site visitor measurement on which we will focus in the following.

There are two main technological approaches to collecting the data – both can be processed to produce web traffic reports. Using the first method, web server log file analysis software reads the log files in which the web server records all its transactions. However, the development of the internet (with for instance web pages that span multiple HTML files, the increasing use of images in HTML, the extensive use of web caches, search engine spiders and robots, web proxies, dynamically assigned IP addresses) has created concerns about the accuracy and usability of this data collection method in relation to usability improvement.

It takes a lot of skill to truly extract knowledge from log files. If you are interested in log file analysis you should keep an eye on University College London (EuropeanaConnect WP3.1) who does all the work in the Europeana context.

The second data collection method, whose popularity is rapidly growing, uses a JavaScript “page tag” on each web page to collect data instead of using the web-server log file. This type of data collection is often referred to as “front-end” or “client-side” because it is the visitor’s web browser that enables this type of data collection. While software for this kind of data collection can be run in-house from the organisations own IT infrastructure, it is very common that the data collection is outsourced so data is hosted and analyzed in another location. In this case your visitors simply come to your site, download your web page (with the page tag) in their browser, the page tag is executed and information is sent to the vendor’s data center. All you have to do then is to log into an online interface and view the data in pre-defined or customized reports, downloadable from the interface or delivered to your email.

The challenge is to decide which Key Performance Indicators to measure progress in order to reach the organisations goals. Key Performance Indicators (also known as KPIs or KSIs – Key Success Indicators) are quantifiable measurements that reflect the critical success parameters of the organization. The definition of KPIs will differ from organization to organization, from

⁸ Page 6 in "Web analytics Demystified..."

department to department. A sales department may for instance have as one of its Key Performance Indicators the percentage of its income that comes from returning customers. An education department may focus its Key Performance Indicators on graduation rates of its students. Whatever Key Performance Indicators you select must reflect the organization's goals, be key to its success, and must be quantifiable (measurable).

Key Performance Indicators (KPIs) need to:

- Make sure that your KPIs are approved by all the important decision makers in your organisation at all levels. Consider involving decision makers at all levels to increase their acceptance and dedication.
- Define your KPIs as long-term considerations so they will not have to be changed all the time – change them only if the goals of the organization change, or it gets closer to achieving a goal.
- Only work with a few KPIs. It is critical to limit them to those factors that are absolutely essential to the organization reaching its goals This will help keep everyone's attention focused on achieving the same KPIs
- Always define your KPIs as rates, ratios, averages or percentages; not just “raw” numbers.

6.7.3. Before the session – checklist

1. Prepare the web statistics in very good time before you plan to start the data collection. You have a lot of initial decisions to make. Keep in mind that data collection software need to collect statistical data for a while before it can tell you anything about user trends.
2. What is the “mission” of the organization or the department and its web services?
3. Define the aim of the statistic. Is it marketing purpose? Is it usability adjustment purposes? Is it because of political purposes? Do you need off-site or/and on-site web analytics data?
4. What are the goals and who are (all) the stakeholders? Defining site goals is the first step when preparing an analytics plan. Without at clear goal for each sub section of your site it is impossible to improve a site using web analytics data. Define your goals as specifically as possible and point exactly to which part of your site you want to change, how you will do it and the expected changes (for instance a 10 % increase in traffic from June to July). Essentially this is the "before" reporting in your key performance indicators report – the first step in the measure cyclic process.
5. Find out which Key Performance Indicators that reflect the critical success parameters of the organization. Who should be involved in the work of finding Key Performance Indicators? When deciding which indicators you are going to report, be inclusive and make sure to talk to all the groups of recipients. You have to make sure you are giving them the data they actually need. Also, by including them in the process you'll increase their interest in the results from the very beginning.
6. Choose the focus for your statistical research. Consider carefully what kind of knowledge you want from the statistics – what kind of questions do you want to answer?
7. Make a plan for the statistical data collection. Consider the following:
 - a) What kind of technical solution will you use – a web server log file solution or a “page tag” solution?

- b) Which vendor should provide you with your on-site web analytics software and services?
 - c) Will the software for the data collection be run in-house from the organisations own IT infra structure or will the data collection be outsourced so data is hosted and analyzed in another location? In that case – to whom do you outsource?
 - d) When do you need the statistical data and when will you have to start the data collection?
 - e) Who will support you technically and help you with the configuration (or reconfiguration) of your statistics software. Even when using outsourced solutions you will have to do some basic configuration.
 - f) Which procedures will need to be established around the statistical data? Should they be accessed by one main responsible or should more people have access to this information?
 - g) Who will do the work with the statistical analysis, the maintaining of the analytics tool as well as the continuous review of web analytics data? It is important that a single person (or group) dedicate themselves and take responsibility for determining which KPIs are right, how to build those indicators using the available data, annotating that data and distributing it to relevant stakeholders. If it is a part of somebody’s job, there is a god chance that the work will actually get done. Is there a need to hire a statistician to ensure the result is reliable?
 - h) How will the information generated from the statistic be shared effectively within the organisation?
8. Sign up for – or install – the technical solution or service you have selected for your data collection.
 9. You can add the JavaScript “tags”, designed to detect information about the visitors, to every Web page you wish to track. It may be integrated in the global header or footer structure for your entire site.
 10. A standard key performance indicator report must be designed to summarize meaningfully compared data – showing values for the current and previous reporting period. Consider some form of one-page graphical “scorecards” that report the progress toward specific site goals. This gets everyone focused on the right metrics and recipients become more likely to use the analytics tool.

- ∅ Remember to exclude your organization's internal traffic from your analysis. Otherwise you will not get a true picture of how your site is used by others.
- ∅ Many different vendors provide on-site web analytics software and services. When choosing your technical solution we strongly advise you to get involved only with an outsourced web analytics vendor that provides you with reports you can understand and a tag you can easily implement and who has a good reputation.
- ∅ Be careful to choose a vendor with a tag, that easily can be integrated on your entire site, and that does not result in additional delay in loading and rendering your web pages, that accepts to keep and store your data for as long time as you want it (not all vendors offers free database storage), that the solution is actually able to collect the type of data you need, that it provides you with report and analyse facilities you need, the possibility for data-backup at no or little extra costs (who owns the data in case the contract is cancelled?), how do they handle privacy issues concerning your data.

6.7.4. During the session – checklist

1. Make sure everyone knows who is responsible for generating the reports and that they know who they can ask about the data.
2. Send out your KPIs frequently as they will only be effective if people see them enough to actually keep them in mind when making business decisions. In general, it is recommended that KPI reports (for an example on a KPI report – see appendix 7) are delivered on a daily or weekly basis (depending on the type of organisation). Even if it is not possible to meet to discuss the ramifications of the report, the indicators should be generated, annotated and delivered. Doing so will keep recipients up to date and hopefully make any conversation about the metric more productive.
3. Have regular meetings with (groups of) stakeholders to discuss the data. Avoid the temptation to automate the distribution of the reports and just expect people to automatically understand the data and (know how to) use it properly. For most people, this type of data is new and unfamiliar – it needs to become institutional knowledge.
4. Post the KPIs everywhere: in the lunch room, on the walls of every conference room, on the company intranet, even on the company web site in some cases. Show what the target for each KPI is and show the progress toward that target for each of them. People will be motivated to reach those KPI targets.
5. Do not be inflexible regarding which indicators you report. If people start asking for additional data then be happy – it is a god sign and indicates that people have started looking at the information.

6.7.5. After the session – checklist

1. Do a PowerPoint presentation so you will be ready to communicate the result of the statistics to team members, stake holders and decision makers. Keep the presentation short, stick to the main points (the KPIs)
2. Act on the statistical data! Web analytics data are too often viewed as last month's report card. Instead the real question is "What do we do next?" Used effectively, statistical data can actually drive site performance, not just monitor it. Once goals are established and stakeholders are looking at the data, action needs to be taken so the data collected is

actually used to improve site performance. This presupposes that all involved commit to regular, iterative, data-driven site optimization.

∅ Do not go for huge and comprehensive changes of the entire web site. This will probably just create a whole new suite of problems that need to be addressed. Instead, prioritize your changes, break every perceived problem down in to as many small actions as possible, and tackle them one by one. You will only be able to understand and register the effect of a change if you make one change at a time.

∅ A rule of thumb⁹ is if you want success with your web statistics you need to spend 10% of the resources on the technical solution and the implementation. The remaining 90% you need to use for the intelligent (human) interpretation of the data.

∅ Always work to get the decision makers' support, acceptance and backing. Technical tools are not enough to secure success; no system can make the important decisions, decide priority, define KPIs, provide the necessary financial resources, and dedicate an employee to focus on this specific issue.

∅ Define your KPIs before you decide which tagging solution to use. You need to find the solution that supports the goal of your organizations, not the other way round.

6.7.6. Resources

- Web log analysis software. This can be performed in-house, but are often provided as a third-party service. Vendors typically charge a monthly fee based on the number of pageviews per month collected. As an alternative to commercial solutions, several open-source logfile analysis tools are available free of charge.
- An experienced web analyst or the training of a suitable in-house person.
- Technical expertise within the organization.
- Storage facilities for the collected data (not all vendors offers free database storage)

⁹ Avinash Kaushik – <http://www.misura.dk/webanalyse/10-gode-raad-til-webanalyse.html>

7. Phase of Design

After the phase of pre-analysis, this phase is the second busiest period in relation to usability activities. The more information collected at this stage, the better chances the developer team has for developing a product that actually meets the users' needs in the end. All the usability activities in this phase will provide you with input to the specification of a product – whether this is the development of a completely new website, redesigning – or developing a new feature to an existing website. The purpose of the usability activities are:

The overall purpose of this phase is the development of an interface, and usability activities in the development phase basically focus on testing design suggestions, exploring what works for the users and what does not work.

From the previous phase (or previous work) you will be familiar with the users, and what kind of tasks they want to perform using your product. In this phase you are going to explore the information architecture and the design of the interface. How should it work to satisfy the need of the users? The aim of this phase is to make a detailed specification that describes all aspects of the product.

Usability activities are focused on implementing a user friendly interface, usable functions, intuitive workflows, logical structures, and a suitable navigation. Lots of prototypes – drafted by the hand on paper, in Word or PowerPoint – are produced, tested on project members, family or on real users, discussed and then redesigned and tested again.

The activities in this phase are centred around the following:

1. Decide the overall architecture and flow of the information and the services (build a flowchart).
2. Do a sketch of the front-page (index.htm) – consider what facilities and information you want on this level.
3. Decide what kind of basic navigation you need, including how the users should navigate through the different information and services.
4. Categorise information and services in “obvious” (for the users) groups; decide the overall menus; their order and content.
5. Check whether your decisions correspond with current “Best (web) practice”.
6. Provide the designers with information, so they can begin the actual designing of the pages.

7.1. Methods of User Involvement – "How-to" descriptions

The following methods are also relevant if an already existing product is about to be improved during the following development process.

7.1.1. Card Sorting – advantages and disadvantages

Advantages

- A very simple, easy and quick test method to perform. It can be organized and run almost everywhere without a lot of overhead. It is easy to run and re-run the evaluation many times in the development process and whenever you make changes.
- You do not have to bring in the informants to a venue as the test only lasts for ten minutes.
- Even within one session you can change the classification as you go or test alternatives on the fly.
- You can get input concerning your labelling and information architecture before the development work has started and before you have developed a prototype.
- It is easy to "convince" users to participate in the test as the test requires only little input from individual users.
- The method is very cheap as it only demands a stack of cards or yellow Post-It's. There not even a need for a computer.
- With this method you can involve users in building an information architecture mirroring users tasks and opinions of the information "space"; their mental models – not the designers or the organizational structure of the sender.
- Using this technique before your in-depth usability test means that you can focus the usability testing on interface issues, rather than on the classification.

Disadvantages

- The method is very focused on content and do not take into account, that users in real life have different purposes for their visits on the site. This might influence their approach.
- The meaning of a heading on one of the cards may be unclear for the informant so they find it difficult to place the card in the information architecture.

7.1.2. Heuristic Inspection – advantages and disadvantages

Advantages

- The heuristic inspection (sometimes called a discount usability technique) requires few resources in terms of money and time, as it does not directly involve users. It provides quick and relatively inexpensive feedback to designers.
- The method is very useful in circumstances where a review of the product in relation to usability is needed, but a usability test is not an option (due to for instance lack of time, lack of budget or an unwilling client).
- Heuristic inspection can be done with only one expert, but if more inspectors are involved, more problems are likely to be discovered.

- Heuristic inspection prior to user testing can reduce the number and severity of design errors discovered by the informants, which makes it possible for the informants to focus on overall usability problems.
- A heuristic inspection can be strengthened if it is done on the basis of personas (a persona-led heuristic inspection) instead of just a simple check-list approach.

Disadvantages

- The inspection is not based on observations of real user behaviour. There is a risk that the "usability problems" identified in a heuristic inspection differ from those obtained in a performance testing. Thus the inspection might result in suggestions for change that never would be required by the users.
- Because a heuristic inspection solely is based on guidelines (theory) and opinions, disbelieving designers might argue: "Why are your opinions better than mine?"
- The inspection does not always give you clear recommendations of improvement such as you would get in a usability test. Some problems might not be revealed in a inspection, because they only are discovered when the product is used.
- The result of the inspection depends heavily on the qualification of the inspector. A less experienced inspector might produce disastrous amounts of "false usability alarms" or assign the wrong heuristics to potential problems.
- It can be difficult to judge the severity of proposed usability issues.

7.1.3. Cognitive Walk-Through – advantages and disadvantages

Advantages

- Is intended especially to help understand the usability of a system for first-time or infrequent users – how difficult it will be to start using the system without reading the documentation and how many wrong moves will be made in the meantime.
- Direct experience for the team from the informants' perspective.
- Rapid, as the method does not require external informants, it is quick to administer, and does not require any trials.
- Uncovers significant usability issues and design gaps.
- Yields a prioritized list of issues and actions that is generated by the team.
- Can be easily repeated.
- Can be used as a basis for and compared to future usability tests.
- Is anchored in the relatively concrete context of performing specific tasks.

Disadvantages

- The test is based on the team's judgement of and assumptions on what our users would do or think, not on actual user's actions and opinions. If this is not qualified the outcome will not be valid.
- The usability practitioner must have a good knowledge of the general principles of human actions on different kinds of websites, and a good ability to make judgements about users' cognitive abilities, knowledge and skills, as well as the cognitive skills necessary to complete a task.

- Does not address user satisfaction or efficiency.

7.1.4. Paper Prototyping – advantages and disadvantages

Advantage

- Paper prototyping is especially useful for gathering data about concepts and terminology, navigation, workflow, content, page layout, as well as missing functionality.
- Prototyping lets you create and refine an interface based on user feedback before implementation. But put a paper prototype in front of someone and watch them use it, and you will quickly discover whether it meets their expectations.
- Make changes fast and cheap.¹⁰ With a paper prototype, you can revise the interface very quickly, even during a usability test. If a term is confusing, you can cross it out and try a different one.
- Although a working prototype (high-fidelity) take significantly longer to develop (weeks instead of minutes) than a paper prototype (low-fidelity), there is a significant degree of overlap between the problems found using the two methods. The return from taking the additional time to develop a working prototype is diminishing. You only uncover a few more problems but spending much more time and money.¹¹
- Paper prototypes effectively avoid nitpicking feedback because it is obvious to informants that you have not specified the look yet. This encourages users to focus on the concepts and functionality instead of minor design details.
- Paper prototypes (compared to computer based) often turn out to encourage the creativity of especially non-technical users, as they seem to feel more comfortable exploring an unfinished design.
- Paper prototyping gives all the stakeholders across disciplines (technical writers, graphic designers, market usability practitioners, software engineers and users) the opportunity to participate directly in the creation of solutions.

Disadvantages

- It may be uncomfortable for the designers to show an unfinished – or even flawed – design to outsiders. Some argue that paper prototypes are not taken seriously
- Paper prototypes neither demonstrate colours, fonts, download time or other response time nor technical capability.

¹⁰ Nielsen (2003) estimates that it's 100 times cheaper to make changes before any code has been written than to wait until after the implementation is complete.

¹¹ http://www.snyderconsulting.net/article_paperprototyping.htm

7.2. Card Sorting – The “Tree testing method”

7.2.1. Purpose

The purpose of card sorting is to get input to the structure and organization of information and services in logical groups and sub-groups (called the taxonomy). This will help you make decisions about which menus you need to help users predict where to find what.

Used early in the designing (or re-designing) process this method can help you find an information structure and hierarchy that users find intuitive. When used later, it can help you see whether your classification will be successful and potentially identify structural and hierarchical problems.

The method is particularly informative when informants “think-aloud” during the card sorting. It can be run as part of a focus group or as a preparation to your in-depth usability test so this can focus on interface issues, rather than issues about classification.

7.2.2. Method

Card sorting is a useful method for designing information architecture, workflows, menu structure, or web site navigation paths – typically performed as a low-tech method. Content of a website is first identified and then written onto simple index cards or Post-it notes. Informants are then asked to work with these cards; either to *suggest* an information structure and categories; to *judge* a given structure and set of categories; to *predict* the content of categories; or to suggest usable labels for content and categories.

There are several variations of the method card sorting.

Reverse card sorting – also known as Tree testing method: Informants are given a number of “find it” tasks (e.g., “Look for a picture from Germany (1975) showing a typewriter”), and they point under which top-level topics of the website they assume they will find it. They choose a heading, and are then shown a list of subtopics. They continue choosing (moving down through the navigation tree) until they find the correct topic (or give up).

Open card sorting: (Not described in this document). Informants create their own information categories as well as name them. This reveals not only how users mentally classify the cards, but also what terms they use for the categories. This method helps generate ideas for organizing information.

Closed card sorting: (Not described in this document). Informants are provided with a predetermined set of category names. They then assign the index cards to these fixed categories. This evaluative method helps reveal the degree to which the informants agree on which cards belong under each category as well as judge whether a given set of category names provides an effective way to organize a given collection of content.

The method is simple. It requires only little input from individual users: 10 minutes from about 20 users inexperienced with web-design. However, the method will provide you with a significant amount of feedback concerning your classification.

7.2.3. Before the session – checklist

1. Find informants representative of the target group(s). Fifteen to twenty informants is advisable.
2. Arrange 10-15 minute sessions with each informant.

3. If the informants are professionals, do not forget to get permission from the head of the establishment to do the card sorting test.
4. Do some research on the (coming) website content and come up with a (different) way of grouping information. Make sure your classification goes down to a fairly detailed level, not just broad categories. Even though you may tell informants that this is not an information-seeking exercise, informants are pleased when they “find it.”
5. Go through your classification, number it as shown in the example below (as far into the hierarchy as you need), and give names (headings, sub-headings and topics) to the different information categories at all levels:
 - 1.0 Heading (level 1 – ex. About us)
 - 1.1. Sub-heading (level 2 – ex. Contact information)
 - 1.1.1 Topic (level 3 – ex. Phone)
 - 1.1.2 Topic (level 3 – ex. E-mail)
 - 1.2. Sub-heading (level 2 – ex. Background)
6. Transcribe classification numbers and names onto the index cards. On the first index card, write the level 1 headings and number. If you need to use more than one index card, do so. Write large enough so the card can be read at a distance by someone sitting at a desk. Just one level on each card or set of cards.
7. Bundle all the cards at each level with elastic bands. Now they are ready for your test.
8. On a separate set of index cards, write down tasks that you know users currently look for on the website. One task on each card. If you have made scenarios you can use them for this purpose.
9. Write down the scenario ID and classification number in a spreadsheet. In this spreadsheet the observer can record the results of the test during the session. Be sure that your observer knows how to fill in the spreadsheet.
10. Practice the procedure of presenting the cards and re-bundling them a bit before you do your first real test. It takes a few tries to get the hang – particularly with a big classification.

- ∅ Ask the observer to take notes of the informants’ comments – they are often very useful.
- ∅ It is a good idea to handwrite rather than type the cards, as it makes it easier to change the cards during the session.

7.2.4. During the session – checklist

1. Introduce yourself and the observer. Tell the informant about the exercise and why you are doing it. These few minutes give them a chance to get comfortable in order to perform well for the short time they participate. Let them know that it takes only a very short time (1-2 minutes).
2. Ask the informant to read a task or scenario. To give the informant a quick success, always start with an easy, one. If there are tasks on the cards that the informant find “mysterious” or that do not make sense then just skip them.
3. Put the top-level card on the table.

4. Ask the informant to tell you where they would look for the information: “Out of these choices, where would you look for the information needed to solve the task?”
5. Let the informant point out or tell you where in the list they would look first to find the information. Ask the informant to think-aloud while they are making their considerations and drawing their conclusions.
6. For each item the informant chooses, put the corresponding cards on the table until you get to the lowest level of your classification.
7. When the informant has decided where they guess the information might be, the observer writes down the classification number under the corresponding scenario ID.
8. Pick up all the cards except the top level, and start again giving the informant a new scenario card and repeat the procedure from point 2-7.
9. End the card sorting session with a “wrap-up” at the end. This is especially useful for getting additional feedback from informants (about for instance; if there has been trouble with a label, you can ask what the label means to them. If there is a section of the classification that they did not choose, you can explain what might be there and see how they respond).
10. When the informant has left, it is time to make sure that all results are noted in the spreadsheet as well as interesting comments.

- ∅ *Always have in mind – You are testing your choice of solutions, not the informants!*
- ∅ Suggestions for labels or names can be written directly on the corresponding card. If you have more informants on one day remember to produce one set of cards for each informant.
- ∅ Pay attention to the non-verbal signals the informant gives you, and adjust your introduction and pace for each informant.

7.2.5. After the session – checklist

1. Analyze the results noted in the spreadsheet by answering the following questions:
 - Could informants successfully find particular items in the tree?
 - Could informants find those items directly, without having to backtrack?
 - If informants could not find items, where did they go astray?
 - Could they choose between topics quickly, without having to think too much?
 - Overall, which parts of the tree worked well, and which did not?

7.2.6. Resources

- A facilitator (not necessarily someone trained in usability) to conduct the session.
- An observer (from the developer team) to fill out the spreadsheet and take notes during the way. This can be done by the facilitator.
- A desk with two chairs (one for the informant and one for the facilitator) – this might take place at the informants’ workplace or home.
- A desk and a chair for the observer (not necessary if the note taking is done by the facilitator)

- Cardboard (or Post-its), pencil, scissors, sticky notes, etc.
- A (small) gift to the informants for their effort and time – maybe just some candy.
- A proposed classification system or proposed changes to an existing system. Some uncertainty, mess and duplication is OK.
- A large set of tasks or scenarios that will cover information-seeking tasks using the classification.

7.3. Heuristic Inspection

7.3.1. Purpose

The purpose of a heuristic inspection is, without the direct involvement of users, to identify and list potential usability issues or problems and provide feedback to the developers on the extent to which the interface is likely to be compatible with the intended users' needs and preferences.

In a heuristic inspection the heuristics are assumed to have been previously learned and internalized by the inspectors as it is required that they assign a specific heuristic to each potential problem.

Using heuristic inspection prior to user testing will reduce (not eliminate) the number and severity of design errors discovered by users. Problems detected running the inspection is attended to as part of an iterative design process. It is beneficial to combine other usability techniques with the heuristic inspection, for instance the heuristic inspection can precede a usability test and the evaluation result can be a starting point for the planning of the usability test.

7.3.2. Method

'Heuristics', otherwise known as 'rules of thumb', are guidelines for good design. In a heuristic inspection a small number of inspectors independently select their heuristics and examine the user interface, judging its compliance with the chosen heuristics. The usability principles (heuristics) are taken from published and generally accepted lists¹². Ideally, each potential usability problem is assigned to one or more heuristics guideline to help fix the problem, just like the inspectors might give their recommendations on how problems might be solved.

Sometimes the inspectors are asked to estimate the degree to which each usability issue potentially could impede user performance or acceptance. This is done to help set priorities for making revisions to the system. Use for instance the following severity classification:

- a) Serious problem, must be fixed right away,
- b) Medium problem, must be fixed,
- c) Slight problem or cosmetics,
- d) Good solution, this is worth preserving.

Persona-led Heuristic Inspection

It is possible to improve your heuristic inspection by basing it on personas describing key segments of your users. The persona-based inspection is done by visiting the sites from the point of view of each of the personas and reviewing each site as one of the personas, and take notes as if the persona had performed a 'think aloud' commentary on it.

Heuristic inspection can be done with only one inspector, but because different people naturally pay attention to different issues it is suggested to use multiple inspectors (from three to five)¹³. Though the use of about five inspectors is recommendable, with three as a minimum, it is important to remember that one inspector is better than none.

¹² There are several examples on different heuristics. See for instance which are especially relevant in relation to older web users http://www.redish.net/content/handouts/Audience-Centered_Heuristics.pdf

¹³ Heuristic inspection is known to find more than 90% of usability problems if performed by 3 to 5 experienced people (<http://articles.sitepoint.com/article/heuristic-evaluation-guide>)

Most heuristic inspections can be accomplished in a matter of hours, though the time required varies with the size and complexity of the product tested, the heuristic used, the nature of usability issues that arise in the review, and of course the competence of the reviewers. Approximately one working day is enough to evaluate a relatively limited application, combining the results of each inspector may take half a work day. Add to this the time used for documenting.

These inspections are easily conducted over the internet.

One of the most well known heuristic is Jakob Nielsen's 10 usability heuristics:

1. Visibility of system status – Does the system always keep users informed about what is going on, where they are and can go next, through appropriate feedback within reasonable time?
2. Match between system and the real world – Does the system speak the user's language, with words, phrases and concepts familiar to the user – making information appear in a natural and logical order?
3. User control and freedom – Does the system make it easy for users to escape an unintended action, using undo and redo facilities as well as “emergency exit” possibilities?
4. Consistency and standards – Does the system follow platform conventions and never confuse the users using different words, situations or actions for the same thing?
5. Error prevention – is the system designed so it prevents problems from occurring?
6. Recognition rather than recall – Is the system intuitive to use and re-use, does it provide visible as well as easily retrievable instructions for use?
7. Flexibility and efficiency of use – Does the system provide facilities for both the inexperienced and the experienced user (accelerators – unseen by the novice user – that allows the experienced user to tailor frequent actions)?
8. Aesthetics and minimalist design – Is the system designed so it provides relevant information in such a way that relevant parts do not have to “compete” with irrelevant or rarely needed information (organizing information in layers, use of links to details)?
9. Help users recognize, diagnose, and recover from errors – Does the system provide error messages expressed in plain language, precisely indicating the problem and constructively suggesting possible solutions?
10. Help and documentation – Does the system provide the users with the necessary help facilities such as contextual online help, search possibilities, user task focus or lists divided into steps?

7.3.3. Before the session – checklist:

1. Start the preparing of the heuristic inspection at least 2 weeks before you intend to run the sessions.
2. Make a plan for the session. Consider the following:
 - a) When will the sessions take place?
 - b) Define the scope of the inspection; is the whole system evaluated or part of it?
 - c) Decide whether it is up to the inspectors themselves or up to you to choose which heuristics to follow. In the latter case, then decide the heuristics you want the inspectors to access your site against – what they should look for on the website.

- d) Should the heuristic inspection be broken into parts with pauses between? Focusing on certain task entities (i.e. printing dialogs) can be beneficial. Breaking the heuristic inspection and focusing may help to discover more issues.
 - e) For how long will each session run?
 - f) Who has the responsibility for the inspection sessions? (facilitator)
 - g) Who is suitable as inspectors? They should be familiar with the heuristic rules
 - h) Prepare a form (see appendix 5) where the inspectors can report their findings
 - i) Where will the inspection sessions take place? Should it be done remotely, so the inspectors fill out the check list online?
 - j) What kind of equipment is needed for the session and how will you get it?
 - k) What kinds of gift or payment will you (or can you) give to the inspectors after the session?
 - l) How will the session be documented? Is the heuristic check list enough?
 - m) Other practical things like something to drink and eat during the session, materials used during the session etc.
3. Invite the inspectors to the session by email.
 4. Identify tasks that are critical to your website's success – the tasks most important to these users. Formulate them as short scenarios.
 5. (If using personas then) Choose the relevant personas that represent your expected target groups.
 6. Develop a form in which the inspectors can easily and quickly register their findings in a homogeneous way.
 7. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
 8. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

7.3.4. During the session – checklist

1. Start the session by welcoming the inspector. Introduce yourself and tell them very shortly about the background for the inspection, why they have been invited and what you expect from the inspection.
2. Tell the inspector what time the session ends. Ask if this is alright. Inform the inspector where they can smoke, have a break and use the mobile phone.
3. Seat the inspector at a table and offer them something to drink and eat.

(If the inspection is done online – the process starts here)

4. Ask the inspectors to perform the task (using one or more of the personas).
5. When an inspector has worked their way through the tasks, they choose the heuristics they want to use to evaluate the site, or alternatively you tell the inspector which heuristic to use.

6. On the basis of the personas the inspectors evaluate the system in the light of the chosen heuristics and record the findings in the heuristic check list.
7. Let the inspector also judge the issues found according to their estimated impact on user performance using your pre-defined severity classification system.
8. When the inspector has finished solving the tasks (or time has run out) collect the check list, thank them for their effort and give them their present/payment.
9. Let the inspector know who they can email or phone if they have further comments.
10. Give each inspector a present or payment for their time and effort.
11. If you use more than one inspector, these should do the inspection individually without discussing their findings with each other. They might do the inspection on different days.

7.3.5. After the session – checklist

1. Collect and analyze the data from all the individually performed inspections, as well as the notes from the following discussions (read more about how to analyze data later)
2. Do a short report summing up the findings from all the inspections.
3. Do a PowerPoint presentation so you will be ready to communicate the result of the inspections to developers and other team members, web site providers and decision makers. Keep the presentation short, stick to main points.
4. Make sure all relevant people get your report.

7.3.6. Resources

- Between one and five different inspectors (with some experience working with usability heuristic) to do the inspections.
- A quiet room, comfortable, and free from outside distractions (The inspection can also take place at the inspector's own place)
- A desk with a chair for the inspector.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- A set of heuristics taken from published and generally accepted lists.
- A form with a heuristic check list in which the inspectors can easily and quickly register their findings.
- Payment or present to the inspectors for their effort and time.
- (If persona based then a set of relevant personas and scenarios).

7.4. Cognitive Walk-Through

7.4.1. Purpose

The cognitive walk-through is a technique for evaluating the design of a user interface, with special attention to how well the interface supports "exploratory learning," i.e., first-time use without formal training. It is a practical task and scenario based inspection of the product that does not require a fully functioning prototype, or the involvement of users.

Instead, it helps developer teams take on a potential user perspective, inspect the prototype and identify some of the potential problems and difficulties, that users *might* experience performing typical tasks. The judgement of problems is solely based on the developer teams' *assumptions* about what effect the product's interface might have on users in the light of their cognitive abilities and expectations.

Because no users are involved in the evaluation, the method is sometimes called a "discount" ("quick and dirty") method. It is important to notice that cognitive walk-throughs do not address user satisfaction or efficiency; and there might be a risk, that the designer may not behave as the average user when using the application. Therefore, this method should not be used as the only test method.

7.4.2. Method

In a cognitive walk-through one or more members of the developer team (in this situation called inspectors) approach the inspection from the point of view of a "typical" user, focusing on how easy it is for new users to accomplish tasks with the system.

To assess the ease with which the correct action will be selected, the walk-through process suggests four criteria for evaluating the stories told about a "typical" user's actions. The four criteria for evaluating the stories directly reflect the information processing model that underlies the walk-through. They ask evaluators to consider:

1. The user's **goal** which needs to be accomplished with the system (for instance: "find a relevant picture in Europeana and buy it for personal use").
2. The user **searches** the interface for currently available actions (For instance: menu items, buttons, search field, etc.).
3. The user's **action** that seems most likely to make progress toward the goal.
4. The user's **evaluation** of the system's feedback for evidence that (the expected) progress is being made toward the current goal.

On the basis of a set of characteristic tasks or scenarios, the inspectors "role-play" the four steps – using different user profiles or personas. The cognitive walk-through examines each of the correct actions needed to accomplish a task, and evaluates whether the four cognitive steps will accurately lead to those actions.

All potential problems or difficulties along the way are noted, while trying to predict whether or not the user would have any difficulties at various stages of completing the task.

A cognitive walk-through can be done either individually or team based. The team based walk-through can be more effective than an individual walk-through.

The walk-through can be performed in the early stages of design, before empirical user testing is possible.

7.4.3. Before the session – checklist

1. Prepare the cognitive evaluation one week before you intend to run the session (the preparation period has to be longer if predefined personas and scenarios are not available).
2. Choose the overall focus for the usability test. What do you need to know more about? Is it most appropriate to focus on certain parts of the product?
3. Make a plan for the session. Consider the following:
 - a) Define the purpose of the Walk-Through.
 - b) How will you get information on who the potential users will be? Will you be using personas?
 - c) How will the typical tasks be defined? It is advisable to use scenarios.
 - d) Decide whether the Cognitive Walk-Through is going to be individual or team based.
 - e) Who will do the walk-through? If the walk-through is run on a team basis then decide who from the developer team will do the role-playing and who will be doing the recording of usability issues and potential solutions.
 - f) Where will the walk-through take place?
 - g) For how long will each session run? (Depends on the number of tasks, personas and scenarios as well as the complexity of the product).
 - h) What kind of equipment is needed for the session and how will you get it?
 - i) How will the results be documented?
4. If doing a team based walk-through – invite the relevant people from the developer team.
5. Work out a detailed agenda for the session.
6. Make a general description of who the users might be and what relevant knowledge they possess. If personas are available, each of these can be used as basis for the walk-through.
7. Consider the characteristic tasks (should be a representative collection of benchmark tasks), which the different user groups would perform using your product.
8. Define the correct action sequence for each task. For each task, there must be a description of how the user should solve the task. It can also be a sequence of several simple actions that a typical user could execute as a block, such as "Select 'Save' from 'File' menu".
9. How is the interface defined? The definition of the interface must describe the prompts preceding every action required to accomplish the tasks being analyzed, as well as the reaction of the interface to each of these actions.

7.4.4. During the session – checklist

1. The inspector, or team of inspectors, walk-through the application discussing usability issues through the use of a paper prototype or a working prototype.
2. Discuss very carefully the developed descriptions (or personas) of who the users might be and what relevant knowledge they possess. It is very important that you get a very good sense of the different user profiles as this will be the basis for the walk-through and help

you predict whether the user will select each of the correct actions along the solution path.

3. “Role-play” the four steps – using different user profiles or personas. Decide who should play the roles. Tell believable stories about why the prospective user would choose a particular action.
4. Examine each of the correct actions needed to accomplish a task, and evaluate whether the four cognitive steps (sets a goal, searches, selects the action and evaluates) will accurately lead to those actions. The following four questions need to be asked as the walk-through inspection proceeds:
 - a) Will the users try to achieve the right effect? For example, their task is to print a document, but the first thing they have to do is select a printer. Will they know that they should select a printer?
 - b) Will the user notice that the correct action is available? This relates to the visibility and understandability of actions in the interface.
 - c) Will the user associate the correct action with the effect to be achieved? Users often use the “label-following” strategy, which leads them to select an action if the label for that action matches the task description.
 - d) If the correct action is performed, will the user see that progress is being made towards solution of the task? This is to check the system’s feedback after the user executes the action.
5. Record any usability issues that appear during the walk-through. If team based, one team member does the role-playing while others record usability issues and potential solutions.

∅ Note the walk-through process is not an open forum approach of predicting what activities the user might engage in, given this interface and task. It is specifically limited to considering whether the user will select each of the correct actions along the solution path.

∅ The “Role-play” is very efficient if the inspector (and other team members) put some effort in acting the different parts. In this process it can be a help – and very funny too – to use accessories symbolizing the different user profiles and personalities. For instance an old telephone or a new watch – or anything, that might help you get focused on (or get “in the mood” of) a particular user profile.

7.4.5. After the session – checklist

1. After the walk-through with each user profile or persona, write a short note based on what you discovered. Keep the notes from each persona separate. If you are working with a paper prototype then write the notes directly on the paper or print.
2. Arrange a short meeting soon after the walk-through with the team members that have been part of the session. Discuss main issues, important findings and possible solutions. Involving developers at this stage is good for commitment, focus on a common goal and the creation of a common base of knowledge and experience.
3. Do a short note/report summing up the findings from the walk-through process. Order the identified problems according to their importance and the severity. Add – if possible – paper prototypes illustrating new design ideas or solutions.

4. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short and stick to main points.
5. Make sure all relevant people get your report so changes can be decided and acted on.

7.4.6. Resources

- One or more members of the developer team (could also be someone trained in usability)
- Someone from the developer team to take notes along the way and record issues raised during the session.
- A prototype – paper or computer based.
- A quiet room, comfortable, and free from outside distractions.
- Paper, pencil, scissors, sticky notes, etc.
- Accessories that symbolize the different personas.

7.5. Prototype Testing

7.5.1. Purpose

Prototype testing is a test method where a draft version of a web site is tested instead of a fully developed web site.

The reason for doing prototype testing in this phase of the development process is to explore whether users think the sketched out solution is relevant and usable: What works and what does not work? What do they like or dislike? What is superfluous and what is missing? Using this method you can locate potential problem areas and gather feedback from users so early in the design process to make changes fast and cheap. Even though prototype testing does not uncover every usability problem on a site, it effectively illuminates how well the site supports the most typical goals users have for visiting the site. Combined with the think-aloud protocol, it provides you with a detailed and useful snapshot of user behaviour, performance and opinions of using your site. The following typically show up in a prototype test:

- Confusing concepts, poor terminology, lack of feedback, layout problems or any other situation in which users cannot get the interface to work the way they need to.
- Missing (or mis-specified) functional requirements – users might have some needs the developer team was not aware of (or had mistaken) at project start.
- Preference for one design alternative – the development team and the users might differ in their preference for a design so the team might want the easy-to-do or smart-to-see design, where users might prefer the easy-to-use solution.
- Priorities – It is important to distinguish between nice-to-have and need-to-have features. Some features might be more important for the developer team than for the users.

7.5.2. Method

A prototype test works much like any other usability testing session except from the point that the product tested is a version of a yet-to-be-built site. A number of users are – one at a time – asked to “solve” three or four realistic tasks and to “think-out-loud” during the process. The informant pretends to interact with the prototype by “clicking” (touching) on the prototype buttons or links and “type” by hand writing their data in the prototype’s edit fields (using transparent or removable tape prevents the prototype from being written on directly)

The facilitator (or one of the developers) play the role of “computer” and changes the page manipulating the prototype to simulate how the interface would behave.

This allows you to simulate, test and change ideas of interaction and screen designs on “real users” early in the development process, before large amounts of time and money are invested.

A prototype can be so called low-fidelity prototypes (for instance paper drawings or power-point-illustrations), sketchy and incomplete, with some characteristics of the target product but is otherwise simple and easy to change. Low-fidelity prototypes are especially usable when you are in the early stage of the design process. A prototype can also be quite close to the final product, the so called high-fidelity prototype (like wire frame prototypes or HTML prototypes) with lots of details, functionality and interactivity, but still without much coding. Even though test informants as well as developers prefer to work with the computer-based prototypes, the two types of prototypes essentially produces the same quantity and quality of critical user observations.

A prototype test typically lasts 30-45 min. in total.

Always have in mind – testing with one user is 100% better than testing with no users at all.

7.5.3. Before the session – checklist

1. Sketch out a plan for the session. Consider the following:
 - a. Work out what areas of the site you want to test. What do you need to know more about? Is it most appropriate to focus on certain parts of the product?
 - b. Who will run the session? (called the facilitator)
 - c. Who are suitable as informants and how will they be recruited? How many do you want to test? (depends on time and resources)
 - d. What kind of tasks or questions should the informants have during the session?
 - e. Will anyone be observing the session? (Called the observer) and take notes? A prototype test can be done without, but then the facilitator will need to take notes.
 - f. Where will the test take place?
 - g. How long will each test last?
 - h. What kind of prototypes (high or low fidelity) is needed for the session and how will you get it? What other accessories are needed?
 - i. What kind of present will you give to the informants after the session?
 - j. How will the session be documented?
 - k. Other practical things like something to drink and eat during the session, materials used during the session etc.
2. Define the tasks that you would like the informants to accomplish. Stick to a few core tasks.
3. Begin by selecting a range of testers who represent the target groups. Send them an invitation to participate in the test.
4. Create your prototypes as a high or low fidelity. Make screen shots and/or hand-sketched drafts of the windows, menus, dialogue boxes, pages, popup messages, etc. that are needed to perform those tasks. Hand-sketched drafts are fine, especially when you are in the early stage of design. For every link and button on your mock-ups, be prepared to have a matching sketch ready to display. To test more detailed interaction, prepare pieces of paper with menus, scroll boxes, dialogue boxes, etc.
 - Each tab might be a separate piece of paper so it can be moved to the front if the user chooses to do this.
 - A drop-down list might be written on a separate piece of paper and is shown if the user touches the drop-down arrow.
 - A radio button may be simulated using removable tape.
5. Do a “dry run” with someone who does not know about the product – to make sure the timing works and you have everything you need.
2. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
3. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

7.5.4. During the session – checklist

1. Start the session by making the informant feel comfortable with the situation. Introduce yourself and inform about the role of the facilitator (and others involved in the test). If the test is recorded then tell them what is taped, why and how. Make sure to get their permission on paper.
2. Seat the informant at a table and offer them something to drink.
3. Tell the informant what time the session will end. Ask if this is all right. Remind them to switch off their mobile phone.
4. Briefly talk about the background for the test, why they have been invited. Tell them that you are interested in their experience and opinions about the prototype, that it is a test of ideas and prototype, not an examination of the informant.
5. Introduce the “Think aloud”- method and encourage the informant to tell whatever they might think during the test, what they see and experience – what is positive, negative or just unexpected. Encourage the informant to think aloud as much as possible.
6. Tell the informant about how a prototype test is done, that they have to use their imagination, that they "click" by touching the prototype buttons or links and "type" by (hand-) writing their data in the prototype's edit fields. As the informant selects options on each screen, the facilitator explains what happens, and either points to the next screen or presents the next screen to the informant (without giving any hints!). The facilitator acts as the “computer” along the way and manipulates the prototype to simulate how the interface would behave.
7. The informants are given realistic tasks to perform.
8. Ask the informant to draw what they expect to happen next. Allow the informants to mock up ideas that might solve a problem.
9. Document the testing sessions with video to review the users' emotional state when using your mocked-up interface. Mark on the prototype (if it is a paper prototype) where a user attempted to “click” or otherwise interact with the interface. Write notes right on the prototype or on the back of each sheet.
10. When the informant is finished solving the tasks (or the time has run out) it is time to sum up on the test experiences. This is done together with the informant.
Ask the informant:
 - a. What was your general impression of the product? Were your expectations met?
 - b. Please mention the three most positive AND the three most negative things?
 - c. Is there anything more you want to add or elaborate on?
11. The facilitator sums up some of the (from a developers' perspective) most important lessons learned during the session, for instance specific usability problems.
12. Let the informant know who they can email or phone if they have further comments or questions.
13. If it has been a difficult or stressful experience for the informant, then make sure to emphasize that it is the system that is being tested, not the informant.
14. Give the informant a small present or payment for their time and effort. Thank them again as you say goodbye.

- ∅ *Always have in mind – You are testing your choice of solutions, not the users!*
- ∅ Avoid the temptation to argue with your tester, or to "explain away" the problems they identified. Remember, the "computer" does not explain how the interface is supposed to work, but merely simulates what the interface would do. In this manner, you can identify which parts of the interface are self-explanatory and which parts are confusing.
- ∅ Keeping the dialogue in an informal, relaxed and brainstorming manner will provide you with most feedback.
- ∅ When informants "type" by doing handwriting in the prototypes edit fields, you can use transparent or removable tape to prevent the prototype from being written on directly.
- ∅ Have copies of the prototype for making notes on and write your comments directly on the prototype. It makes it easy to remember the issues raised by the informant.

7.5.5. After the session – checklist

1. Straight after a completed test session, write a short note based on what was discovered from this particular informant. This is especially important if you have more sessions on the same day. The risk of mixing up your observations increases the longer you wait to write your report.
2. Transcribe session recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later)
3. Arrange a short meeting soon after the session with any developers that have been watching the session. Discuss the session with them and sum up main issues, important observations, informative comments or suggestions for solutions from the informants. Involving developers at this stage is good for commitment, focus on a common goal and the creation of a common base of knowledge and experience.
4. Prioritize unresolved issues and discuss top issues and possible solutions, create an action plan to address the issues.
5. Analyze all the data from all the tests – the transcriptions and the notes from the facilitator and the observer (read more about how to analyze data later)
6. Do a *short* report summing up findings from all test sessions. Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
7. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
8. Make sure all relevant people get your report.

7.5.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable, and free from outside distractions.
- A desk with two chairs (one for the informant and one for the facilitator).
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informant with their presence.

- A tape recorder, a digital or video camera to record the informant's responses (recommended not mandatory).
- A prototype – either a low fidelity prototype (for instance paper drawings or power-point illustrations), a high fidelity prototype (like wire frame prototypes or HTML prototypes) or anything in between.
- A computer with the prototype installed, if it is a high-fidelity prototype.
- Paper, pencil, scissors, sticky notes, re-stickable glue, etc.
- A gift to the informants for their effort and time.

8. Phase of construction

In this phase the product is developed from the prototypes. Most work relies on programmers and designers and at this particular point in the process the usability activities are limited. The developers work on the code and technical tests are conducted by the project team to monitor that all technical applications are working according to the specifications. Some of these tests are “pure” technical tests, with the aim to identify and solve technical problems.

These tests should not be confused with usability tests as they do not involve users or user perspectives, but focus on whether all applications function the way it is described in the specifications. It is advisable to let the usability practitioner participate in these functionality and acceptance tests, as the usability practitioners has another view on the final product than the developers usually have. Their participation (and dialogue with the developers) helps to ease the process and results in better products. However, the main usability activity is to evaluate the (almost) final interfaces to secure usability. At this stage unpredicted problems might turn up due to for instance technical limitations. Continuous inspections and discussions of alternative solutions to secure the fulfilment of usability specifications should be carried out along the way.

The activities in this phase are centred around the following:

- Ongoing discussions with the programmers and designers about different solutions and suggestions.
- Expert evaluations (evaluations without users) of the developed solutions to find and change technical and usability related problems before the product is launched. Expert evaluations are, for instance, heuristic cognitive Walk-throughs.

8.1. Methods of user involvement – ”How-to” descriptions

8.1.1. Heuristic Inspection – advantages and disadvantages

Advantage

- The heuristic inspection (sometimes called a discount usability technique) requires few resources in terms of money and time, as it does not directly involve users. It provides quick and relatively inexpensive feedback to designers.
- The method is very useful in circumstances where a review of the product in relation to usability is needed, but a usability test is not an option (due to for instance lack of time, lack of budget or an unwilling client).
- Heuristic inspection can be done with only one expert, but as more inspectors are involved, more problems are likely to be discovered.
- Heuristic inspection prior to user testing can reduce the number and severity of design errors discovered by the informants, which makes it possible for the informants to focus on overall usability problems.
- A heuristic inspection can be strengthened if it is done on the basis of personas (a persona-led heuristic inspection) instead of just a simple check-list approach.

Disadvantages

- The inspection is not based on observations of real user behaviour. There is a risk that the "usability problems" identified in a heuristic inspection differ from those obtained in a

performance testing. Thus the inspection might result in suggestions for change that never would be required by the users.

- Because a heuristic inspection solely is based on guidelines (theory) and opinions, disbelieving designers might argue: "Why are your opinions better than mine?"
- The inspection does not always give clear recommendations of improvement such as you would get in a usability test. Some problems might not be revealed in an inspection, because they only are discovered when the product is used.
- The result of the inspection depends heavily on the qualification of the inspector. A less experienced inspector might produce disastrous amounts of "false usability alarms" or assign the wrong heuristics to potential problems.
- It can be difficult to judge the severity of proposed usability issues.

8.1.2. Cognitive Walk-Through – advantages and disadvantages

Advantages

- Is intended especially to help understand the usability of a system for first-time or infrequent users – how difficult it will be to start using the system without reading the documentation and how many wrong moves will be made in the meantime.
- Direct experience for the team from the informants' perspective.
- Rapid, as the method does not require external informants, it is quick to administer, and does not demand any trials.
- Uncovers significant usability issues and design gaps.
- Yields a prioritized list of issues and actions that is generated by the team.
- Can be easily repeated.
- Can be used as a basis for and compared to future usability tests.
- Is anchored in the relatively concrete context of performing specific tasks.

Disadvantages

- The test is based on the team's judgement of and assumptions on what our users would do or think, not on actual user's actions and opinions. If this is not qualified the outcome will not be valid.
- The usability practitioner must have a good knowledge of the general principles of human actions on different kinds of websites, and a good ability to make judgements about users' cognitive abilities, knowledge and skills, as well as the cognitive skills necessary to complete a task.
- Does not address user satisfaction or efficiency.

8.2. Heuristic Inspection

8.2.1. Purpose

The purpose of a heuristic inspection is, without the direct involvement of users, to identify and list potential usability issues or problems and provide feedback to the developers on the extent to which the interface is likely to be compatible with the intended users' needs and preferences.

In a heuristic inspection the heuristics are assumed to have been previously learned and internalized by the inspectors as it is required that they assign a specific heuristic to each potential problem.

Using heuristic inspection prior to user testing will reduce (not eliminate) the number and severity of design errors discovered by users. Problems detected running the inspection is attended to as part of an iterative design process. It is beneficial to combine other usability techniques with the heuristic inspection, for instance the heuristic inspection can precede a usability test and the evaluation result can be a starting point for the planning of the usability test.

8.2.2. Method

'Heuristics', otherwise known as 'rules of thumb', are guidelines for good design. In a heuristic inspection a small number of inspectors independently select their heuristics and examine the user interface, judging its compliance with the chosen heuristics. The usability principles (heuristics) are taken from published and generally accepted lists.¹⁴ Ideally, each potential usability problem is assigned to one or more heuristics guidelines to help fix the problem, just like the inspectors might give their recommendations on how problems might be solved.

Sometimes the inspectors are asked to estimate the degree to which each usability issue potentially could impede user performance or acceptance. This is done to help set priorities for making revisions to the system. Use for instance the following severity classification:

- e) Serious problem, must be fixed right away,
- f) Medium problem, must be fixed,
- g) Slight problem or cosmetics,
- h) Good solution, this is worth preserving.

Persona-led Heuristic Inspection

It is possible to improve your heuristic inspection by basing it on personas (about creating personas, see elsewhere) describing key segments of your users. The persona-based inspection is done by visiting the sites from the point of view of each of the persona and reviewing each site as one of the personas, and take notes as if the persona had performed a 'think aloud' commentary on it.

Heuristic inspection can be done with only one inspector, but because different people naturally pay attention to different issues it is suggested to use multiple inspectors (from three to five).¹⁵ Though the use of about five inspectors is recommendable, with three as a minimum, it is important to remember that one inspector is better than none.

¹⁴ There are several examples on different heuristics. See for instance which are especially relevant in relation to older web users http://www.redish.net/content/handouts/Audience-Centered_Heuristics.pdf

¹⁵ Heuristic inspection is known to find more than 90% of usability problems if it's performed by 3 to 5 experienced people (<http://articles.sitepoint.com/article/heuristic-evaluation-guide>)

Most heuristic inspections can be accomplished in a matter of hours, though the time required varies with the size and complexity of the product tested, the heuristic used, the nature of usability issues that arise in the review, and of course the competence of the reviewers. Approximately one working day is enough to evaluate a relatively limited application, combining the results of each inspector may take half a working day. Add to this time used for documenting.

These inspections are easily conducted over the internet.

One of the most well known heuristic is Jakob Nielsen's 10 usability heuristics:

1. Visibility of system status – Does the system always keep users informed about what is going on, where they are and can go next, through appropriate feedback within reasonable time?
2. Match between system and the real world – Does the system speak the user's language, with words, phrases and concepts familiar to the user – making information appear in a natural and logical order?
3. User control and freedom – Does the system make it easy for users to escape an unintended action, using undo and redo facilities as well as “emergency exit” possibilities?
4. Consistency and standards – Does the system follow platform conventions and never confuse the users using different words, situations or actions for the same thing?
5. Error prevention – is the system designed so it prevents problems from occurring?
6. Recognition rather than recall – Is the system intuitive to use and re-use, does it provide visible as well as easily retrievable instructions for use?
7. Flexibility and efficiency of use – Does the system provide facilities for both the inexperienced and the experienced user (accelerators – unseen by the novice user – that allows the experienced user to tailor frequent actions)?
8. Aesthetics and minimalist design – Is the system designed so it provides relevant information in such a way, that relevant parts do not have to “compete” with irrelevant or rarely needed information (organizing information in layers, use of links to details)?
9. Help users recognize, diagnose, and recover from errors – Does the system provide error messages expressed in plain language, precisely indicating the problem and constructively suggesting possible solutions?
10. Help and documentation – Does the system provide users with the necessary help facilities such as contextual online help, search possibilities, user task focus or lists divided into steps?

8.2.3. Before the session – checklist:

1. Start the preparing of the heuristic inspection at least 2 weeks before you intend to run the sessions.
2. Make a plan for the session. Consider the following:
 - a. When will the sessions take place?
 - b. Define the scope of the inspection; is the whole system evaluated or part of it?
 - c. Decide whether it is up to the inspectors themselves or up to you to choose which heuristics to follow. In the latter case, then decide the heuristics you want the inspectors to access your site against – what they should look for on the website.
 - d. Should the heuristic inspection be broken into parts with pauses between? Focusing on certain task entities (i.e. printing dialogs) can be beneficial. Breaking the heuristic inspection and focusing may help to discover more issues.
 - e. For how long will each session run?
 - f. Who has the responsibility for the inspection sessions? (facilitator)

- g. Who is suitable as inspectors? They should be familiar with the heuristic rules
 - h. Prepare a form (see appendix 5) where the inspectors can report their findings
 - i. Where will the inspection sessions take place? Should it be done remotely, so the inspectors fill out the check list online?
 - j. What kind of equipment is needed for the session and how will you get it?
 - k. What kinds of gift or payment will you (or can you) give to the inspectors after the session?
 - l. How will the session be documented? Is the heuristic check list enough?
 - m. Other practical things like something to drink and eat during the session, materials used during the session etc.
3. Invite the inspectors to the session by email.
 4. Identify tasks that are critical to your website's success – the tasks most important to these users. Formulate them as short scenarios
 5. (If using personas then) Choose the relevant personas that represent your expected target groups.
 6. Develop a form in which the inspectors easily and quickly can register their findings in a homogeneous way.
 7. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
 8. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

8.2.4. During the session – checklist

1. Start the session by welcoming the inspector. Introduce yourself, tell them very shortly about the background for the inspection, why they have been invited and what you expect from the inspection.
 2. Tell the inspector what time the session ends. Ask if this is alright. Inform the inspector where they can smoke, have a break and use the mobile phone.
 3. Seat the inspector at a table and offer them something to drink and eat.
- (If the inspection is done online – the process starts here)
4. Ask the inspectors to perform the task (using one or more of the personas).
 5. When an inspector has worked their way through the tasks, they choose the heuristics they want to use to evaluate the site, or alternatively you tell the inspector which heuristic to use.
 6. On the basis of the personas the inspectors evaluates the system in the light of the chosen heuristics and record the findings in the heuristic check list.
 7. Let the inspector also judge the issues found according to their estimated impact on user performance using your pre-defined severity classification system.
 8. When the inspector has finished solving the tasks (or time has run out) collect the check list, thank them for their effort and give them their present/payment.
 9. Let the inspector know who they can email or phone if they have further comments.
 10. Give each inspector a present or payment for their time and effort.
 11. If you use more than one inspector, these should do the inspection individually without discussing their findings with each other. They might do the inspection on different days.

8.2.5. After the session – checklist

1. Collect and analyze the data from all the individually performed inspections, as well as the notes from the following discussions (read more about how to analyze data later)
2. Do a short report summing up the findings from all the inspections.
3. Do a PowerPoint presentation so you will be ready to communicate the result of the inspections to developers and other team members, web site providers and decision makers. Keep the presentation short, stick to main points.
4. Make sure all relevant people get your report.

8.2.6. Resources

- Between one and five different inspectors (with some experience working with usability heuristic) to do the inspections.
- A quiet room, comfortable, and free from outside distractions (The inspection can also take place at the inspectors own place).
- A desk with a chair for the inspector.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- A set of heuristics taken from published and generally accepted lists
- A form with a heuristic check list in which the inspectors can easily and quickly register their findings.
- Payment or present to the inspectors for their effort and time.
- (If persona based then a set of relevant personas and scenarios).

8.3. Cognitive Walk-Through

8.3.1. Purpose

The cognitive walk-through is a technique for evaluating the design of a user interface, with special attention to how well the interface supports "exploratory learning," i.e., first-time use without formal training. It is a practical task and scenario based inspection of the product that does not require a fully functioning prototype, or the involvement of users.

Instead, it helps developer teams take on a potential user perspective, inspect the prototype and identify some of the potential problems and difficulties, that users *might* experience performing typical tasks. The judgement of problems is solely based on the developer teams' *assumptions* about what effect the product's interface might have on users in the light of their cognitive abilities and expectations.

Because no users are involved in the evaluation, the method is sometimes called a "discount" ("quick and dirty") method. It is important to notice that cognitive walk-throughs do not address user satisfaction or efficiency, and there might be a risk that the designer may not behave as the average user when using the application. Therefore, this method should not be used as the only test method.

8.3.2. Method

In a cognitive walk-through one or more members of the developer team (in this situation called inspectors) approach the inspection from the point of view of a "typical" user, focusing on how easy it is for new users to accomplish tasks with the system.

To assess the ease with which the correct action will be selected, the walk-through process suggests four criteria for evaluating the stories told about a "typical" user's actions. The four criteria for evaluating the stories directly reflect the information processing model that underlies the walk-through. They ask evaluators to consider:

1. The user's **goal** that needs to be accomplished with the system (for instance: "find a relevant picture in Europeana and take it for personal use").
2. The user **searches** the interface for currently available actions (For instance: menu items, buttons, search field, etc.).
3. The user's **action** that seems most likely to make progress toward the goal.
4. The user's **evaluation** of the system's feedback for evidence that (the expected) progress is being made toward the current goal.

On the basis of a set of characteristic tasks or scenarios, the inspectors "role-play" the four steps – using different user profiles or personas. The cognitive walk-through examines each of the correct actions needed to accomplish a task, and evaluates whether the four cognitive steps will accurately lead to those actions.

All potential problems or difficulties along the way are noted, while trying to predict whether or not the user would have any difficulties at various stages of completing the task.

A cognitive walk-through can be done either individually or team based. The team based walk-through can be more effective than an individual walk-through.

The walk-through can be performed in the early stages of design, before empirical user testing is possible.

8.3.3. Before the session – checklist

1. Prepare the cognitive evaluation one week before you intend to run the session (the preparation period has to be longer if predefined personas and scenarios are not available).
2. Choose the overall focus for the usability test. What do you need to know more about? Is it most appropriate to focus on certain parts of the product?
3. Make a plan for the session. Consider the following:
 - a) Define the purpose of the Walk-Through.
 - b) How will you get information about who the potential users will be? Will you be using personas?
 - c) How will the typical tasks be defined? It is advisable to use scenarios.
 - d) Decide whether the Cognitive Walk-Through is going to be individual or team based.
 - e) Who will do the walk-through? If the walk-through is run on a team basis then decide who from the developer team will do the role-playing and who will be doing the recording of usability issues and potential solutions.
 - f) Where will the walk-through take place?
 - g) For how long will each session run? (Depends on the number of tasks, personas and scenarios as well as the complexity of the product).
 - h) What kind of equipment is needed for the session and how will you get it?
 - i) How will the results be documented?
4. If doing a team based walk-through – invite the relevant people from the developer team.
5. Work out a detailed agenda for the session.
6. Make a general description of who the users might be and what relevant knowledge they possess. If personas are available, each of these can be used as basis for the walk-through.
7. Consider the characteristic tasks (should be a representative collection of benchmark tasks), which the different user groups would perform using your product.
8. Define the correct action sequence for each task. For each task, there must be a description of how the user should solve the task. It can also be a sequence of several simple actions that a typical user could execute as a block, such as, "Select 'Save' from 'File' menu".
9. How is the interface defined? The definition of the interface must describe the prompts preceding every action required to accomplish the tasks being analyzed, as well as the reaction of the interface to each of these actions.

8.3.4. During the session – checklist

1. The inspector, or team of inspectors, walk-through the application discussing usability issues through the use of a paper prototype or a working prototype.
2. Discuss very carefully the developed descriptions (or personas) of who the users might be and what relevant knowledge they possess. It is very important that you get a very good sense of the different user profiles as this will be the basis for the walk-through and help you predict whether the user will select each of the correct actions along the solution path.

3. “Role-play” the four steps – using different user profiles or personas. Decide who should play the roles. Tell believable stories about why the prospective user would choose a particular action.
4. Examine each of the correct actions needed to accomplish a task, and evaluate whether the four cognitive steps (sets a goal, searches, selects the action and evaluates) will accurately lead to those actions. The following four questions need to be asked as the walk-through inspection proceeds:
 Will the users try to achieve the right effect? For example, their task is to print a document, but the first thing they have to do is select a printer. Will they know that they should select a printer?
 - a. Will the user notice that the correct action is available? This relates to the visibility and understandability of actions in the interface.
 - b. Will the user associate the correct action with the effect to be achieved? Users often use the “label-following” strategy, which leads them to select an action if the label for that action matches the task description.
 - c. If the correct action is performed, will the user see that progress is being made towards solution of the task? This is to check the system’s feedback after the user executes the action.
5. Record any usability issues that appears during the walk-through. If team based, one team member does the role-playing while others record usability issues and potential solutions.

- ∅ Note the walk-through process is not an open forum approach of predicting what activities the user might engage in, given this interface and task. It is specifically limited to considering whether the user will select each of the correct actions along the solution path.
- ∅ The “Role-play” is very efficient, if the inspector (and other team members) put some effort in playing the different parts. In this process it can be a help – and very funny too – to use accessories symbolizing the different user profiles and personalities. For instance a old telephone or a new watch – or anything, that might help you get focused on (or get “in the mood” of) a particular user profile.

8.3.5. After the session – checklist

1. After the walk-through with each user profile or persona, write a short note based on what you discovered. Keep the notes from each persona separate. If you are working with a paper prototype then write the notes directly on the paper or print.
2. Arrange a short meeting soon after the walk-through with the team members that may have been part of the session. Discuss main issues, important findings and possible solutions. Involving developers at this stage is good for commitment, focus on a common goal and the creation of a common base of knowledge and experience.
3. Do a short note/report summing up the findings from the walk-through process. Order the identified problems according to their importance and the severity. Add – if possible – paper prototypes illustrating new design ideas or solutions.
4. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short and stick to main points.
5. Make sure all relevant people get your report so changes can be decided and acted on.

8.3.6. Resources

- One or more members of the developer team (could also be someone trained in usability)
- Someone from the developer team to take notes along the way and record issues raised during the session.
- A prototype – paper or computer based.
- A quiet room, comfortable, and free from outside distractions.
- Paper, pencil, scissors, sticky notes, etc.
- Accessories that symbolize the different personas.

9. Phase of Implementation

In this phase the solution is developed and the project team needs to prepare and implement the product, so the target group can start to use it. In this phase usability activities will be even more limited than in the previous phase. If the implementation of the solution in its real environment turns out to be complicated, there might be some technical tests with the aim to identify and solve technical problems. It is advisable that the usability practitioner participates in these activities, but basically usability activities in this phase will be to start planning a follow-up evaluation when the product has been used for a period by *real* users, in its *real* environment, to do real tasks.

The activities in this phase are centred around the following:

- Dialogue with the technicians during the implementation.
- Testing whether the technical functionalities are working as planned.
- Stress testing the system.
- Registration of possible issues for the coming phases usability tests.

9.1. Methods of user involvement – ”How-to” descriptions

In this phase there are only functionality tests, which will not be described in this usability catalogue.

10. Phase of post analysis

In this phase the project team has implemented the product, so the target group can start to use it in the “real” environment. Usability activities are focused on the evaluation of the implemented solution.

Activities in this phase are centred around:

- Evaluate whether the final product, implemented in its “real” environment and used by “real” users, satisfy all expectations concerning: Accessibility, learnability, memorability, efficiency of use, correctness, user satisfaction, usefulness, appropriateness and quality.
- Getting knowledge about where the product must be improved in the next development iteration (the next version).
- Prioritize features left out of first version of the product because of lack of time and resources.
- Make plans for a follow up evaluation when the product has been used for a period.

10.1. Methods of User Involvement – “How-to” descriptions

10.1.1. Questionnaire – advantages and disadvantages

Advantages

- A cheap and effective method for gathering data from a large user population.
- It can easily be distributed to an unlimited amount of informants. This will make it possible for the usability practitioner to saying something about the *distribution* of phenomena.
- The usability practitioner will not need to be present while informants are filling in the questionnaires, and the questionnaire will be free of “investigator effect”.
- The informants will be anonymous.

The uniform character of the responses makes it easy to handle and communicate the test result using statistical methods.

Disadvantages

- The usability practitioner is far from the informant.
- It is uncertain whether the informants who have taken the time and effort to complete the questionnaire are a representative sample of those investigated. They might represent extreme opinions since they have taken the trouble to respond.
- It is uncertain whether the informants have understood questions in the sense they were intended. The informants will not be able to ask anyone in case they are uncertain about the meaning of a question.
- Questions need to be very carefully formulated before launching. If the questions are not clear misinterpretation might occur.
- You may get a low response rate – especially if the list of questions is long.

10.1.2. Feedback Box – advantages and disadvantages

Advantages

- A cheap method to gather data from a large user population.
- Data can be collected continuously.
- It can easily be distributed to an unlimited amount of people – also people that are not a part of your target group (depending on where you make it available), which might help you discover things that were unexpected.
- Responses are free from the usability practitioner's interference – and is only initiated on the initiative of the users when they feel they have something to say to us.
- The informants will (typically) be anonymous.

Disadvantages

- The data is unstructured and of a rather varying character and quality.
- The usability practitioner is far from the informant and because the informants are typically anonymous every form of follow-up contact with the user will be either impossible or difficult.
- It is difficult to manage and control which user groups you get feedback from.
- The usability practitioner has a minimal influence on the subject and issues on which the users comment.
- It is difficult to predict the response rate.

10.1.3. Interview – advantages and disadvantages

Advantages

- A very flexible method to collect qualitative data.
- Questions can be re-focused during the interview if needed and the interviewer can easily catch new subjects that the informant might bring up. There is only a minimal risk that the informant misinterprets the questions to which they are replying. First, the facilitator is able to rephrase the question if the informant replies in an un-meaningful way. Secondly, the informant is free to ask the facilitator anything they might be uncertain of.
- The face-to-face meeting is a good way to establish the confidentiality needed for asking the informant more personal questions and is expected to give longer, in-depth answers.
- A interview can be used in situations where the interviewer only has a vague idea of what the informant might answer (open-ended question interview), as well as where the interviewer has a clearer idea of what might turn up (a semi-structured interview)

Disadvantages

- The work needed for transcription, handling and analyzing of test results is very time consuming.
- The cost of just a small series of interviews is high compared to for instance questionnaires. Especially the transcription of the interviews from tapes is very time consuming.
- Data might be influenced by an investigator/respondent effect, and may end up being unrepresentatively moderate as most people have a desire to be accommodating and not too negative.
- The informant is not anonymous to the usability practitioner.

10.1.4. Usability Test – advantages and disadvantages

Advantages

- Very effective for obtaining a lot of qualitative data from only a few informants.
- Data is available from direct observation of what the informants are doing and hearing what they want, or is trying to do.
- If the informants get into difficulties, the facilitator can clarify the situation.
- The verbalisation of the issues makes it possible to understand *what* problems the informants face using the product as well as *why* these problems arise, which can lead directly to design solutions.

Disadvantages

- Unavoidable interference between the informants' verbalisation and the task they are performing as they are using the product *and* trying to verbalise what they are doing.
- The informants might rationalize their actions trying to explain what they are doing, or they might censor their opinions to please the facilitator.
- The way the facilitator prompts the informants can have an effect on their task solving and the problems that arises.
- With the relatively small number of informants, your test result will depend crucially on your choice of informants.

10.1.5. Statistical Web Analysis – advantages and disadvantages

Advantages

- Web statistics provide you with quantitative data, statistics, ratios, and comparisons that might help you improve the overall quality of your web and help you keep track of visit, popularity and traffic trends on your site. With this information you can optimize your web site as well as plan your marketing effort.
- Web statistics is a very efficient tool for decision makers. It is (at least to a certain extent) based on tracking what informants actually see instead of what we think they see and most tagging solutions has report and analysis facilities that make it easy to do very convincing presentations.
- Performance does not depend on the time consuming (expensive) active involvement of informants.
- Key Performance Indicators are very effective tools to manage performance as well as motivate the web responsible in an organization. KPIs give everyone in the organization a clear picture of what is important, which direction they need to go, and what they need to make happen.
- Often, the basic implementation is simple and easily done, though some technical assistance may be needed for the set-up and adjustment of the solution.
- Web statistics can be obtained at low cost as there are some very usable products free on the market today (the expensive part of web statistic is not the software – unless it is an outsourced solution – but the manpower to analyze the numbers, devise suitable solutions to erase usability problems, and communicate the findings to involved partners).

Disadvantages

- Statistics only tell you what informants have done on your web site, not the (qualitative) reasons why they did it, for what reasons, what they did or did not gain from their visit, or what kind of experience they had.
- You need to add a page tag to every web page you want to track. This can be a potentially time-consuming problem if your site does not have a global header or footer, or if it is a very complex tag you need to implement.
- There might be some uncertainty related to the “objective” data due to certain technical issues. Page tagging depends heavily on cookies and JavaScript. If the visitor has either of these technologies disabled, the quality of data collection is reduced (especially the disabling of cookies). Some tracking solutions do not report on non-HTML views (downloadable file types, error pages, redirects, etc.) or has a very opaque procedure for excluding internal traffic from the analysis.
- When using outsourced web analytics solutions the reporting formats might be standardized with little or no possibility to customize them according to your need.
- Page tags may cause delay in loading and rendering your web pages.
- Because there is cost associated with disk space and database storage page tags vendors do not keep your data forever. They might not provide you with back-up facilities or they might sell your data for other purposes.
- Analytical skills as well as knowledge about the organization’s operations are important for analyzing the statistical information. Otherwise the data can easily be misinterpreted and wrong conclusions may be reached.

10.1.6. Focus Group – advantages and disadvantages

Advantages

- This method is very useful to collect data about social groups’ interpretations, interactions and norms as well as get an overall definition of the requirements for a product and alerting the designers to potential usability problems that need to be avoided.
- It is a very flexible method, suitable to discuss a concept, a prototype or a final product, as well as insight into users’ attitudes, thoughts and needs.
- It is easy for the informants to raise new issues because of the loose structure of the session.
- The informants stimulate each other’s ideas because of the group dynamics, just like it stimulates comparison of individual experiences. There are experiences that can only be accessed by the usability practitioner by being in a social context with the informants.
- The method can (when used in the pre- and post-analysis phases) provide you with an overall understanding of the informants social and cultural perspectives as well as language.

Disadvantages

- The method is less suitable to collect in-depth data about each informant’s individual life.
- The discussion is typically not about what informants do, but more what they think they do – which may involve estimates, idealization or memory difficulties. Informants’ opinions about a site or product are rarely consistent with how they behave when they actually interact with it.

- The dynamics of the group may become a problem if one or two informants turn out to be particularly dominant or retiring, or the group splits into sub-groups.

10.2. Questionnaire

10.2.1. Purpose

A questionnaire allows you to gather information from a large number of informants in a systematic and quantitative way. The advantage with a questionnaire is that you can reach more informants and in that way gain greater statistical representativity than with in-depth interviewing involving only a few respondents. As the informants in a questionnaire survey all answer the same questions, this research method allows you to conclude on the *dissemination* of the “phenomenon”, you are researching.

You can use questionnaires for several purposes in the phase of post-analysis: help you redefine your user profiles and personas, ensure that your test participation selection has given you the informants you need, or to gain knowledge about what they like and dislike about a previous product.

Questionnaires are suitable as a *part of* another test method such as interview research, focus group, field observation or a usability test. When used together with other test methods, a questionnaire is usable to collect information on a more factual basis (sex, experience, age, work area, education, address etc.). If it has been sent to the informants ahead and returned before the session, it can help you control that your test informants fit your criteria, as well as help you save valuable time during the usability tests, because you already have basic information.

10.2.2. Method

Questionnaires can be made either as a low tech basis (offline – paper based) or a high tech solution (online web based). However, they all have the same purpose – gathering self reported data from multiple informants who have been asked the same questions.

Questions can be worded for requirements capture, as well as for investigating users’ attitudes to prototypes or finished products. In principle, a questionnaire can contain as many questions as the usability practitioner wants answered. However experiences shows that **thirty questions are absolute maximum**. The longer the list of questions, the shorter the list of respondents that might answer your questionnaire will most likely be. No matter the number of the questions, they should be on a form that makes it easy for the informant to confirm or dis-confirm the hypotheses.

Use one (or more) of the following forms:

- Yes/no – questions: The respondent chooses between the answers: Yes, No, Maybe, Do not know.
- Extend – questions: The respondent chooses how well a certain statement fits their answer: Very good, Good, Neutral, Bad, Very bad.
- Priority – questions: The respondent prioritizes between a number of possibilities, writing (for instance) 1 for highest priority, 2 for medium priority and 3 for lowest priority.

If you are interested in getting more “open” answers – you can use a form beginning with: What, How, Why, Tell, Write etc. However, open questions will give you a lot of different answers, which will complicate comparisons. If you want answers different from the confirm/dis-confirm ones, then consider a method suitable for collecting qualitative data instead (like focus groups,

interviews or field observation). Questionnaires can be used as a supplement to other kinds of usability tests or as an individual study.

The collection of data using offline questionnaires takes much longer time than the online method, because you have to do the registering by hand, as well as get in contact with people who want to be informants. Using online questionnaires the informant themselves do the answering while the software handles the data and reports.

10.2.3. Before the session – checklist

1. Prepare the questionnaire at least three weeks before you intend to run the study. If part of an interview – prepare the questionnaire when you start preparing the regular user test.
2. Choose the focus for your questionnaire study. Consider carefully what kind of knowledge you want from the questionnaire and what knowledge you want from a potential following user test. Is it background information about a target group? Is it an evaluation of an existing product? Is it an evaluation of ideas?
3. Make a plan for the questionnaire study. Consider the following:
 - a. Define the aim of the questionnaire.
 - b. Decide the main subjects of the questionnaire.
 - c. Who will do the work with the questionnaire?
 - d. Who are suitable as informants and how will you reach them?
 - e. Will the questionnaire take place offline? Online? In case of an online questionnaire – where will the informant find the questionnaire on the web?
 - f. What kind of equipment is needed for the questionnaire and how will you get it? (Europeana has an online tool you may use).
 - g. Will you give a reward to the informants for completing the questionnaire or do you draw lots for a winner?
4. Find the informants if your informants belongs to a specific group.
5. Make a draft with all the relevant subjects.
6. (Only if part of an interview) Investigate whether all the informants have the opportunity to answer the questionnaire before the user test. Otherwise they must bring it with them when the test is carried out.
7. Make the specific wording of the questions. Consider in which order the questions appear in a natural way and finish the questionnaire.
(Only if part of an interview) Make the specific wording of the questions, at the same time as you work on the agenda for the regular test so that questions asked in the two tests supplement rather than overlap each other.
8. Do a “dry run” with a minimum of two users representing your target group to check that questions are understandable and that categories of possible answers are meaningful.
9. Make the needed corrections to the questionnaire.

- ∅ Developing questions for a survey is not a simple task, so be very careful about possibilities for misinterpretation.
- ∅ The types of questions you ask should be relevant so that you can obtain results that will be useful to you.
- ∅ Be fair and general with your questions and do not lead informants into giving specific answers that are not accurate and truthful: you will only be misleading yourself.

- ∅ Keep the questionnaire short and have a reasonable balance between open and closed questions so that interviewees/recipients will engage their interest and co-operation.
- ∅ There are several ways that questionnaires can be distributed and may be determined by the type of business you are in. Do not shoot blind-folded: target those people in the market that your questionnaire is directed at but at the same time, be sure that your sample is as random as possible in order to obtain an unbiased and varied response.
- ∅ (Only if part of an interview) Remember to reserve one of the questions in the questionnaire to ask for the name of the informants, so you later can relate the questionnaire to the informant.
- ∅ Analyzing the data is a task that requires good analytical skills so the data accumulated from the questionnaire can be interpreted and turn it into a proposed strategy for developing the website.

10.2.4. During the session – checklist

1. (Only if part of an interview) Send a questionnaire to each of the test informants one and a half week before the test.
2. (Only if part of an interview) Together with the questionnaire you send a letter explaining what you want them to do, and – most importantly – how you want it returned to you. Do you want them to send it to you in advance or to bring it with them to the test?
3. Wait until the research time expires

- ∅ To boost the users' motivation to answer your questionnaire you can establish a competition among the participants with a prize. This does, however, presuppose as a minimum that users provide a name and email address.

10.2.5. After the session – checklist

1. Once you have issued your questionnaire and have a number of responses that you are happy with, you need to analyze your data.
2. First step is to accumulate totals for each question answered. You can use plain spreadsheet software or you can use a more specialized software product to systematize the data from your questionnaire survey.
3. Convert all responses into numerical data (for instance: how many answered yes to this question? And how many percent of all the answers is that?)
4. Convert all numerical data into diagrams and charts so you get geometric symbolic representation of your data. This will help you analyze the data in which you can draw conclusions on your findings. There are numerous ways to represent your data, where some of the most used are: Bar Charts, Histograms; Pie Charts; Line Graphs; Frequency Curves, Scatter Graphs etc. Which of these you should use depends on the specific information need and purpose.
5. You might want to find more patterns by splitting your results into more details like for instance the informants' age groups or location. By doing so, you can identify more precise patterns in the data you have collected.

6. Producing diagrams to help analyze results is ideal for numerical data but for those questions that are 'open' are harder to interpret as they give unique and diverse answers. There is no common way of analyzing these results and you should use them in a way that you will benefit from. It may be that you use the comments as advice when designing the product/service or to find a link between the comments made and the numerical results.

- ∅ Analyzing data is very intensive and by using analytical tools you will discover patterns and findings that will help you determine a marketing plan that is accurate and feasible to assist your future success.
- ∅ Take time when analyzing the results as this is where many usability practitioners fail if they do not bother to make detailed conclusions on their findings.
- ∅ On the Internet you will find lots of free statistical software as well as online graph creation tool to help you analyze and represent your data. These tools might be very helpful for usability practitioners with little formal training in statistics because they help you solve the vast majority of quality-related issues: essential data analysis, reporting and charting.

10.2.6. Resources

- The Europeana online tool kit (or alternatively spreadsheet software or another kind of statistical software)
- A prize, if this is part of your plan.
- A usability practitioner (usually someone trained in usability and with some statistical skills) to analyze the data.

10.3. Feedback Possibility

10.3.1. Purpose

A feedback possibility (often called a “feedback-box”) is basically a little input box or an email form added to some or all of a site’s web pages. Users can, in a very simple and easy way, communicate their opinions and spontaneous reactions. The purpose with this method is – continuously or for a shorter period of time – to collect user feedback in a very cost effective way. The user feedback can be helpful in the process of correcting and improving the site.

10.3.2. Method:

A feedback possibility basically works in one of three ways, each of them with its own strengths and weaknesses.

1. It can work together with an email program, so when a user clicks on a link, then their mail program opens, giving them the option of sending an email. When a person uses their e-mail software, it saves a copy of sent messages for future reference. On the other hand – users then have to wait for their email program to open, which often takes longer to load than users find acceptable. The waiting time might prevent some users express their opinions. This solution might also give you problems with spam, HTML e-mails, and (unwanted) e-mails sent with attachments.
2. It can work as a submit-solution, where users can send an email directly from the webpage using a form, without opening their mail program and without leaving the webpage. Users type the appropriate information into an html form and then click on the “Submit” button to send the data as an email to the designated recipients. Using this method users do not necessarily have to have access to their e-mail software to give their feedback, they do not have to wait for their email program to open, and they can send their feedback anonymously, which might help encouraging shy users to send messages. Anonymity will, however, make it possible for a certain type of user to send abusive messages.
3. It can work as a link-solution, where users click on a link on a web page which brings them to another site and directly to a form made by a web-based online survey software tool. On the internet you can find many of these tools that allow you to build a survey or feedback box quickly, with no technical expertise needed and with nothing to install. Some of these tools are offered for free in a time- or answer-limited period, or as a free but limited version.

No matter which solution you choose always keep in mind that simplicity and ease of use is most important when it comes to getting continuous feedback. If you ask the user too many questions or force them to sign up before writing their comments, they might leave you before giving you any. Instead, it can be an advantage to offer users the opportunity that they – if they write their email address – can get a copy of the message sent to their mail box.

This will also allow you to send a confirmation message to the user including a copy of the e-mail. This will make it harder for users to abuse the form by entering the address of someone else, as that person will now know their address has been used. The confirmation message should return a thank you for the feedback, as well as explain to the recipient that the information was entered on an online contact/feedback form, and that if their address was used without their consent they are under no obligation. Some solutions have an auto-responder to automatically respond to form submissions so you will not have to do this manually and some let you instantly receive notifications of new form submissions via email or text messages.

Notice: Zoomerang Online Survey Software is a web-based online survey software tool that can be used for both alternative 2 and 3. The EuropeanaConnect project has bought a license to this software so project partners can use it for free until the end of the project in 2011.

10.3.3. Before the session – checklist

Consider the following:

- Is it going to be a feedback email link or a feedback form?
- On which pages should the feedback possibility be available (on all web pages or just some of them)?
- Where on the relevant web pages should the feedback possibility be available? The more central and visible it is potentially more feedback will be received.
- How many information and information fields do you need? Do not ask the user for unnecessary information – keep it as simple as possible. Which fields should be mandatory, which should be optional?
- Will you allow users to send comments anonymously or do you want them to provide their email/name or go through a regular sign-up procedure before writing their comments? – Keep in mind that a time consuming sign-up procedure might prevent some users from giving their feedback.
- Decide which email account you want to use to receive the feedback from the users.
- Decide how you – on an ongoing basis – will process the submissions you get from users.
- Which technical solution do you want to use for your feedback form?
- Decide the text for the auto-response (an automatic response on submission).

10.3.4. During the session – checklist

- It is important that you regularly go through the submissions you receive from the feedback solution. When users can write any kind of comment, you might get important information about usability issues, technical problems or relevant improvement suggestions along with opinions and visions. The first category you will have to take into account immediately so that problems with your site can be corrected.
- Categorize comments into relevant groups according to their character and the kind of action they demand.
- Some feedback form solutions allow you to download form submissions as a spreadsheet.

10.3.5. After the session – checklist

1. (If the feedback form is temporary) Remove the code from all the web pages where it has been integrated.
2. Analyze the data (continuously) and organize it in usable categories as for instance: bug-fixes, development suggestions, enhancements, complaints, front-end, back-end, search functionality, navigation or whatever might suit your website and organization.
3. Have regular meetings with (groups of) stakeholders to discuss the data.
4. Evaluate each their importance with the decision makers and make a plan of action.

10.3.6. Resources

- Technical expertise within the organisation to set up the form.
- A usability practitioner to manage and analyze the feedback.
- A form generator. If your web site is based on a CMS (Content Management System) a form generator might be integrated. If not, you can find many (commercial) sites offering you access to free form generators on the Internet (for an example visit <https://www.freedback.com/>). Most of the form generators on the internet allow you to generate forms in very simple ways and without knowing anything about html or programming. You simply choose the features of the form, press the “submit”-button, copy the piece of code from the generator and paste it onto your web site enabling it to show the Mail Forms box.

10.4. Interview

10.4.1. Purpose

The aim of interviews in the post-analysis part of the development process is to gain qualitative information about users (or potential users) and their needs, wishes, thoughts and opinions concerning the product before new development begins. In the interview you can focus on:

- The users' background, what is relevant for them or how they want the product designed.
- The collection of in-depth knowledge about the user as a representative of a target group.
- Letting the users evaluate existing ideas for the future product, or evaluate similar sites already in use.

10.4.2. Method

Individual interview is a method involving a face-to-face dialogue about a specific topic, a website or specific web facilities. When used at this point in the development process the interview is generally semi-structured, driven by a set of questions or topics provided by the test facilitator. The objective of the interview is to gather information about users' thoughts, needs, expectations and experience in a semi-formal way. If you only know little about your target group, you should keep the interview to only a few subjects, and instead let the informants themselves give you the information they find important to communicate.

It is recommended to interview six people from a target group in order to get the most information and at the same time avoid hearing too many repetitions. But this is only if the target group is very homogenous. If the target group consists of two (or more) sub-groups – each with their own characteristics – the recommended number of informants is four from each sub-group, as there will be a certain degree of overlap between information from the groups. If the number of interviews is small then consider inviting an “extra” in case of a cancellation from one of the informants. But remember – testing with one user is 100% better than testing with no users at all.

An interview should last a maximum of one hour. If longer, the informant will get tired and lose concentration. If shorter, you will not get enough information.

10.4.3. Before the session – checklist

1. Prepare the interview at least three weeks before you intend to run it. Do not underestimate the task of finding informants.

2. Choose the focus for your interview research. Is it explorative – to collect information about the target group or is it an evaluation of ideas, or a combination?
3. Make a plan for the interview. Consider the following:
 - a. Define the purpose of the interviews.
 - b. Decide the main subjects of the interviews.
 - c. Who is suitable as informants and how will they be recruited? Will you or a professional bureau recruit them?
 - d. Who will run the interview? (called the facilitator)
 - e. Who will be observing the interviews (called the observer) and take notes.
 - f. Where will the interviews take place?
 - g. What kind of equipment is needed for the interviews and how will you get it?
 - h. What kind of present will you give to the informants after the interview?
 - i. How will the interview be documented?
 - j. Other practical things like something to drink and eat during the session, materials used during the session etc
4. Find informants who represent your target groups. Send them an invitation to participate in the interview.
5. Work out a detailed agenda for the interviews.
6. Do a “dry run” with a colleague evaluating your agenda and your questions carefully to make sure they work as expected – are they suitable to give you the information you expect from the interviews? Are the questions formulated in an open positive, non-leading and unprejudiced way?
7. Go through the agenda and the questions with the facilitator and the observer so these will know exactly what will happen at the session. Make sure especially the facilitator is prepared.
8. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
9. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

10.4.4. During the session – checklist

1. Start the session by making the informant feel comfortable. Small-talk while they get seated and offer them something to drink.
2. Introduce yourself and tell them about the role you (the facilitator) and the observer have during the interview.
3. Ask the informant to sign a release form for any video or audio recordings.
4. Briefly talk about the background for the interview, why they have been invited, that it is not a test of a specific product, nor is it a test of their knowledge or qualifications. Let them know that it is in the beginning of a development process, that everything is still on the idea level and that their input is crucial for the future development of the project. Tell them that every opinion is important.
5. Tell the informant what time the session will end. Ask if this is all right. Remind them to turn off their mobile phone.
6. Start the interview with a few easy, factual questions (like for example the informant's work, use of internet). It is crucial for the further process, that the opening question is neither complicated nor abstract, but something that is very familiar to the informant.

7. Ask the questions you have planned for the interview – using an interview technique appropriate for your focus and questions. Do not forget to *listen* to the answers that the informant gives you.
8. It is very helpful to let the informant solve some tasks during the session such as evaluation of pre-produced prototypes or to let them produce a prototype themselves. This always gives inspiration to interesting comments and opinions.
9. Help the informant to set up a list of wishes for the new product.
10. The facilitator rounds off the discussion by summing up the most important statements the informant made during the interview.
11. Let the informant know who they can email or phone if they have further comments or questions.
12. End the session and give the informant their present.

- ∅ *You are testing your choice of solutions, not the users!*
- ∅ At all costs avoid the temptation to argue with your tester, or to "explain away" problems they identify.
- ∅ Do not forget that the best parts of the interview are the ones you did not plan.
- ∅ Always schedule a little extra time for each session in case the informant has a lot to say to you.
- ∅ Leave time in the schedule for your own breaks.
- ∅ Remember a release form with permission to use the audio/video for internal purposes.

10.4.5. After the session – checklist

1. Straight after a completed interview session, write a shortsummary based on what was discovered from this particular informant. It may include main points from the user's general impression of the product, the user's statement about positive and negative things, as well as the facilitator's own statements about lessons learned from the interview. This is especially important if you have more sessions on the same day. The risk of mixing up your observations increases the longer you wait to write your report.
2. Transcribe the interview recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later)
3. Collect and analyze all the data from all the interviews – the transcriptions and the notes from the facilitator and the observer. Use for instance affinity diagramming to analyze the data gathered.
4. Do a short report summing up the findings from all the interviews (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
5. Do a PowerPoint presentation so you will be ready to communicate the result of the interviews to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
6. Make sure all relevant people get your report.

7. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

10.4.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable, and free from outside distractions.
- A desk with two chairs (one for the informant and one for the facilitator).
- A tape recorder, a digital or video camera to record the informant's responses.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informant with their presence.
- Paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.

10.5. Usability Testing

10.5.1. Purpose

Usability testing is relevant if you are about to test an existing product. The product might be finished, almost finished or about to be improved during the following development process. The usability test can be used as a follow up after a questionnaire or a log file analysis.

The reason why you do usability testing in this phase of the development process is to explore:

- How users interact with the product?
- What works fine and what does not and therefore needs to be improved?
- What is superfluous and what is missing?
- Do users find the product relevant?
- Does the structure, navigation and categorising of information work as presumed? What do they like or dislike? What works fine and what does not?

Even though the usability test may not uncover every usability problem on a site, it effectively illuminates how well the site supports the most typical goals users have for visiting the site. Combined with the think-aloud protocol, it provides you with a detailed and useful snapshot of user behaviour, performance, and opinions about using your site.

10.5.2. Method

Usability test is a method to learn about how users experience and understand your website, by observing how informants – in a realistic manner – interact with the site. A number of users are – one at a time – asked to solve three or four realistic tasks using the product being tested, and to “think-loud” during the process. A facilitator supports the users along the way, while observers watch and write down any problems users meet, their reactions and comments. After the user has solved the tasks the user may give an overall evaluation of the site as well as point out which obstacles that influenced on their experience with the site.

The number of informants depends on the complexity of the site as well as the target group. Five to six users from each user segment is advisable. But keep in mind – testing with one user is 100% better than testing with no users at all.

Each individual evaluation session should last about one hour – otherwise informants may get tired and lose concentration. One and a half hours is an absolute maximum duration for a session.

10.5.3. Before the session – checklist

1. Prepare the usability test at least three weeks before you intend to run the session. Do not underestimate the task of finding informants.
2. Choose the overall focus of the usability test. What do you need to know more about? Is it most appropriate to focus on certain parts of the product? It is advisable in this phase to focus the test on functions crucial for the users, or on problematic parts that have been identified in previously conducted questionnaires or interviews.
3. Make a plan for the process. Consider the following:
 - a) Define the purpose for the usability test.

- b) Decide the main subjects of the discussion.
 - c) Who will run the session? (called the facilitator)
 - d) Who is suitable as informants and how will they be recruited? Will you or a professional bureau recruit them?
 - e) Who will be observing the session (called the observer) and take notes when something important turns up. Who from the developer team should be invited to watch (at least some of) the tests?
 - f) Where and when will the usability tests take place?
 - g) For how long will each test run?
 - h) What kind of equipment is needed for the session and how will you get it?
 - i) What kind of present will you give to the informants after the session?
 - j) How will the session be documented?
 - k) Other practical things like something to drink and eat during the session, materials used during the session etc.
4. Find informants who represent your target group. Send them an invitation to participate in the usability test.
 5. Formulate your questions/tasks as scenarios: “now – imagine that you want to...” Focus on problem areas identified in a previously conducted questionnaires, or functions crucial for the users. Depending on the extent of the tasks 3-4 tasks/questions are normally suitable.
 6. Work out a detailed agenda for the session.
 7. Do a “dry run” with someone who does not know the product in order to evaluate your agenda and your questions carefully to make sure they work as expected.
 8. Go through the agenda and the questions with the facilitator and the observer so these will know exactly what will happen during the session. Make especially sure that the facilitator is well prepared.
 9. Two weeks (approximately) before the session you write to the informants informing them where to meet for the session and when.
 10. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

∅ Consider whether you can afford to hire a company to find your informants – it will save you a lot of time.

∅ Consider whether you can afford to let a professional usability company perform your test.

10.5.4. During the session – checklist

1. Start the session by making the informant feel comfortable. Small-talk while they get seated and offer them something to drink.
2. Inform the informant what time the session will end. Ask if this is alright. Remind them to switch off their mobile phone.

3. Introduce yourself and tell them about the role of the facilitator, the observer and others involved directly in the test.
4. If the test is recorded, inform the informant about what is taped, why and how. Make sure to get their acceptance on paper.
5. Briefly talk about the background for the test, why they have been invited, that it is not an examination of the informant but the usability of the product and that their input is crucial for the future development of the project. The focus is on their experience and opinion about the product.
6. Tell the informant if problems may arise during the test due to the unfinished condition of the product.
7. If relevant start the session with a short interview without using the system at first. Use this to get more specific information about the informant, who they are and their daily tasks, knowledge about the specific site and the domain, as well as use of the internet in general. If you want to use interview-based tasks later in the test, then use this introductory interview to formulate tasks in co-operation with the informant. Ask the informant to describe what they did last time they visited a similar website. Use this as a task in the test.
8. Introduce the “Think-aloud”- method and encourage the informant to say whatever they might think during the test – what is positive, negative or just unexpected. Let them know that you might start asking questions if they forget to think-aloud or you want more.
9. Start the session with reading a scenario to the informant, for instance “Now, imagine that you are at home and are about to order a picture found at ...” Give the paper with the scenario to the informant, and let them read the question again. Only give them one task at a time.
10. Ask the informant to solve a task – one at a time.
11. When the informant has finished solving the tasks (or time has run out) it is time to sum up on the test. This is done together with the informant. Ask about the informant’s impression of the product. Were expectations met? Was it a comfortable experience?
12. Ask the informant to mention the three most positive AND the three most negative experiences.
13. The facilitator sums up some of the (from a developers’ perspective) most important lessons learned during the session, for instance specific usability problems.
14. Let the informant know who they can email or phone if they have further comments or questions.
15. If it has been a difficult or stressful experience for the informant then make sure to emphasize that it is the system that is being tested, not the informant.
16. Give the informant a small present or payment for their time and effort. Thank them again as you say goodbye.

- ∅ *Always have in mind – You are testing your choice of solutions, not the users!*
- ∅ At all costs avoid the temptation to argue with your tester, or to "explain away" any problems they identify. If a test user finds something confusing, then it is a safe bet that a certain percentage of your overall visitors will find it equally unclear.

- ∅ If the informant stops during the test and is unable to continue, then make a note about the problem and give the informant exactly the amount of help needed in order to complete the test. NEVER try to control the session in any way. Your help or questions should never get in the way of the informants expressing their opinions, experiences, and suggestions.
- ∅ Do not ask the informant during a usability test the question “why”, as evidence shows that informants are usually bad at explaining why they behaved in a particular way. Instead, your usability test should focus on what informants do – rather than what informants say – and to what extent a product helps specific users to achieve specified goals with effectiveness, efficiency and satisfaction.
- ∅ It might be an idea to invite one informant more than you actually need, because very often someone cancels or gets sick last minute. If you have one “in reserve” you will still be able to conduct your test with the right number of informants.
- ∅ Always check out the technical equipment the day before the test. It is waste of everyone’s time if technical problems cause delays or – in worst cases – cancellation of a test.
- ∅ Make sure that the informant is not left with questions or comments never expressed or answered. Tell them to send an email if something in relation to the test turns up.
- ∅ If the informants are given money for their participation in the test, then do not forget the risk of cash incentive. Informants often cannot help being nice to people who gives them money.
- ∅ The artificiality of getting users to step through a series of tasks in a test situation can lead to behaviour that is different to how they would behave if they were in their natural “habitat” doing the same tasks of their own accord.

10.5.5. After the session – checklist

1. Straight after a completed test session, write a short report based on what was discovered from this particular informant. It may include main points from the user’s general impression of the product, the user’s statement about positive and negative things, as well as the facilitator’s own statements about lessons learned. This is especially important if you have more sessions on the same day. The risk of mixing up your observations increases the longer you wait to write your report.
2. Arrange a short meeting soon after the session with the developers (that may have been watching the session). Discuss the session with them and sum up main issues, important observations, informative comments or suggestions for solutions from the informants. Involving developers at this stage is good for commitment, focus on a common goal and the creation of a common base of knowledge and experience.
3. Transcribe session recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later)
4. Collect and analyze all the data from all the tests – the transcriptions and the notes from the facilitator and the observer, as well as the notes from the following discussions with the developers (read more about how to analyze data later)

5. Do a short report summing up the findings from all test sessions (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
6. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
7. Make sure all relevant people get your report.
8. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

Ø If a usability test results in serious changes in design or function, you need to test again. Even though the redesign is meant to "fix" the problems found in the first study, there is no guarantee that the new design does in fact fix the problems. A second test will discover whether the fixes worked or not. Also, when introducing a new design, there is always the risk of introducing a new usability problem, even if the old one did get fixed.

10.5.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable, and free from outside distractions.
- A desk with two chairs (one for the informant and one for the facilitator).
- A tape recorder, digital or video camera to record the informant's responses.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informant with their presence.
- Paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.
- One or two usability practitioners (usually someone trained in usability) to analyze the result of the usability tests.

10.6. Statistical Web Analysis

10.6.1. Purpose

Statistical web analysis, also called web analytics, is the assessment of a variety of data including web traffic, web-based transactions, web server performance, usability studies, user submitted information and related sources to help create a generalized understanding of the visitors experience online¹⁶. It provides internet data that tells you about traffic and popularity trends, as well as how users navigate on your site. Depending on which method used and which technical solution selected, it tracks details like the number of visits, visitors, page views, hits, referrals, MB downloaded, browsers used when visiting your website, search engine and keywords used to find you site, geographic location, etc. Some even track mobile data trends. This data is typically compared against Key Performance Indicators (KPIs) for performance and used to measure progress toward the organisations goals.

With this information you can optimize your web site as well as plan your marketing effort.

10.6.2. Method

There are two categories of web analytics: off-site and on-site web analytics. Off-site web analytics measure a web site's potential audience, visibility and the buzz around the Internet in general. On-site web analytics measures visitor's usage behaviour as they are on your web site. Historically, web analytics has primarily referred to on-site visitor measurement on which we will focus in the following.

There are two main technological approaches to collecting the data – both can be processed to produce web traffic reports. Using the first method, web server log file analysis software reads the log files in which the web server records all its transactions. However, the development of the internet (with for instance web pages that span multiple HTML files, the increasing use of images in HTML, the extensive use of web caches, search engine spiders and robots, web proxies, dynamically assigned IP addresses) has created concerns about the accuracy and usability of this data collection method in relation to usability improvement.

It takes a lot of skill to truly extract knowledge from log files. If you are interested in log file analysis you should keep an eye on University College London (EuropeanaConnect WP3.1) who does all the work in the Europeana context.

The second data collection method, whose popularity is rapidly growing, uses a JavaScript “page tag” on each web page to collect data instead of using the web-server log file. This type of data collection is often referred to as “front-end” or “client-side” because it is the visitor’s web browser that enables this type of data collection. While software for this kind of data collection can be run in-house from the organisations own IT infrastructure, it is very common that the data collection is outsourced so data is hosted and analyzed in another location. In this case your visitors simply come to your site, download your web page (with the page tag) in their browser, the page tag is executed and information is sent to the vendor’s data center. All you have to do then is to log into an online interface and view the data in pre-defined or customized reports, downloadable from the interface or delivered to your email.

The challenge is to decide which Key Performance Indicators to measure progress in order to reach the organisations goals. Key Performance Indicators (also known as KPIs or KSIs – Key Success Indicators) are quantifiable measurements that reflect the critical success parameters of the organization. The definition of KPIs will differ from organization to organization, from

¹⁶ Page 6 in "Web analytics Demystified..."

department to department. A sales department may for instance have as one of its Key Performance Indicators the percentage of its income that comes from returning customers. An education department may focus its Key Performance Indicators on graduation rates of its students. Whatever Key Performance Indicators you select must reflect the organization's goals, be key to its success, and must be quantifiable (measurable).

Key Performance Indicators (KPIs) need to:

- Make sure that your KPIs are approved by all the important decision makers in your organisation at all levels. Consider involving decision makers at all levels to increase their acceptance and dedication.
- Define your KPIs as long-term considerations so they will not have to be changed all the time – change them only if the goals of the organization change, or it gets closer to achieving a goal.
- Only work with a few KPIs. It is critical to limit them to those factors that are absolutely essential to the organization reaching its goals This will help keep everyone's attention focused on achieving the same KPIs
- Always define your KPIs as rates, ratios, averages or percentages; not just “raw” numbers.
- Use KPIs as a carrot and as a performance management tool. They give everyone in the organisation a clear picture of what is important, which way the organisation needs to go, and what they need to make happen.

10.6.3. Before the session – checklist

1. Prepare the web statistics in very good time before you plan to start the data collection. You have a lot of initial decisions to make. Keep in mind that data collection software needs to collect statistical data for a while before it can tell you anything about user trends.
2. What is the “mission” of the organization or the department and its web services?
3. Define the aim of the statistic. Is it marketing purpose? Is it usability adjustment purposes? Is it because of political purposes? Do you need off-site or/and on-site web analytics data?
4. What are the goals and who are (all) the stakeholders? Defining site goals is the first step when preparing an analytics plan. Without a clear goal for each sub-section of your site it is impossible to improve a site using web analytics data. Define your goals as specifically as possible and point exactly to which part of your site you want to change, how you will do it and the expected changes (for instance a 10 % increase in traffic from June to July). Essentially, this is the "before" reporting in your key performance indicators report – the first step in the measure cyclic process.
5. Find out which Key Performance Indicators that reflect the critical success parameters of your organization. Who should be involved in the work of finding Key Performance Indicators? When deciding which indicators you are going to report, be inclusive and make sure to talk to all the groups of recipients. You have to make sure you are giving them the data they actually need. Also, by including them in the process you'll increase their interest in the results from the very beginning.
6. Choose the focus for your statistical research. Consider carefully what kind of knowledge you want from the statistics – what kind of questions do you want to answer?
7. Make a plan for the statistical data collection. Consider the following:

- a. What kind of technical solution will you use – a web server log file solution or a “page tag” solution?
 - b. Which vendor should provide you with your on-site web analytics software and services?
 - c. Will the software for the data collection be run in-house from the organisations own IT infra structure or will the data collection be outsourced so data is hosted and analyzed in another location? In that case – to whom do you outsource?
 - d. When do you need the statistical data and when will you have to start the data collection?
 - e. Who will support you technically and help you with the configuration (or reconfiguration) of your statistics software. Even when using outsourced solutions you will have to do some basic configuration.
 - f. Which procedures will need to be established around the statistical data? Should they be accessed by one main responsible or should more people have access to this information?
 - g. Who will do the work with the statistical analysis, the maintaining of the analytics tool as well as the continuous review of web analytics data? It is important that a single person (or group) dedicate themselves and take responsibility for determining which KPIs are right, how to build those indicators using the available data, annotating that data and distributing it to relevant stakeholders. If it is a part of somebody’s job, there is a god chance that the work will actually get done. Is there a need to hire a statistician to ensure the result is reliable?
 - h. How will the information generated from the statistic be shared effectively within your organization?
8. Sign up for – or install – the technical solution or service you have selected for your data collection.
 9. You can add the JavaScript “tags”, designed to detect information about the visitors, to every Web page you wish to track. It may be integrated in the global header or footer structure for your entire site.
 10. A standard key performance indicator report must be designed to summarize meaningfully compared data – showing values for the current and previous reporting period. Consider some form of one-page graphical “scorecards” that report the progress toward specific site goals. This gets everyone focused on the right metrics and recipients become more likely to use the analytics tool.

- Ø Remember to exclude your organization’s internal traffic from your analysis. Otherwise you will not get a true picture of how your site is used by others.
- Ø Many different vendors provide on-site web analytics software and services. When choosing your technical solution we strongly advise you to get involved only with an outsourced web analytics vendor that provides you with reports you can understand and a tag you can easily implement and who has a good reputation.
- Ø Be careful to choose a vendor with a tag, that easily can be integrated on your entire site, and that does not result in additional delay in loading and rendering your web pages, that accepts to keep and store your data for as long time as you want it (not all vendors offers free database storage), that the solution is actually able to collect the type of data you need, that it provides you with report and analyse facilities you need, the possibility for data-backup at no or little extra costs (who owns the data in case the contract is cancelled?), how do they handle privacy issues concerning your data.

10.6.4. During the session – checklist

1. Make sure everyone knows who is responsible for generating the reports and that they know who they can ask about the data.
2. Send out your KPIs frequently as they will only be effective if people see them enough to actually keep them in mind when making business decisions. In general, it is recommended that KPI reports (for an example on a KPI report – see appendix 7) are delivered on a daily or weekly basis (depending on the type of organisation). Even if it is not possible to meet to discuss the ramifications of the report, the indicators should be generated, annotated and delivered. Doing so will keep recipients up to date and hopefully make any conversation about the metric more productive.
3. Have regular meetings with (groups of) stakeholders to discuss the data. Avoid the temptation to automate the distribution of the reports and just expect people to automatically understand the data and (know how to) use it properly. For most people, this type of data is new and unfamiliar – it needs to become institutional knowledge.
4. Post the KPIs everywhere: in the lunch room, on the walls of every conference room, on the company intranet, even on the company web site in some cases. Show what the target for each KPI is and show the progress toward that target for each of them. People will be motivated to reach those KPI targets.

∅ Do not be inflexible regarding which indicators you report. If people start asking for additional data then be happy – it is a god sign and indicates that people have started looking at the information.

10.6.5. After the session – checklist

1. Do a PowerPoint presentation so you will be ready to communicate the result of the statistics team members, stake holders and decision makers. Keep the presentation short, stick to the main points (the KPIs)
2. Act on the statistical data! Web analytics data are too often viewed as last month's report card. Instead the real question is "What do we do next?" Used effectively, statistical data can actually drive site performance, not just monitor it. Once goals are established and stakeholders are looking at the data, action needs to be taken so the data collected is actually used to improve site performance. This presupposes that all involved commit to regular, iterative, data-driven site optimization.

∅ Do not go for huge and comprehensive changes of the entire web site. This will probably just create a whole new suite of problems that need to be addressed. Instead, prioritize your changes, break every perceived problem down in to as many small actions as possible, and tackle them one by one. You will only be able to understand and register the effect of a change if you make one change at a time.

∅ A rule of thumb¹⁷ is if you want success with your web statistics you need to spend 10% of the resources on the technical solution and the implementation. The remaining 90% you need to use for the intelligent (human) interpretation of the data.

¹⁷ Avinash Kaushik – <http://www.misura.dk/webanalyse/10-gode-raad-til-webanalyse.html>

- Ø Always work to get the decision makers' support, acceptance and backing. Technical tools are not enough to secure success; no system can make the important decisions, decide priority, define KPIs, provide the necessary financial resources, and dedicate an employee to focus on this specific issue.
- Ø Define your KPIs before you decide which tagging solution to use. You need to find the solution that supports the goal of your organizations, not the other way round.

10.6.6. Resources

- Web log analysis software. This can be performed in-house, but are often provided as a third-party service. Vendors typically charge a monthly fee based on the number of pageviews per month collected. As an alternative to commercial solutions, several open-source logfile analysis tools are available free of charge.
- An experienced web analyst or the training of a suitable in-house person.
- Technical expertise within the organization.
- Storage facilities for the collected data (not all vendors offers free database storage)

10.7. Focus Group

10.7.1. Purpose

A Focus group is an interview form involving a group of users who are brought together to discuss a subject, theme or product determined by the facilitator. Qualitative data is then produced with the help of both the facilitator and the dynamic internal in the group.¹⁸ It is a very suitable method to get empirical data about users' attitudes, thoughts and needs towards a future product, what they (potentially) find relevant and how they imagine it realized. Also their opinion of the organization behind the product can be illuminated using focus groups.

10.7.2. Method

In focus groups 7-8 persons are guided through a discussion by a facilitator. Before the session there a number of subjects have been selected for the discussion – as well as questions to be examined. A focus group should be arranged for each primary target group, unless these are very alike in their use of the product. At least two focus groups should be conducted unless the target group is very narrow. But certainly, one focus group is better than none.

A focus group discussion typically lasts about two hours.

10.7.3. Before the session – checklist

1. Prepare the focus group at least three weeks before you intend to run the session. Do not underestimate the task of finding informants.
2. Choose the subject for the focus group discussion. Is it explorative or is it an evaluation of ideas, pre-produced prototypes, or a combination?
3. Make a plan for the session. Consider the following:
 - a. Define the purpose of the focus group.
 - b. Decide the main subjects of the discussion.
 - c. Who is suitable as informant and how will they be recruited? Will you or a professional bureau recruit them? 7-8 informants' is suitable. If you have more

¹⁸ A definition from Bente Halkier, "Fokusgrupper" (2005), Samfundslitteratur, p. 11-12.

informants you risk that some of them never get the chance to say anything or that the group splits into sub-groups.

- d. Who will run the session? (called the facilitator)
 - e. Who will be observing the session (called the observer) and take notes when something important turns up.
 - f. Where will the focus group take place?
 - g. What kind of equipment is needed for the session and how will you get it?
 - h. What kind of present will you give to the informants after the session?
 - i. How will the session be documented?
 - j. Other practical things like something to drink and eat during the session, materials used during the session etc.
4. Find informants who represent your target groups, and send them an invitation to participate in the focus group.
 5. Work out a detailed agenda for the session.
 6. Do a “dry run” with a colleague evaluating your agenda and your questions carefully to make sure they work as expected – are they suitable to open up for discussions? Will they help to bring discussions in the right direction without being too guiding?
 7. Go through the agenda and the questions with the facilitator and the observer, so these will know exactly what will happen at the session. Make sure that especially the facilitator is well prepared.
 8. Two weeks (approximately) before the session, you write to the informants informing them where to meet for the session and when.
 9. Two days (approximately) before the session you send an email to the informants reminding them of your appointment, repeating where to meet and when. Add your phone number in case they need to contact you last minute.

- ∅ As a minimum the session should be sound recorded in order to support the following analysis of data. A preferable alternative would be a video recorder as it will make it possible to review the informants' expression and emotional state during the session.
- ∅ Group discussions are harder to organize than individual sessions because you need several informants in the same place at the same time. They are also harder to manage because you have to control not only individual reactions but also group processes. You will want to stimulate some group processes (e.g. opinion disclosure) but at the same time avoid unwanted group effects (e.g. group intimidation).

10.7.4. During the session – checklist

1. Start the session by making the informants feel comfortable with the situation. Small talk while informants get seated around the table and let them have something to drink
2. Introduce yourself and tell them about the part you (the facilitator) and the observer have during the session.
3. Briefly talk about the background for the focus interview, why they have been invited, that it is not a test of a specific product, nor is it a test of their knowledge or qualifications. Explain that it is in the beginning of a development process, that everything is still on the idea level and that their input is crucial to the future development of the project. Tell them not to worry, that other informants are more “clever” than them, as the group has been put together carefully in order to get as many perspectives as possible. Everyone’s opinion is important.

4. Tell them what time the session will end. Ask if this is alright with everyone. Tell them there will be breaks along the way, where to find the lavatory, where they can smoke. Remind them to turn off their mobile phone.
5. Let everyone introduce themselves.
6. Start the discussion with an easy question. It is crucial for the further process that the opening question is neither complicated nor abstract, but something that everybody has an opinion – and can talk – about.
7. Ask the group the questions you have planned for the discussions, but give them time enough to “finish” one subject before changing to a new one. Ask them to elaborate on their statements and ideas. This session is all about the informants, so give them the necessary space.
8. It is very helpful to let informants solve some tasks during the session, such as evaluating pre-produced prototypes or to let them produce prototypes themselves. This always gives inspiration to interesting discussions among the informants.
9. Help the informants set up a list of requests for the (new) product.
10. The observer takes notes during the session. Let the observer round off the discussion by summing up some of the important conclusions the informants agreed upon.
11. If the session has been documented on video, then get their permission to use it for internal purposes. Get their permission on paper.
12. End the session and give the informants their presents.
13. Let the informant know who they can email or phone if they have further comments or questions.

- ∅ *You are testing the developer team’s choice of solutions, not the users!*
- ∅ At all costs avoid the temptation to argue with your tester, or to "explain away" the problems they identified.
- ∅ As a facilitator you must help create balance in the group of informants. Some informants talk more and louder than others. It is the facilitator’s duty to manage the group dynamics. If one of the informants is dominating the conversation, the facilitator should politely acknowledge the informant’s contribution and then pass the question to another informant.
- ∅ If one of the informants is particularly retiring and quiet during the discussion the facilitator can address questions directly to this person.

10.7.5. After the session – checklist

1. Straight after a completed session, write a short summary based on the discussions of the group. It should sum up main issues of the discussion, important observations, informative comments or suggestions for solutions from the informants. Writing the summary right after the focus group session is important as the risk of forgetting observations increases the longer you wait to write your report.
2. Transcribe session recordings regardless of the media. This can be either a word-by-word transcription, or a transcription of each observation, event, or comment from the session (read more about transcription later).
3. Collect and analyze all the data from all the tests – the transcriptions and the notes from the facilitator and the observer. Use for instance affinity diagramming to analyze the data gathered.

4. Do a short report summing up the findings from all test sessions (read more about how to do a report later). Remember to secure informants' anonymity – i.e. refer to informants by numbers instead of names.
5. Do a PowerPoint presentation so you will be ready to communicate the result of the tests to team members, web site providers and decision makers. Keep the presentation short, stick to main points and use the most central and illustrative user quotations.
6. Make sure all relevant people get your report.
7. If the report is published on the internet you should write to the informants letting them know where to find the report. Take the opportunity to thank them again for their effort and time.

10.7.6. Resources

- A facilitator (usually someone trained in usability) to conduct the session.
- An observer to take notes along the way and record issues raised during the session.
- A quiet room, comfortable and free from outside distractions.
- A table big enough and with enough chairs for 7-8 informants and one facilitator.
- A tape recorder, a digital or video camera (recommended not mandatory) to record the informants' responses.
- A computer with a prototype installed or – if the product is already launched – with access to the internet.
- An extra table and chair for the observer – placed in such a way that the observer sees as much as possible, without disturbing the informants.
- Paper, pencil, scissors, sticky notes, etc.
- Payment to the informants for their effort and time.

11. Methodological questions

This chapter is for those who want to know more about the arguments and considerations behind the suggested usability tests in this catalogue.

11.1. Qualitative and Quantitative Data

Within social research there are two broad categories of data collection methods: qualitative and quantitative. The terms 'quantitative' and 'qualitative' refer to the kind of data you get from the research method. Before you decide which method to use, you need to think about the nature of the data you want from the test. Some methods provide data which are quantitative and some methods data which are qualitative – complementing each other in various ways.

- **Qualitative research** explores attitudes, feelings, behaviour and experiences (rather than drawing statistical conclusions). Data is collected through such methods as diaries, open-ended questionnaires, unstructured interviews and unstructured observations, and focus groups. These methods are designed to help usability practitioners understand the meaning informants assign to social phenomena and to elucidate the mental processes underlying behaviours. Typically, fewer informants participate in qualitative research, but the interaction between the usability practitioner and informants during the study tends to last longer and be of a more direct kind. The usability practitioner is the instrument of data collection, and results may vary greatly depending upon who conducts the research as well as who conducts the analysis. Knowledge of an area is necessary to attempt interpretation of qualitative data and great care must be taken when doing so. Qualitative data is typically descriptive data, and as such more difficult and time consuming to analyze than quantitative data. Analyzing requires accurate description of participant responses, for example, sorting responses to open questions and interviews into broad themes and patterns. It involves reading, re-reading, and exploring data while hypotheses are generated. Quotations from diaries or interviews may be used to illustrate central points of an analysis.
- **Quantitative methods** focus on numbers, frequencies, and quantities (rather than on meaning and experience). Data is collected through methods which to a large extent are adopted from natural science research. They are designed to produce quantifiable data that is replicable and representative of a larger number of people. These methods include random selection of research informants in an unbiased manner, standardized questionnaires, and statistical methods. Focus is often on generation of statistics through the use of large-scale survey research that includes many informants. The usability practitioners' contact with the informants is much quicker than in qualitative research and the usability practitioner is considered external to the actual research.

Most research today tends to adopt a combination of qualitative and quantitative approaches to provide a more complete picture of the issue being addressed. This allows statistically reliable information obtained from numerical measurement to be backed up by, and enriched by, information about the research informants' statements. It is, however, important to realise that there is no sharp division of qualitative and quantitative data. The two types of data are intimately related to each other. All qualitative data can be described and manipulated numerically and all quantitative data is based upon qualitative judgments.

11.2. Interview guide

Often an interview is performed on the basis of an interview guide. The guide is a help to the one who performs the interview, to structure the conversation and make sure that all relevant themes are covered. Depending on the character of the interview, the guide can be varying from a few roughly sketched topics to a detailed list of carefully formulated questions. Use the interview guide during an interview to make sure that all relevant questions are answered. Tick as you go along.

An interview guide can be done in Excel or Word, or it can be in the shape of small pieces paper or cards – depending on what works best for the usability practitioner. There is no ultimate recipe for how the guide should be worked out. Though, the result of the interview depends on the informants' will to give you information, so it is important to keep the conversation smooth and comfortable and the guide needs to support this. Therefore it is recommended:

- Always have a rich supply of suggested questions to ask the informants in case they have a hard time keeping the conversation going.
- Never read questions directly from the guide. This will create distance between the informant and the usability practitioner, as well as break up the natural flow of the conversation.
- Be so familiar with the area and the questions in the guide that allows you to focus your full attention on the interview situation and the answers from the informant.
- Formulate the questions to each informant according to the informant's language, educational level and personality. Usually, questions need to be formulated short and precise, avoid asking the informants abstract theoretical questions.

How important it is to follow the guide strictly might depend on the character and subject of the interview, as well as the experience of the usability practitioner. It should be kept in mind that the more natural and spontaneous the conversation takes place, and the more the usability practitioner is allowed to follow up on interesting and unexpected statements during the conversation, the bigger possibility for getting valuable and surprising answers from the informant. On the other side, the more un-structured the conversation is, the more difficult it might get to analyze and compare the outcome of numerous interviews. Always do a test run of your guide to be sure that it can be used to keep the conversation going and that questions are clear and will bring you the type of information you need.

11.3. User Centred Design

User centred design (UCD), also called human-centred design process, focuses specifically on making systems usable. It is a design and development approach that grounds the whole development process in information about the people who will use the product. From the very beginning and at every stage of the development process, users' requirements, needs, wants, and limitations – are given extensive attention. The UCD approach differs from other approaches as it tries to optimize the product around how users can, want or need to use the product, rather than forcing the users to change their behaviour to accommodate the product. The focus is on usability goals, user characteristics, environment, tasks, and workflow in the design of an interface.

UCD follows a series of well-defined investigative methods and techniques for analysis, design, and evaluation of mainstream hardware, software, and web interfaces. The UCD process is an

iterative process, where design and evaluation steps are built in from the first stage of projects and are being repeated until the project's usability objectives have been attained.

Following principles for UCD can be formulated¹⁹

1. Early focus on users and tasks
 - Structured and systematic information gathering (consistent across the board).
 - Designers trained by experts before conducting data collection sessions.
2. Empirical measurement and testing of product usage
 - Focus on ease of learning and ease of use.
 - Testing of prototypes with actual users.
3. Iterative design
 - Product designed, modified and tested repeatedly.
 - Allow for the complete overhaul and rethinking of design by early testing of conceptual models and design ideas.

11.4. Personas

Personas are not descriptions of actual people, but rather a sort of archetypal users – a fictional “person” who represents a major user group for your site in terms of needs, goals and personal characteristics. A persona usually includes:

- Name and a picture.
- Demographics such as age, education, ethnicity, or family status.
- Job title, including major responsibilities.
- Goals and tasks they are trying to complete using the site.
- Personality, attitudes, search behaviour, domain knowledge.
- Expectations and motivations
- What matters most to the persona in relation to your web site.

Although personas are fictitious, they are typically based on data generated by user research conducted previously, demographic information in general, knowledge about users' search behaviour and use pattern on the internet, tasks, habits and trends in skill levels and tasks performed etc. As such, each persona represents many users. Personas are done in a specific context, for at specific purpose and with regional characteristics, and the form and level of details depend on the context in which the personas are to be used.

The purpose of the personas is to act as ‘stand-ins’ for real users and help guide the developer teams decisions about functionality and design as it can constantly be evaluated against the personas.

Using personas gives you the following advantages:

- It brings users to life and puts a 'real' face onto the sometimes rather dry results from user research.
- The team can concentrate on designing for a manageable set of personas knowing that they represent the needs of many users.
- It makes it easier for the developer team to evaluate ideas from a user-point of view.
- It makes it easier for the developer team to “wear their users' shoes”, and evaluate ideas from a user-point of view. In this way personas can work as a tool to prioritize design efforts.

¹⁹As defined by Jeffrey Rubin, Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests, John Wiley and Sons, Inc., 1984.

- It gives a better understanding of and focus on users' goals and needs. By always asking, "Would Jim use this?" it might help avoid the trap of building what users ask for rather than what they will actually use.
- It helps to ensure that the personas represent end users (rather than the opinion of the person writing the personas) and to avoid the trap of designing for the "average" user that does not actually exist.
- It helps you get shorter design cycles, as designs can be constantly evaluated against the personas, reducing the frequency of large and expensive usability tests and the number of months spend gathering user requirements.
- It supports the communication between members in the developer team and helps overcome disagreements over design decisions because these can be sorted by referring back to the personas.

Typically, multiple personas that represent the spectrum of the target audience are developed in the early stages of the development process. As a basis there should be at least one persona representing each major segment of your users. Though most sites have lots of user groups these need to be condensed to 3-5 personas – more will make it difficult for the developer team to remember the different personalities of the personas.

11.5. Scenarios

Where personas are fictitious characters that represent the needs of the intended users, scenarios complements the personas by describing how their needs can be met.

A scenario is a short story, a "vision of the future" – describing a task and a possible use situation, where a fictive user, a persona, interacts with the web page. It can be either "problem scenarios", "idea generating scenarios" or "idea testing scenarios".

A scenario is a creative developer tool to investigate ideas related to technical functionality, design and marketing.

How are scenarios made?

1. Create your personas.
2. Consider the needs the persona has for using the website and in which situations the persona will use the site.
3. Make a list of characteristic tasks (should be a representative collection of benchmark tasks) that the different personas would perform using your product. The task selection should be based on the results of marketing studies, needs analysis, concept testing, and requirements analyses.
4. Let a persona "solve" a task, and tell the story of what will happen – what will the persona do, not do, or wish to do? The story is one of your scenarios. While you work through your scenarios, you must write down all the potential obstacles and new ideas to improvement etc. that appear during the work.
5. Let all personas "solve" all (relevant) tasks.

How to work with Europeana personas and scenarios

- Be clear about what it is you want to test or develop.
- Re-read available data (qualitative as well as quantitative) about the affected user groups and consider what basic parameters divide the users from each other?
- Choose from the Europeana personas – who are the primary and/or secondary target groups?
- Consider the personas – should any *details* in the personas descriptions be changed to secure the designers' / developers' engagement with the personas? It is crucial that the personas are so vivid that the developers can engage with the personas and imagine their needs and behaviour. If possible – get feedback from colleges, users or other relevant persons.
- Consider the needs each persona has for using the system and in which situations that persona will use the system. Make a list.
- Let each persona “experience” all the listed situations and write scenarios for each situation – i.e. realistic stories of what personas with different needs would (or would not) do, and how they would (or would not) do it.
- If you have 5 different personas and 3 different situations, you will end up with 15 scenarios. There are different kinds of scenarios: Problem scenarios, idea generating scenarios and idea testing scenarios. If possible – get feedback from colleges, users or other relevant persons.
- Discuss each of these 15 scenarios and from these extract ideas of/to:
 - Possible needs and potential obstacles.
 - Possibilities for improvement – both functionality and design related.
 - Better guidance, filters, lists etc.
 - Transparent and coherent workflows.

Stay in your most creative mood during these considerations and let always discussions lead to answering the question: how can we develop/improve the feature/site to the advantage of this persona – this kind of user?

- Consider the list with all the ideas for improvement and split the ideas up in categories: easy to do, should be done and will not be done.

If possible – get feedback from the affected user groups.

- Integrate the personas in your daily work, “ask” them for advice, and let them influence your decisions.

11.6. Do I need a lab to do usability testing?

No, you do not necessarily need a high-tech usability lab.

It is important to state, that you should do usability testing even if you do not have a usability lab or access to one. A fancy lab is not a must.

You can do effective usability testing in any of these settings:

- A usability lab having two or three connected rooms outfitted with audio-visual equipment.
- A conference room, or the user's home or work space, with portable recording equipment.

- A conference room, or the user's home or work space, with no recording equipment, as long as someone is observing the user and taking notes.
- Remotely, with the user in a different location.

However, there are advantages as well as limitations with all types of test locations. In a usability lab you have all the technical equipment you need, so you do not have to spend time doing practical stuff such as connecting a web cam or tape recorder, arrange a table for your observer, and so on – it is all there. At the same time it is possible for you to invite all the relevant developers and decision makers to watch and learn from the sessions, as there is typically a separate observation room behind a mirror. You do not have the same advantages when you perform the test at the informant's location. Add to this the time you save because you do not have to spend time moving around visiting all the informants.

In spite of this, you generally get the best results doing the test in the context of use – at the place, where the informants normally would use your (or a similar) product. All you need is a room with no disturbance (very important), a computer and access to the internet. The room should be of a size where there is room for a single observer (besides the informant and the test facilitator) discreetly in the back of the room.

11.7. Do I need to record sessions on video or digital camera?

No, it is not absolutely necessary. But it can be very helpful, especially if you are an inexperienced facilitator or usability analyst.

Recording what users do during a test session is a very common practice. One of the most useful recordings you can make involves recording the face of the informant at the same time as recording what happens on the screen – the mouse moving, pages scrolling, clicking links, typing in search terms and so on. It will give you some very useful advantages:

- **Support memory:** Even though most usability tests have rather few informants (about 5 to 8 informants), you cannot possibly catch everything in every session. Unless you are a trained facilitator, with a well developed note taking technique, notes taken during a session might not be sufficient to support the following analysis. Recordings can help you review what happened during the sessions, to check whether you missed crucial information, or help you to locate exactly where informants faced problems and where they proceeded effortlessly.
- **Documentation:** Recordings make it possible for you to document your findings and conclusions, as well as share them with a research partner. In case of someone doubting your findings or conclusions, the recordings can always be reviewed for evidence. Especially video clips can be a powerful tool to convince developers of the severity of a usability problem when they – with their own eyes – watch the informants' emotional state while struggling with the product.
- **Communication:** Recordings will make it possible for you, and for anyone who needs to communicate the outcome of the test, to spice up Power Points with video clips and screen dumps.
- **Educational reasons:** It is always very useful for a facilitator to watch the sessions afterwards. The recordings make it possible to evaluate their interview technique and performance as a facilitator and see if anything might improve communication with the informants.
- **Remote testing:** Recordings make remote testing possible. This may in some cases be necessary – for instance if an informant is somehow prevented from showing up at your site or if it is necessary for the test result that it takes place in a particular environment. It

will also be possible for stakeholders to observe a session (live) over the network, regardless of their individual location.

Today recording is not difficult, even if you are operating within a very limited budget. It really only takes a web camera and some relatively inexpensive recording software for the test computer.

Recording screen activity may be done with free trial versions of software programs available for download. Most of the software solutions are pretty easy to use and provide functionalities to assist the usability practitioner in planning, testing, analysing data, as well as reporting results. The programme runs in the background, capturing everything that appears on the screen and saving it to a video file with no loss of detail. Each frame of the resulting video can be used as a screenshot in the following presentation.

Though the software approach is very appealing, it does have its limitations. First, some of the programs have a tendency to influence the performance of the website tested, slowing down the machine, giving the informant an unrealistic user experience. Second, it will only record what happens on the screen and not the users themselves. If you want to learn something from the user's body language and physical movements, you will need to combine it with other recording methods as for instance a camcorder (a video camera recorder that combines a video camera and a video recorder into one unit) or a webcam (video camera which feeds its images in real time to a computer or computer network). With both of these relatively cheap and flexible solutions, a webcast can be set up in a few minutes and although the resulting video will be a bit "fuzzy", it is still useful for getting a good idea of what the user did.

Most kinds of recording equipment, videos, web cams and digital cameras are available at a reasonable price and even if you decide to use a regular video camera rather than a web cam, or multiple cameras, the technology is affordable and accessible.

Permission, privacy and confidentiality

If you record the test sessions, remember you will need to ask the informant to sign a recording permission. In this you need to state – in plain language:

- How the recording will be used
- Who will use the recording
- How long you (or your institution) will store the recording and how the recording will eventually be discarded

You ask informants to sign a recording waiver that sets out the specific purposes of the recording. Let your legal department approve your statement and let the organization make sure that the waiver is respected so recordings will not be misused in any way. Do not forget that users always have the right to refuse the recording. If this happens, do not panic. You can do all kinds of testing without it you will just have to rely on your written notes.

11.8. Do I need to transcribe my interviews?

Yes – mostly!

During your test sessions, whether these are interviews, background interviews, prototype testing or regular usability testing, you often record the sessions on video, tape recorder or the like.

Every one of these recorded test sessions should be transcribed into text before the analyzing of the test data begins. Transcribing means that you go through the recordings and type word for word what you hear. The transcription needs to be as exact as possible, as the interpreter – at this stage in the process – will not know what might be relevant and what is not.

Even though the process of transcription is a very time consuming process, the transcriptions will be of indispensable help to you in the further process, as it will:

- Help you get familiar with – and remember – what happened at the sessions, the actions taken, the thoughts and views expressed during the sessions. It is fairly certain that after a couple of tests you lose the ability to remember what happened when.
- Make further analysis and interpretation possible, and help you categorize incidents, problems and actions as well as identify patterns and tendencies.
- Help document the identified problems and support recommendations and solution suggestions (this is particularly important if the person analyzing the results is different from the test facilitator or if you are part of a usability team).

As a guiding rule, a one-hour test session usually takes six to eight hours to transcribe. The actual use of time varies greatly depending on various factors such as recording equipment, the sound quality of the recording, the speed and sound level of the speech, the number of informants participating in the test session at the same time, how quick the transcriber types and how familiar they are with transcribing.

On the internet you can find different transcription programs designed to assist the transcription of audio recordings (for example Express Scribe or Soundsciber) – some of which are free and can be used without any restrictions (in the hope that you will buy their commercial version of the product). These programs usually make it easy to stop and restart the recording, wind forward and backward, as well as loop a certain sequence of the recording allowing you to double check that you have not left anything out. They have search, notes, counting and coding facilities to help you with the following analysis. Some of these programs allow you to add a foot switch to help you perform start and stop actions.

Good advice to speed up your transcription and get a better result

- Use a good-quality stereo headset. The better you can hear what you are transcribing, the more you will be able to type without having to go back over the audio again and again.
- Work in a quiet environment to maximize your ability to hear the audio.
- Create templates if you need to transcribe a larger number of recordings, so all you have to do is fill in the necessary blanks and start typing, rather than having to re-create the documents over and over again.
- Create macros in your software program. Macros will from a few letters insert long sentences you commonly use saving the transcriber a lot of time and keystrokes and help you keep up with the spoken word. Also, take advantage of your software's automatic correction functionality to create shorthand codes for commonly used words or phrases.
- Practice – the more you transcribe, the faster you will get (and the more routinely you will be able to use your macros and automatic correction shortcuts).
- Spell check your final product and proof it for grammar and make sure that you have not inadvertently used any wrong words. If you are in doubt, then listen to the recording again, or let somebody else do it, just to be sure you got the words right. The reliability of the transcription can be increased with the use of two independent transcribers.

11.9. Do I need to invite as many informants as possible to my (qualitative) usability test?

Usually 8 to 12 informants will effectively spotlight a substantial number of the website's strengths and weaknesses.

The question of how many informants you need for a test has been, and still is, the subject of an ongoing discussion among testing professionals. They argue about how many test users it takes to find a certain percentage of usability problems on a website. Some argue that five users are enough to find 80-85 % of all usability problems. Others argue that no less than 15 users will be necessary to get a valid and reliable result. A lot of effort has been spent arguing for different kinds of mathematical formulas for “estimating problem discovery rates”. It is beyond the scope of this catalogue to go further into these theoretical discussions. Instead we will try to approach the question from a practical point of view.

First of all, it is important to remember, that “zero users give zero insights”. If you make tests with a few informants you may not find all usability problems – you may not even find the most important ones, but at least you will find some. And every single usability problem you erase from your site is one less frustration for the users. Therefore, if you are short on time and resources, it is better to test with just a few informants (or even just one), than to do no test at all.

Secondly, it is of crucial importance that the group of informants used for a test must mirror the expected user population. If the target group is very complex, you need to test additional users even though there might be similarities between the observations from the groups. You will need to make sure that all important variations and segments that might influence the way users interact with your website are represented among the test informants. If you have different potential user groups (for instance customers and staff; parents and their children) the two groups of users will have sufficiently different behaviour for it to become necessary to test with informants from both groups.

If time and resources were unlimited we would advise you to test with as many different informants, and as many times during the development process, as possible. But for practical purposes, and based on experience conducting usability tests, we find that 8 test users is a good compromise that will provide you with a lot of useful findings.

If you test with less than five informants you might overlook important usability issues. Typically, by informant number 5 clear patterns tend to emerge and usability problems start repeating themselves. From participant numbers 5-8 there will be a lot of repetition but occasionally new issues show up. Cost and workload does not increase appreciably from 5 to 8 informants. This is not to say that informants 8 to 15 would not be similarly helpful, but from a practical standpoint, given the realities of test expenses, we find that 8 test users who represent one or two core groups of users will be sufficient. They can successfully spotlight core strengths and weaknesses of your website's information architecture, visual aesthetic, ease of use, and use satisfaction. Iterative testing will then enable us to make changes and, in a second round of tests, evaluate 1) the efficacy of changes done after the first test round and 2) catch any new important issues.

There is, however, a special technique used by a growing number of testing professionals. It is referred to as "**RITE**" testing – **Rapid Iterative Testing and Evaluation**. Using this approach you distribute your budget across many small focused tests, following an iterative test-and-design methodology, instead of using your entire test budget on a single, elaborate study with a large number of informants. The approach differs from usual methods in that it advocates that changes to the user interface are fixed as soon as a problem is identified and a solution is clear. Sometimes this can occur after testing only one informant as there is no point in seeing more

informants struggle to overcome the same problem. The changed interface is then tested with the next user in the following session. The rapid iterations are necessary because there is no guarantee that the “fixed” design does in fact solve the problems found in the first study. Also, there will always be a risk of introducing new usability problems when fixing the old ones.

Notice: If you want quantitative information from testing your products or systems, you'll need more informants to be able to derive statistically representative results. Your sample size (number of informants responding your questions) needs to be big enough to secure validity, reliability and generalizability. Sample sizes may vary enormously. The smallest quantitative surveys comprise less than 100 interviews (often 60 is cited as the smallest “stable” sample); while the largest surveys comprise many thousands of responses. In deciding on sample size we need to take into account a number of factors:

1. How big is the group of people of interest – is it most of the population “in the world” or is it a much smaller segment.
2. The number of subgroups which we want to analyze – the sample size will then have to be big enough to provide you with a stable amount of responses within each group.
3. The purpose of the result. Consider what your acceptable level of ‘error’ is. Will results be used for public purposes or for internal purposes only)

On the internet you can find more details about how to calculate the size of you sample depending on the accepted margin of error.

11.10. How do I make tasks and questions for the test?

11.10.1. Tasks for usability tests

Between three to five tasks in relation to interviews or usability tests are suitable – depending on the complexity of the tasks.

As you consider what to ask informants to do during the usability test, focus on tasks that:

- uncover the biggest problems,
- are critical (important for your business to obtain success – Key Business Areas),
- are done frequently,
- have serious consequences if done incorrectly,
- you or managers, designers, developers, writers are worried about,
- are free of hidden clues and jargon.

In general, the task must appear as realistic as possible and mirror the users’ work tasks, use situations and needs – not just the facilities of the system. Therefore formulate the tasks on the basis of at least one of the following:

- Every kind of concrete knowledge you might have about users’ behaviour on your site (statistics, observations, webmaster-questions, pilot interview, etc.)
- Concrete tasks you have seen users perform during a field study, where you have visited members of your target groups in that specific context in which they normally use your product – at workplaces, at home, at educational institutions etc.
- Interview-based tasks formulated by the informants themselves. You might ask them what they usually do using this (or similar) products, or how they usually solve tasks like the one you want to know more about. Letting the informants define their own tasks, secures the maximum degree of relevance.

11.10.2. Tasks for discussions in focus groups

Using questions in an interview or a focus group also aim at providing an overall direction for the discussion and help start the discussions in case it “dies out”. The questions should flow from

general to specific. Questions should be open-ended, simple, unbiased, and focused on the issue at hand. Find questions that can be used to trigger more conversation, not just lead the discussion to a particular answer. Remember to use the questions ONLY if the conversation dies out.

11.11. How does the “think-aloud method” work in usability tests?

Think aloud method (also called “Think aloud protocol”) is a technique where users are asked to vocalize their thoughts, feelings and opinions while interacting with a site as they perform a task. While focus in other user testing methods is primarily on how effectively a user performs the required tasks (and not on how users believe they are performing), verbalizations are useful in understanding mistakes that are made and getting ideas for what the causes might be and how the interface could be improved to avoid those problems.

Most informants find it odd to speak their thoughts out loud, and they will need to know (and continually be reminded) that it is the most important element of the test. Begin the test by introducing the “think-aloud-method” to the informants.

11.12. Which roles are involved in usability tests?

11.12.1. Informants

The informants are the people who are participating in the usability test – whatever form it might have. In a test there might be one or more informants – depending on the method used. Informants should be considered as someone to provide information to the developers, and not someone being *tested*. We design – or try to design – systems and services to specific user groups and from these groups we select our informants. For this reason informants are “*the experts*”, and not someone who has misunderstood your product.

11.12.2. Facilitator

The facilitator is usually someone trained in usability or a usability practitioner. Their responsibility is to sit along with the informants doing the tests – either this is a single person in an interview, or it is a group of informants participating in a focus discussion.

The facilitator's main responsibility is to ensure that the session is not too stressful for the informants, who tend to blame themselves when they run into difficulties with the interface. The facilitator must be able to create a relaxed, informal atmosphere where informants feel free to express their opinions.

Advice to the facilitator

1. Keep as neutral as possible while the informant solves the tasks and never express your opinion about the informant or the product – neither defend it, nor criticize it.
2. The facilitator is normally not allowed to help the informant and should be very careful not to give direct or indirect assistance using vocal or body language. If an informant is unable to continue without help, the facilitator should only provide an absolute minimum of help. On the other hand, the facilitator needs to probe into the issues that arise, so the development team can get the information they need to make the needed improvements. Having a feel for what is the right level of prompting is a skill central to running, for instance, a think-aloud session.
3. If necessary – remind the informant to think-aloud.
4. The facilitator must keep an eye on the clock so as many of the important areas and issues as possible are covered within the time frame.

11.12.3. Observer

With test methods where the facilitator is in direct contact with the informants, it is advisable to have one or two observers. The observer is a person that might be present during a test, but will never – except from the first hello – participate in the dialogue with the informant. While the facilitator’s attention should be focused on the dialogue with the informant, the observer can focus broader and will often notice things that the facilitator misses. In addition to this the observer is allowed to note interesting incidents during the test and act as a sparring partner for the facilitator.

There might be more observers than one. Sometimes it can be a very good thing to let the developer team watch the users struggle to use the product. This can have a very convincing effect, and help the team to keep focus on the user’s experiences instead of their own.

Just remember to pay attention to the informant’s wellbeing. It might get very unpleasant for them if there are too many observers “on the shoulder” of one informant. It is advisable to “hide” observers so they are less visible to the informants.

*Advice to the observer*²⁰

1. Stay for the entire test, but keep out of the informant’s sight.
2. Keep as neutral as possible while the informant solves the tasks. Never let the emotions show no matter what the informant does. Be conscious of your body language.
3. Never help the informant. It is the facilitator’s role to get informants back on track if they get stuck.
4. Respect the informants and the confidentiality of their data. Do not include names in any reports.

11.12.4. Inspectors

In some test methods there is no direct contact with the informants. Instead the test is done with the involvement of “Inspectors”, which is the case with “Heuristic Inspection” and “Cognitive Walk-Through”. In both these methods inspectors are asked to go through a web product and evaluate it on the basis of well known and accepted heuristics or the perspective of the user.

Inspectors are usually someone with a lot of experience in working with software design, usability and usability heuristics. It is a must that they are capable of working systematically as well as be loyal to the chosen heuristics or user perspective.

11.13. Reading pattern (and writing guidelines)

Users reading on the web follow a scan pattern that is very different from the way they read a printed book. Reading on the web takes 25% longer time than reading on paper²¹ and the reading pattern follows in a consistent way a “F“-shape with two horizontal stripes followed by a vertical stripe (see illustration).

First, users read in a horizontal movement, typically across the upper part of the content area. This forms the F’s top bar. Second, they move their eyes a bit down the page and then read across in a second horizontal movement



Source: <http://persuasionbusiness.blogspot.com/>

²⁰ Paper Prototyping by Carolyn Snyder, published by Morgan Kaufmann Publishers.2003

²¹ ”Brugervenlighed i praksis”, by Rose & Soerensen, Frydenlund (2004), p. 99.

that typically covers a shorter area than the previous movement. This forms the F's lower bar. Thirdly, users scan the content's left side in a vertical movement. This forms the F's stem.

This reading pattern appears clearly in eye tracking visualizations as "heat maps". A heat map shows how much users look at different parts of a web page. Areas where users look the most are red; the yellow areas indicate fewer views and blue areas the least-viewed. Grey areas didn't attract any views at all.

The implications of this F-pattern are²²:

- Users read differently on the web – for which reason you have to write differently.
- Most users do not read your text thoroughly in a word-by-word manner. Some users will read more, but most will not.
- Users might read your most important information – if this is placed on the page in the two horizontal stripes of the F.
- It is more likely that information in the upper horizontal stripe will be read than information in the lower stripe.
- Use subheads, paragraphs, and bullet points with information-carrying words which is more likely to be noticed by the users when scanning down the left side of the content in the final stem of their F-behaviour.
- Users read the third word on a line much less than the first two words.

Increasing readability – guidelines

Here are a few guidelines to increase the readability of your text on the web²³

- Write half as much – minimize the amount of text and cut to the bone.
- Write for the target group – write only words and statements familiar to and relevant for the target group.
- Place the most important information (the conclusions) on the page in the two horizontal stripes of the F.
- Write directly to the reader using the form "You".
- Avoid language imperfections in for instance spelling, commas, grammar, foreign words etc.
- Write short, precise and factually. Organize your text hierarchically in levels so the first level is "light" and gives an overview, while the more "heavy", explanatory, elucidating information is "hidden" under for instance links to "Read more".
- Use resumes – sum up conclusions at the end of a longer, explanatory text.
- Put only a few links directly in your text – otherwise it decreases the readability
- Increase readability by using punctuation.
- Make the text narrow – so it does not fill more than half the size of the screen.
- Use lots of smaller text sections with short but explanatory headings. Each subject – one section.
- Let headings be explanatory.
- Use bold and italic when you want to accentuate text. Avoid underlining your text – users will assume it is a link.

²²Jakob Nielsen – http://www.useit.com/alertbox/reading_pattern.html

²³"Brugervenlighed i praksis", by Rose & Soerensen, Frydenlund (2004), p. 99.

11.14. Affinity diagram

An affinity diagram is a method to gather and structure large numbers of ideas during a brainstorming or a test session and sort them into logical groups for review and analysis and to capture themes that have emerged. These diagrams, simple to produce, are particularly useful in large groups where ideas which are generated at a fast pace require to be organized.

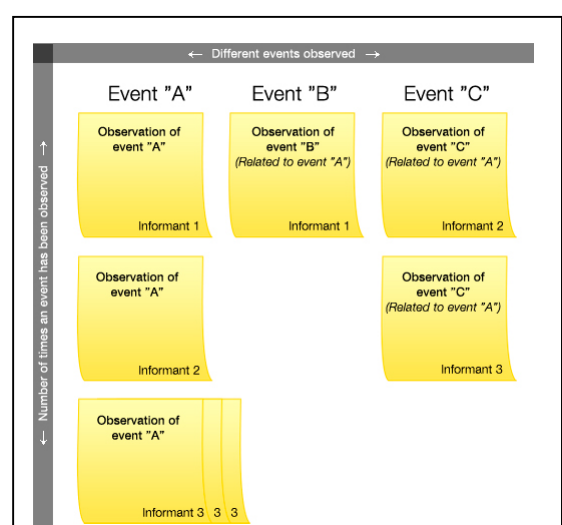
The process for producing the affinity diagram is the following:

1. Conduct a session for the input collection. This could be for instance a brainstorming meeting or a usability test.
2. Record ideas and issues on post-it-notes or cards. This can be done during the session (in groups or individual) as well as afterwards, if the session is recorded.
3. Gather post it notes/cards in a single place (for instance a desk or wall)
4. Sort the ideas into groups. It is best if this grouping of ideas is done together with the informants based on their thoughts. If this work is done afterwards, the usability team may do the work. Continue until all cards/notes have been sorted and the team is satisfied with their groupings.
5. Name each group with a description of what the group refers to and place the name at the top of each “group”.
6. Capture and discuss the themes or groups and how they may relate. Use an appropriate number of groups within the diagram. Too many groups can become confusing and unmanageable. Too few groups does not allow for analysis.
7. At the end – make sure that ideas/issues that have been captured are understood (brainstorming sessions have a habit of simplifying issues or agreeing without understanding the concepts being discussed).

Step 1: Result of brainstorm on usability issues



Step 2: Affinity Diagram



On the internet there are several resources from where you can get different kinds of templates, guidelines and check-lists to support your usability activities.

A few of these resources are worth mentioning in this guide, as they free of charge offers a huge amounts of well-considered and useful templates. These templates can help you with:

- Organizing the notes you take during a test situation. This allows you to keep your full attention on the informants and the test situation.
- Remembering what to say and do in a situation most people are not particular familiar with (when not working with usability testing every day).
- Ensuring a certain level of homogeneity from test to test as well as in the following handling and analyzing of test output.
- Handling the situation with surplus and seriousness which will emphasize the importance of the informants' effort.
- Increase efficiency of some of the very time consuming processes.
- Professionalize your test activities, which is an advantage in relation to the involved decision makers and for the result.

Take a look at the templates on the following websites. Both offer collections of forms, checklists and other useful documents for conducting usability tests and user interviews. They can be customized for your organization's usability needs. All of these are in the public domain and can be freely downloaded. Credit to the original contributors, when available (usually included in each file), is appreciated.

1. Usability.gov

An official U.S. Government website and the primary government source for information on usability and user-centered design:
<http://www.usability.gov/templates/index.html>

2. Usability & User Experience Community

A community to share information and experiences on issues related to the usability and user-centered design:
<http://www.stcsig.org/usability/resources/toolkit/toolkit.html>

12. Appendices

12.1. Appendix 1 – Criteria to evaluate usability

Several criteria can be used to evaluate the usability of any system²⁴:

- **Accessibility** – how easy it is for different kinds of users to use the application (users with special needs, children, etc.) in diverse environments and through diverse channels.
- **Learnability** – how easy it is for users to learn how to use the application
- **Memorability** – how easy it is for users to use the system after a long period of non-use
- **Efficiency of use** – how easy it is for users to complete their tasks within the application
- **Correctness** – lack of errors, or at least existence of only a few, relatively unimportant errors.
- **User satisfaction** – how pleasant is the user experience.
- **Usefulness** – the ability of the application to provide value to its users through appropriate functionalities, content, structure, and form.
- **Appropriateness** – the match between what an application provides in the situation it is intended for, and the audience it wishes to address.
- **Quality** – the conformance of the application to context-specific excellence criteria, such as high quality and usability design, authenticity of visual resources, and authority of content.

²⁴ As defined in: Calimera – Cultural Applications: Local Institutions Mediating Electronic Resources. Deliverable D18: Usability Guidelines", (Contract No. 507740). 2005. p. 4-5. And by Jakob Nielsen www.useit.com

12.2. Appendix 2 – Jakob Nielsen’s 10 usability heuristics

1. Visibility of system status – Does the system always keep users informed about what is going on, where they are and can go next, through appropriate feedback within reasonable time?
2. Match between system and the real world – Does the system speak the users’ language, with words, phrases and concepts familiar to the user – making information appear in a natural and logical order?
3. User control and freedom – Does the system make it easy for users to escape an unintended action, using undo and redo facilities as well as “emergency exit” possibilities?
4. Consistency and standards – Does the system follow platform conventions and never confuse the users using different words, situations or actions for the same thing?
5. Error prevention – is the system designed so it prevents problems from occurring?
6. Recognition rather than recall – Is the system intuitive to use and re-use, does it provide visible as well as easy retrievable instructions for use?
7. Flexibility and efficiency of use – Does the system provide facilities for both the inexperienced and the experienced user such as accelerators (unseen by the novice user) allowing experienced user to tailor frequent actions?
8. Aesthetics and minimalist design – Is the system designed so it provides relevant information in such a way, that relevant parts do not have to “compete” with irrelevant or rarely needed information (organizing information in layers, use of links to details)?
9. Help users recognize, diagnose, and recover from errors – Does the system provide error messages expressed in plain language, precisely indicating the problem and constructively suggesting possible solutions?
10. Help and documentation – Does the system provide the users with the necessary help facilities such as contextual online help, search possibilities, user task focus or lists divided into steps)?.

12.3. Appendix 3 – Draft of a Test Report

Reporting the test result is normally not offered many thoughts as this activity takes place when the usability practitioner has mentally completed the test. Do not underestimate the importance of presenting your test result in a report which can be used effectively by the developers, financial providers, customers or yourself. Above all, a good usability report must be convincing and reliable which implies.

- The results are analyzed properly.
- It is it possible for others to learn from your usability activities.
- It builds up the usability qualifications of the organization.
- The results appear more professionalized and convincing. This makes it easier for decision makers and developers to let the findings support their next step in the development process.

There are many ways to document the findings of your test. In principle it can be done on the back of a paper napkin, but here are some main recommendations for creating a usable usability report. Just keep in mind, that even a perfect report is useless if it does not result in beneficial changes to the interface. Good communication with the development team through effective consensus building is even more important than a good test report.²⁵

Advice to writing of test reports:

1. Keep it short. No more than approximately 50 comments and 30 pages. It is part of the job of the usability professional to limit the comments to the ones that are really important.
2. Provide a *one-page executive summary* in the beginning of the report. Include the top three positive comments and the top three problems.
3. Describe very shortly, and in a precise and neutral language, each observation and illustrate with a user quotation from the test. Do not forget to include positive findings. The *ideal* ratio between positive findings and problems is 1:1.
4. Classify the comments. Distinguish between disasters, serious problems, minor problems, positive findings, bugs, and suggestions for improving the interface. Use a recognizable icon for each category.
5. Include illustrations and screen dumps with arrows and circles pointing out the issues at stake.

²⁵ DialogDesign ved Rolf Molich – http://www.dialogdesign.dk/Testrapporter_fra_DD.htm

12.3.1. A Suggestion for The Structure of A Test Report

Chapter 1:

a. Introduction.

What is tested – which site?
 When did the test take place?

b. Executive summary.

Mention the *most important findings* – that is issues that turned out during the test to be the most important findings in relation to the focus of the test. Mention both the positive and the problematic findings, but keep this list short, informative and limited to the most important findings. You can let yourself be inspired by the following report draft, though some of the things mentioned will not always be necessary, depending on the degree of formality of the delivery. See the following examples:

- Specifying searches: Most computer users have problems specifying searches, so the catalogue User Interface (UI) must make it as easy as possible.
- Conceptual model: The UI does not match the conceptual model that a typical patron has of a library catalogue. Better organization of information and better visual design would help patrons understand search results and other screens.
- Terminology: The system uses many technical terms that users will not understand. Software should always employ the users' terminology.
- Consistency: Some important features are not always present and the system does not always follow web standards. Users need this consistency to learn and use software.

Chapter 2:

a. A report outline.

How is the report build op?

b. The purpose of the test.

What was the focus of the test? For example: Design of the site, usability and relevance for the users.


c. Procedures.

Who was tested and why? Specify in what way this choice might have an effect on the test result.

d. How? Where? When? If the test has a more formal character a more detailed description can be added as an appendix.

e. Categorizing the observations or findings.

It is very useful if you categorize the issues and problems you have observed during the test according to their importance in relation the usability of the product. This will help decision makers and developers to plan the next iteration. Explain the categorization you use in your report and mark the categorization with a small symbol like for example:

- “V”: good – a solution that works well.
-  : a good idea – suggestion from an informant, which might better the usability.
- “!” : a cosmetic problem – observation with minor influence.
- “!!” : a disturbing problem – should be fixed as it disturbs the use of the product.

- “!!!” : a serious problem – disturbs the task so much, that the test user cannot continue the test without help.
- “(!)” : a potential problem identified by the facilitator, which might cause problems for other users.

Chapter 3:

This chapter contains a detailed list of all the relevant observations done in the test. Depending on the number of iterations the product has been through the list might be long. Classify the observation themes and mark them with a symbol according to their importance for the use of the product. Give examples and use screen dumps if relevant as this makes it easy for the developers to visualize the problem. List your recommendations concerning each specific issue.

Appendix A:

If the test has a more formal character you can describe the test method in detail.

Appendix B:

A diagram containing names and selection criteria concerning informants. The diagram can build on personas or knowledge about the character of the users of the product. Such a diagram might look like this:

No.	Profession	Subject	Gender	Age	Knowledge of website	IT-knowledge	Notes
1.	Researcher		Female	40-50	Never	Standard	
2.	Researcher (ph.d.)		Male	30-40	Often	Experienced	
3.	Student (last year)		Male	20-30	Often	Standard	
4.	Student (1. year)		Female	20-30	Limited	Experienced	
5.	Student (last year)		Female	20-30	Often	Standard	

Appendix C:

List of tasks used in the test

12.4. Appendix 4 – Videotape Release Form

I agree to participate in the study conducted and videotaped by the [Agency].

I understand and consent to the use and release of the videotape by [Agency]. I understand that the information and videotape is for research purposes only and that my name and image will not be used for any other purpose. I relinquish any rights to the videotape and understand the videotape may be copied and used by [Agency] without further permission.

I understand that I can leave at any time.

I agree to immediately raise any concerns or areas of discomfort with the study administrator.

Your signature: _____

Date: _____

Please print your name: _____

Thank you!

We appreciate your participation.

Source: www.usability.gov

12.5. Appendix 5 – A Heuristic Inspection Checklist

Heuristic no.	Review Checklist	Is it ok? Yes/No 0 = unacceptable 1 = acceptable 3 = better than most 5 = outstanding	Comments	Importance

More examples:

http://www.stcsig.org/usability/resources/toolkit/he_cklst.doc

http://www.stcsig.org/usability/resources/toolkit/brief_h.doc

12.6. Appendix 6 – A facilitators checklist

Checklist 1: a week or so before the test

- Take the test yourself
- Conduct a pilot test
- Revise the product
- Check out all the equipment and the testing environment

Checklist 2: one day before the test

- Check that the video equipment is set up and ready
- Check that the product, if software or hardware, is working
- Assemble all written test materials
- Check on the status of your informants
- Double-check the test environment and equipment

Checklist 3: the day of the test

- Scan your customized checklist
- Prepare yourself mentally
- Greet the informants
- Have the informants fill in and sign any preliminary documents
- Read the orientation script and set the stage
- Have the informants fill in any pre-test questionnaires
- Move to the testing area and prepare to test
- Start recordings
- Establish protocol for observers in the room
- Provide any prerequisite training if your test plan includes it
- Either distribute or read the written task scenario(s) to the participant
- Record start time, observe the informants, and collect all critical data
- Have the informants complete all post-test questionnaires
- Debrief the participant
- Close the session
- Organize data collection and observation sheets
- Debrief with observers
- Provide adequate time between test sessions
- Prepare for the next participant

Source: www.usabilityworks.com

12.7. Appendix 7 – A key Performance Indicator Report

There is a variety of ways you can deliver performance indicator reports throughout your organization. Email, spreadsheets, slides, documents, dashboards etc. are all usable. However, spreadsheets like Microsoft Excel provide most of the functionality necessary to reach the presentation goals. Additionally, many web analytics programs provide direct data access from Microsoft Excel which simplifies the report generation process.

Basically a standard key performance indicator report shows values for the current and previous reporting period and typically also visual indicators of directional change, percent change, target value, percent of goal and any relevant warnings to quickly call out problem metrics.

A key Performance Indicator Report – an example

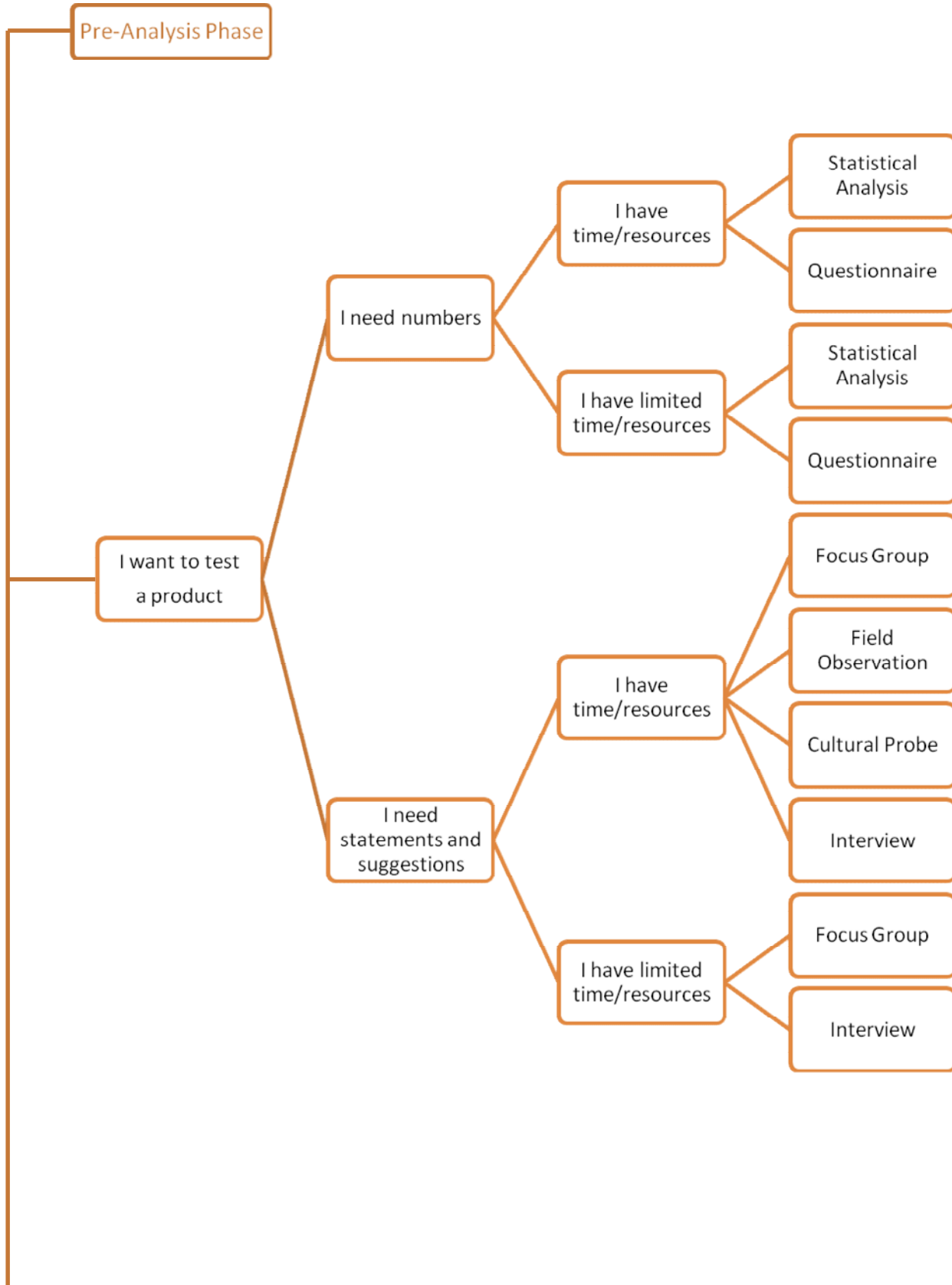
Key Performance Indicator	This Period	Last Period	Change	% Change	Target	% of Goal	Warnings
AVERAGES							
Average Page Views per Visit	2.5	1.6	▲	56%	5	50%	
Average Visits per Visitor	2	2.5	▼	-20%	5	40%	Off Target
Average Time to Respond to Email Inquiries (Minutes)	10	15	▼	-33%	5	200%	Precipitous Drop
Average Cost per Visitor	\$40	\$60	▼	-33%	\$30	133%	Precipitous Drop
Average Cost per Visitor	\$20	\$24	▼	-17%	\$10	200%	
Average Cost per Conversion	\$125	\$80	▲	56%	\$100	125%	
Average Cost per Visitor	\$40	\$60	▼	-33%	\$40	100%	Precipitous Drop
Average Revenue per Visitor	\$20	\$10	▲	100%	\$30	67%	
Average Revenue per Visit	\$10	\$4	▲	150%	\$10	100%	
Average Order Value	\$25	\$8	▲	200%	\$10	250%	
Average Items per Cart Completed	50	50	▲	0%	\$10	500%	
Average Clicks per Impression (Email)	0.08	0.032	▲	150%	1	8%	Off Target
Average Clicks per Impression (Banner Ads)	0.06	0.016	▲	275%	1	6%	Off Target

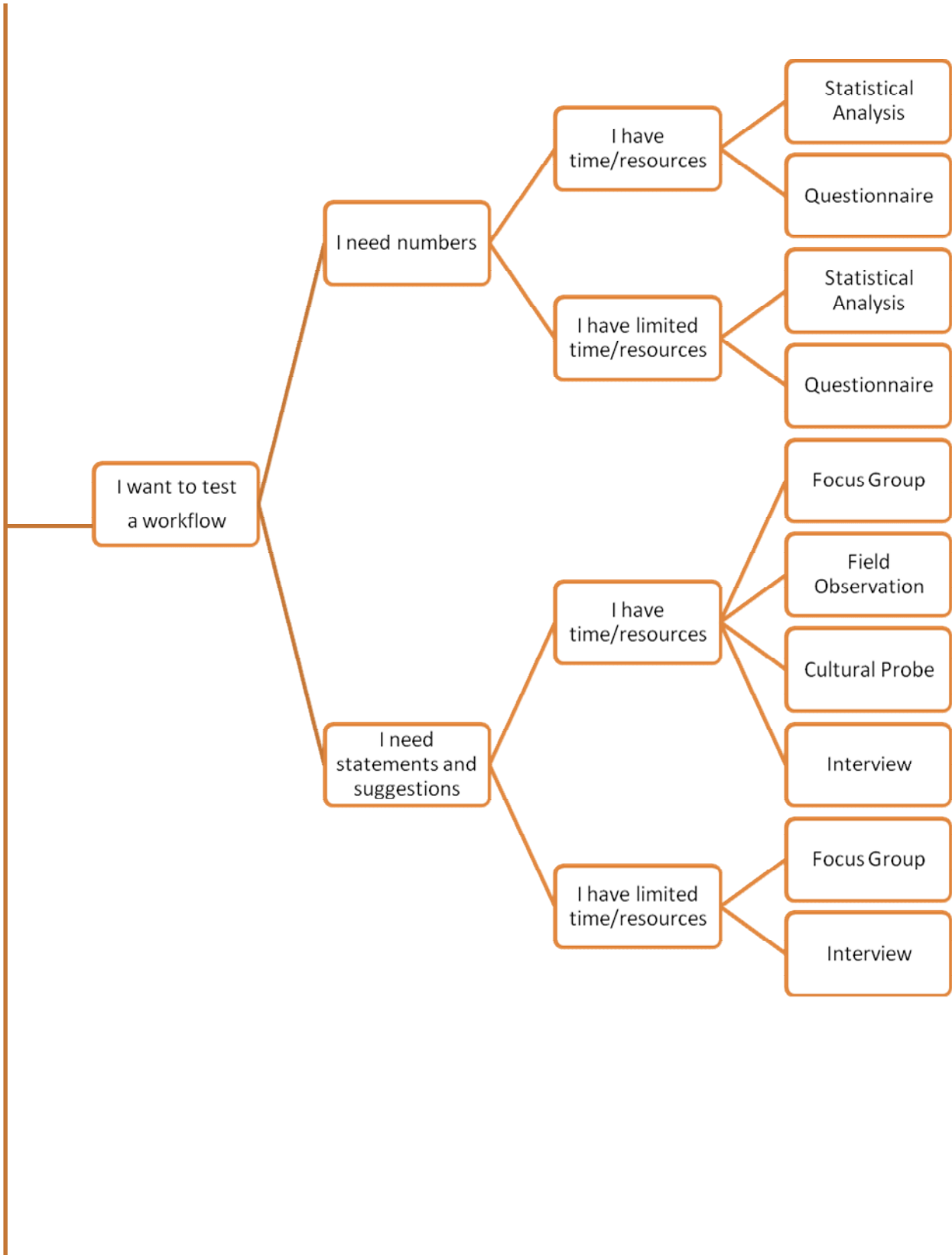
Source -"The Big Book of Key Performance Indicators", by Eric T. Peterson, published January 2006 (page 9).
http://www.webanalyticsdemystified.com/downloads/The_Big_Book_of_Key_Performance_Indicators_by_Eric_Peterson.pdf

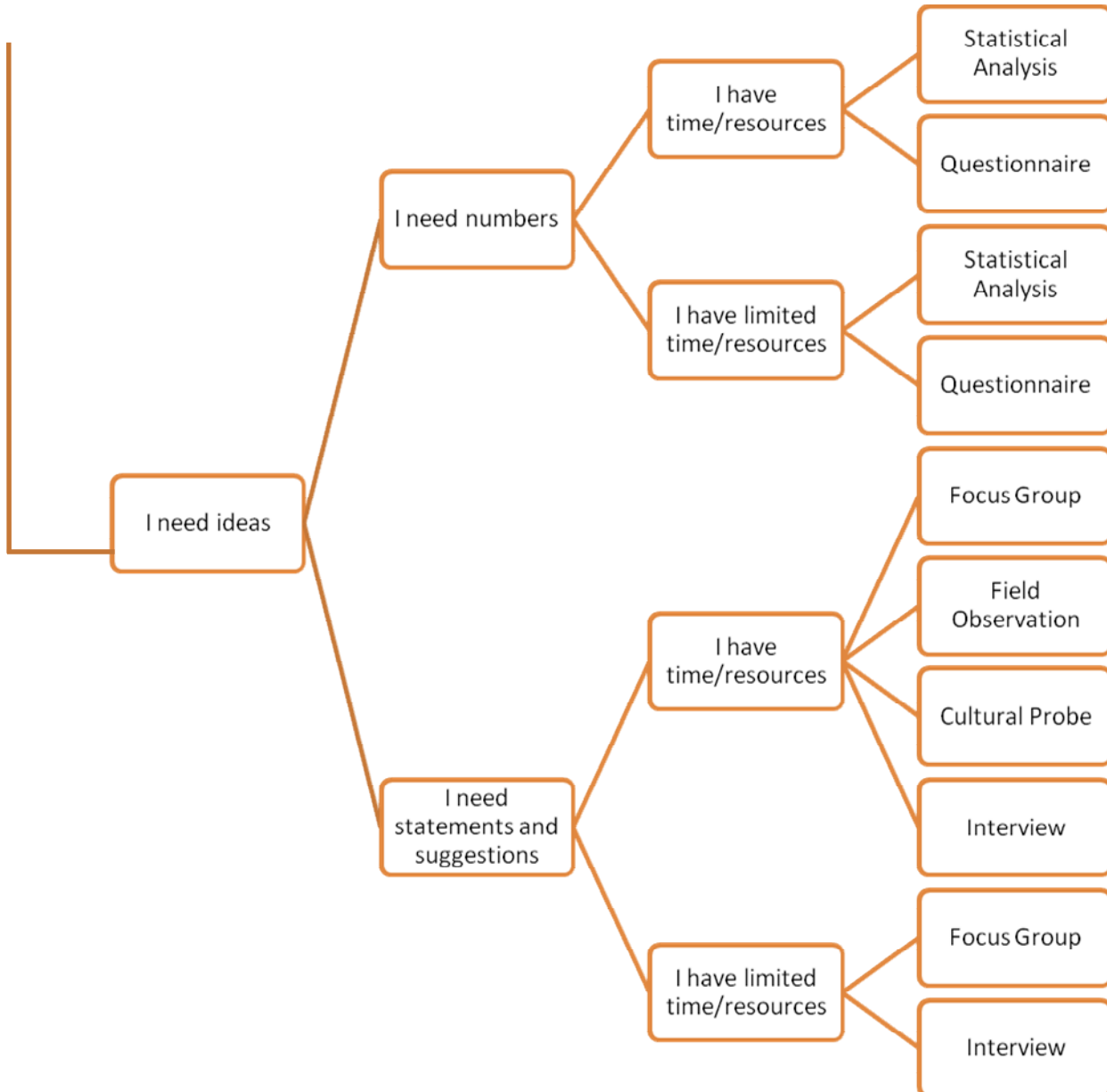
The visual indicators as the use of down- and upward arrows, as well as the colours red and green makes it very easy to identify the critical information in the report. Even without any warning messages.

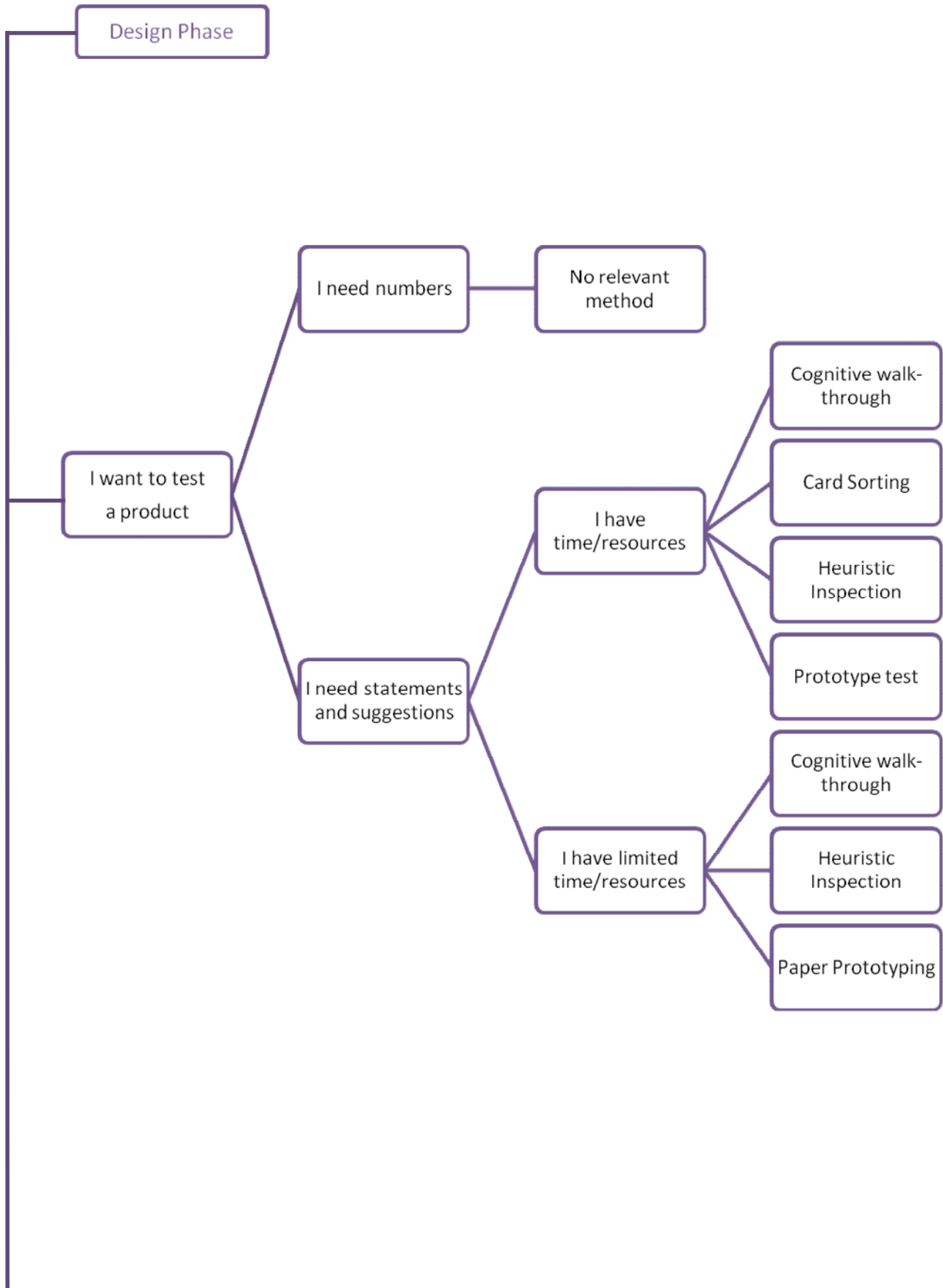
12.8. Appendix 8 – Decision Tree

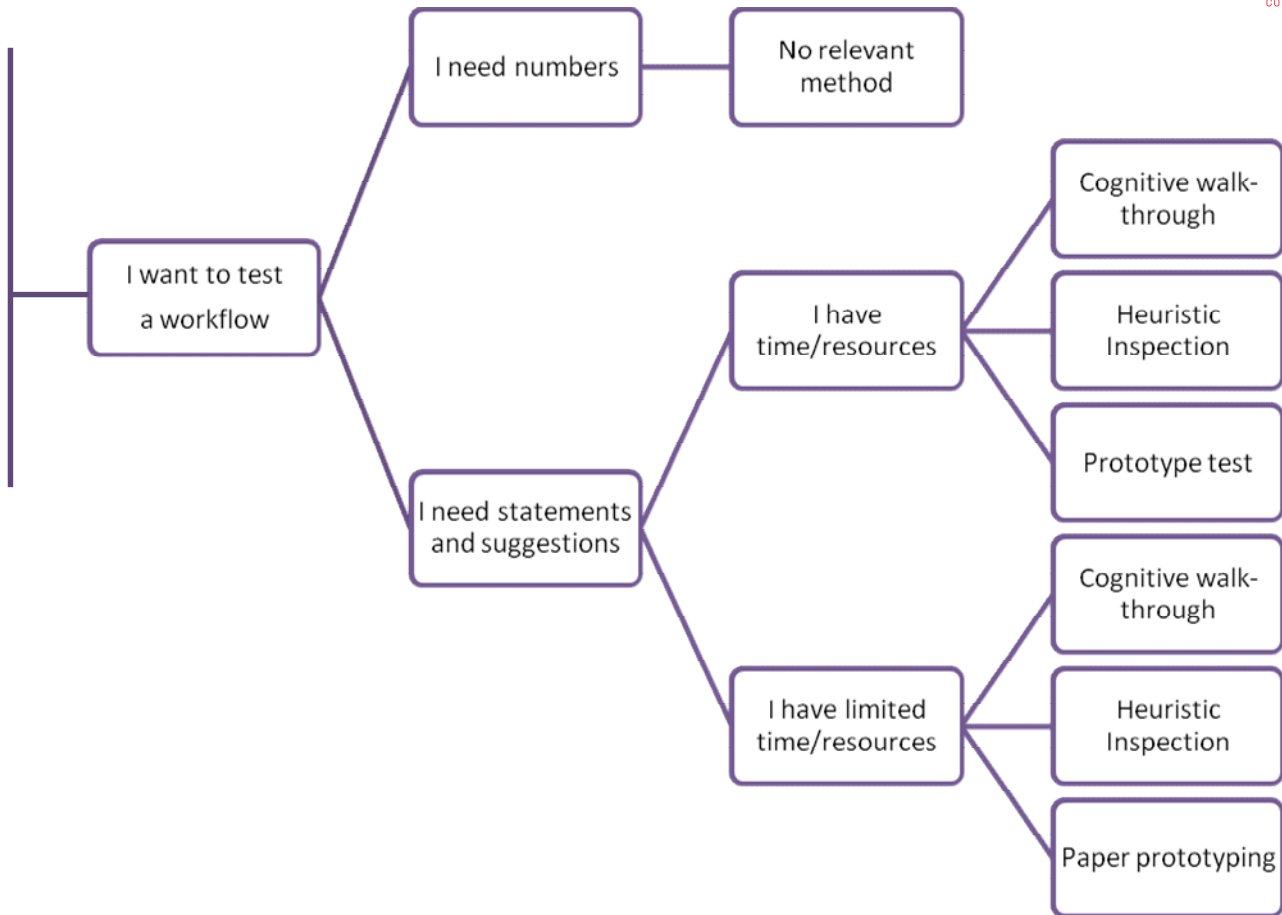
This decision tree is intended as a help for those unwilling to read through the whole guideline document. Choose your phase and desired outcome and look up the method in the index.

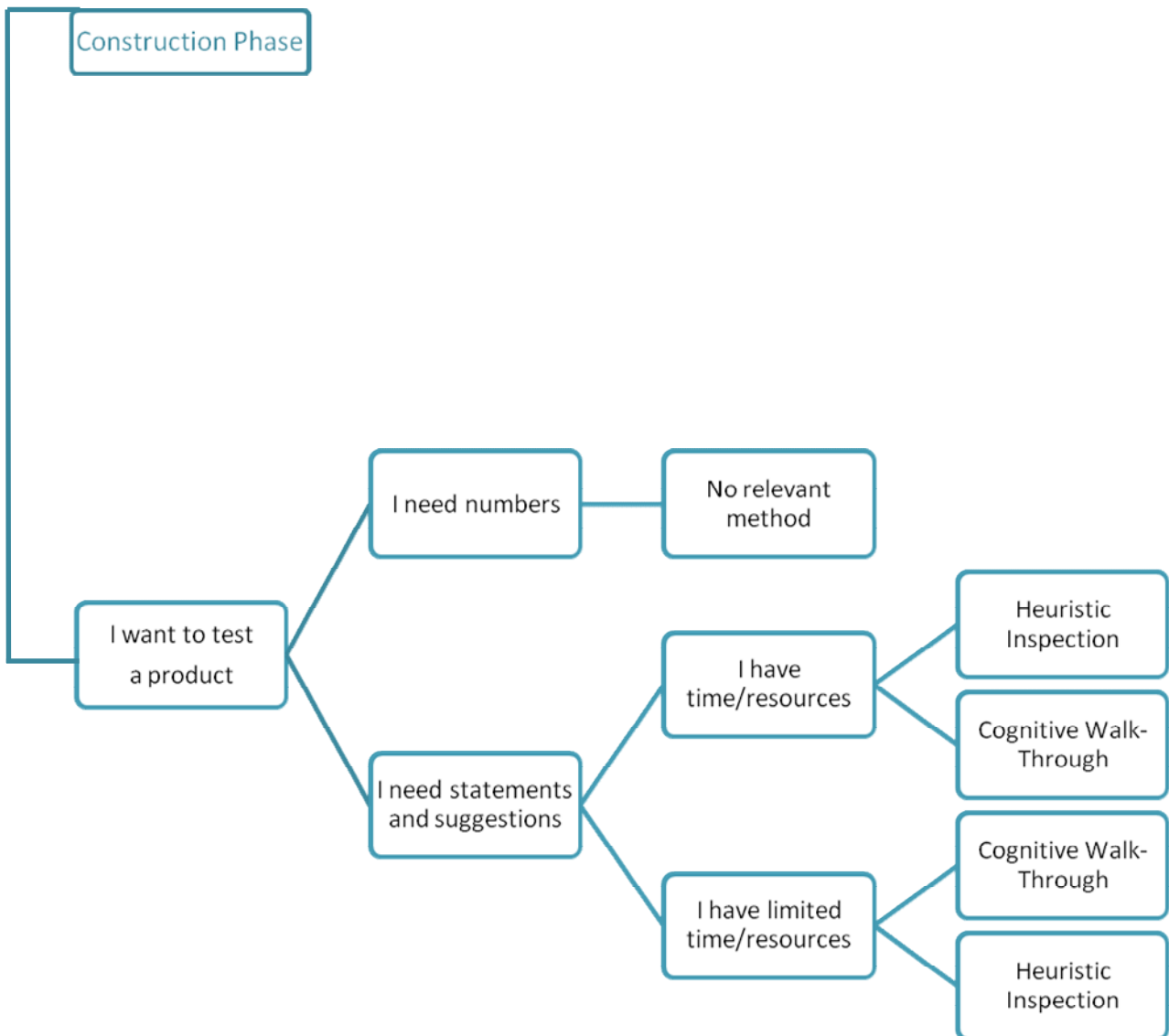


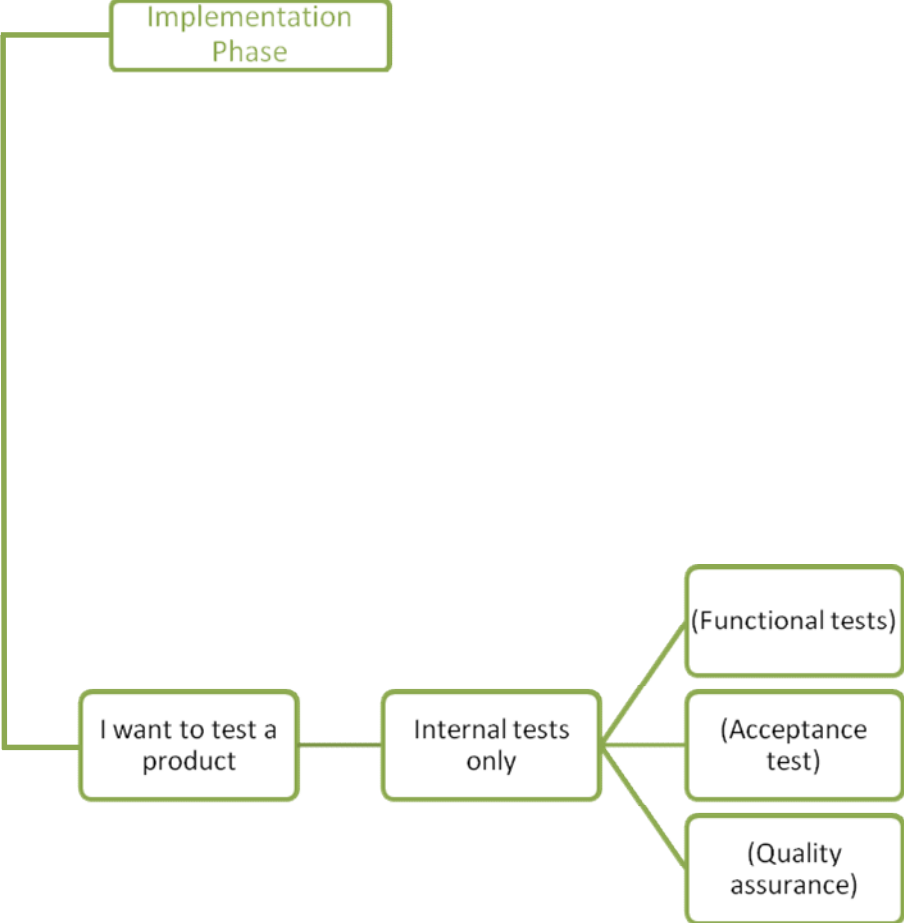


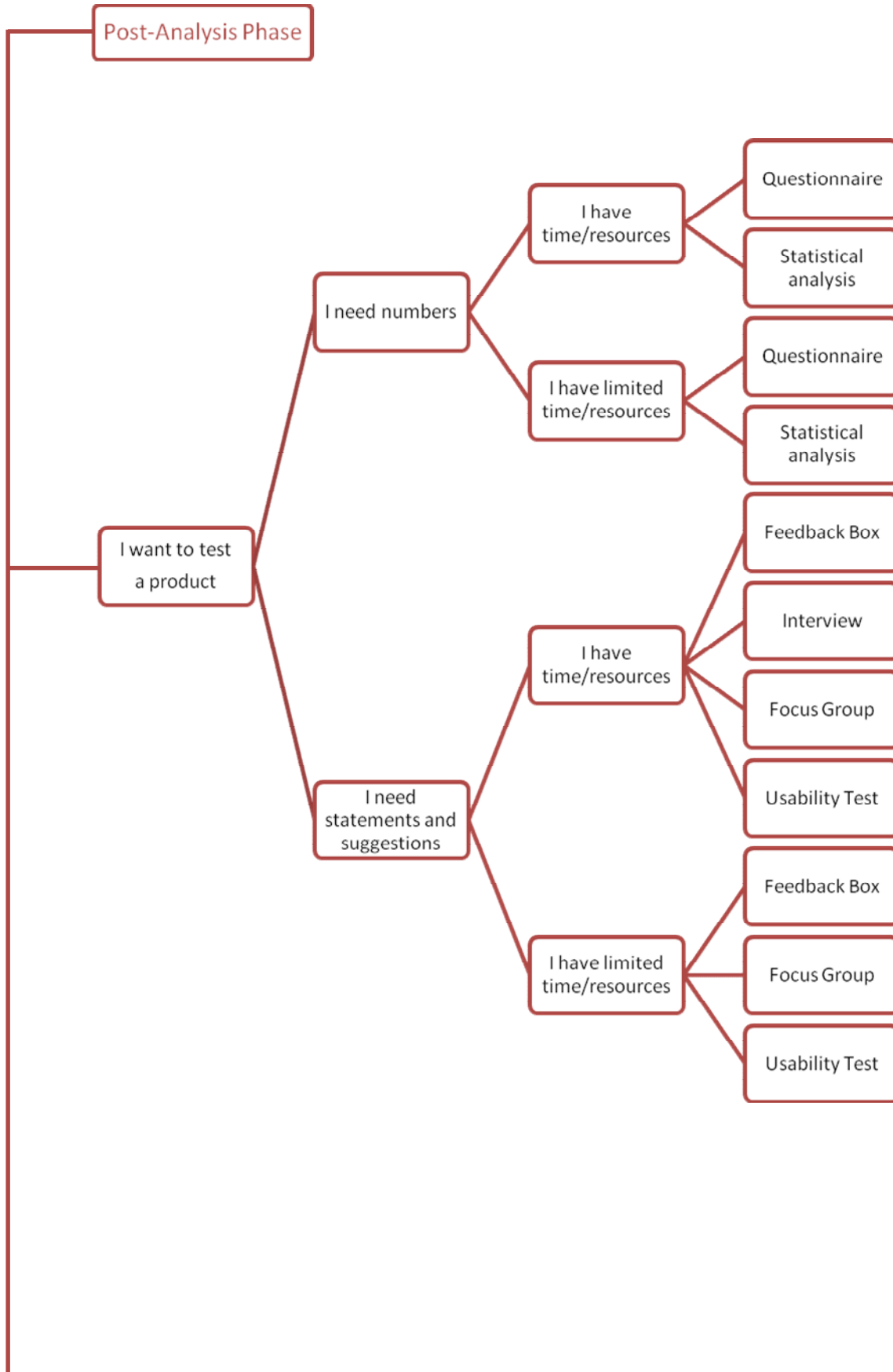


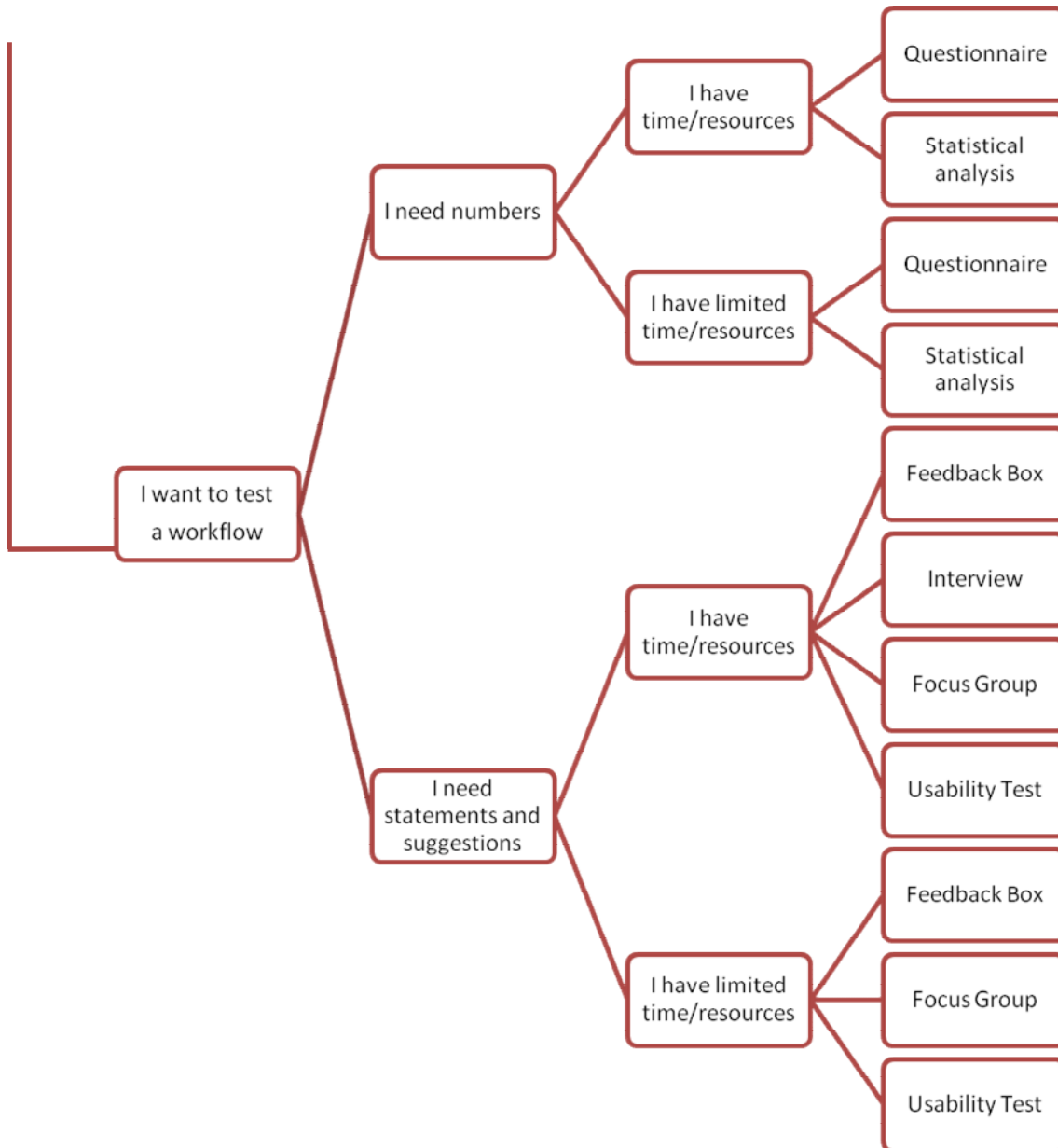












13. Suggestions for further reading

Concerning informants:

- <http://useit.com/alertbox/20000319.html>
- "A Mathematical Model of the Finding of Usability Problems" by Jakob Nielsen and Thomas K. Landauer. Proceedings of ACM INTERCHI'93 Conference (Amsterdam, The Netherlands, 24-29 April 1993), pp. 206-213.
- <http://www.usability.gov/>
- "Notes on Usability Testing – On the Number of Usability Test Informants" by Shawn Henry. Latest updated 23. September 2003 on Web Accessibility initiative WAI, WC3. <http://www.w3.org/WAI/EO/Drafts/UCD/ut.html>
- "Why You Only Need to Test with 5 Users", Jakob Nielsen's Alertbox on useit.com, March 19, 2000. <http://www.useit.com/alertbox/20000319.html>
- "Eight is Not Enough", by Christine Perfetti and Lori Landeman, published originally in user interface engineering's Newsletter: Jun 18, 2001. <http://www.uie.com>
- "Beyond the Five-User Assumption: Benefits of Increased Sample Sizes in Usability Testing", by Laura Faulkner, in Behavior Research Methods, Instruments, & Computers, 2003, 35 (3), 379–383.
- "What's in a Number?", by Carol M. Barnum, Originally printed in The Usability SIG Newsletter: Usability Interface, januar 2003 issue, (vol. 9, No. 3). <http://www.stcsig.org/usability/newsletter/0301-number.html>
- CHI 2003 Feature: "Testing... 1 2 3 4 5 ... Testing...", by Larry Constantine, published 1 May 2003. <http://www.usabilitynews.com/>
- "Determining Usability Test Sample Size" by Carl W. Turner, James R. Lewis, and Jakob Nielsen. In International Encyclopedia of Ergonomics and Human Factors, 2006, Second Edition, Volume 3. http://drjim.0catch.com/2006_DeterminingUsabilityTestSampleSize.pdf
- "How many users should you test with in usability testing? (Latest Research)", by Frank Spillers (professional usability consultant), published January 21, 2005 (http://www.demystifyingusability.com/2005/01/latest_research.html)
- "Not The Usual Suspects: How To Recruit Usability Test Informants", by Elizabeth Neal, published January 18th, 2005. <http://articles.sitepoint.com/article/usability-test-informants>
- "Testing web sites: five users is nowhere near enough", by Jared Spool and Will Schroeder. Published in: Proceeding CHI 2001 New York, NY, USA ©2001, ISBN:1-58113-340-5
- <http://articles.sitepoint.com/article/usability-test-informants>
Sampling techniques.
- http://www.resolutions.co.nz/sample_sizes.htm
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