Studies: Design, Procedure and Documentation

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Study design

Methods

As methods for these studies we propose to use interviews and focus groups (German "Gruppeninterview" resp. "Gruppendiskussion"), since they allow us to get acquainted with our communities and are relatively easy to organize and conduct. The choice is up to the community manager, but we suggest conducting one-to-one interviews on this stage, since they are easier to moderate.

The University of Kiel has conducted the number of studies already. In both their studies, they used group interviews (of a focus group) as a method. Nevertheless, we suggest that the other partners choose the one-to-one interviews first.

We see observations as additional possible method, since they can give us the understanding how the researchers work and what challenges they have. Moreover, the observations let us to understand researcher's workflows better and make it easier to use this knowledge for designing the interaction with GeRDI.

Number of participants

We should interview more than one person. This enables us to identify similarities in handling data or other topics interesting for GeRDI. It also helps to single out special cases. The number of community members to be interviewed depends several factors. Generally, the goal here is getting enough information about the topics we want to discover, while noticing, when no additional information can be retrieved through the interviews. According to Nielsen[1] , it is enough to ask 5 Persons to get 80 – 85% of all usability problems. Since we do not conduct quantitative studies, but qualitative ones it may be – according to Patton[2] – be best, to choose the number according to time allotted, resources available, and study objectives.

So, we suggest starting with three participants and then extending the number, if we do not getting enough information for the analysis. We propose the same strategy for the focus groups. According to literature it is not really fixed, how many groups (and of what size) are required[3] . It is often suggested to depend the size upon the specific project, e.g.

[1] https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/

[2] Patton, Michael Quinn (1990): Qualitative evaluation and research methods. 2. ed., [Nachdr.]. Newbury Park, Calif.: Sage

[3] Bryman, Alan (2012): Social research methods. 4. ed. Oxford u.a.: Oxford Univ. Press

2 – 8 focus groups with 5 – 12 participants each[4] . We suggest beginning with one group and then expanding if needed.

Pretests of the changed interview guides

It is important to consider here that some communities use special vocabulary. For instance – according to different studies about RDM systems – research communities understand sometimes "data management" or "metadata" differently from us. The community manager should keep this in mind during interview preparations. Likewise, if the communities have some special vocabulary the community manager should adjust the guide to make it more appropriate to the communities' language. In this case, we ask the community manager to conduct a pre-test, to see whether his/her questions work or not. The test person should be chosen carefully: she/he should belong to the community, but cannot later be part of the study itself. The contact person or community manager discusses changes of the interview guides within the group. In addition, consults ZBW staff if in need of support.

General study setup

This study instrument represents the general documentation concerning the studies we are going to conduct in the context of WP 1.1. It is a guideline and could be changed according to needs of methods and interviewer. This set includes the following parts:

Handout

In several paragraphs, these study topics are covered:

- Information on GeRDI
- Intent and background
- Procedure
- Result storage and data privacy.
- Optionally: place and time of the study.

The handout header to be completed with information about institution, community manager and study. It should be sent out beforehand, but it can also be handed over at the beginning of the meeting.

[4] http://qsf.e-learning.imb-uni-augsburg.de/book/export/html/523

We prepared two variants and the community manger can choose the one better fitting to the community. They are both in German. In case we have English speaking only communities, we will translate them into English.

Informed Consent

If the session is going to be recorded, all study participants should sing this statement, so we can use data in further analysis. This document also should be given to the study participant before the interview begins.

The consent is also just in German and can be translated if necessary.

Study guide check list

This part of the instrument belongs to interviewer. He or she should take notes as soon as possible after the session.

Interview recording and transcription checklist

The recording of the session should start only after the greeting, with the start and end being explicitly announced. It should be encrypted. It is helpful for the further analysis to create the results report of the interview on the very same day. We do not transcribe interviews as the linguists do: The documentation of questions and their answers is enough, while the omission of uninteresting parts should be marked. The interview recording should be deleted after the transcription and proofreading by the community (and optionally a peer from GeRDI).

Audio recording of the interview sessions

There are in general two ways to document studies: to write a protocol during and after the interview or to record interviews and to transcribe them later. They both have positive and negative effects:

Audio recording[5]	
positive	**negative**
Lets you concentrate on the communication not on the writing.	Transcribing takes a lot of time (experience: 1 hour focus group in English took 5 hours to transcribe)
It helps to correct the natural limitation of our memories and of the intuitive glossing over[6]	Some study participant could be less talkative by recording, than without
It allows more thorough examination of what people say[7]	Some curtail point could be concealed because of recording
It allows data to be reused in other ways from those intended by the original researcher. For example, in the light of new theoretical ideas or analytic strategies[8]	Data privacy and the rules of storing of the interviews are complicated and could delay the interview flow

Written protocol	
positive	**negative**
Easier to organize: no need of recording gadget no any special privacy restrictions	Some important point could be omitted, if the same person ask questions and writes the protocol
No problems with data storing	Forgotten points stay forgotten.
It is prompt ready after the interview	

The contact persons of WP 1.1 have discussed this topic at the meeting in Berlin and during the telco on the February 8th, 2017 and decided to test it in the next interviews in the following way:

[5] The colleagues from Usability Lab of ZBW recommended to record the interviews
[6] Bryman, Alan (2012): Social research methods. 4. ed. Oxford u.a.: Oxford Univ. Press.
[7] Bryman, Alan (2012): Social research methods. 4. ed. Oxford u.a.: Oxford Univ. Press.
[8] Bryman, Alan (2012): Social research methods. 4. ed. Oxford u.a.: Oxford Univ. Press.

They ask the participants, whether they agree to be recorded during the session. The community manager should decide after meeting whether the participant omitted some topics because of the recording or not. In this case, the community manager should write a protocol and not use recorded session during future meetings.

If the community manager decides not to record the interviews, we suggest to conduct the interview together with a colleague, who is going responsible for the protocol.

Review of interview protocols/transcripts

The contact persons of the work package agreed, that it would be good to let the study participants read the transcripts or protocols of the interviews: The then can correct us, if we misunderstood something. This would help us to be sure, that the base for the use cases is correct. It is up to community manager to decide, whether it is required or not to send the protocol for reviewing.

Code list

According to the informed consent it is not allowed to write the names of participant into the transcript or protocol. All participants should therefore be pseudonymised. Only the community manager has the list with pseudonym and the real name of the participant. This list should be locked separate from the interview recordings and transcribes. This list has to be destroyed after the analyzing the data.

Documentation of the study outcomes and results

Throughout the whole life cycle of the requirements analysis we are going to document our activities and their results.

For the documentation of the use cases we plan (in agreement with CAU) to use guidelines of Alistair Cockburn. All identified use cases should be approved by the respective communities. Personas are going to be documented first with the help of Use Case Diagrams (UML). Moreover, we encourage each project partner to document their activities, even though they do not concern the studies directly, e.g. background information of their communities. So other project partner know the users we develop for. The documentation of the study outcomes – such as a raw data – should consist of the following:

- A session's transcript or protocol
- Note about the session (e.g. if something noteworthy happened)
- The interview guide (or list of questions) used, if it deviated from the suggested guide.

Gaining of information out of interviews

There are different methods how to follow up qualitative interviews and get desired information out of them. The most common way is the content analysis. It is rather complicated and it would go beyond the scope of our needs. For us it would be better to make the pragmatic interpretation of the interviews[9]. It contains four general phases:

1. Transcribing
2. Analysis of one interview (Einzelanalyse)
3. Generalizing analysis (generalisierende Analyse)
4. Control phase

Transcribing

It is technical, but essential phase for conducting further steps.

Analysis of one interview

[9] Lamnek, Siegfried (2010): Qualitative Sozialforschung. Lehrbuch. 5., überarb. Aufl. Weinheim u.a.: Beltz, pp. 366-371

The idea of this step is to concentrate the information content.

1. Mark central passages and delete the irrelevancy
2. From this point work with the passages from 1. Take the most important and pregnant text passages
3. Comment on this text. How this short version is linked with the general information from the interview.

In this phase one can follow either the three previous or the six following steps[8]

Step 1: During the first reading of transcript mark all passages that are the answers to the questions of the interview guide. It is important to differentiate between facts and assumptions of interviewee.

Step 2: During the second reading sort the text passages in to the categories (e.g see the categories of the check list for the requirements topics). Extend the list of categories if necessary.

Step 3: During the third reading of the transcript one should pay attention to the logic between all marked passages. Therefore, it is understandable how these were chosen.

Step 4: Write a text about the process of “changing” of the transcript.

Step 5: Compare your text (everything you marked and noted) with the transcript.

Step 6: Prepare your text for presentation, without any changes of content or interpretation

The most relevant are the steps 1 – 3 and the step 5.

Generalizing analysis

In this phase all interviews should be viewed in order to achieve generalized findings.

1. Look for the similarities in all interviews
2. Take note of differences (do not omit them)

Control phase

This phase should prevent that relevant information geat missed.

1. Consult the full transcription on every stage of the analysis
2. Work in team and discuss unclear passages with your team

Writing down the use cases and requirements

We suggest extracting possible use cases from interviews and getting feedback to them from communities.

In the beginning Phase we document uses case according to Cockburn[10]. In the second documentation phase, community manger split use cases in slices based on Use Case 2.0 Guidelines[11]. These two types can be documented in Confluence and/or in JIRA as an Epic or a Task. Description of Story contains user story and scenario according to BDD[12] Later we make use of user stories to maintain the exchange between communities and developer team. These are supposed to be documented in Confluence.

Example for user story

Use Case: Storing data to the cloud

As a researcher, I can see feedback or supportive information about what data sets, what size and format of data and how long it would last to upload the data to a cloud while triggering the store functionality, so I am aware about action and time it would cost.

[10] Alistair Cockburn; Writing Effective Use Cases – Crystal Series for Software Development; Addison-Wesley Longman
[11] https://www.ivarjacobson.com/publications/white-papers/use-case-ebook
[12] John Ferguson Smart; BDD in Action: Behavior-Driven Development for the whole software lifecycle; Manning Publications; 1st Auflage

Example for documentation according to Use Case 2.0 Guidelines[13]

[SAI-62] Free keyword search on website: Extension 1	
Status:	Done
Project:	System Architecture and Integration
Component/s:	None
Affects Version/s:	None
Fix Version/s:	None

Type:	Task	**Priority:**	Medium
Reporter:	[redacted]	**Assignee:**	[redacted]
Resolution:	Done	**Votes:**	0
Labels:	None		
Remaining Estimate:	Not Specified		
Time Spent:	Not Specified		
Original Estimate:	Not Specified		

Epic Link:	Free keyword search on website

Description

User story:
As a researcher on the website
I want to be able to enter my keywords
so I get an information in case there are no relevant results for me

Scenario:
Given I am on the website
And There are no temperature data for Meissen in the index
And there are at least 20 temperature data in the index
When I enter "temperature Meissen"
And I click the search button
Then The displayed result is empty and a status is shown saying "No relevant results found"

[13] https://www.ivarjacobson.com/publications/white-papers/use-case-ebook

Example for documentation according to Cockburn[14]

Use Case	Free keyword search on website
ID	SSA-43 - Free keyword search on website
Community	
Precondition	Website is accessible for The Researcher, search field is available index is not empty
Trigger	The Researcher wants to type in a search term
Goal	The Researcher receives search results relevant to his/her search term
Main Scenario	The Researcher clicks on search field The Researcher types in the search term The Researcher clicks on a search button or on Enter Search result is displayed
Extension	The Researcher clicks on search field The Researcher types in the search term The Researcher clicks on a search button or on Enter No data have been f[15]und a corresponding message will be displayed
Successful Postcondition	The Researcher found relevant search results relevant to his/her search term
Failure Postcondition	Search results are not relevant for the search of the Researcher

[14] Alistair Cockburn; Writing Effective Use Cases – Crystal Series for Software Development; Verlag: Addison-Wesley Longman