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Design and prototypical implementation of a user-optimized online Tools, for organizing trainings in Refugee Settlements in Uganda and South Sudan.

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Affidavit

I hereby declare that Bastian Walthierer has written this master thesis independently without the help of third parties and without the use of sources and aids other than those indicated. All passages taken verbatim or in spirit from the sources used are identified as such individually.

This work has not yet been submitted to any other audit authority and has not been published.

I am aware that a false statement will have legal consequences.

Berlin, February 26, 2023

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I. Introduction

A. War in South Sudan and its effects

In 2011, South Sudan, which had already been declared autonomous, gained its independence and founded a republic. The new government of the young state collapsed in 2013, leading to a five-year civil war. The causes of the conflict stem from the "distribution of political power and economic resources along ethnic lines."¹ The peace treaty signed in 2018 between former Vice President Riek Machar and South Sudanese President Salva Kiir Mayardit ended the civil war, leading to a slow-moving peace process that established a transitional government in February 2020.

Despite the official peace, the country's population is dependent on humanitarian aid due to the many years of war. For example, more than 50 percent of the population is affected by extreme food insecurity.²

The civil war and its aftermath are driving the country's inhabitants to flee - some "2.3 million"³ South Sudanese are fleeing to neighboring countries. Uganda is the country that takes in the most people, with around "854,000"⁴ South Sudanese who have fled.

Uganda's liberal refugee policy lays the foundation for several refugee settlements in the north of the country, such as the Pagirinya Refugee Settlement in Adjumani District. This huge influx of people brings with it additional challenges for the region. As many communities are unable to cope with these pressures, assistance is needed to achieve economic resilience. The goal

¹ *South Sudan*. (n.d.). Federal Ministry for Economic Cooperation and Development, from <https://www.bmz.de/de/laender/suedsudan>

Accessed: 09.01.2023

² *South Sudan*. (n.d.). Federal Ministry for Economic Cooperation and Development, from <https://www.bmz.de/de/laender/suedsudan>

Accessed: 09.01.2023

³ *Situation south Sudan*. (n.d.). Unhcr.org, from <https://data.unhcr.org/en/situations/southsudan>

Accessed 09.01.2023.

⁴ *Situation south Sudan*. (n.d.). Unhcr.org, from <https://data.unhcr.org/en/situations/southsudan>

of this aid is to strengthen the community of refugee settlements and host communities in such a way that a sustainable and self-sufficient economy is guaranteed.⁵

The Federal Republic of Germany and its Federal Ministry for Economic Cooperation and Development (BMZ) consider these goals to be worthwhile, which is why it supports institutions and non-governmental organizations (NGOs). In the area of refugees, support is provided in particular to South Sudanese refugees and host communities in northern Uganda. The focus is on education and job creation.⁶

An example of such an NGO is the r0g_agency, a nonprofit gGmbH whose motivation they express as follows: "The r0g_agency's mission is to promote open, innovative, and peaceful societies through programs that focus on open tech, open knowledge, and peacebuilding activities."⁷



Figure 1: Pagirinya Refugee Settlement

⁵ Patrick Poehlmann, *Supporting refugees and host communities in Northern Uganda*, from <https://www.giz.de/en/worldwide/74940.html>

Accessed: 09.01.2023

⁶ Uganda. (n.d.). Federal Ministry for Economic Cooperation and Development, from <https://www.bmz.de/de/laender/uganda>

Accessed: 09.01.2023

⁷ R0g Agency; r0g_agency for open culture and critical transformation gGmbH. *About*, from <https://openculture.agency/about/>

Accessed:

B. #ASKnet

The r0g_agency describes its **ASKnet** (Access to Skills and Knowledge Network) project as, "#ASKnet is a capacity-building and hub-development program that links together five community-based, youth-led innovation hubs in South Sudan and Uganda. "⁸

1. TARGET

The ASKnet network, which is located in South Sudan and Uganda, is an association of South Sudanese media organizations and media professionals. The population in the regions where the network operates suffers from a high level of educational poverty and a low level of media literacy. The network offers training courses to counteract this problem. The ASKnet pursues the goal of providing free access to information and establishing, or rather promoting, media literacy by means of these training courses, which are also referred to as trainings. Thus, the overriding aim of the members is to contribute to the reconstruction of their country by strengthening civil structures and promoting peacemaking measures.⁹

2. MEMBERS AND ORGANIZATION

The network is divided into five independent media organizations, called **hubs**, and consists of about 50 media experts and trainers. Characteristic of all the hubs is that they were founded out of self-motivation and interest, and the subsequent, self-managed organization of the educational offerings. The hubs operate independently of the government and focus their training on young people, refugees and women. The hubs act as a conglomerate of training center, youth meeting place and coworking space, which transfer the exchange of experiences, ideas and knowledge. In most cases, the hubs rent buildings for this purpose. The YEF hub (Youth Empowerment

⁸ #ASKnet access-to-skills-and-knowledge-network. (2019, November 27), by R0g Agency; r0g_agency for open culture and critical transformation gGmbH, <https://openculture.agency/asknet-access-to-skills-and-knowledge-network/>.

Accessed: 13.01.2023

⁹ Bellinghausen, 2021 Project proposal, project number: p5751, by r0g_agency for open culture and critical transformation gGmbH, https://docs.google.com/document/u/0/d/1yFfhoGUnJs-Y5v2GSKM47vjcKUTgNm5BLChsctp-C9oE/mobilebasic_p.6

Accessed: 13.01.2023



Foundation) in Pagirinya goes a step further and independently constructs a building (Figure 2) from sustainable and low-cost raw material en.¹⁰



Figure 2: Hub in Pagirinya

C. ASKtraining

In order to support hubs in the planning and design of Trainings, the project ASKtraining is being launched, which will be able to present a first prototype as early as 2021. "The online tool (Figure 3) allows users to create a training plan from a set of predefined modules by dragging and dropping. In addition, the system calculates certain elements such as for example: number of days and hours, material costs, minimum number of trainers, maximum number of participants, etc. and displays them in an overview . A training consists of

¹⁰ Bellinghausen, 2021 Project proposal, project number: p5751, by r0g_agency for open culture and critical transformation gGmbH,

¹¹ #ASKtraining - HedgeDoc. (n.d.). Bmen.cc, from <https://md.bmen.cc/training-generator> Accessed 01/16/2023.

<https://docs.google.com/document/u/0/d/1yFfhoGUJJs-Y5v2GSKM47vjcKUTgNm5BLChsctp-C9oE/mobilebasic> p.6 et seq.

Accessed: 13.01.2023

¹¹ #ASKtraining - HedgeDoc. (n.d.). Bmen.cc, from <https://md.bmen.cc/training-generator>
Accessed 01/16/2023.

modules, which in turn is made up of various resources.¹² This structure is discussed in more detail in Section II.E.4, *Functional Scope and Principles*.

Figure 3: Prototype ASKtraining 2021

The screenshot displays the Prototype ASKtraining 2021 interface. On the left, a sidebar titled "Filter modules by tags" lists categories like "Web&Software", "Hardware&Repair", "Community&Moderation", "Organizational_Development", "Media&Art", "Data_Security&Research", "Open_Source&Knowledge", and "Sustainability". Below these are three training modules:

- Community Repair Café - Simulation**: 0 Hours 30 Minutes, advanced, \$ 207 material costs. Resources included: Unit: ASKotec Introduction | Unit: DIY LED Light | Unit: DIY Solar Charger | Unit: Open Guides Introduction | Tool: Open Hardware Guide | Tool: Open Documentation Guide | Tool: #ASKtec Kit.
- Media Hub Business Model Canvas Workshop**: 1 Hours 0 Minutes, easy, \$ 1000 material costs. Resources included: Tool: #ASKtec Kit.
- Minimal Module**: CC-BY-SA 4.0 ASKtraining, view on Github | #ASKnet Website

The main area shows a training schedule for "#ASKtraining - Title of the Training". The schedule includes:

- Introduction into the training** (9:00am - 9:15am)
- Theory of Change Workshop** (9:15am - 9:30am): Introduction into the module. Duration: 2 hours 15 minutes, medium, \$ 0 material costs. Source: CC-BY-SA 4.0 International.
- Theory of Change** (9:30am - 11:30am): Be clear about the impact you want to create. License: CC-BY-SA 4.0 International.

A large orange button at the bottom right says "Drag and drop more modules to add". At the bottom, a summary section shows: 1 day(s), 2 hours, 30 minutes, total time of your training.

Since this prototype is being developed in Germany without a previous, comprehensive user survey and is not yet in use, it is decided to start the development of the tool again, focusing on the front-end area. The cultural, technical and local conditions of the region of use are to be taken into account. Therefore, a technical and primarily scientific approach is sought for the new development, which takes these circumstances into account during the development. The goal of this development is a first prototypical implementation of a user-optimized online tool for the organization of trainings especially in Uganda and South Sudan. To pursue this goal, the Usage-Centred Design method developed by Larry Constantine and Lucy Lockwood was chosen.

¹² #ASKtraining - HedgeDoc. (n.d.). Bmen.cc, from <https://md.bmen.cc/training-generator>. Accessed 01/16/2023.

II. Usage-Centered Design

After the beginnings of work with large computers reserved for only a few people in the 1960s, the term **user-centered design was** coined by Don Norman in the mid-1980s. For the first time, the human being - the user - was the focus of the development of new technologies. In user-centered design, as the term clearly indicates, the users are the center of the design process for systems. Constantine praises this development, but is of the opinion that a main focus on users does not automatically lead to more suitable tools, because a tool is useful if it primarily serves its purpose.¹³

Constantine believes that users do not always name their problems clearly.

In addition, during the communication between designers and users, functionalities that are urgently needed are often not named.¹⁴

"To design dramatically more usable tools, it is not users who must be understood, but usage-how and for what ends software tools will be employed. "¹⁵ With this view Constantine lays the foundation for his **Usage-Centered Design**, in which not the user, but his goals, which are tried to be reached with the use of the software, are in the center.

A. User groups

The user groups describe the different types of users of the application. In order to define these groups, the key question of the type of users and their interaction with the system must be answered.¹⁶

The tool ASKtraining will be used to plan workshops and trainings, to document, and to share teaching and learning materials. The website of the r0g_agency gives answers in which environment the application to be developed will be used for the time being.

¹³ Larry Constantine, Lucy Lockwood, 1999 p. 22 f

¹⁴ Larry Constantine, Lucy Lockwood, 1999 p. 9

¹⁵ Larry Constantine, Lucy Lockwood, 1999 p. 23

¹⁶ Larry Constantine, Lucy Lockwood, 1999 p. 30

The aim is to establish a "five community-based, youth-led innovation hubs in South Sudan and Uganda "¹⁷.

The purpose of the ASKnet community is: "Providing access to skills and knowledge through ToT (Training of Trainers) workshops. These workshops include open source hardware and software using ASKotec [- a kit that work as a mobile training set -], entrepreneurship, media production, gender equality awareness, trauma healing, and financial literacy. "¹⁸

It should be noted that the future users of the tool are members of the ASKnet and work in an interdisciplinary way. The common framework is both the residency in a region with a weak infrastructure and the aspiration to impart education.

B. Interviews

In order to design software, it is important to ask for certain information up front. To begin the design process, Constantine suggests the following questions:

- "What will the users of this software be doing?
- What will they be trying to accomplish?
- What do they need from the system to accomplish it?
- How should the system supply what they need? "¹⁹

In order to get an overview of these questions, several people will be interviewed at the beginning. It is assumed that the respondents can be divided into two groups, trainers and participants of workshops / trainings. After the recommendation

"End users are the primary and ultimate source of information to guide usage-centered design "²⁰, the main focus will be on talking to people who are familiar with the cultural context of the application's provisional area of use - Refugee Settlements in Uganda.

¹⁷ #ASKnet access to skills and Knowledge Network. (2019, November 27). R0g Agency; r0g_agency for open culture and critical transformation gGmbH. <https://openculture.agency/asknet-access-to-skills-and-knowledge-network/>.

Accessed: 16.06.2022

¹⁸ #ASKnet access to skills and Knowledge Network. (2019, November 27). R0g Agency; r0g_agency for open culture and critical transformation gGmbH. <https://openculture.agency/asknet-access-to-skills-and-knowledge-network/>.

Accessed: 16.06.2022

¹⁹ Larry Constantine, Lucy Lockwood, 1999 p. 69 - translation by the author

²⁰ Larry Constantine, Lucy Lockwood, 1999 p. 70

and South Sudan - are close to, or belong to. Thus, two different user groups are defined and the following areas are determined for which questions are formulated:

Trainer:

A trainer is a person who plans and holds workshops / trainings (survey: 5 - 10 people):

- Information about the person, profession / activity
- Information about participants
- Venue information
- Information about the trainings
- Organization within the hubs
- Funding

Participant:

A participant is a person who takes part in a workshop / training (survey: 2 - 5 persons):

- Information about the person, profession / activity
- Information about the teaching materials
- Application of learned skills
- Infrastructure information

The interviews are conducted online. For this purpose, the tools **BigBlueButton**, "an audio and video conferencing system "²¹, and **Telegram**, "a cloud-based mobile and desktop messaging app "²², will be used.

Due to the inadequate digital infrastructure, the implementation of the in
The interviews are problematic - connections are regularly broken off or do not come about at all. Moreover, only ASKnet trainers are interviewed, because training participants are difficult to reach online. The majority of trainers began their careers as participants in training courses, so the interviewees can provide information about both groups of people.

It is

²¹ *BigBlueButton server*. (n.d.). Bigbluebuttonserver.de, from <https://bigbluebuttonserver.de/>
Accessed 03.01.2023.

²² *Telegram - a new era of messaging*. (n.d.). Telegram, from <https://telegram.org/>
Accessed 03.01.2023.

It should also be noted that the group of participants is of secondary importance for the development and design of the application.

C. Role Modeling

"The relationships between users and the system. "²³ The role model describes the different user roles of a system, which are represented in the user role map with their different interrelationships and dependencies to each other.

1. USER ROLE

"A user role is an abstract collection of needs, interests, expectations, behaviors, and responsibilities characterizing a relationship between [...] users and a system. "²⁵ When designing user roles, it is important to consider, on the one hand, which behavior is very characteristic for a user and, on the other hand, which users are also necessary to support the application or to provide it with content. In a first analysis, the following preliminary roles emerge, as already stated in the user groups:

Trainer:

- Enters information into system
- Arranges information logically
- Links outsourced information to the system
- Receives information from the system

Participant

- Reads information from the system

In order to be able to describe the user roles even more precisely, the statements from the interviews are first checked for similarities and differences. The extent to which the differences are significant or negligible is assessed. These points will be summarized in a document (*X. Appendix D. Services provided by application*) and divided into potential and possible services that the ap-

²³ Larry Constantine, Lucy Lockwood, 1999 p. 30

²⁴ Larry Constantine, Lucy Lockwood, 1999 p. 30

²⁵ Larry Constantine, Lucy Lockwood, 1999 p. 79

plication should provide, reformulated. These tasks are then used to define the user roles. Figure 4 illustrates the process of deriving roles from the individual structured requirements, which correspond to the different tasks from the requirements analysis. It can be seen that the group of trainers in particular has different requirements for the application.

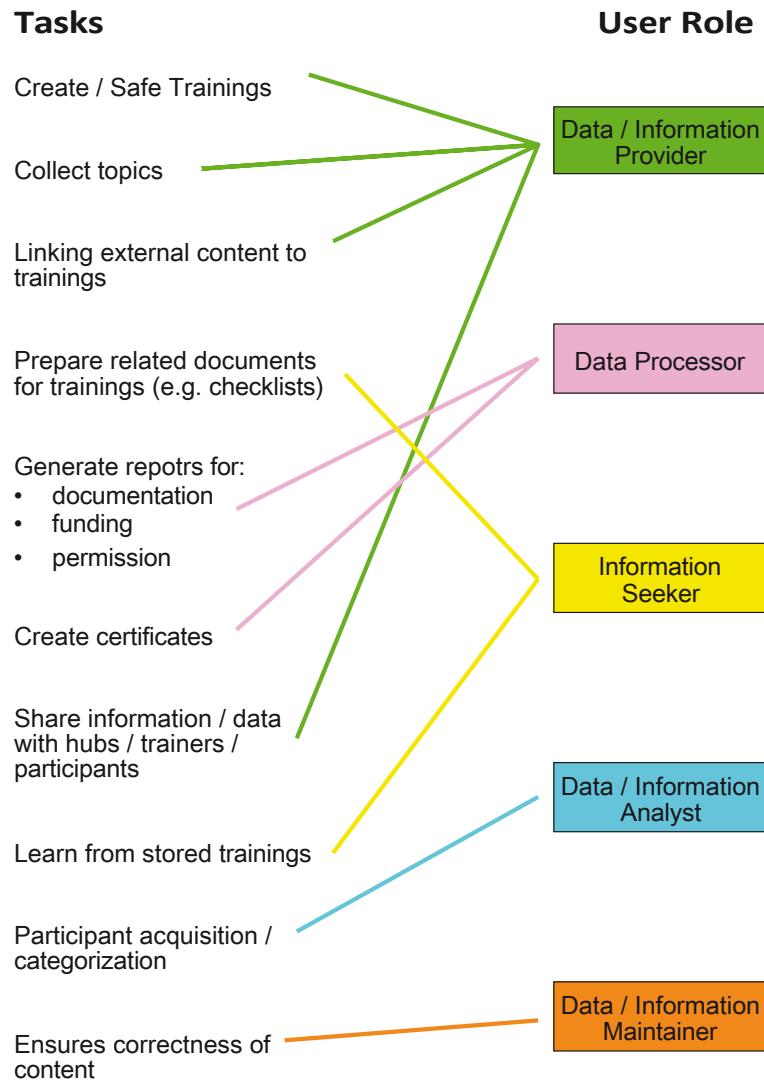


Figure 4: User Roles and Tasks

The following principle is taken into account in the choice of role names: "Each role is given a name that typifies the relationship of such users to the system."²⁶ When choosing a name, care must be taken to ensure that it is clear how the role interacts with the system.

²⁶ Larry Constantine, Lucy Lockwood, 1999 p. 81

interacts. Constantine recommends that "the right name is less important than getting the right idea "²⁷.

The following User Roles are thus determined:

- **Data / Information Provider:** Person who creates and stores content (e.g., creates and schedules training).
- **Data Processor:** Person who receives data from the system and processes it further (e.g. for documentation purposes, generating certificates).
- **Information Seeker:** Person who receives content from the system (e.g. participants, or trainers from another hub who want to offer similar training)
- **Data / Information Analyst:** Person who analyzes data from the system (e.g. participant acquisition, categorization of participants).
- **Data / Information Maintainer:** Specialist in a subject area to verify information and content.

2. FOCAL ROLES

"Focal user roles play a special part in helping to shape and define the user interface. "²⁸ This is why it is important to determine these roles, since it can be assumed that they are "the most common or typical, or that they are considered particularly important from a different perspective. "²⁹ The focal user role in this case is that of the **data/information provider**, since it is considered to be the main actor for the use of the application due to its tasks. In addition, as the user role map (Figure 5) shows, the focal role includes a large proportion of the other user roles.

3. USER ROLE MAP

The user role map is a tool for the clear representation of the different roles of a system. Roles are related to each other according to similarities, group membership or the composition of their properties.³⁰ "The user role map

²⁷ Larry Constantine, Lucy Lockwood, 1999 p. 81

²⁸ Larry Constantine, Lucy Lockwood, 1999 p. 82

²⁹ Larry Constantine, Lucy Lockwood, 1999 p. 83 - translation by the author

³⁰ Larry Constantine, Lucy Lockwood, 1999 p. 84 f.

is a way of capturing the big picture; it reveals how all the various roles fit together in defining who will use the system and how.³¹

As the map shows, several roles are derived from the focal role of the **data / information provider**. A special feature is the role of the **Data / Information Maintainer**, which is, so to speak, a superordinate or specialized form of the **Data / Information Provider**. This role can, for example, be assumed by educational institutions or similar official bodies in order to verify learning content and formally recognize the completion of a training course.

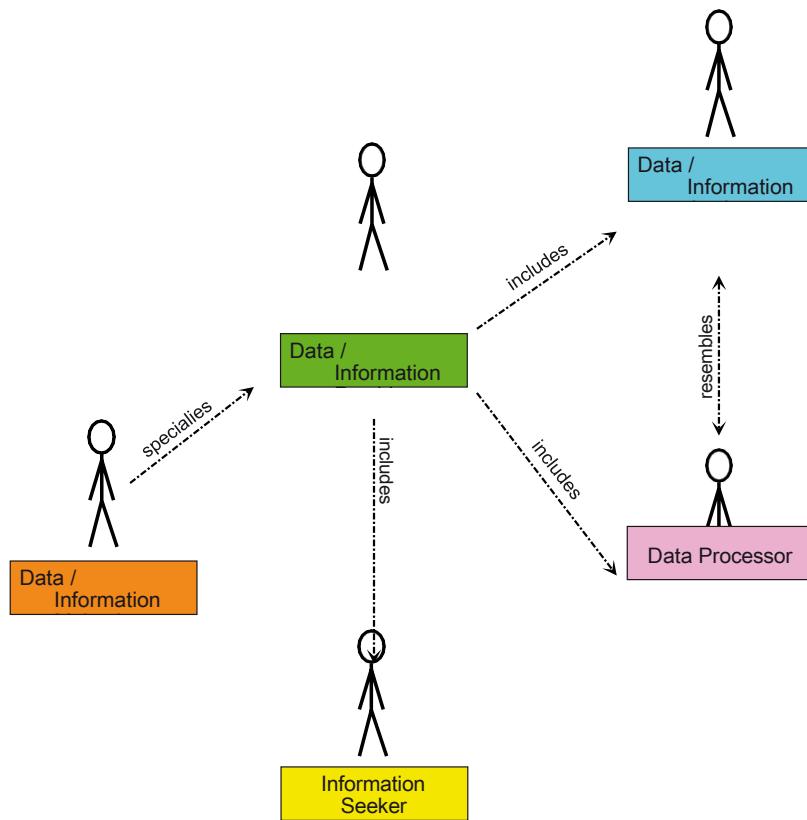


Figure 5: User Role Map

D. Task Modeling

The interviews reveal what the users' tasks are. In order to better understand the individual work steps for task modeling, people are again interviewed about specific aspects that are considered particularly important for the development of the tool.

³¹ Larry Constantine, Lucy Lockwood, 1999 p. 84

worthwhile. "To give people better, more useful tools with which to work, we must understand what they are doing and what they are trying to do. "³²

The focus will now be on a detailed account of the following processes:

- Participant acquisition
- Issuance of certificates
- Achieving and setting training goals
- Agreements with authorities from the education sector
- Project documentation
- Funding from additional donors (mostly projects are funded only with the financial resources provided by the r0g_agency).

One member from each of the Platform Africa and GoGirls ICT hubs was interviewed. Both hubs are considered to be particularly well established. The interviewees also hold key positions in their hub. In addition, they provide documents that they use during the planning of trainings and workshops. This information is a key factor in the development of the personas and scenarios.

1. PERSONAS

In order not to lose touch with the future users during task modeling, personas are developed. These should represent typical users and reflect their needs and expectations. In doing so, they promote the detection of universal functionalities. "The purpose of personas is to create reliable and realistic representations of your key audience segments for reference. "³³ Personas help in testing and prioritizing options and properties of the applications to be developed by establishing a connection to reality or the context of the application. The personas have a name, age, marital status, profession, a photo, etc., in order to get as accurate an impression as possible of this fictitious person.³⁴

³² Larry Constantine, Lucy Lockwood, 1999 p. 97

³³ Assistant Secretary for Public Affairs. (2013). *Personas*. <https://www.usability.gov/how-to-and-tools/methods/personas.html>.

Accessed: 03.08.2022

³⁴ Assistant Secretary for Public Affairs. (2013). *Personas*. <https://www.usability.gov/how-to-and-tools/methods/personas.html>.

Accessed: 03.08.2022

In order to make the personas as realistic as possible, the impressions from the interviews are mainly used for the development. In addition, elements from the persona descriptions of the LEAD (Local - Expert - Action - Directory) were taken over. "LEAD is a directory of #ASKnet experts in your area who are there to provide guidance and assistance."³⁵ This web platform is part of the ASKnet, which members of the various hubs use to network. As a rule, they introduce themselves with a short biography and a description of their personal skills and knowledge and can contact other members accordingly.

Figure 6 shows a persona. The structure of the document with photo, personal data and description is based on a resume or motivation letter.

AMANYARA WILLIAM

Age:	24
Nationality:	South Sudanese
Marital Status:	Single
Hub:	Community Creativity for Development (CC4D)
School Education:	no graduation or degree
Languages:	English, Arabic, Kakwa, Pojulu, Kiswahili
Mobile Phone:	Smartphone with access to internet



Amanyara William is a 24 years old South Sudanese male, living in Eden at Rhino Camp Refugee Settlement, Uganda. He left South Sudan due to the civil war that erupted back in 2016.

This negatively affected his education, he couldn't graduate high school. Hence he was quite happy when he found out about the #ASKnet trainings in his settlement. He became very interested in informatics, open source projects and repairing broken mechanical and electronic devices.

Soon after his first trainings he became a member of the CC4D hub and they started to organize a community repair cafe event, where participants are able to fix broken devices. Amanyara also planned and organized trainings for women only. This training consists of two different parts: empowerment and hands-on training on repairing.

Furthermore Amanyara is developing technical devices with the open source hardware and software project Arduino.

Figure 6: Persona

³⁵ LEAD is a directory of #ASKnet experts in your area who are there to provide guidance and assistance (n.d.). Asknet.community, from <https://lead.asknet.community/> Accessed: 21.07.2022

2. SCENARIOS

"A scenario in general is an episodic description of tasks and activities in their context.

Scenarios are used as tools. Through them

the facts are to be better illustrated.³⁶ The scenarios are thus used as tools are used to derive the resulting use cases. When designing the scenarios, care is taken to do justice to the everyday situation of the people in the refugee settlements as much as possible. At this point, reports and information from the interviews are incorporated. The scenarios are described with the two persons identified from the personas.

"Scenarios for user interface design narrate the interaction between a user or type of user and a system.³⁷ For this reason, the technical component is also considered in the reports.

The description of the technical component is sometimes difficult when working out details of certain work processes, as it is not always clear from the interviews how to proceed precisely with certain activities. Therefore, additional documents from the various hubs are included for a complete description. For the elaboration of the scenarios, templates for project documentation and proposals from r0g_agency, certificates for trainings from GoGirl ICT and Google forms for the application for participation in trainings from CC4D are used.

3. CONVENTIONAL USE CASES

"A weakness of scenarios as an integrative construct is that, as informal representations, they are usually written in natural language and are often inadequate or flawed for difficult discussion among users, developers, usability experts, and other stakeholders, each with different motivations

and backgrounds are not sufficient.³⁸ Nevertheless, according to DATech's guide Usability the scenarios are necessary in order to derive the use cases from them. "In the design project, the usage scenario is the most important prerequisite for the design of a use case, the specification of functional requirements. First use scenario, then use case. This

³⁶ Brigitte Eller, 2009 p. 74

³⁷ Larry Constantine, Lucy Lockwood, 1999 p. 101

³⁸ Brigitte Eller, 2009 p. 75

The sequence is mandatory if the functional requirements are to be specified from the usage perspective.³⁹ The conventional use cases are derived from the previously developed scenarios.

The method of use cases was developed by Jacobson as early as 1992, since when it has become a widely used tool in software development. The use cases are divided into individual dialog steps and are divided into **User Action Model** and **System Response Model**. A user interacts with the system and the system responds accordingly. Thus, a clear distinction can be made between the interests of the user and the tasks of the system, regardless of the content of the task. The use cases are designed linearly, starting with the first action and ending with the completion of the task. Care must be taken to describe the interaction completely, in detail, and in a meaningful way.⁴⁰

The use cases are linked to the usual tasks for the processing of these specific tasks. Tools described, such as Google forms, GitHub via web browser, tabulation programs, etc....

USE CASE: CONDUCTING SAVED TRAINING

User Action	System Response
Click on web browser	Open web browser
Enter „github.com“	Display website
Click on „Sign in“	Display login page Request username / email address Request password
Enter Username Enter Password Click „Sign in“	Verify login data Display dashboard
Click on „DIY Solar Generator“ repository	Display repository
Click on „materials.md“	Display „materials.md“
Press „Ctrl + P“ for printing	Print document
Navigate back to „DIY Solar Generator“ repository	Display repository
Click on „tools.md“	Display „tools.md“
Press „Ctrl + P“ for printing	Print document

Figure 7: Use case described with GitHub via web browser

³⁹ DATech, 2009, p. 167

⁴⁰ Larry Constantine, Lucy Lockwood, 1999 p. 101 f

4. ESSENTIAL USE CASES

"Conventional use cases typically contain too many built-in, premature assumptions, often hidden or implicit, about the form of the user interface do be designed."⁴¹ Accordingly, it is necessary to reduce the detailed descriptions of conventional use cases to the essentials. This is achieved by changing the two models: the User Action Model is the **User Intention Model** in the Essential Use Case and the System Response Model is the **System Responsibilities Model**. Thus, an Essential Use Case describes the user's intention and expectations of the system during use. In the subsequent development of the interface, this aspect is essential, because the change from the mechanical or technical description to the description of the user's intention avoids that design decisions are included. This is because a conventional use case is developed using a specific software, tool, device, etc. and therefore also indirectly describes the barriers, properties, and behaviors of the software, tool, or device within which a use case was developed.⁴²

Constantine defines Essential Use Cases as a "structured narrative, expressed in the simplified, generalized, abstract, technology-free and implementation-independent description of one task or interaction that is complete, meaningful, and well-defined from the point of view of users in some role or roles in relation to a system and that embodies the purpose or intentions underlying the interaction."⁴³

Figure 8 shows the comparison of a conventional use case with the essential use case derived from it. It can be clearly seen how the description of the task is shortened in the Essential Use Case by the change of the two models.

⁴¹ Larry Constantine, Lucy Lockwood, 1999 p. 103

⁴² Larry Constantine, Lucy Lockwood, 1999 p. 103 f

⁴³ Larry Constantine, Lucy Lockwood, 1999 p. 103

USE CASE: PLANING TRAINING

Extends: Creating Resources
Selecting existing Resources

Conventional Use Case		Essential Use Case	
User Action	System Response	User Intention	System Responsibility
Click on web browser	Open web browser		
Enter „github.com“	Display website		
Click on „Sign in“	Display login page Request username / email address Request password		
Enter Username Enter Password Click „Sign in“	Verify login data Display dashboard		
Click on „new“ - button	Display „create a new repository“ site	Creating new content	Possibility to create new content
Click on text Feld beneath „Repository name“	Show flashing cursor for text writing		
Enter repository name Choose bullet „Public“ Click „Create repository“ - Button	Display „Quick setup“ site	Label the content Make it public	Possibility to name new content Provide public access to content

Continues on this point with Use Case: Creating Resources and Use Case: Selecting existing resources

Figure 8: Conventional and Essential Use Case

5. USE CASE MAP

The use case map graphically depicts the relationships of the various use cases to one another and in this way makes it possible to describe the overall scope of the tasks that are processed with the application. Related use cases - also called **subcases** here - are grouped into so-called **supercases**. By means of this generic summary of the use cases, it is possible to simplify the general purpose of the application. The subcases are a specification of the respective supercases and correspond to the previously elaborated essential use cases. Accordingly, it is not necessary to present all use cases in the use case map; it is sufficient to use an appropriate number of meaningful use cases.⁴⁴

⁴⁴ Larry Constantine, Lucy Lockwood, 1999 p. 109 f

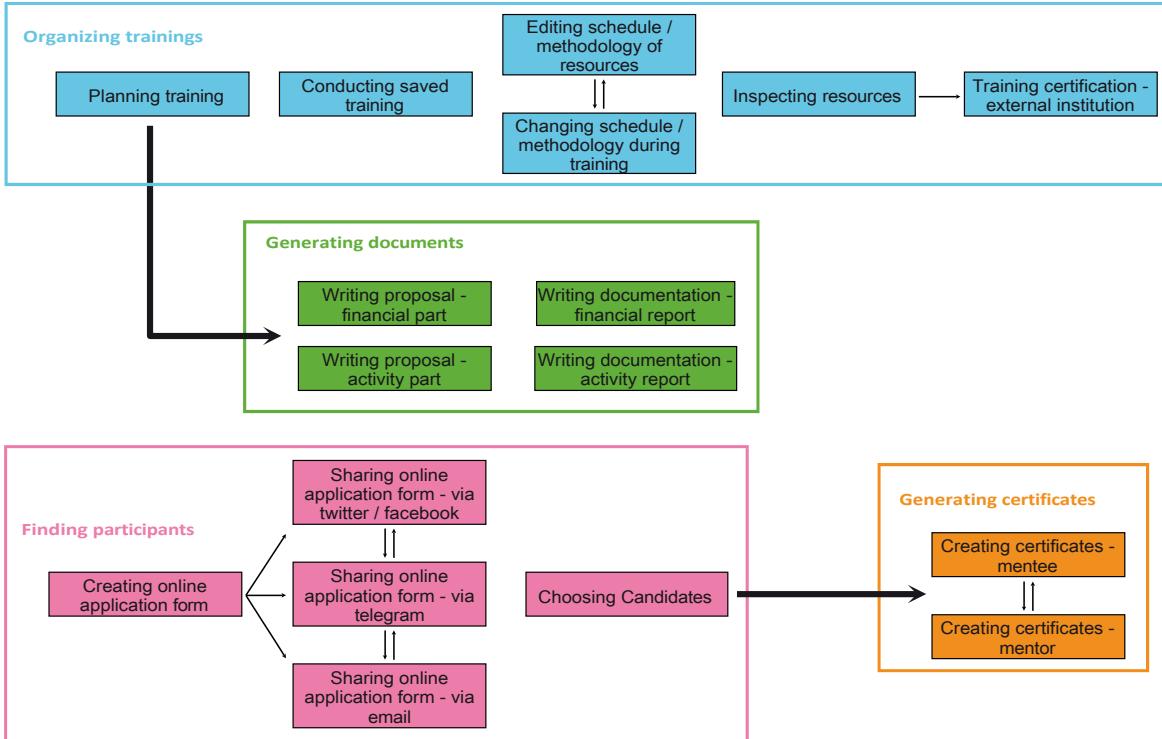


Figure 9: Use Case Map

The use cases are organized into the following four supercases:

- **Organizing trainings:** These are all tasks related to the creation, editing, modification, etc. of trainings.
- **Generating documents:** This Supercase deals with the generation of documents for the documentation as well as for the project proposals.
- **Finding participants:** Describes the search for suitable participants for trainings.
- **Generating certificates:** The creation of certificates for participants of trainings.

6. FOCAL USE CASE

The Focal Use Cases are chosen to determine where the development will initially focus. In the course, they help to organize the design of the interface in sequence, because they serve as a starting point for the design process. The choice of focal use cases takes into account what is defined as a requirement for the system at the beginning of the project and what is named as particularly useful from the point of view of the user survey in the interviews. This results in the following supercases for the focal use cases

"Organizing trainings" and "Generating documents". The Focal Use Cases are also linked to the Focal User Roles; for these, the role of Data / Information Provider was chosen, which is to be regarded as the main actor in the Focal Use Cases.⁴⁵

E. Interface Contents and Navigation

The next step links the modeled tasks with the various components of an interface. The goal is to create a basis with which the tasks from the use cases can be processed with the help of the tool to be developed.

1. INTERACTION CONTEXT

Interaction context refers to the various areas in which users interact with the user interface and all its elements and information.

The contents of the various interaction contexts are functions and data that the application uses to fulfill the tasks of the use cases. The interaction context also serves as the cornerstone for the interface design.⁴⁶

Figure 10 shows the interaction context map. Here, for the first time, the various use cases are arranged in a form that on the one hand corresponds to the workflow of the users; and on the other hand, they are structured in classes, as within the use case map. The map also shows which use cases are derived from others; for example, "Planning training" includes "Creating resources" and "Selecting existing resources".

⁴⁵ Larry Constantine, Lucy Lockwood, 1999 p. 115

⁴⁶ Larry Constantine, Lucy Lockwood, 1999 p. 125 ff.

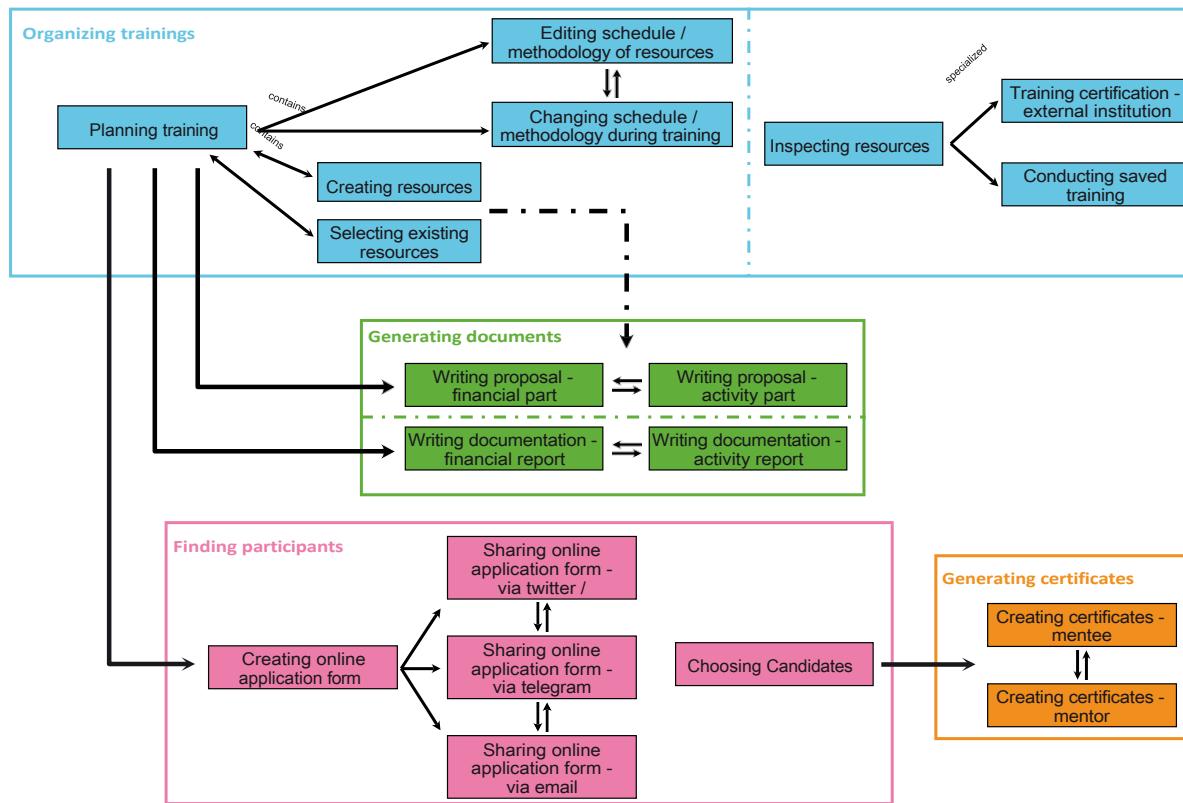


Figure 10: Interaction Context Map

2. TOOLS AND MATERIALS

After preparing the Interaction Context Map, the tools and materials should be defined within the framework of the Usage-Centered Design. Here, the tools are comparable to functions and capabilities that serve the fulfillment of a specific task. Materials are data and domains that are in turn processed by the functions, i.e. the tools, . These abstract components serve as placeholders for visual attributes of the interface and are helpful in designing the interaction.⁴⁷ Essential Use Cases are used to develop the Tools and Materials, which in their abbreviated form describe the essence of the workflows. Paired with the abstract components of the Tools and Materials, this provides a further basis for the design of the interface - free from influences of that software from the Conventional Use Cases. The designations are chosen in such a way that they exemplify the respective purpose . The color choice is, as Constantine it in "hot colors"⁴⁸ for tools and in "cool co-

⁴⁷ Larry Constantine, Lucy Lockwood, 1999 p. 133 f.

⁴⁸ Larry Constantine, Lucy Lockwood, 1999 p. 133

lors⁴⁹ for materials. Figure 11 shows the different components for the Interaction Context Generating Documents.

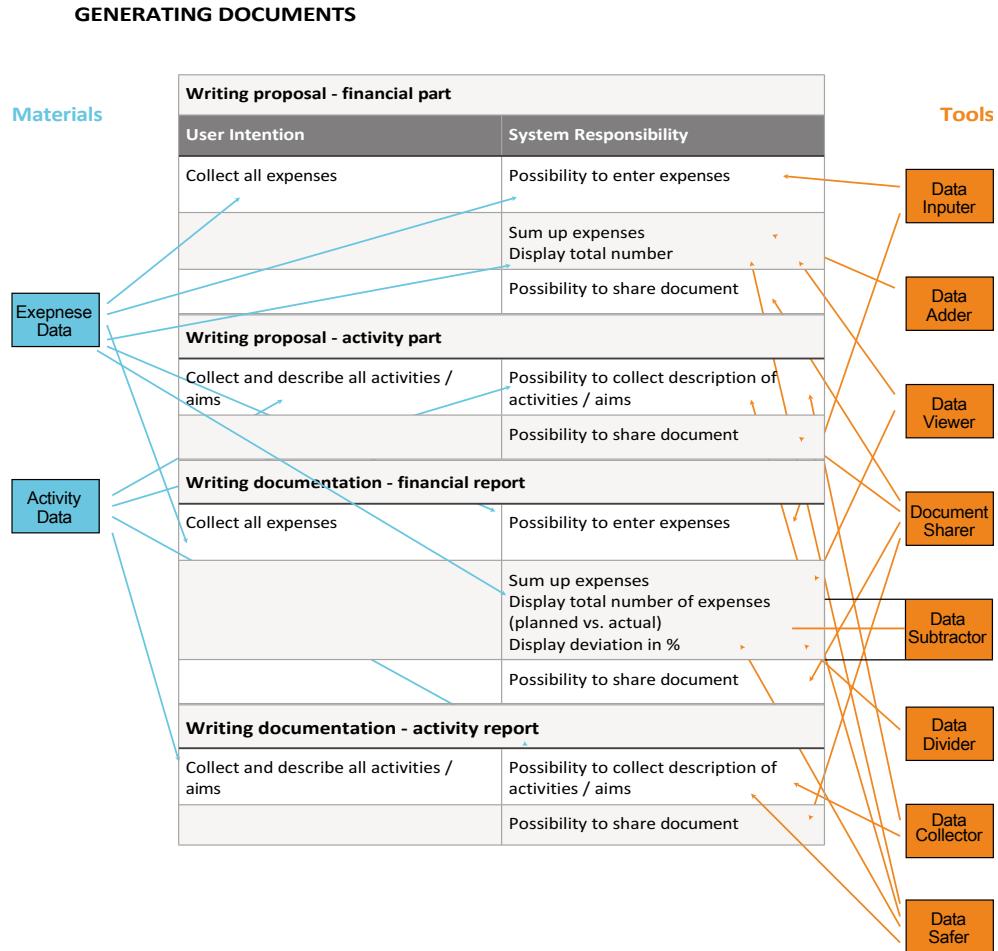


Figure 11: Tools and Materials

3. CONTEXT NAVIGATION MAP

The Context Navigation Map represents the complete interface architecture and shows the scope of the system's complexity. It consists of different elements that are related to each other by arrows. The map also describes the relationships of the interaction contexts and consists of the same. It is created taking into account the tools and materials, i.e. the data types described therein and the associated necessary functions for the respective interaction contexts. The arrows describe the change between different areas and can be compared to a navigation through an application via buttons, menus and the like.

⁴⁹ Larry Constantine, Lucy Lockwood, 1999 p. 133