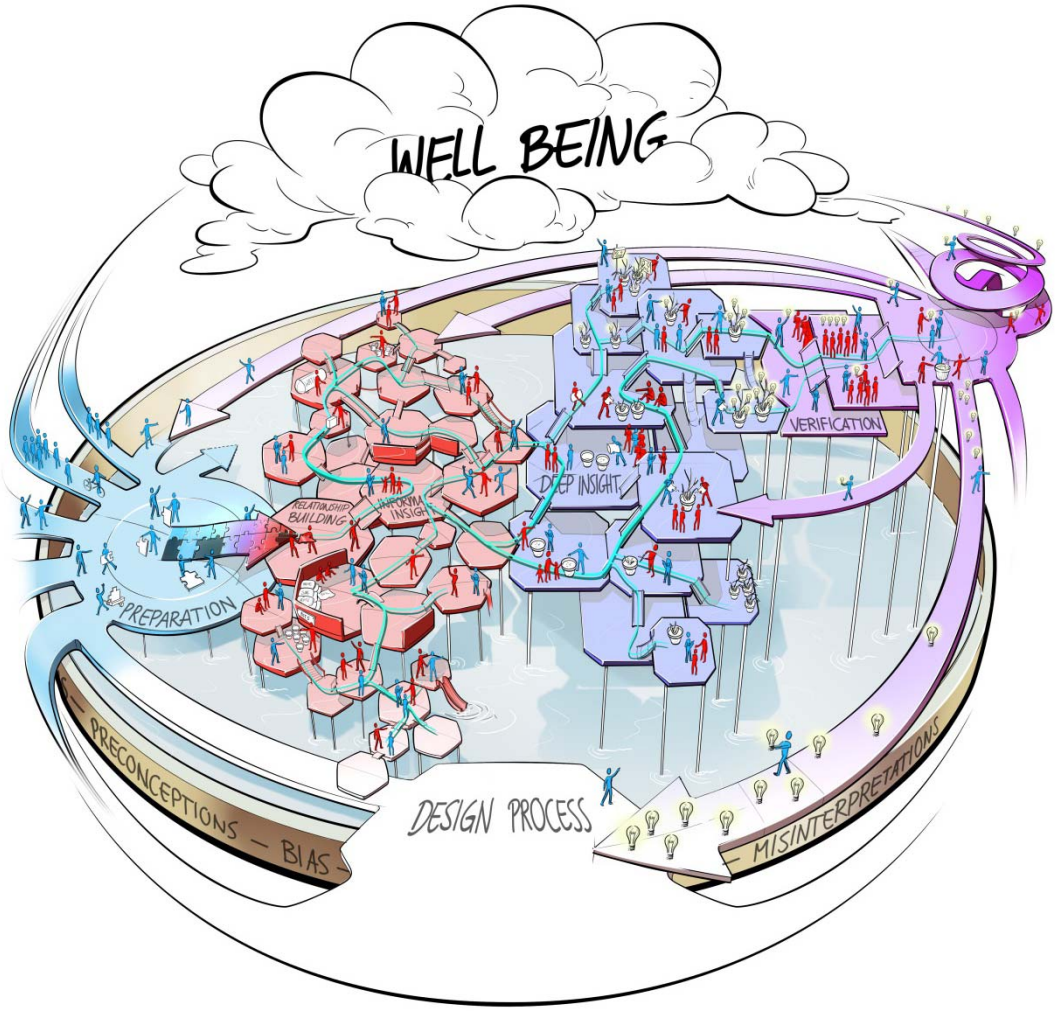
Capability Driven Design Manual



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Capability Driven Design

An Approach for Understanding Users' Lives in Design for Development

www.design4wellbeing.info

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1. Introduction

The CDD approach origins from a design project of an Industrial Design Engineering student at Delft University of Technology (Annemarie Mink). This project once started as an internship in 2004 and concerned the re-design of a silk reeling machine in Deoghar, India, to economically empower disadvantaged and marginalized rural women. The existing machine (see figure 2) replaced the traditional methods of reeling (see figure 1), but was suffering from many problems, such as failure of parts, yarn quality problems and yarn breakage. Four years later, in 2008, the Anna Tasar Reeling Machine was patented and marketed, being a small, easy-to-carry machine for home use, improving the reelers' income, working conditions and safety (see figure 3 – 10). A classic success story.

Figure 1: ***Traditional method of reeling ('thigh reeling')***
Figure 2: ***Old reeling machine used in a reeling centre***
Figure 3, 4, 5, 6, 7, 8, 9 and 10: ***Development of the Anna Tasar Reeling Machine***

However, in 2010 when looking back, it became clear that the project had not fully captured the wickedness of the design challenge and capturing the end-users true desires and preferences. It turned out that the smaller size of the new machine, which enables the reelers to work from home, resulted in the women being forced to work from home, whereas most prefer working together with others in a reeling centre. Thereby, some reelers indicated to prefer the previous, bigger machine for the status it provided them. Moreover, the easy-to-use new machine encourages child-labour, which represents an issue if it stops girls from going to school.

If spending 18 months with potential users and working on the design for four years did not lead to a deep enough understanding, then how can these challenges be addressed when time and resources are much more limited, which usually is the case in design projects?

That is how CDD started. Annemarie Mink started her PhD research in 2010 and successfully defended her work on 11 November 2016 (see: 'references' for her thesis work). She conducted the research under guidance of prof. Prabhu Kandachar and Dr. JC Diehl. The CDD approach presented in this manual and on www.design4wellbeing.info is the result of this PhD project. The CDD approach is based on literature, developed by the researchers when deploying it in the field and discussing the approach with experts. The approach is evaluated by eight design teams using the approach in the field during their design projects and by 52 experts from different countries and backgrounds. The approach as presented here remains open to critique and modifications and you can contribute to its continuous development by using the approach and sharing your experiences and feedback (see: 'you' on www.design4wellbeing.info)

1.1 What is Capability Driven Design?

The Capability Driven Design (CDD) approach is created to guide product design teams to efficiently and comprehensively explore the user context in what is called 'Design for Development' projects. It is important to understand potential users and their context to be able to create products and services that will be accepted and adopted, and which support the potential users in the things they want to be and do. By using the approach, the design team is not only supported to develop more appropriate designs, but also in deliberate decision making throughout the design process, making the process more efficient and effective. Moreover, the obtained insights are a source of inspiration.

The Capability Driven Design Approach provides conversation topics and questions to help in getting to learn a lot about potential users and their context in a limited amount of time. It includes a step-by-step approach, several methods, techniques and tools in order to rigorously obtain comprehensive insight. Prerequisites and guidelines for conducting fieldwork are also provided.

1.2 Why Capability Driven Design?

Products and services partly shape and change our world, and designers can, in this way, use design to improve human well-being and address basic needs. The field of Design for Development (DfD) specifically aims at developing products and services to improve the well-being of "*disadvantaged or marginalized populations*" (Donaldson 2002). These products and services can expand the opportunities that people have to do what they want to do and to be who they want to be. Several universities, organisations, and companies and consultancies are active in the domain of DfD and several of them have developed processes, methods, techniques and tools to better address the needs of the disadvantaged and marginalised. Although significant efforts have been made, there are many examples of products specifically designed for development that failed in their purpose, such as mosquito nets being used as fishing nets (Duflo 2010) or as goal post nets (see figure 11), toilets which are being used as a kitchen or to store cow-dung cakes (see figure 12) or agricultural products

(Gupta 2011), and playpumps which have been abandoned (see figure 13), due to its complex design requiring expensive and / or unavailable parts, its dependency on children's' play, and safety issues (Nhlema 2015; Borland 2011; Unicef 2007).

Figure 11: A mosquito net being used as a goal post net in Zambia (Photo by Moisés Mwape, AP 2014)
Figure 12: Toilet building used for storing cow dung cakes in India (Photo by Shantanu Gupta 2011)
Figure 13: Abandoned playpumps in Malawi (Photo by Mhruti Nhlema 2015)

While product designers evidently pay significant attention towards investigating the user context and integrating the users' perspective and experiences in the design process, their view is often limited to the interaction between the user and the to be designed product. Sklar and Madsen (2010) stress that to be able to truly address the needs of potential users, designers should see the world from their point of view, and should understand their motivations and aspirations. A comprehensive view of the user's world might reveal relevant aspects that, in the eyes of the designer, are not directly linked to the design assignment. For instance, the introduction of mobile phones, developed for personal use, caused privacy problems in developing regions, as family members often share a single phone (Rangaswamy and Singh 2009). Or the development of small, affordable ultrasound devices, which make healthcare more accessible in rural areas, also resulted in increased gender selection (Darnton 2010). Another example is the rejection of backscatter technology, which enables full-body scans at airports to improve safety, because of privacy problems and health concerns (Ahlers 2013) (see figures 14-16).

Figure 14: Mobile phone usage in India (Photo by Banerjee, AP 2014)
Figure 15: A portable ultrasound device in use (Photo by CNN 2013)
Figure 16: Backscatter full *body* scan (Photo by Scott Olson, Getty Images, 2013)

Involving users and entering into a dialogue with potential users from the start of the product design process onwards is vital to be able to address their true needs and wants and improve their well-being. Understanding potential users improves the applicability, acceptance and adoption of the designed product or service (Nakata and Weidner 2012; Parmar 2009; Wilkinson and De Angeli 2014; Robertson and Simonsen 2012; Donaldson 2009; Prahalad 2012). This understanding should go

beyond the product-user interaction: a comprehensive understanding of users' lives, lifestyle, behaviour, values, habits, needs, desires and aspirations is required. By getting to know people comprehensively, aspects can be detected that are not obviously linked to the design assignment, but turn out to be relevant. By direct engagement, less distortion and filtering of information takes place and information can be gained about attitudes and values of which the potential users are not consciously aware. Not for every design project the relevance and level of direct engagement and participation is the same, but especially in DfD projects it is important, as the lives of most product designers differ substantially from those of the marginalised and disadvantaged. The understanding will not only result in products that better fit users' needs and wants, but also results in design requirements, less frustration during decision-making, and reduces the number of design iterations.

In design projects, time and other resources are often limited. Therefore, the comprehensive insight must be obtained in a limited time. To support designers in doing so, the Capability Driven Design approach has been developed. Capability Driven Design is a designer-friendly approach to efficiently guide product designers to comprehensively explore the lives of potential users in Design for Development projects. For this systemic approach analytic guidance is derived from Sen's 'Capability Approach' (CA), and practical guidance is derived from the domains of human-centred design and rapid ethnography. The resulting approach saves preparation and execution time during fieldwork and ensures comprehensive and rigorous data collection. While existing rapid ethnographic and design manuals provide methods, techniques, tools, guidelines, tips and tricks for effectively obtaining user insights, they do not specify which topics can or should be addressed when obtaining comprehensive user insight. They leave it up to the designer to think about the type of information and the insights to be collected for each project. Moreover, ethnographic approaches are not specifically tailored to the needs of designers who are often not trained to conduct ethnographic research, and the design manuals and toolkits provide a method database, but no procedure to follow. According to Margolin (1997, p. 234), there is no "*systematic way of developing a social needs inventory to stimulate the invention of beneficial new products*". Designers in the field, trying to understand their potential users, need analytic guidance for conducting rigorous fieldwork (Button 2000) and therefore require "*efficient tools and frameworks for conducting, analyzing, and presenting user research*" (Boztepe 2007, p. 517).

Therefore, the CDD approach offers efficient frameworks, methods, tools, and systematic analytic guidance for conducting comprehensive user context research in order to help designers to obtain comprehensive user insights. These insights can be used to inspire designers to develop in a participatory manner products and services that anticipate most unintended consequences, truly contribute to people's valued beings and doings, and improve their well-being. The focus is therefore on the first phase of the design process. Figure 17 visualises the research scope and focus within the design process.

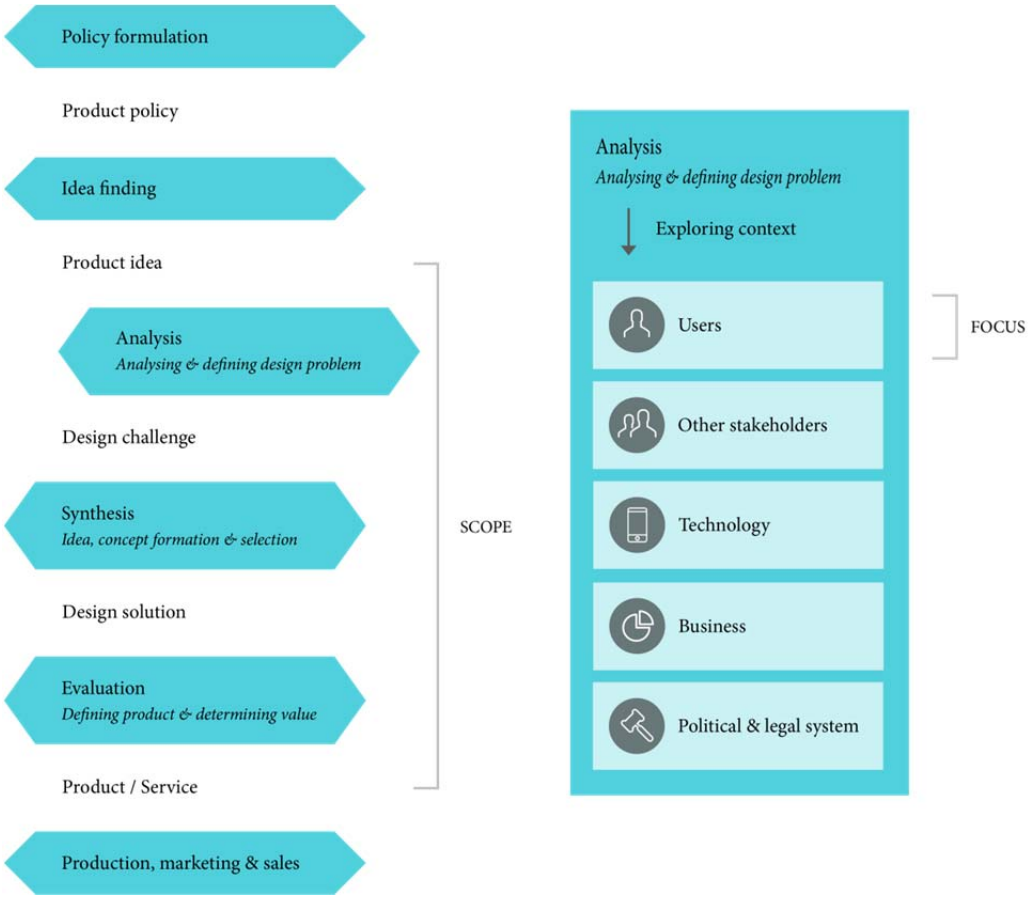


Figure 17: Design process with scope of CDD (left) and the focus of the CDD approach (right)

Outcomes

The CDD approach results in comprehensive insight in a specific group of users and their context. This insight can be used to develop products and / or services that are applicable for those users, and accepted and adopted by those users, and at the same time improve their well-being by enabling the users to do what they want to do and be who they want to be.

The outcomes of the CDD approach are only generalizable for the investigated context. Moreover, the insights obtained comprise past and current experiences, but not future experiences. It is, however, not the goal of the CDD approach to obtain statistically generalizable or future insights, the insights obtained are meant to get a feel for the lives of the potential users to better address their needs and wants now and in the future, and to take their lives, lifestyle, behaviour, norms, values, habits, desires and aspirations into consideration when developing the product and / or service, resulting in better accessibility, applicability, acceptance and adoption of the design outcome.

The obtained insights are many and processing them takes time. The CDD approach propagates iterative data analysis, after each conducted activity. Being part of the CDD approach, the outcomes should be checked after being analysed and interpreted. Time needs to be planned for this analysis and checking, and also for implementing the outcomes in their projects. Immediately noting down surprising and unexpected insights and identifying patterns can link the outcomes to the design process.

2. The Capability Driven Design Approach: Contents and Procedure

The CDD approach consists of two parts. The first part is its contents (theoretical) consisting of a thinking framework, prerequisites, guidelines a set of conversation topics (themes) and questions. The second part is a procedure (practical) consisting of a four-step procedure, tips and tricks. Both parts of the approach are presented in this manual. The full approach is presented in figure 18 below.

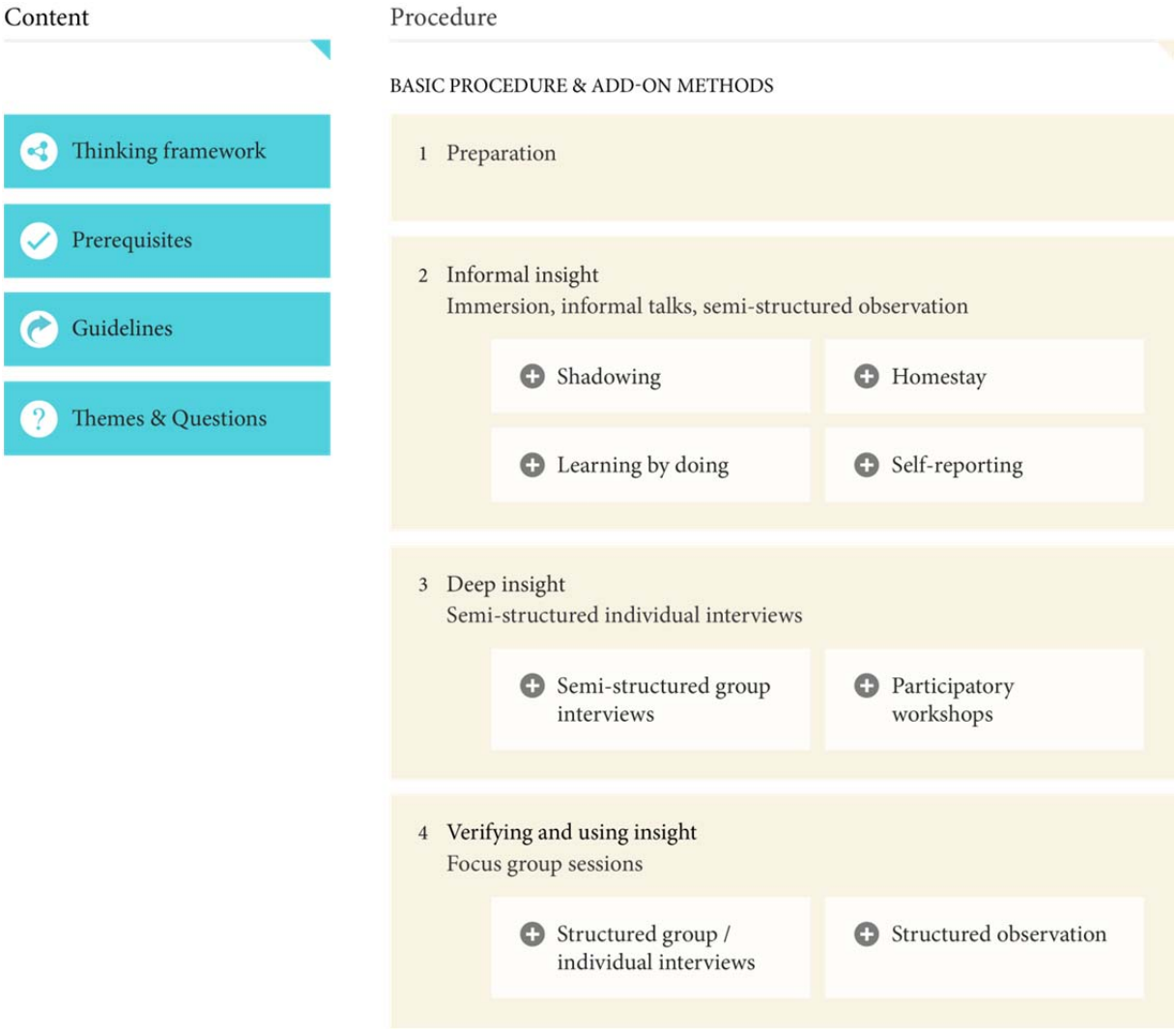


Figure 18: The Capability Driven Design approach and its two components: content (theoretical) and procedure (practical)

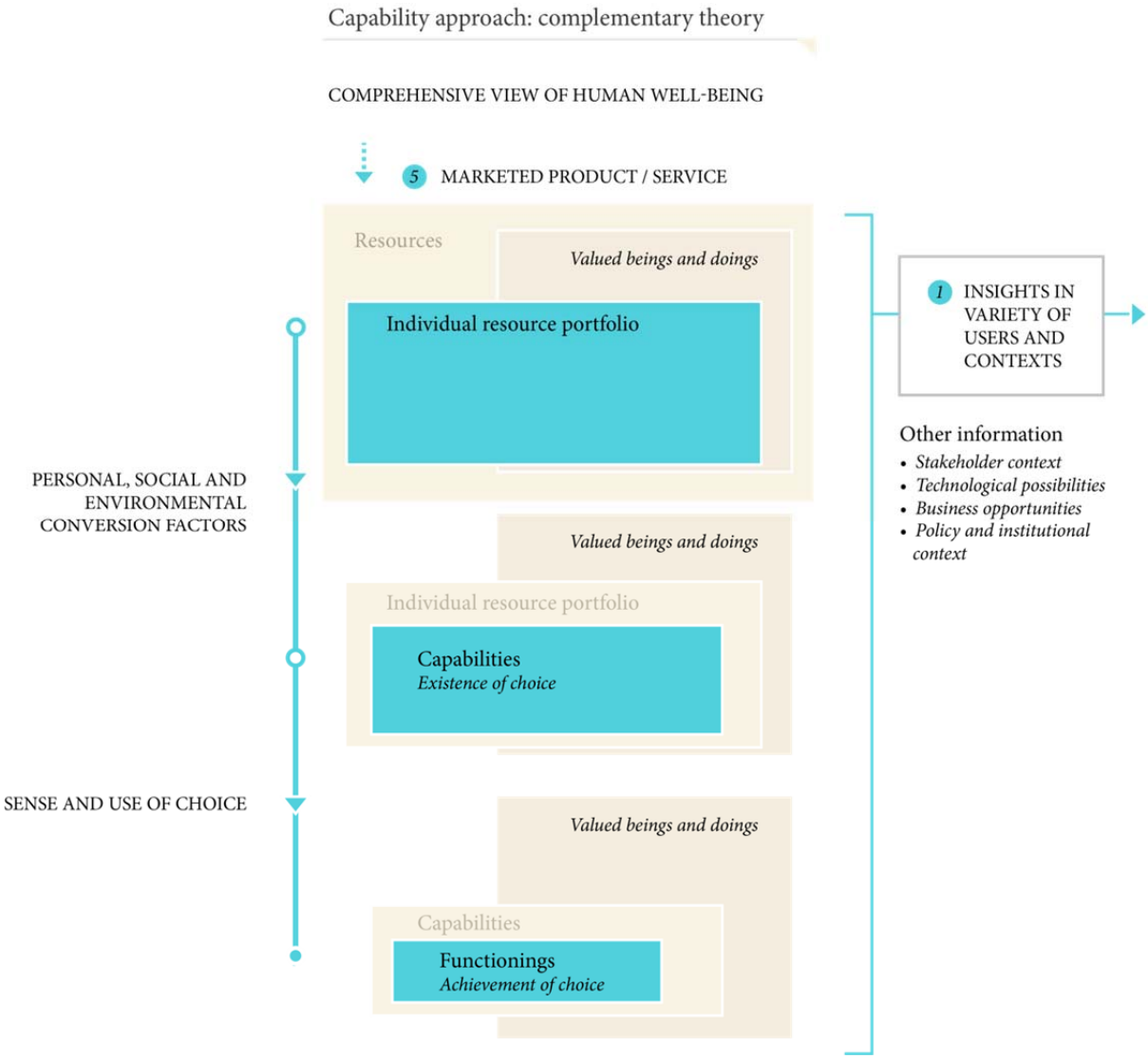
3. The Contents of the Capability Driven Design approach

The CDD approach content consists of a thinking framework, prerequisites, guidelines, and a set of conversation topics (themes) and questions. All of these are explained below.

3.1 Thinking framework

The thinking framework is based on the capability approach and the design process, and is visualised and explained below. The thinking framework is a process consisting of five steps, which are numbered in figure 19 and explained below:

1. By identifying potential users' opportunity space designers can obtain comprehensive user insight. The opportunity space consists of:
   - Capabilities. The valuable 'beings and doings' that a person can achieve. Within the capability approach (CA), the definition of capability differs from its use in everyday language. Gasper (2007b) explains that within the CA capabilities refer to attainable outcomes and are consequently hypothetical, while in daily language capability is mainly used in the sense of inborn or trained potentials (skills, abilities and aptitudes). The focus in the CA is on these opportunities that enable people to do what they want to do and to be who they want to be (Robeyns 2005).
   - Functionings. When a person achieves a certain capability set, the capability set is turned into a set of functionings (Sen 1999).
   - Resources. Kleine, Light, and Montero (2012) describe eleven resources which comprise an asset portfolio that can be converted into capabilities. These can be viewed in table 1 below.
   - Conversion factors. Conversion factors say something about the circumstances in which a person lives and are defined as "the degree in which a person can transform a resource into a functioning" (Robeyns 2011, p. 13). Kleine, Light, and Montero (2012) describe conversion factors as the 'opportunity structure' of a person. Robeyns (2011) divides conversion factors into three sources, which are described below.
   - Choice making behaviour. Kleine (2011) developed the 'Choice Framework' as an attempt to operationalise the CA. In this framework she describes four dimensions of choice: the existence, the sense, the use, and the achievement of choice. If different capabilities exist and people sense their availability, a person can make a choice which results in a specific outcome.
   - Preferences. Things that people like or want, more than another thing (Merriam-Webster dictionary).
   - Needs and wants. The things that people need and desire. Often used by product designers to indicate the information that needs to be obtained from the potential users.
2. The insights inform the design process, aiding in defining the problem and developing design requirements.
3. The insights are considered throughout the product development process, enabling designers to make deliberate design decisions, keeping the potential users involved.
4. To enhance people's real opportunities, product designers can develop products and services that provide users with choices they value.
5. When the choice is made to use the product and/or service, it impacts the life of its user. The new opportunity space can be evaluated and again used to inform a new design process.


Capability approach: complementary theory
COMPREHENSIVE VIEW OF HUMAN WELL-BEING
5 MARKETED PRODUCT / SERVICE
Resources
Valued beings and doings
Individual resource portfolio
1 INSIGHTS IN VARIETY OF USERS AND CONTEXTS
Other information
• Stakeholder context
• Technological possibilities
• Business opportunities
• Policy and institutional context
PERSONAL, SOCIAL AND ENVIRONMENTAL CONVERSION FACTORS
Valued beings and doings
Individual resource portfolio
Capabilities
Existence of choice
SENSE AND USE OF CHOICE
Valued beings and doings
Capabilities
Functionings
Achievement of choice

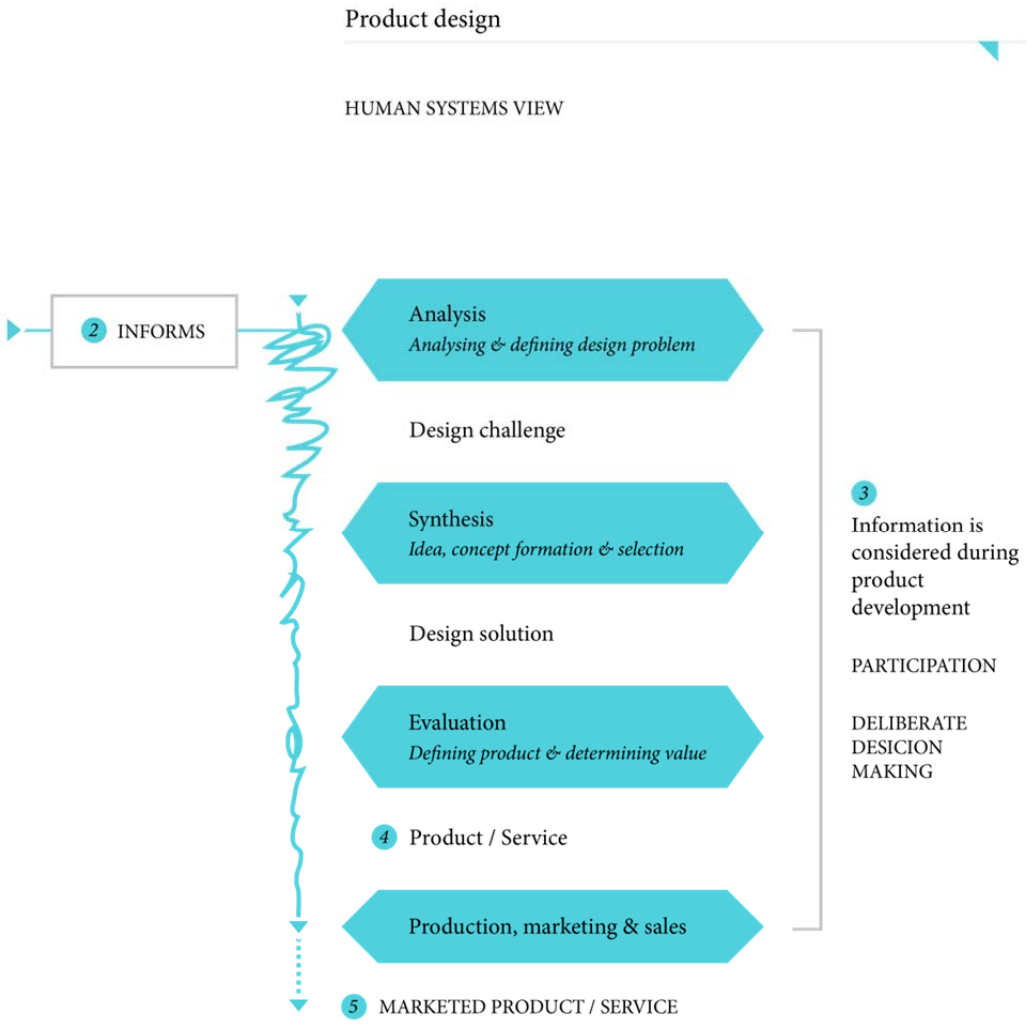


Figure 19: Capability approach based thinking framework

Process of capability enhancement

The left side of figure 19 illustrates the process of capability enhancement: of a set of resources (see table below), an individual has an individual resource portfolio. When the personal, social and environmental conversion factors (described below) allow resources to become real opportunities, capabilities arise. Some of these capabilities coincide with an individual's preferences and needs, others do not. When a person has a sense of this existing choice, this person can use this choice and transform the opportunity into a functioning.

Table 1: List of resources adapted from Kleine, Light, and Montero (2012, p. 47 and 56)

Resource	Description
Internal	
Health	Physical and mental health of a person.
Educational resources	Education and skills acquired through formal and informal means.
Psychological resources	May include capability to envision, self-confidence, tenacity, optimism, creativity and resilience. Spirituality or religious beliefs can strengthen or weaken them.

External	
Material resources	The material objects owned. They are also essential inputs in the production process.
Financial resources	Financial capital in all its forms (such as cash, savings, shares).
Cultural resources	The habitus a particular person lives in, objects (such as paintings, instruments and monuments which only the initiated can use or appreciate) and prestige attached to things (for example to academic titles or leadership roles).
Social resources	Network of relationships of mutual acquaintance and recognition, or in other words membership of a group (can be defined by kinship, friendship, shared ethnicity or class, or informal commonality ties).
Natural resources	Geomorphologic and climatic conditions and related aspects (such as soil quality, naturally available resources, access to water, the attractiveness of the surrounding nature).
Geographical resources	The practical implications of location and relative distances (also includes the intangible qualities of a location).
Information	Access to information and the process of filtering and transforming information into meaningful knowledge.
Self-governed time	The available time a person has.

Conversion factors

Conversion factors influence the transformation of a resource into a capability and comprise:

- *Personal conversion factors*: Factors internal to a person, such as metabolism, physical condition, gender, reading skills, or intelligence.
- *Social conversion factors*: Factors from the society in which one lives, such as public policies, social norms, practices that unfairly discriminate, societal hierarchies, or power relations related to class, gender, race, or caste.
- *Environmental conversion factors*: Factors that emerge from the physical or built environment in which a person lives. Aspects regarding geographical location are, for example; climate, pollution, the proneness to earthquakes, and the presence or absence of seas and oceans. Aspects regarding the built environment are, for example; the stability of buildings, roads, and bridges, and the means of transportation and communication.

To illustrate this transformation (see figure 20): a person might be able to own a mobile phone (individual resource), but only has the capability of distant communication when this person is allowed to use it (social conversion factor), is able to use it (personal conversion factor) and has, for example, a power supply (environmental conversion factor). Whether this person actually achieves the capability for communication depends on the awareness of the phone's ability for distant communication (sense of choice) and the availability of other valuable options (such as playing a game on the phone, or going out and enjoy time with friends) which the person might prefer over communication through the phone (use of choice). If this person actually uses the mobile phone, this capability turns into a functioning.

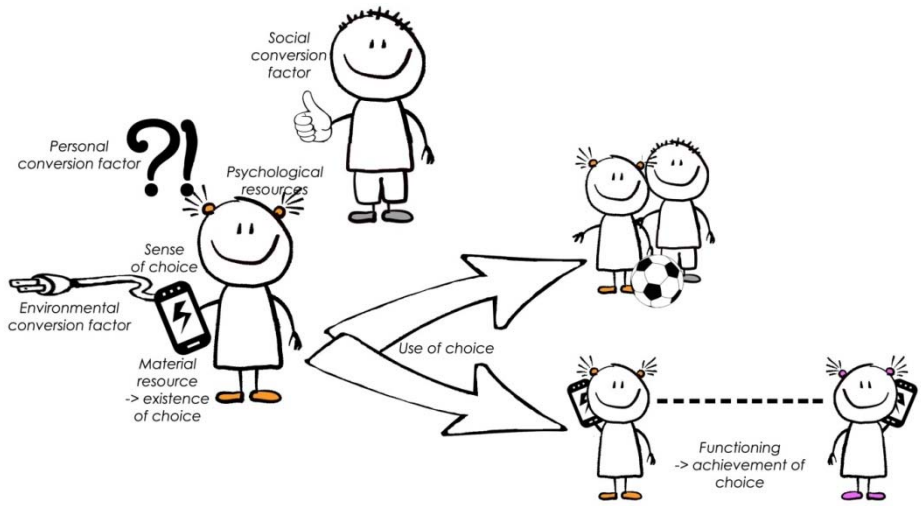


Figure 20: Process of capability transformation

Personal choice

Kleine (2011) mentions four stages of choice: the existence, the sense, the use, and the achievement of choice. If different capabilities exist and people sense their availability, a person can make a choice which results in a specific outcome. Kleine (2011, p. 123) notes that choice does not only have an instrumental role, but also intrinsic value, as '*being able to pursue one's own choices is part of being fully human*.'

The transformation of a capability into a functioning specifically depends on people's sense and use of choice. People's sense of choice relates to people's imagination and is influenced by several aspects, such as educational resources and discourses (Kleine 2010; Kleine, Light, and Montero 2012). The use of choice depends not only on people's preferences and conception of the good life, but also on people's ability to choose, which can be influenced by age and mental ability, and on outside influences, as for example social pressure (Robeyns 2005). Both the sense and use of choice can be influenced by adaptive preferences. This phenomenon is described by Sen (1999, p. 63) as "*the adjustment of people's desires and expectations to what they unambitiously see as feasible due to their deprivation*." According to Clark (2009) adaptive preferences come into existence due to several reasons: (1) the malleability of people's aspirations and desires to the circumstances in which they live; (2) the social conditioning or cultural and religious indoctrination; and (3) the more general form of people's own limitations to make informed judgments and rational choices.

3.2 Prerequisites

There are certain prerequisites regarding Capability Driven Design that need to be followed. These comprise the following:

A. *Triangulate for data reliability and validity.* In order to enhance data reliability and validity designers should triangulate data. There are multiple types of triangulation:
   - Discipline triangulation: involving designers from multiple disciplines to look from different perspectives and in this way reduce errors (prerequisite B);

- Investigator triangulation: conduct the research with multiple designers (varying in gender, age, colour, status, insider/outsider role) to cross-verify observations and descriptions (prerequisite C);
- Data triangulation: using different data sources (e.g., from different people, places) (prerequisite H);
- Theory and methodology triangulation: using multiple methods, for example a combination of observations with interviews and discussions (prescribed by Capability Driven Design approach)
- Tool and technique triangulation: using multiple tools and sources of confirmation, for example by asking different type of questions about the same topic, by using drawings and showing pictures (prescribed by Capability Driven Design approach)

Capability Driven Design already prescribes the use of multiple data sources, methods, tools and techniques, and prerequisites B, C and F ensure discipline, investigator and data triangulation. This prerequisite is mainly added to stress the importance of these different types of triangulation.

B. *Multidisciplinary team.* In order to enhance data reliability and validity designers should triangulate data. Capability Driven Design already prescribes the use of multiple data sources, methods, tools and techniques, to improve data reliability and validity. To further improve outcomes, designers from multiple disciplines should be included in the design team: they should have different backgrounds, skills and knowledge. This leads to a balanced perspective, access to a range of participants. Thereby, when team members conduct activities - in pairs – at the same time, the process of user context exploration is sped up.

C. *Establish local partnerships.* Local partners are required in order to adjust quickly to the local circumstances, obtain information about the potential users and community structures, get advice on activities, help figuring out what to do, be properly introduced in the community, help provide access to an unbiased selection of participants, build trust in communities, and to be properly introduced to the local people. They can also aid in selecting participants and finding translators. A community partner should be someone who understands local things and is respected by the people.

D. *Get the team, client and translator on board.* It is important for all those involved to see the relevance of the CDD approach to ensure reliable, rigorous data collection.

E. *Follow qualitative research and ethics training.* In order to conduct sound, rigorous research that does not invade people's private lives in an incompetent way, and which results in valuable data, designers should have a solid and broad understanding of doing good research in the field. The research should be executed in a systematic, sceptical, ethical and rigorous manner. Designers should not conduct extractive research, but ensure an interactive, participative process together with the potential end-users to their mutual benefit. Therefore designers need to follow a training in which they are taught the right attitude, behaviour and questioning skills, and during which they practice their learned skills and techniques. Designers should also continuously examine their attitude, behaviour and questioning when conducting user context research in order to improve upon them. Capability Driven Design contains a 'training module' that designers can use to learn about doing good research in the field. In addition, a card with the most important interviewing rules will be added to the ODK toolkit. This module and card, however, do not replace practical training under guidance of an expert.

F. *Learn the themes by heart*. In order to obtain broad insight into all aspects that comprise a person's life and context, the themes and topics are leading. The themes should therefore be learned by heart, in order to allow for quick changes in conversation topics and establishing a fluent dialogue in which participants truly open up. They also help to pay attention to a comprehensive set of aspects when observing potential users in their natural settings. It helps to study the themes and questions, to roleplay them and to pilot them in the field. The facilitator and / or note-taker can keep track of the themes and questions by using the question cards.

G. *Plan for it.* Conducting user context research takes time, especially in developing regions where 'things do not always go as planned', and often time is needed for travel, for establishing contacts to obtain access, and for acclimatisation to the local situation. It should not be a 'side-activity'. Preparation takes time, conducting activities takes time, and data analysis and validation take time. Plan sufficient time to properly follow all the steps and to conduct rigorous user context research.

H. *Select a variety of participants with different characteristics for a broad range of insights*. Especially a variety in gender, ethnicity, social class, age, and religion are important to include. Do not only include potential users, but obtain a broader picture to learn more about task distributions and perceptions of the broader community. Be aware not to only select participants that are easy to access, as this results in bias. It is, however, not always possible to talk to an unbiased sample of participants, as some people are truly difficult or even impossible to reach. It often depends on the community partner what is possible.

I. *Activities should be conducted in pairs and preferably be recorded.* Capability Driven Design already prescribes the use of multiple data sources, methods, tools and techniques, to improve data reliability and validity. To further improve outcomes, each activity should be conducted with a minimum of two persons, even when the researchers are familiar to the ODK and bring recording devices. By assigning one activity facilitator and one note taker, each of them can focus on their own specific task, while interpretations, experiences and perceptions can be compared, ensuring investigator triangulation and improved data reliability. A third person can be added to take photographs or shoot video (when consent is given), but more people can overwhelm participants. Activities should preferably be recorded, to enable the note-taker to focus on behaviour, body language and the environment. When it is not possible to conduct an activity with multiple team members present, for example when a situation with solely women needs to be created and there is only one female team member, the activity should be recorded to allow for the designer to focus on the activity and the participant and to enable other team members to listen back to the things being said. However, only when consent for recording is given by the participant.

A. *Activities should be conducted in participants' natural setting*. Potential users should be directly observed and interacted with in their natural settings in order to improve learning and understanding by building a shared language, capturing detail, gather concrete data, develop empathy and reduce bias and rationalization, filtering and distortion of information. Preferably, the design team will be in the field throughout the design project, but if that is not possible, at least at the beginning, prior to problem definition, and during prototyping, in order to obtain feedback and make adjustments to the design.

J. *Participatory, simple and enjoyable activities*. Capability Driven Design stimulates the use of a variety of techniques and tools, which can be tweaked by the designers to better fit their purpose. For the ODK interview method, techniques and tools have been selected and defined,

but can still be changed. When designers develop or adjust techniques and tools, it should be kept in mind that multiple techniques and tools should be used (prerequisite A), and that activities should be simple, engaging and interactive, in order to create an enabling atmosphere in which participants feel free to express themselves. It is advised to let participants perform tasks or to let them create things, to stimulate expression of latent and tacit needs and desires.

K. *Use insights to inform the next activity.* As newly obtained information leads to new understanding, research goals and methods should be changed accordingly to obtain additional information. The research outcomes should therefore be analysed by the team after each activity to adjust the activities based on new insights.

L. *Discuss outcomes in a larger group to improve their value*. The information, knowledge and interpretations should be shared with participants to point out misunderstanding and to improve data validity. If participants agree, they should also be shared with the community and local partners to keep stakeholders involved, enhance transparency and openness and improve data reliability.

M. *Critical reflection on limitations.* The data obtained, the methods used, the researchers involved and the project executed all have limitations and the researchers should reflect on them and be open and honest about them. These limitations can depend on the following:
   - The facilitator's quality, skills, behaviour, bias, subjectivity and terminology used;
   - The design team's presence, characteristics, agenda and perspective;
   - The participant's character, motivation, interest, well-being, feelings, emotions, etiquette, availability of time, scepticism, distrust, suspicion, prior experiences, cultural background and values;
   - The setting of the interview, the audience present, gatekeepers present, disturbances and distractions from outside;
   - The translator' s presence, biases, skills, interest in and understanding of the project;
   - The amount of distortion due to translation;
   - The presence of recording devices.

3.3 Guidelines

The following eight guidelines designers are advised to follow when using the CDD approach:

A. *Appropriate behaviour and attitude.* All team members should follow the tips and tricks for 'appropriate behaviour and attitude'. It is important to have an open mind, to build trust, to respect participants and their time, to treat them as experts and to truly listen without beliefs, biases, and making assumptions. Be honest about goals, keep participants informed about the progress made regarding the design project, properly thank and compensate participants for their invested time and effort. See: 'tips & tricks'.

B. *Compensation*. Compensation can and should be provided to participants for their lost time and possible transportation costs, but be aware that money does not become an incentive to participate, as this influences the interview outcomes. Money, food and gifts to bring depend on the activity and on the context. Providing a tangible gift allows the participant to show the gift to other people, but might not be appreciated everywhere. It is important to find out what the people in the area find valuable. The compensation can be decided upon in collaboration with local partners.

C. *Appropriate questioning.* The facilitator(s) should be trained on qualitative research skills (prerequisite). In order to guide the facilitator, the tips & tricks regarding 'appropriate questioning' should be followed. See: 'tips & tricks'.

D. *Observe, listen, and document everything*. Note down characteristics of the participant (e.g., name, gender, social class, religion, age, occupation), of the activity (e.g., type of activity, the people present, date and location, materials used), and of everything that is seen, heard, felt, smelled, tasted, and / or surprising. Observations during the interviews are a useful means to check and interpret answers, and valuable when starting and continuing the dialogue. Observe during the touchstone tour, but also observe the participant's behaviour and body language. Keep an eye on intonation. Follow the tips and tricks for 'what to pay attention to'. See: tips & tricks.

E. *Selecting, instructing and working with a translator*. A translator forms a disconnect between you and the participant, as participants often focus on the translator. This limits the building of rapport. Translators differ in motivation, understanding and skills. Their age, gender, social class, clothing, religion and ethnicity of the translator with reference to the participant plays a role. Therefore, the tips and tricks for selecting, instructing, and working with a translator should be followed. See: 'tips & tricks'. It is not always possible to control all translator characteristics, but by building rapport with the translator, and with a proper instruction the translator can be guided to diminish his / her influence on the outcomes.

F. *Schedule more time than planned*. Things often take more time in the field, due to, for example, dependency on other people, differences in punctuality, religious breaks, unavailability of electricity, internet access or the required materials, limited infrastructure, and limited access to stakeholders.

G. *Be aware of your position*. Local people perceive you in a certain way. Because you are an 'outsider', you might be perceived as interesting to talk to, as a professional or expert, or you can be distrusted or not being taken seriously. It might even be dangerous to walk around and talk to people. People might also see you as a source of help (financial or otherwise) and therefore try to convince you of their misery, or they might be embarrassed and try to hide their situation from you. Your age, gender, social class, religion, ethnicity and with reference to the participant plays a role. It is important to build rapport and behave and interact appropriately (tips & tricks). It is important to be aware of the influence of age, gender and clothing, and how these are perceived by participants, to limit its influences on the interview outcomes and to at least take this influence into consideration during data analysis and interpretation.

H. *NEW - Influence of recordings.* Using video, voice recording and / or photography have several benefits and disadvantages. They might result in participants becoming shy or hiding information in order to not let it be recorded. On the other hand, they provide visuals and dialogue which aid the designers to analyse and interpret the data and to communicate the data to their team members. The design team can decide to secretly record observations and interviews, but should always ask permission afterwards for using these, and must realise that secret recordings can seriously damage the relationship with the potential users.

I. *NEW* – Contextualising visualisations. As the intended 'receivers' of the message displayed in the visualization vary, it is difficult to develop one universal set of visualizations suitable for every context. Therefore, contextualizing the visualisations might stimulate discussion. See: tips & tricks for developing these visualizations.

3.4 Themes and questions of Capability Driven Design

The CDD approach offers themes and topics that all need to be addressed when conducting activities, in order to obtain comprehensive user insight. These themes and topics can be viewed below.

Person	**Self-Reflection & Dreams**	**Spirituality**	**Knowledge & Skills**	**Body & Appearance**
	Self –reflection, identity, plans for the future, goals, self-improvement, habits, expectations, barriers, confidence, life satisfaction	*Religion, beliefs, rituals, functionings. Involvement of others, time spend, way of practicing, body energy, inner peace, intentions*	*Knowledge, skills, (in)formal education, training, talents, capacities, imagination, work, reasoning, literacy, languages, activities, critique availability of education,*	*Appearance, care, hygiene*
Health	**Health**	**Healthcare**	**Happiness & Worries**	**Food & Drinks**
	Physical condition, life expectation, health limitations, medicine, mortality, body energy, ability to perform activities	*Doctor, nurse, dentist, clinic, hospital, medicines, (in)formal care, trust, familiarity, beliefs, stigmas, attitude, superstition, subsidies, affordability, accessibility, connectivity*	*Worries, stress, strain, love, care, support, loneliness, happiness, bless, expression of feelings, vulnerability, uncertainty about future*	*Habits, intake, nutritional value, availability, affordability, variety, quality, cooking*
Relation-ships	**Family**	**Community**	**Social Life**	**Colleagues**
	Partner, children, parents, siblings, in-laws. Attachment, ties, love, romance, children (contraception, abortion, care, infertility), pressure, tradition, knowledge transfer, support, hierarchy, cooperation, acceptance, appreciation, competition, activities, decision making, having voice, sharing	*Friendships, ties, activities, attachment, stigmatisation, class differences, acceptance, appreciation, competition, cooperation, pressure, tradition, sharing, support, social status*	*Friends and acquaintances. Strong and weak ties, informal relations, networks / digital, attachment, acceptance, appreciation, competition, cooperation, pressure, tradition, sharing, support*	*Friends, ties, activities, attachment, acceptance, appreciation, competition, cooperation, pressure, support, exploitation, teaching / inspiring others,*
Activities	**Work & Spare Time**	**Movements**	**Participation & Organisation**	**Information & Communication**
	Paid / unpaid (e.g., household, care) activities, leisure, hobby, time perception / usage, activity type, where, with whom, working area, enjoyment, usefulness, power, learning / training, decision making, relaxing celebrations.	*Places to go, freedom to go out, ability to go out, safety to go out*	*Communal, regional, national. Social activities, involvement, participation, express opinion/ speaking up, critique, power, control, view, politics, voting, misuse/misbehaviour/forgery, corruption, justice, rules & regulations, political support*	*Phone, internet, relationships, solving problems, information distribution, mobility, correctness of information*
Living	**Housing**	**Safety & Security**	**Facilities**	**Environment**
	Type, ownership, size, choice, facilities, attachment, migration, own space, comfort, envy / judging	*In- and outside the house and area, day and night. Bullying, discrimination, physical security, emotional security, cyber security, fright*	*Energy, energy access, water, infrastructure. Accessibility, affordability, reliability*	*Nature, environmental conditions, climate, wildlife, eco-system, attachment, access, rules and regulations, relaxing, consciousness*
Posses-sions	**Products**	**Financial Situation**	**Natural Property**	**Animals**
	Household, personal, mobility, communication. Ownership, characteristics, cultural value, product security, attachment, usage, fashion/ trends	*Savings, income, expenditure, possibilities, behaviour, affordability, accessibility/ control, taxes / policies, financial security*	*Land, plants, trees. Number, size, price, availability, rules and regulations, usability, attachment, happiness, relaxing, care, abuse, privacy*	*Pets, cattle for work, protection or food/drinks, acceptance, attachment, beliefs*

The CDD approach also comprises 255 questions, which are example questions to start a dialogue. The questions are categorised per theme and sub-theme. For each sub-theme a set of three pictograms have been made between which designers can choose one to use in their specific context. The pictograms are in one style and in black-and-white, because in different cultures different meanings are attached to different colours. For each sub-theme a question card is made, which is meant to guide the designers during their activities, and more especially during interviews. For communication with the participant, the same pictograms can be used. The design team should choose one pictogram which fits their context best. The choice can be made together with the local partner and / or translator or based on a pilot interview. Some pictograms might still need adjustment to better fit the context of use.

The preference remains to contextualise the visualizations, but if time does not allow for it, the pictograms presented here can be used. It is, however, important to explicitly discuss the meaning of each pictogram, in order to align the dialogue. The pictograms and question cards are presented below, per sub-theme (see figures 21 and 22).

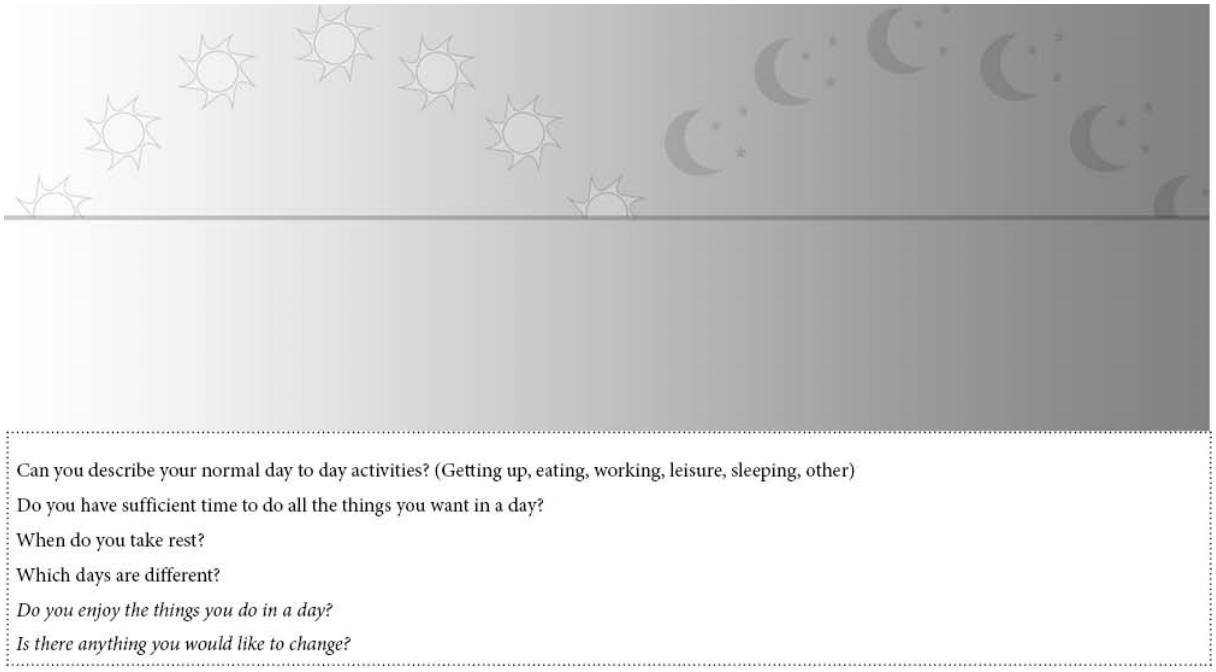


Figure 21: Timeline with questions

Pictograms and question cards

SELF REFLECTION AND DREAMS

Do you have a passion?

Are you satisfied with your life as it currently is?

What are the things you are proud of?

Do you have a plan of what you want to do or be in life?

Who do you go to for advice about your life? Who's opinion matters to you most?

What do you want to achieve in your life? What do you dream about? (can be both short-term and long-term)

Can you decide yourself what you want to do or be in life?

Are you confident?

Do you feel you can make your own decisions in life? (Decisions can be related to: accommodation, healthcare, household, family, products, nutrition, other?)

Would you like to be more involved in decision making?

If you could change anything in your life, what would you want to change?

How / why / what / who / where / when...?

SPIRITUALITY

What does spirituality mean to you? Is it important to you?

How much time do you spend on spiritual practices? Would you like to spend more time?

What do you do when you spend time on spirituality?

Which spiritual rules do you follow? Why?

Which religion do you follow? And your family?

What do you think about other religions? Have you ever considered other religions?

How do you find inner harmony and piece?

Which things in life give you energy?

Do you believe in guilt and punishment?

How / why / what / who / where / when...?

KNOWLEDGE AND SKILLS

Have you been to school, how many years? And your partner / children?

Would you have wanted to go longer back then? If yes: why didn't you?

How do you improve upon your knowledge and skills?

Did you follow any courses / trainings? Do you have diplomas?

Would you like to learn more right now (trainings, courses)? What would you like to learn?

Do your children go to school? Where is the school? What type of school is this? How do you get admitted there? What do you think of the teachers?

Which languages do you speak? Can you read and write? Can you count? Do you have a signature? Do you want or need any of these?

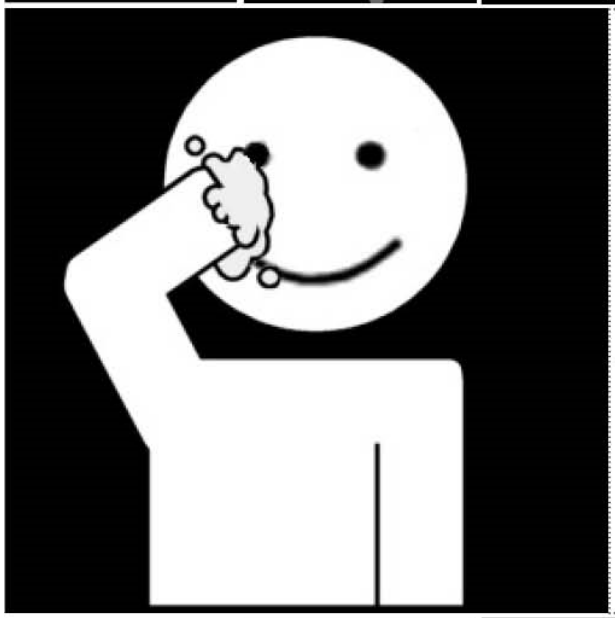
What are the things you are good at in you daily activities?

Do you use your skills and talents in your daily activities? Would you like to use them more?

Do you use your knowledge in your daily activities? Would you like to use it more?

Do you ever face problems you cannot solve by yourself? What kind of problems? Then what do you do?

How / why / what / who / where / when...?



BODY AND APPEARANCE

How much time per day do you spend on personal care (washing, brushing teeth, clothing, styling)?

What kind of products do you use for personal hygiene?

When and how often do you wash your hands?

Do you like your clothing? Do you think you have sufficient clothing?

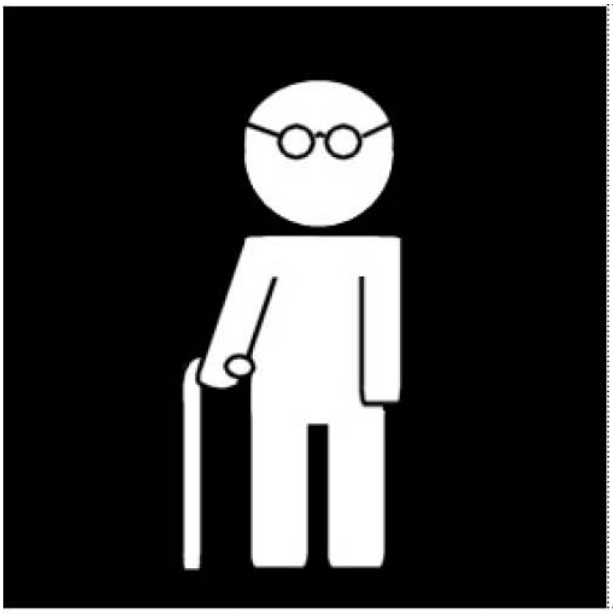
How often do you go to a barber?

Do you work out or exercise?

How confident are you about your appearance?

If applicable: Are you somehow obstructed to do your daily activities when you are menstruating? Do you have a place to change when you are menstruating?

How / why / what / who / where / when...?



HEALTH

How is your physical condition?

Do you have any health problems? And your family members? Do these limitations obstruct you / your family members in your / their daily activities?

Do you or your family members take any medicine?

Where do you get your medicine? And medical devices?

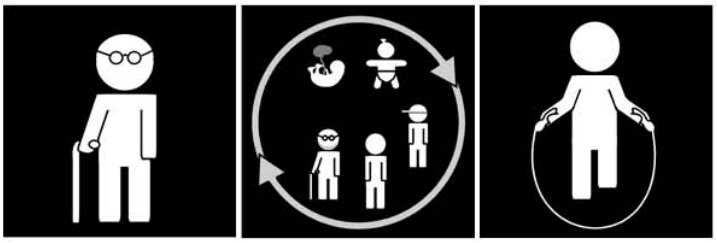
Did anything change regarding your health recently?

How long do you want to live?

How do you try to prevent illnesses?

Is there anything that you require concerning your health?

How / why / what / who / where / when...?



HEALTHCARE

Do you have a doctor / hospital / clinic / dentist / other medical treatment facilities?

How did you choose your doctor / hospital / clinic / dentist / other medical treatment facilities?

How far away is your doctor / hospital / clinic / dentist? Are they easy to reach?

How often do you visit the doctor / hospital / clinic / dentist? When do you visit?

How familiar are you to your doctor / hospital / clinic / dentist?

Can you and your family visit the doctor / hospital / clinic / dentist when required? Are they expensive? How do you pay for them?

Do you trust your doctor / hospital / clinic / dentist?

What type of doctor do you have (quack, homeopathic, allopathic, family doctor, other) ? Why?

Is there anything that you require regarding healthcare?

How / why / what / who / where / when...?

HAPPINESS & WORRIES

Are you happy? Are you hopeful? Why?

Who do you go to when you feel happy?

Who can you count on most for love, care and support?

What do you feel blessed about?

Do you find it difficult to express your feelings?

Do you worry much? Do you ever feel stressed? Do you sleep well? Why?

Do you ever feel sad or lonely? Why?

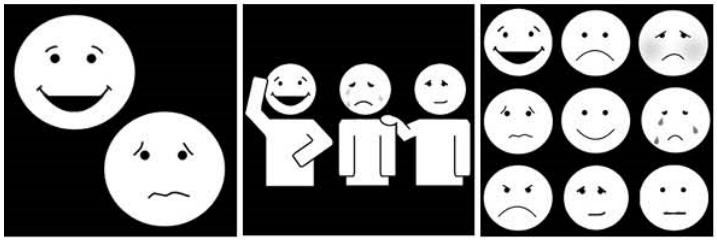
Who do you go to when you feel sad or lonely?

Who are you able to tell everything?

Have you ever felt differently about life?

What would you like to change regarding your feelings and sharing them?

How / why / what / who / where / when...?



FOOD & DRINKS

Do you have a doctor / hospital / clinic / dentist / other medical treatment facilities?

How did you choose your doctor / hospital / clinic / dentist / other medical treatment facilities?

How far away is your doctor / hospital / clinic / dentist? Are they easy to reach?

How often do you visit the doctor / hospital / clinic / dentist? When do you visit?

How familiar are you to your doctor / hospital / clinic / dentist?

Can you and your family visit the doctor / hospital / clinic / dentist when required? Are they expensive? How do you pay for them?

Do you trust your doctor / hospital / clinic / dentist?

What type of doctor do you have (quack, homeopathic, allopathic, family doctor, other) ? Why?

Is there anything that you require regarding healthcare?

How / why / what / who / where / when...?

FAMILY

With whom do you live together? How much time do you spend with them? What do you do together? What do you talk about together?

If applicable: How did you and your partner get together? What do you like most about your partner? When do you spend time together with your partner? If applicable: Do you have children? Do you want to have children / more children? What do you find most important to offer your children? What do you like them to become?

Do you have parents, brothers, sisters, in-laws? Where do they live? How often do you meet them? What do you do together?

Are you happy with your family? Do you feel appreciated / accepted?

Do you have specific family traditions and / or celebrations?

In which ways do you support your family? Do you feel like you can count on your family for support?

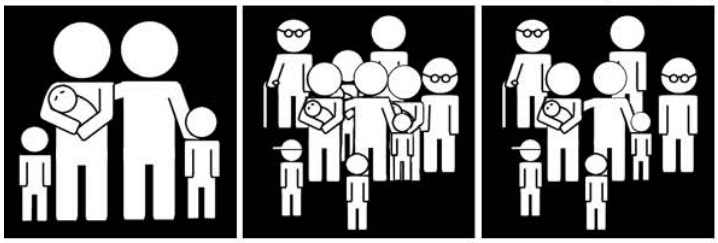
Who makes the decisions in your family? Why? Are you able to speak up freely, express emotions and aspirations?

Do you feel you can make your own choices in life? Do you experience any family pressure?

Did anything change in your family or family relations recently?

Is there anything you would like to change in your family?

How / why / what / who / where / when...?



COMMUNITY

Do you know a lot of neighbours / people in your community?

Do you feel accepted in your neighbourhood / community?

When do you meet the people in your neighbourhood / community?

Do you feel you fit in your community? Are there people who do not fit in the community?

Do you belong to a specific social group?

How does your community treat outsiders?

Are you able to speak up freely within your community?

Are you able to express emotions towards your community?

Did anything change in your community in the past years?

Is there anything that you would like to change in your community?

How / why / what / who / where / when...?

SOCIAL LIFE

Do you have friends? How and where did you get to know them? When did you get to know them?

Do you like to meet your friends? Would you like to meet them more often?

When do you meet your friends? How do you meet your friends?

What kind of things do you talk about with your friends? Do you feel like you can tell your friends everything?

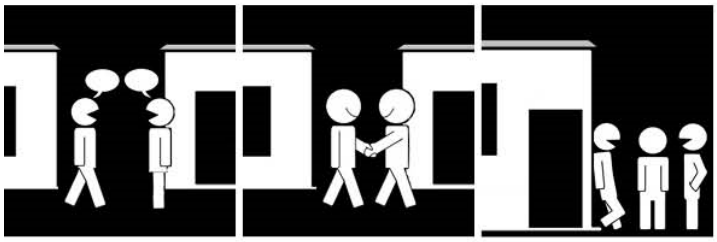
What activities do you do when you meet your friends?

Do you feel like you can share your emotions and aspirations with your friends?

Did anything change in relation to your friends in the past years?

Is there anything that you would like to change in your current friendships?

How / why / what / who / where / when...?



COLLEAGUES

Do you have a boss / co-workers / employees?

Do you have a good contact with them?

How long do you know them?

Do you meet your colleagues also outside working hours?

Do you feel accepted and appreciated at work?

Are you able to speak up freely at work?

Are you able to express emotions and aspirations at work?

Did anything change in relation to your colleagues in the past years?

Is there anything that you would like to change in your relationships with your colleagues?

How / why / what / who / where / when...?

WORK & SPARE TIME

What kind of activities do you do during the day? And your family?

Where do you work? And your family? Who does the household work?

Why do you do this work / activities? Are you happy with doing them?

Where did you learn to do this work? Which training did you have? How do newcomers learn to do the work?

Which work things are you good at? Do you feel appreciated / useful?

Are there other work activities you would like to do?

How many hours do you work? Do you feel you need more work time?

How much time is free in a week? Is there time when you feel free to do nothing? What do you do when you do not work?

How many spare hours do you have in a week? Do you feel you need more free time? With whom do you enjoy spare time together?

Which festivities/parties/events do you celebrate in a year? Why? When?

What do you like best in your daily activities? And what do you dislike?

Is there anything else that you would like to do? Or like to change?

Did anything change in your job / activities in the past years?

How / why / what / who / where / when...?

MOVEMENTS

Do you go out often? Where do you go? Why do you go out?

Do you often go out of your community? Why?

Where do you travel to? (e.g. for family, work, spare time, friends, healthcare, shopping, political participation)

What is the furthest place you ever went? Why did you go there?

Which places do you go when you leave your house? What is your favourite place to go?

Are you able to go wherever you want to go? Whenever you want to go?

Is it safe to go everywhere you want to go?

Which places would you like to visit (more often)?

How / why / what / who / where / when...?

INFORMATION AND COMMUNICATION

How do you communicate with other people? Do you have a mobile phone / internet access / television?

Are you on social media? Does your phone have internet access?

How much money do you spend on mobile phone usage / internet / communication?

Are there other forms of communication which you would like to use?

What kind of communication device do you like most?

How do you search for information? Do you always find an answer? (Information quest can be related to: health(care), transportation, education, nutrition, products, animals, politics, religion, other themes)

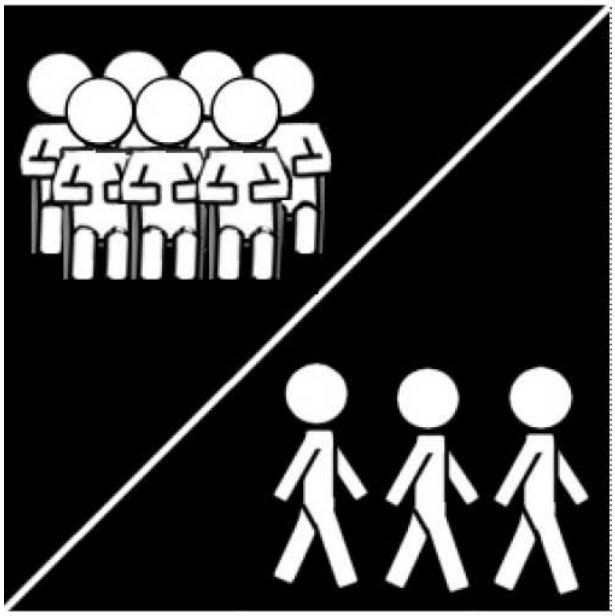
Do you feel you have sufficient access to information? Is the obtained information usable?

Is there a need for you to find more or different information?

Are there more ways for you to gather information that would be convenient?

What has changed in the past years regarding communication and information?

How / why / what / who / where / when...?



PARTICIPATION & ORGANISATION

Do you vote? How do you vote? Why do you vote?

Are you involved in politics? Would you like to participate (more) in political activities?

Are you involved in social activities on a communal / regional / national level?

Do you feel the government provides sufficient support?

Have you ever met public officials?

Do you feel there is any corruption or misbehaviour in your community / region / country?

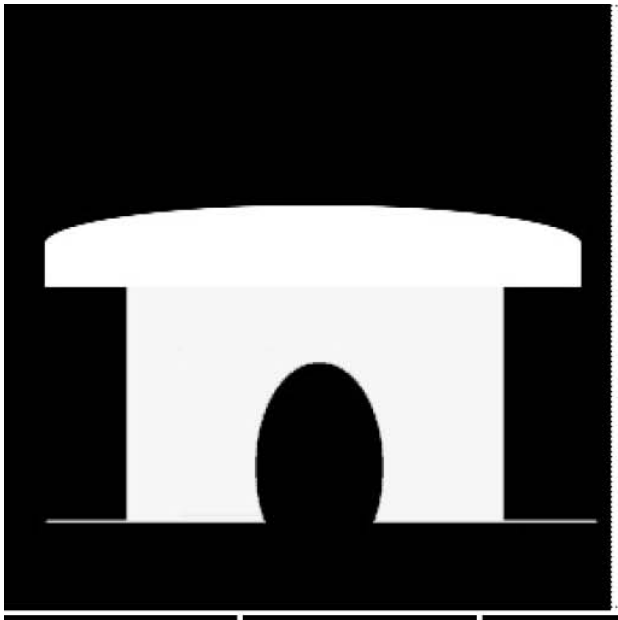
Are there many rules & regulations that you have to stick to?

How is the political situation in your community / region / country? Did anything change in the past years?

What would you like to change regarding the current political situation in your community / region / country?

Do you feel free to participate in political activities? Do you feel free to express your views and opinions in public? Also when they express critique?

How / why / what / who / where / when...?



HOUSING

What type of house do you have (roof, walls, rooms)?

When do you clean your house?

When did you start living here? Why did you choose to live here?

How did you acquire the house (rented, bought, build)? How did / do you pay for this home?

Do you feel that your house is your own space? Do you feel comfortable in your house?

Do you like to invite guests to your house? Why?

What have you changed in the house since you started living here?

Do you feel your accommodation is adequate for your current needs?

Do you have a bathroom / toilet? Where do you go when nature calls?

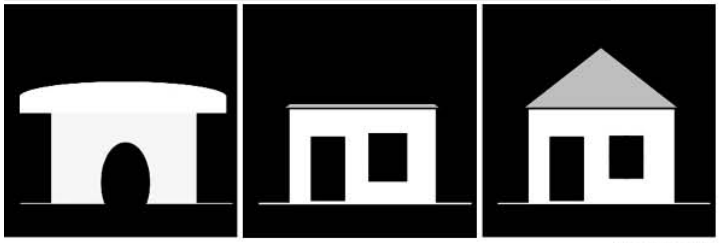
Is there anything that you would like to change in your current house?

Do you feel you were involved in choosing your house?

Do you think you will live here the rest of your life? Why? Are you free to move?

Are there any other houses/places that you would like to live? Why?

How / why / what / who / where / when...?



SAFETY & SECURITY

Do you feel safe and secure in the area you live in? And outside that area?

Do you feel safe to go outside in day-time and night-time? And your family?

Are there any quarrels / fights / crime / conflicts in your surroundings? How often?

Who solves the conflicts in your surroundings?

Do you think people are discriminated or bullied in the area you live in?

Do you ever feel discriminated or bullied?

Do you ever feel scared? What are you afraid of?

Do you ever feel insecure or unsafe?

Has your feeling of safety and security changed in the past years?

Is there anything you would like to change to feel more safe/secure?

How / why / what / who / where / when...?

FACILITIES

Do you have light, electricity, gas?

What type of energy sources do you use? And what for do you use them?

How much money do you spend on energy?

Would you like to use other energy sources? Which ones?

How do you cook?

Where do you get potable / drinking water?

Where do you get water for cooking / cleaning?

Which modes of transportation do you have access to (private / public)? Which ones do you use / have you used?

Would you like to use any other types of transportation?

What is your favourite type of transportation?

Are there any other services / facilities that you have or use?

Did anything change in the past years regarding your access to energy, water or infrastructure?

Are there any services that you would like to have? Why?

How / why / what / who / where / when...?

ENVIRONMENT

How important is your natural environment to you?

Do you ever visit public spaces? What do you do there? How often do you go?

Are there any rules and regulations regarding the use of environment that you are aware of?

Which resources does your environment provide you with?

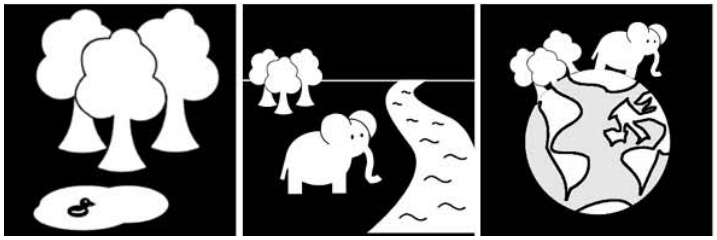
Where do you dispose waste?

How is the climate / weather in your surroundings?

Are there any dangers from nature in your surroundings? Is there wildlife around?

Is the area you live in clean or polluted?

How / why / what / who / where / when...?



PRODUCTS

What kind of personal / household / transportation / work related products do you have? Are there any other products that you have or use?

Where do you use them for?

Which product(s) do you like most? Why?

Which product(s) do you like least? Why?

Who makes the buying decisions?

Do you follow product trends? How do you stay up to date?

Do you feel you can buy everything you want?

Did anything change recently in products that you had or have?

Are there any products that you would like to have? Why?

How / why / what / who / where / when...?

FINANCIAL SITUATION

How much money do you earn in a day / week / year?

Is this amount sufficient for your family?

Are you able to save money? What are you saving for?

Do you have loans? Why did you take a loan?

What do you spend money on? Who is responsible for the expenses?

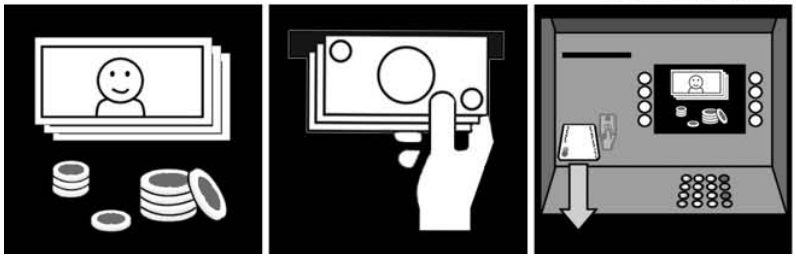
Do you find it difficult to choose between options to spend your money on?

Do you feel your current income is adequate for your current needs? How much money would be enough for you and your family?

Which things would you like / want / need to buy?

Did anything recently change in your financial situation?

How / why / what / who / where / when...?



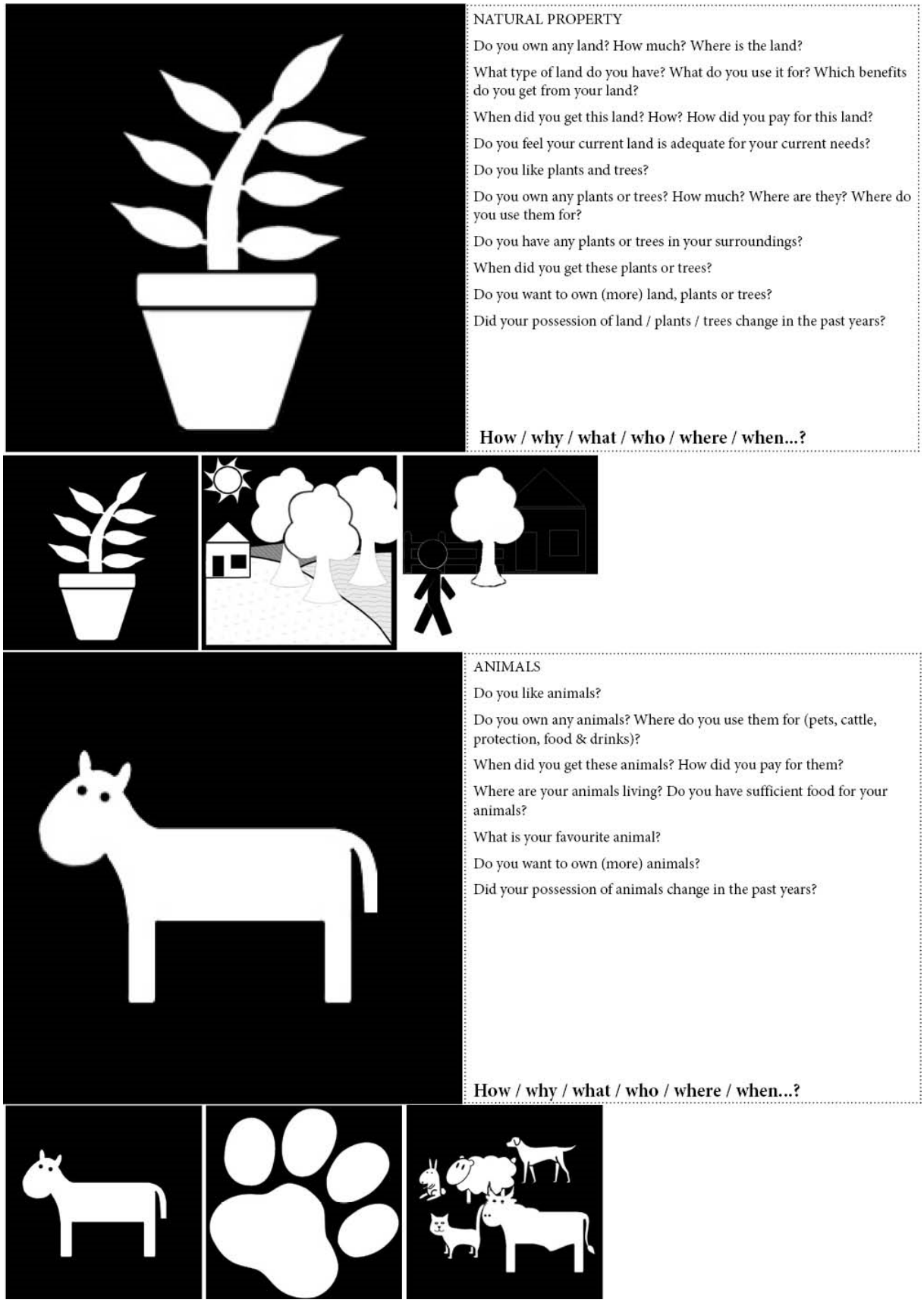


Figure 22: Pictograms and question cards

4. Procedure of Capability Driven Design: Steps and Methods

Four steps comprise the 'basic procedure' of the CDD approach to guide product designers to obtain comprehensive user insight (see figure 23). These steps are:

1. Preparation and planning before entering the field;
2. Informal insight;
3. Deep insight;
4. Reflection and sharing outcomes in a bigger group.

To this basis, the add-on methods can be added, resulting in more steps. The steps and methods are explained below.

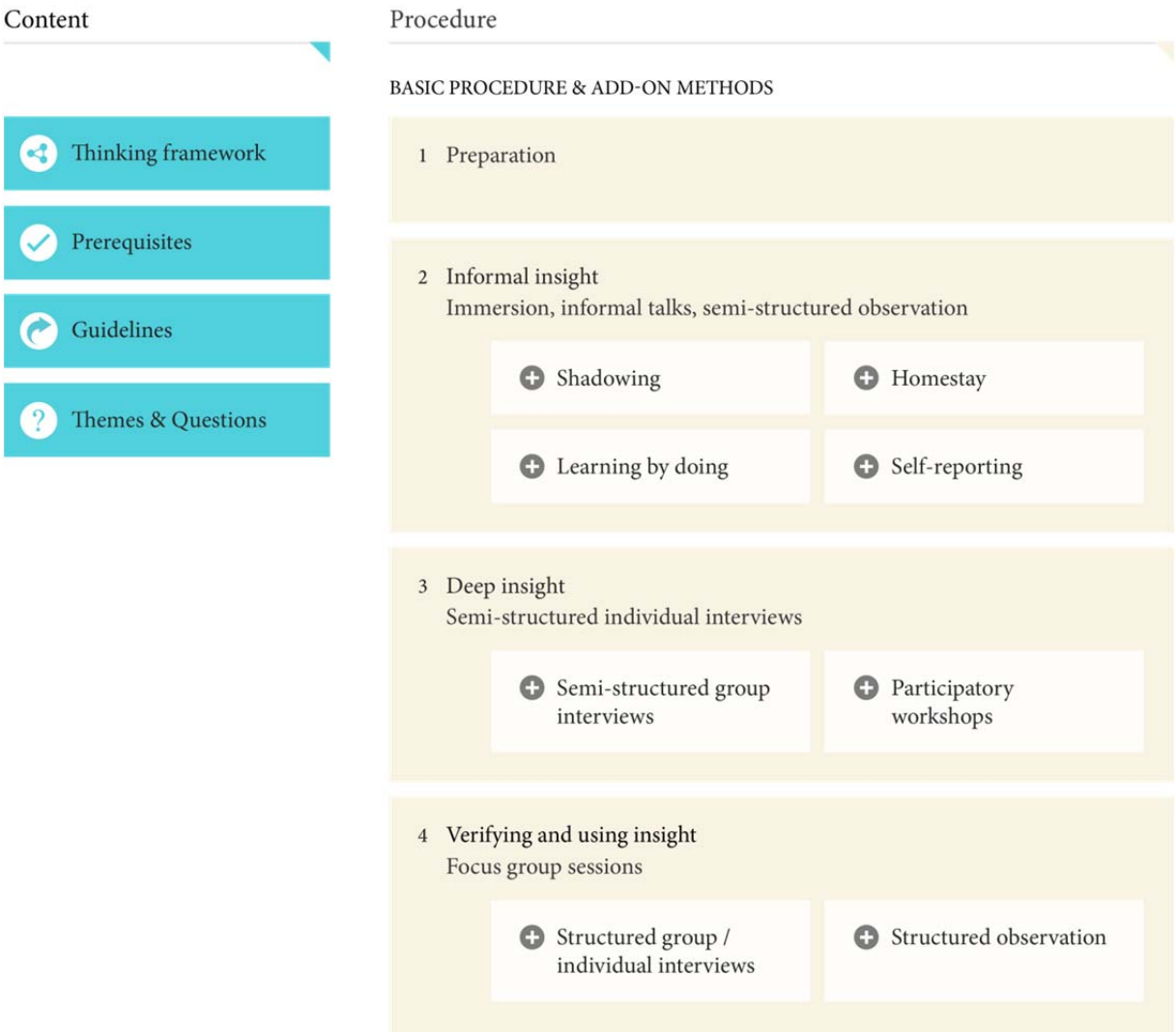


Figure 23: Basic procedure of Capability Driven Design as part of the total approach

4.1 Capability Driven Design step 1: Preparation

Before entering the field, several steps need to be taken to ensure comprehensive and efficient user context research: 1) establish local partnerships; 2) get everyone on board; 3) prepare and train the team; 4) get acquainted with the CDD approach; 5) obtain data before going into the field; 6) prepare methods and materials; and 7) plan the to be conducted activities (see figure 24).

Figure 24: Visualisation of step 1: preparation

Step 1-a: Establish local partnerships beforehand

It is important to build relationships with governmental and non-profit organizations in order to obtain knowledge and information about the potential users, to get advice on the planned activities, to acclimate quickly, to build trust and relationships in communities, to gain access and to make arrangements to start learning.

Step 1-b: Get everyone on board

Make sure that everyone supports the aim to obtain comprehensive user insight and to use the CDD approach: the team, the client, local partners and translators as well – when required during the activities.

Step 1-c: Prepare and train the multidisciplinary team for qualitative research

By attuning work practices and building a creative project space a collaborative working spirit and an inspirational working environment are created. It is relevant to bring about existing knowledge from team members, literature and local partners. By deciding on a project focus and goals an appropriate approach can be chosen. The team should prepare themselves for a possibly overwhelming experience and preferably follow qualitative research training or at least learn about what qualitative research entails, what appropriate and ethical attitude and behaviour is and how questions should be posed. In chapter 3 a list of recommendations for researchers' behaviour and attitude is summed up and explained. In chapter 3 also a list of recommendations for questioning is summed up and explained. The team members must furthermore get acquainted with the flow and structure of the activities as well as with the topics and key questions. This can be done by roleplaying the activities in the team.

Step 1-d: Get acquainted with the CDD backbone

In order to be able to get the most out of the CDD approach, it is important to understand its thinking framework, to fulfil the prerequisites, and to know the themes and questions. Read about it, but also practice using them, by for example role-playing or piloting ODK interviews.

Step 1-e: Obtain meso- and macro-data about the context beforehand.
To get out the most of the ODK interviews it is important to become familiar with general information about the potential users and their context, such as processes, trends, political and social systems, such as healthcare and education systems. Getting to know more about social and environmental conversion factors saves time during the interview. The information can be obtained by internet and literature search, by consulting people from the area, people who have worked in the area, people who are familiar to the area, or by consulting local partners. However, designers must be aware that other people have their own bias and interpretation. It therefore remains important to actually go into the field to experience the situation yourself. By collecting information you have to be aware not to become biased and be aware not to take along assumptions and preconceptions.

Step 1-f: Prepare methods and materials
For the comprehensive context exploration as aimed for in this research, themes and guiding questions have been developed as part of the CDD approach. The themes aid the design team to obtain a comprehensive view of people's well-being. These themes should be taken into account during each activity. Especially during interviewing the themes are of significant value, as they can serve as discussion topics to guide a broad and deep dialogue with potential target users, specifying which topics to discuss. In the field not only user context research need to be conducted, also information from other stakeholders should be obtained, information about local materials and production processes must be collected and information concerning possible business models should be acquired. Therefore, the team must decide how much time they will spend on user context research. For CDD an essential set of different methods have been selected, but the research team can also add methods to this set. The materials for conducting the activities should be prepared and all supplies for the activities should be collected. The design team should check the planned activities with established ethical criteria.

Step 1-g: Plan activities
In order to use the time in the field efficiently, it is recommendable to plan activities, documenting and data analysis beforehand. No more than three intensive activities should be planned for one day and sufficient time should be kept free for documentation, analysis and for unexpected events, appointments or activities to happen.

4.2 Capability Driven Design step 2: Informal insight

When going to the field, the first action for the team is to obtain informal insight. To obtain this insight several steps need to be conducted: 1) meet local partners; 2) select a research area; 3) select and instruct a translator; 4) emerge and build rapport with potential users; 5) analyse, interpret and reflect on the obtained insights within the team; and 6) share interpretations with the participants and local partners (see figure 25).

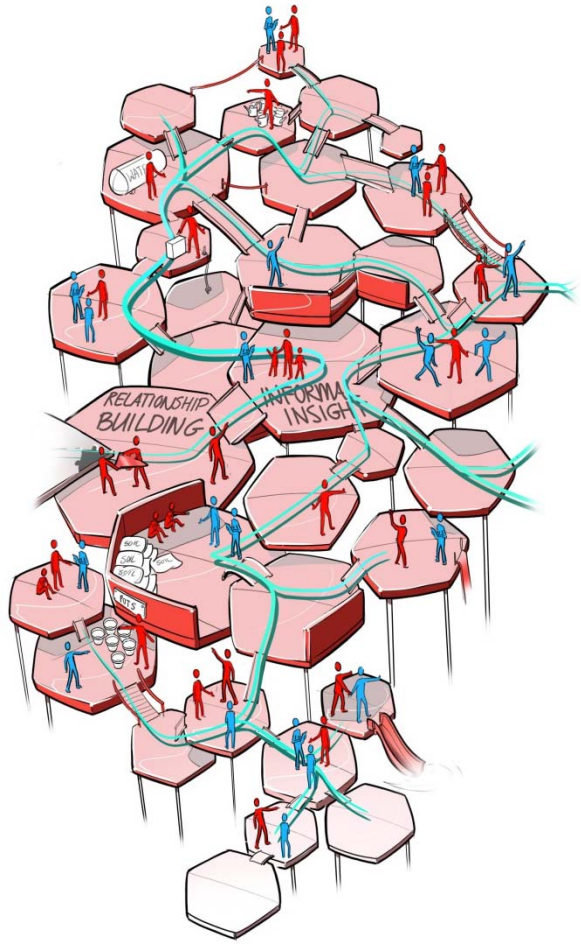


Figure 25: Visualisation of step 2: informal insight

Step 2-a: Meet local partners

When local partnerships have been established (one of the prerequisites!) it is important to meet them and explain the intentions of the research in order to build proper expectations. Local partners can aid in selecting a translator, in selecting the area of research and in selecting participants. They can also introduce the team in the selected area, provide knowledge and information about potential users, and give advice on the planned activities.

Step 2-b: Select the research area

The area of investigation should be selected depending on the purpose of the research, and availability, while carefully thinking about biases: design team should collect data that represents problems and realities and not fall back on quick and short visits to easy to reach locations or locations where activities already take place, during seasons with convenient climate conditions.

Step 2-c: Select and instruct a translator, when required

Working with a translator is difficult, as a barrier is formed to directly talk to participants. Properly select the translator and instruct the person in advance. Role-playing or piloting ODK interviews might help out. Tips & tricks for selecting, instructing and working with a translator are provided in chapter 7 of this manual

Step 2-d: Emerge and build rapport by immersion, observation and informal talks
After proper preparation, it is time for the design team to go into the field to explore the user and its context. The first step is to immerse in the context and meet people where they live, work and socialize. By observing them and informally talking to them rapport and empathy can be build. It is important to get familiar to potential users and their surroundings prior to conducting interviews. If required, a translator should be brought along. It is important to bring all required supplies: e.g., camera's, voice-recorders, notebooks. These observations and talks should be conducted carefully and systematically and be properly documented. First the team should determine what to observe. Here, the list of themes can be used as a checklist. In chapter 3 a list of aspects to pay attention to is provided, in general this comprises everything that is seen, heard, smelled, felt and tasted. For guidance, an observation form and / or a checklist can be prepared.

Step 2-e: Analyse, interpret and reflect within the team
After the observations the obtained data must be discussed between the observers and be reflected upon, analysed, communicated and discussed within the design team. In this way a better distinction can be made between factual behaviour and own speculations. The information obtained after each immersing activity can influence the next one. Thereby, the obtained information can also influence the next step: obtaining deep insight. The activity of obtaining informal insight should preferably be ended when not much new information comes up and sufficient rapport has been build.

Step 2-f: Share interpretations with the participants and local partners
After data analysis, it is important to check interpretations with participants and local partners to correct misconceptions and point out any errors. This improves data reliability and validity and results in a better understanding of the potential users. In this way, the data is also verified in a larger group.

Add-on methods
The following methods can be added to step 2-d when time and resources allow for it:

- *Shadowing.* Mostly, direct observation concerns groups or cultures of people. However, observation can also be conducted following a specific user. Shadowing is aimed at following a participant throughout his or her daily routine without interrupting this routine (Sperschneider and Bagger 2003; Martin and Hanington 2012). It is an exploratory type of observation that aids in understanding participant's actions, routines and decision patterns (Martin and Hanington 2012). During the activity questions may be asked (Martin and Hanington 2012; Larsen and Flensborg 2011). Participants normally know they are being shadowed, although they can be shadowed unobtrusively in public spaces (Martin and Hanington 2012).
- *Homestay*. A homestay accelerates the process of building rapport and means staying a few nights with people in their homes, resulting in improved understanding and empathy (IDEO 2008b). The focus is not on obtaining data, but on building trust and rapport (Simanis and Hart 2008; Larsen and Flensborg 2011). The researchers should assist in daily activities (Simanis and Hart 2008). Compensation for costs should be provided (Simanis and Hart 2008). It is recommended that different team members stay over with different hosts, reflecting a diversity of the community (Simanis and Hart 2008). Limitations of a homestay are that participants might treat the researcher as a guest, limiting the insights obtained (IDEO 2008b). thereby, the

attitude and behaviour of the researchers influence the insights obtained and the rapport being build (Chambers 2004), as well as the extent to which participants and researchers like each other (Handwerker 2001).

- *Learning by doing.* Working alongside people accelerates the process of building rapport and means learning by doing, experiencing activities, resulting in improved understanding of the people under study (IDEO 2008b), trust, and empathy and interest in of the people in the research (Larsen and Flensborg 2011). By following participants and participating in daily activities the researcher experiences daily life challenges and obtains deeper insight as the people under study more easily express their reflections, feelings and ideas while working (Larsen and Flensborg 2011). Limitations of learning by doing are that the researcher might endanger the work of the people and might experience the activities differently (Larsen and Flensborg 2011). They might also create an extra burden on the participants (Simanis and Hart 2008). The attitude and behaviour of the researchers influence the insights obtained and the rapport being build (Chambers 2004). Thereby the extent to which participants and researchers like each other influence the results (Handwerker 2001).
- *Self-reporting.* Self-reporting can be used to capture life as it is felt by the participants (Van Boeijen et al. 2013). Without being physically present, insights can be obtained that would otherwise not emerge (Larsen and Flensborg 2011). Often self-reporting is done by offering participants cultural probe packages. These consist of several artefacts, such as postcards, maps, diaries and/or recording devices which are left intentionally flexible and open-ended (Martin and Hanington 2012). Participants are more likely to participate in creative methods than in more traditional methods of behaviour survey (Martin and Hanington 2012). Self-reporting is an exploratory research method, without a defined outcome, serving as inspiration for the design process, thereby also providing information for starting conversations (Martin and Hanington 2012; Van Boeijen et al. 2013). The method might lead to "*unique discoveries about users, their behaviors, and priorities*" (Martin and Hanington 2012, p. 134). Limitations are that self-reporting cannot be used to validate results or to provide answers to specific questions, and does not explain the reasons behind the things documented (Van Boeijen et al. 2013). Participants might not complete the assignments (Van Boeijen et al. 2013; IDEO 2008b) or misuse the materials for different purposes (Larsen and Flensborg 2011). Thereby, the outcomes depend on the open-mindedness of the full research team (Van Boeijen et al. 2013) and are difficult to interpret as they are unstructured (Roibás 2008).

4.3 Capability Driven Design step 3: Deep insight

After building initial rapport and obtaining informal insight, specific participants can be selected to obtain comprehensive and deep insight into their life-worlds. To be able to obtain deep insight the following steps should be followed: 1) discuss, test and adjust the interview to the local context; 2) prepare the semi-structured interview; 3) select a variety of participants; 4) engage in deep dialogue; 5) analyse, interpret and reflect on the obtained insights within the team; and 6) share interpretations with the participants and local partners. For CDD step 3, a toolkit has been developed, termed 'Opportunity Detection Kit' (ODK). This kit further specifies the steps presented here and offers specific guidelines, techniques and tools which can be used when conducting the interview. See chapter XX for an overview of the ODK (see figure 26).

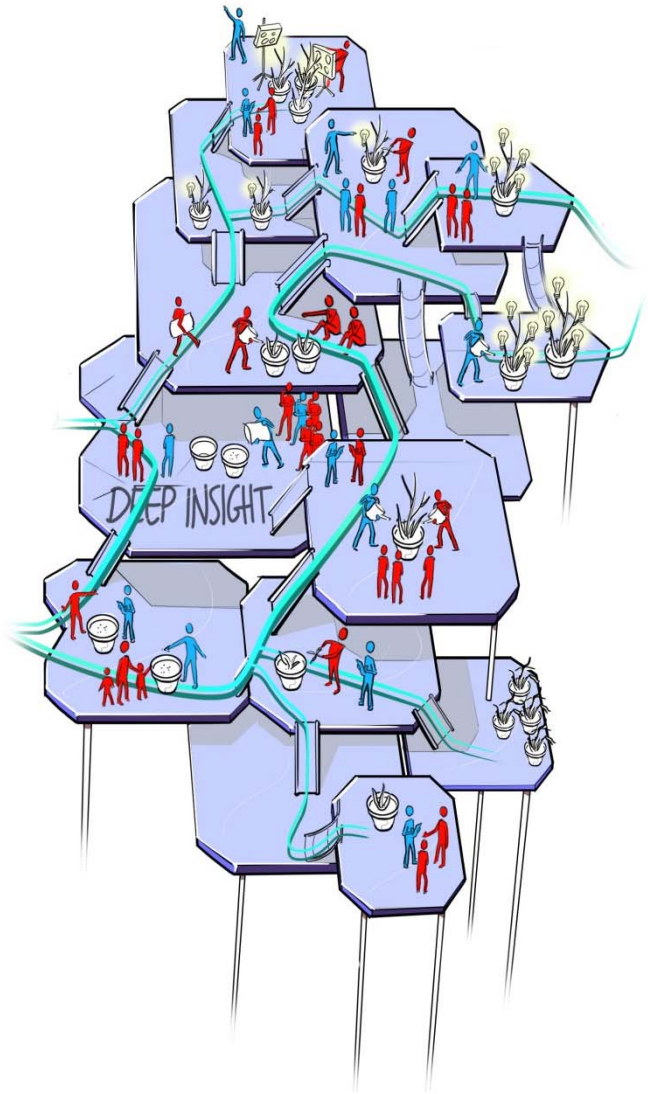


Figure 26: Visualisation of step 3: deep insight

Step 3-a: Discuss, test and adjust the semi-structured interview locally

Before conducting semi-structured interviews, it is recommended to test the length and content of the interview and to adjust it to the context. The content and wordings can be discussed with a local partner to adapt them to the context. The local partner can also point out possible sensitivities. By conducting a local pilot the length of the interview can be tested.

Step 3-b: Prepare the interview: instruct the translator, assign roles

If a translator is required, this person should be carefully selected and instructed. The translator must know the goals of the research and the rules of the interview. By assigning roles for each interview executed, the roles of the design team members who conduct the interview is clear to the participants and the translator.

Step 3-c: Select variety of participants and decide on time and place

Based on the selection criteria, established in accordance with the project goals, a variety of participants should be selected. The established local network (e.g., local partners, participants of observation and informal talks, village heads) can aid in selecting participants. A broad range of participants with different characteristics should be included. These characteristics can be, for example, gender, social class, income, religion, age, ethnicity, occupation, adoption speed, access to resources, community. Especially a variety in gender, social class and age are important to include. It is important to be clear about compensation to set the right expectations for participants. To minimize bias, the design team should focus on the selection criteria and search for participants within the full targeted population, not only for easily accessible or familiar community members. When participants have been selected, a time and place for conducting the interview can be arranged. Preferably, the interview takes places in participants' homes with no audience.

Step 3-d: Engage in deep dialogue

Semi-structured interviewing is the main activity within CDD. The interviews can verify the things observed and interviewing can deepen and broaden the insights obtained by informal talks and observations. The list of recommendations for researchers' behaviour, attitude and questioning should be followed by the facilitator, the list of aspects to pay attention to should be followed by the note-taker. It is important to bring all required supplies: e.g., camera's, voice-recorders, notebooks. These interviews should be conducted carefully and systematically and be properly documented. It is important to address all themes and advised to follow the established guiding questions, but also to remove or add questions in order to be able to follow-up on the unexpected.

Step 3-e: Analyse, interpret and reflect within the team after each interview

As soon as possible after each interview, the obtained data must be discussed between the team members present, in order to reflect on the challenges during the interview. In chapter 3 already challenges of user context exploration methods are described. However, the specific method of interviewing brings about some additional challenges, especially when using a translator. These challenges cannot all be undone, but should be considered during the interviews. The design team should pay attention to them, note them down if they occur, and take into account their influence when judging the outcomes. These challenges depend on:

- The facilitator's quality, skills, behaviour, bias, subjectivity and terminology used;
- The design team's presence, characteristics, agenda and perspective;
- The participant's character, motivation, interest, well-being, feelings, emotions, etiquette, availability of time, scepticism, distrust, suspicion, prior experiences, cultural background and values;
- The setting of the interview, the audience present, gatekeepers present, disturbances and distractions from outside;
- The translator' s presence, biases, skills, interest in and understanding of the project;
- The amount of distortion due to translation;
- The presence of recording devices.

Besides reflection on the above mentioned influences, the outcomes must immediately be analysed, communicated and discussed within the design team. Depending on the information obtained, the next interview can be adjusted to further explore surprising things that come up.

Step 3-f: Share interpretations with the participants and local partners after each interview.

After data analysis, it is important to check interpretations with participants and local partners to correct misconceptions and point out any errors. This improves data reliability and validity and results in a better understanding of the potential users. In this way, the data is also verified in a larger group.

Add-on methods
The following methods can be added to step 3-d when time and resources allow for it:

- *Semi-structured group interviews.* Semi-structured group interviews are open-ended group conversations, during which researchers keep a checklist of topics and questions in mind, or bring one along as a guidance (Narayanasamy 2013; Chambers 2004). This type of interview provides deep and varied insight in existing knowledge, attitudes, perceptions, needs and experiences of people, their contexts and existing networks (Larsen and Flensborg 2011). They can be used to obtain quantitative as well as qualitative data (Narayanasamy 2013). "*This type of interview is free from inflexibility of formal methods, yet gives the interview a set form and ensures adequate coverage of all topics*" (Narayanasamy 2013, p. 292). Limitations are that researchers are likely to make mistakes (Narayanasamy 2013) and that only a few people are reached, resulting in non-generalizable data (Handwerker 2001).
- *Participatory workshops.* Participatory workshops involve several participants and researchers working together conducting several activities and are aimed at understanding the participant's world (Martin and Hanington 2012). These techniques might include collage making, mapping, diagramming and / or modelling (Martin and Hanington 2012). They might involve projective techniques aiming to get to the participants' sub consciousness (Martin and Hanington 2012). Often for creative expression sessions the group is split into smaller groups and in the end, each group presents their outcomes to everyone present (Martin and Hanington 2012). The activities are carefully planned, but can be adapted to circumstances and dynamics (Martin and Hanington 2012). Participatory workshops lead to understanding and building a shared language (Simanis and Hart 2008). Limitations are that it might take a lot of time and effort to prepare and conduct these workshops and that the timing and logistics for the different groups of participants might differ (Martin and Hanington 2012). Thereby, it might be difficult for participants to share personal information in a group (Narayanasamy 2013), and participants might influence each other (Martin and Hanington 2012).

4.4 Capability Driven Design step 4: Verifying and using insight

After obtaining informal and deep insight several steps should be conducted to improve data validity and generalizability: 1) the data needs to be verified with participants and a larger group of potential users; and 2) the insight needs to be transformed into data usable in the design process (see figure 27).

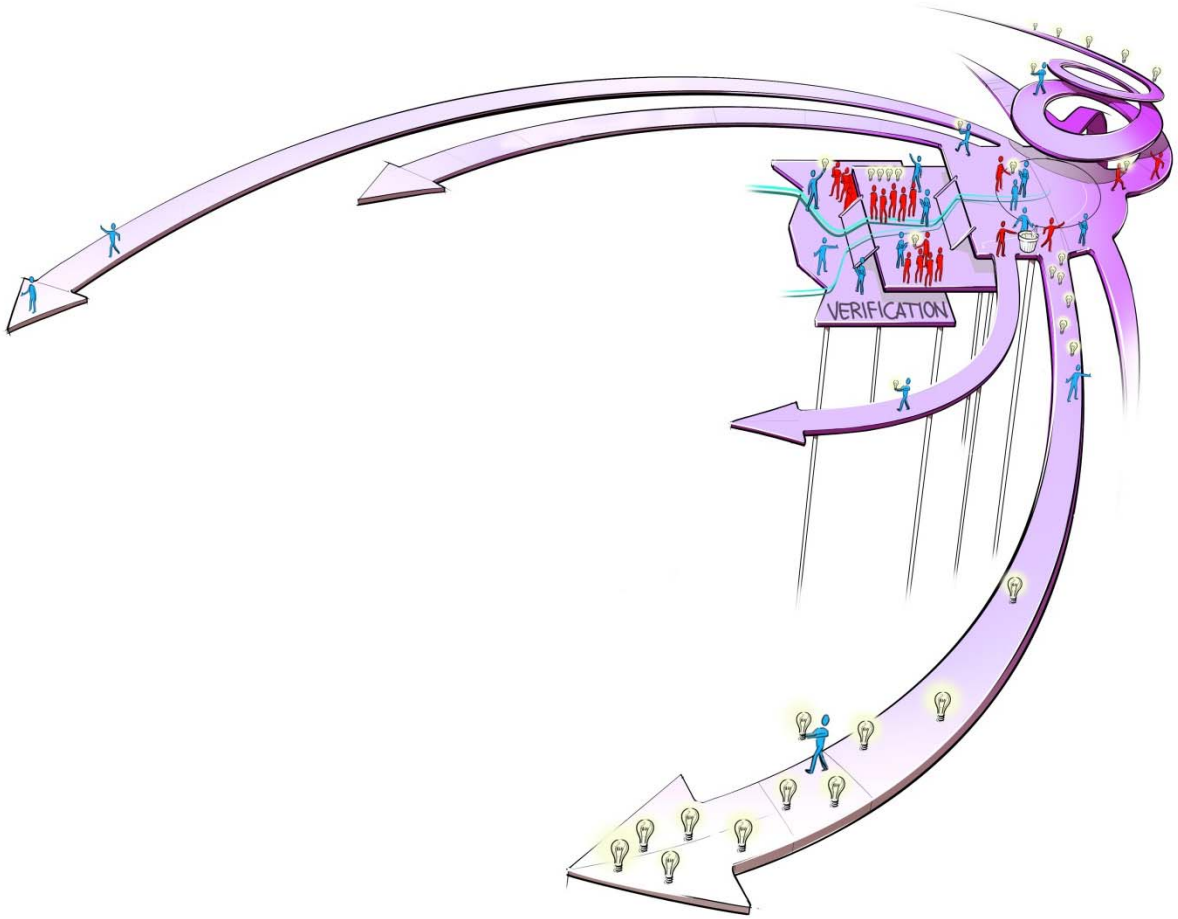


Figure 27: Visualisation of step 4: verifying and using insight

Step 4-a: Share and verify insights with a bigger group of potential users

After analysing and interpreting the obtained data from the immersion, observations, informal talks and semi-structured interviews, the data should be verified with the participants. If the participants agree, the outcomes can also be shared with relevant stakeholders and other potential users. This improves data reliability and validity, as misunderstandings can be pointed out, statements can be clarified, data is triangulated and verified. It also improves feeling of joint ownership, transparency and involvement. This activity can be more focused on a deeper understanding and more extensive exploration of key insights from a larger group of participants selected for their diversity. For this session many things are the same as for the interview: the session should be prepared, piloted, translator and participants should be selected, time and place must be decided upon, roles must be assigned, the activity should be executed and the outcomes should be discussed within the team and with the participants.

Step 4-b: Understand data in larger and future context

The obtained information should be integrated in the design process and inspire designers. Therefore, the insights should be framed in a larger and future context. The insights can lead to design requirements and inform design decisions. However, the design decisions made should be checked with the potential users who should continuously be involved in the design process – following the capability approach and the human-centred design spirit.

Step 4-c: Provide follow-up

It is reputable to provide participants follow-up, as they have spent time and effort and shared their life stories with the researchers. Therefore, the participants should preferably be informed about the next steps and if possible be updated about the progress of the project at hand.

Add-on methods

The following methods can be added to step 4-a when time and resources allow for it:

- *Structured observation.* During structured observation, forms are used to codify observations. This type of observation is often used to deepen insights into specific behaviour or environments (Martin and Hanington 2012). There is an opportunity for quantification if the observational sample is large enough (Martin and Hanington 2012). The risk is that researchers 'find what they are looking for' or force certain information into the pre-set categories.
- *Structured individual / group interviews.* Structured interviews are focused, and are conducted using a detailed and standardised interview schedule (Narayanasamy 2013). During each interview, all the questions listed are posed, and they are asked in exactly the same way (Narayanasamy 2013). This type of interview is suited to collect generalizable data from a diverse and large set of people, providing insight in the significance of the information (Handwerker 2001). Time and questions are easier to control, researchers have less influence on the outcomes, and the data is easier to analyse (Martin and Hanington 2012). However, participants can perceive the interview as being formal and impersonal (Martin and Hanington 2012), and there is a risk that researchers miss out on information they are not specifically looking for or does not fit their pre-set categories.
    - *Individual interviews.* According to Narayanasamy (2013), individual interviews are apt for revealing specific, sensitive, confidential and/or personal information, resulting in representative information. IDEO (2008b, 28) argue that "*individual interviews are critical to most design research, since they enable a deep and rich view into the behaviors, reasoning, and lives of people*."
    - *Group interviews.* Group interviews are more efficient and lead to more natural dialogue (Martin and Hanington 2012), and they can be focused on more specific topics (Narayanasamy 2013). IDEO (2008b) explain that group interviews result in quick learning about the life, dynamics and issues of a community, and they offer all community members a voice. However, a group interview does not result in deep understanding of thoughts, beliefs or behaviours of people (IDEO 2008b), as in groups, personal information is often more difficult to discuss (Narayanasamy 2013). Thereby, participants might influence each other and there is a risk of domination (Martin and Hanington 2012).

4.5 Overview of Capability Driven Design procedure

In figure 28 the steps are visualized together, and in this way form an overview of the procedure of the Capability Driven Design approach.

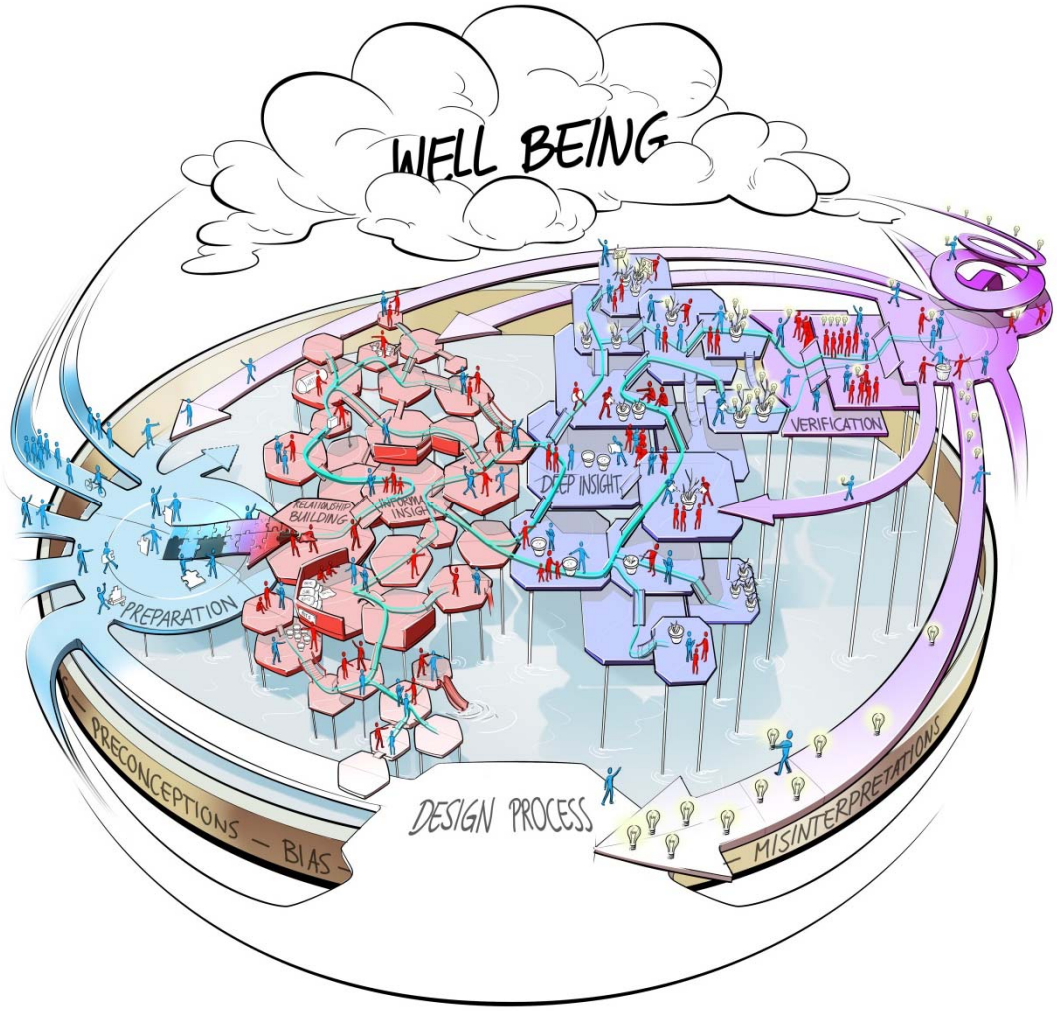


Figure 28: Overview of Capability Driven Design procedure

4.6 Tips and tricks for fieldwork

Below, tips and tricks are provided that aid designers during activities in the field. They comprise tips and tricks for 1) behaviour and attitude; 2) ethical behaviour; 3) questioning, including techniques; 4) 'what to pay attention to'; 5) selecting, instructing and working with a translator; and 6) contextualizing visualizations.

1. Tips and tricks for behaviour and attitude

The recommendations for designers' behaviour and attitude are:

- *Minimise 'outside' hierarchy.* In order to minimise hierarchical perceptions:
  - Sit at the same height level as the participants;

  - Do not sit together if you are with more than one person;
  - Wear casual clothing with the same status as participants, which does not mean identical clothing
  - Avoid organization-branded clothing.
- *Be aware of 'inside' hierarchy.* To approach certain regions or communities, there might be an 'appropriate' way to do so. Pay attention to local hierarchy and follow the local hierarchical rules).
- *Be aware of 'inside' customs.* There might be some local customs that you should be aware of in order to fit in, e.g., taking your shoes of inside a house, sitting on the floor, not pointing with your feet towards someone. Be aware of them and behave accordingly.
- *Build rapport.* Build relationships and trust with potential users early in the process and make them appreciate the work being done. This stimulates becoming accepted and motivates collaboration, resulting in a better understanding. It takes time to win trust and build rapport and this time should be taken in order to stimulate opening up of potential participants. To fasten the process of building rapport, follow the following tips:
  - Be aware of potential codes of behaviour;
  - Explain who you are;
  - Seek and listen carefully;
  - Demonstrate commitment;
  - Show respect towards the people, their culture, their customs, attitudes, beliefs and their way of life;
  - Do not criticize, correct or judge participants, but try to understand their perceptions and underlying reasons, appreciate how people live their lives;
  - Show humility;
  - Show interest;
  - Be honest and transparent;
  - Be open and clear about intentions and do not make false promises;
  - Develop a collaborative dialogue;
  - Be ready to learn and ask to be taught. Invite and answer questions;
  - Share yourself. By sharing personal experiences an open atmosphere is created that allows for vulnerability and gossip;
  - Share information, ideas and food;
  - Accept and give gifts if appropriate;
  - Limit deliberations in your mother tongue or with the translator in a language unfamiliar to the participant.
- *Demonstrate willingness to learn*. Go into the field with the recognition that indigenous knowledge is essential. Do not act as the expert knowing what is best and do not impose theories and insights on participants, but instead be willing to admit ignorance and threat the participants as the experts who should feel that the designers are open to learn from them, that their knowledge is relevant. Gain appreciation for the people, culture, customs and the way people live their lives and do not correct them.
- *Start with an open mind*. You are an 'outsider' who probably speaks a different language and has different perceptions of meanings due to different life experiences and cultures. Try to understand the insiders' perspective, learn about the categories that local people use to

describe situations and inquire about local perceptions of the meaning of important denominators. Learn to think different about the world. To avoid carrying assumptions, it is important to enter the field with an open mind, willing to learn. Put aside what you know and look with fresh eyes, think like a child. Pay attention to detail, question everything, be truly curious, do not judge, look for interesting threads and themes that come up and truly listen. Even if you think you know the answer, pretend you do not know.

- *Listen with genuine interest.* Listen actively and attentively with genuine interest, enthusiasm and curiosity, without thinking about the next question or comment.
- *Encourage answering*. Encourage answering verbally and nonverbally. Say things like 'mmmm', 'uh-huh', 'I see' or 'really?', and use body language, such as head nodding, attentive forward leaning, and smiling.
- *Mind your body language.* While body language can be used to encourage participants to share stories, it can also communicate disinterest or lack of commitment. Be aware and careful about body language and keep an appropriate amount of eye contact.
- *Pay attention to body language*. Decide how to continue an activity based upon non-verbal behaviour of the participant.
- *Stimulate storytelling*. Stories indicate how participants think about the world. Do therefore not try to make participants answer brief and concise, but encourage them to tell stories in their own way - in all its complexity.
- *Encourage sharing of details and context*. Stimulate participants to share details and context to help you to understand which experiences have been significant to them and why they have been significant.
- *Sympathize*. Even if you do not agree, it might be useful to sympathize with the participant in order to make the participant open up more.
- *Limit interruption*. Play an active role in engaging users, but do not interrupt or rush them. Listen first and then talk. Do not be afraid of silence. Give participants the time to reflect, think and respond. However, do not let pauses become awkward.
- *Mind habitual behaviour.* Behave as an apprentice, do not lapse into the role of interviewer, expert or personal friend.
- *Avoid abstract talking*. When participants start to talk in abstract terms, make them talk about actual experiences again. It might be useful to ask participants about concrete examples.
- *Make it relaxed.* The activities need to be conducted within limited time, but this does not mean that they should be rushed. Instead, interactions should be relaxed and conducted with commitment.
- *Learn from failures*. Things will not always go as anticipated. When things go wrong, learn from those failures and start building new plans based on the failed ones.

2. Tips and tricks for ethical behaviour

The recommendations for designers' ethical behaviour are:

- The participant community should be central in the research process, the research should be participatory and conducted with respect for everyone, regardless of ethnicity, culture, religion, gender, class, sexual orientation, disability etc. The first responsibility is towards the participant community: their interests should be central to the study. Do not use your power to the disadvantage of participants, act responsibly.

- Different participants should be included in the research, not only the ones who are easily accessible.
- Permission to conduct research should be obtained, follow formal requirements and procedures. Review obligations of research plans in the designers' home country and in the country under study should be checked.
- Designers should explain who they are, what the nature and goals of the research are and what the programme and purpose of the activity is.
- Objectives, expected outcomes, source of funding, methods to be employed, output usage, risks and benefits should be shared to the community prior to conducting research. Their rights and responsibilities should also be shared. Designers should be open and honest, frank and realistic about research constraints and outcomes, do not make false promises, do not raise unreasonable or unrealistic expectations.
- Informed consent should be obtained. Preferably a written statement in the local language, but if most participants are illiterate, verbal consent is more ethically appropriate. Consent should be obtained for conducting the research activity, recording the activity, and using and sharing the – anonymised – outcomes.
- Designers should be aware of the risks and dangers that the research may pose to local communities and individuals and take appropriate action to eliminate them, in order to protect the weakest in a community. Participants' privacy should be protected. Data should be secured and anonymised in order to protect identities and locations of participants. It should be ensured that the data is protected from misuse and falling into the wrong hands. Designers should be careful to engage with organisations who might use research results against – certain members of – the participant community.
- Designers should conduct research that is sound, well-conducted and results in relevant and useful data, as it is unethical to incompetently invade participant's personal lives resulting in questionable data.
- Designers should recognise and respect people's sensitivities and rights, should not trick them into revealing dark, shameful, personal or sensitive information or feelings, should not be intrusive or too demanding. The designers interests should not be placed ahead of those of the collaborators or the participants. Designers should not mine developing societies for data and should minimise social harm (e.g., intrusion, distress, indignity, physical discomfort, personal embarrassment, psychological harm) and maximize social benefit.
- Designers should be aware of their position, their background and training, power differentials, cultural distance, and the privileged position of power to influence situations through design, as these influence the way they think, the relationships with participants and the reactivity of participants.
- Designers should appreciate varying contexts, cultures, traditions, norms, mores, values, practices, systems and structures and be open to learn without judgement.
- Designers should try to limit inequalities: they should build local partnerships and collaborate on different levels, and try to contribute in a positive way, without making false promises.
- Designers should properly thank participants and local assistants, and provide appropriate compensation for time and effort taken. The research should not result in any material gain or loss for the participants. They should avoid making excessively high rates of payments, but provide appropriate compensation to participants and local assistants. Designers should provide

gifts where this is culturally appropriate or expected, but should not end up in bribery or corruption. They should avoid exploitation of local assistants by providing them a fair return. The appropriate compensation can be discussed with local stakeholders.

- Designers should judge responses, but do so carefully. They should limit misinterpretation of outcomes due to preconceptions or misunderstandings, by triangulation, sharing of data, and consult stakeholders, participants and / or participant communities. They should be open about how interpretations are established.
- Designers should critically reflect on:
  - data limitations. E.g., regarding generalizability, errors;
  - method limitations. E.g., regarding the approach and methods used and the selection of participants;
  - designer limitations. E.g., regarding their position, established relationships, way of working, documentation, handling of delegated power, personal errors and mistakes;
  - project limitations. E.g., regarding the roles of participants, distributed power and agency.
- Designers should resist pressure from funding agencies or local authorities to make the outcomes match their needs or expectations: outcomes should be transparent, genuine and honest.
- Designers should make the research outputs available locally, ideally in a language and / or form that the communities can understand and use. This enhances transparency and openness, and facilitates mutual learning. Designers should acknowledge the contribution of everyone involved.
- Designers should provide follow-up / keep the people involved in an accessible and understandable manner, without making false promises.

3. Tips and tricks for questioning

The recommendations for questioning are:

- *Pose questions that are*:
  - Neutral. Avoid steering participants' answers by implying a right or wrong answer, do not lead them towards an expected answer and avoid blaming questions which suggest the participant is wrong or at fault. Such oriented questions introduce bias;
  - Specific. Avoid using the word 'usually', but make questions more specific by asking about a specific instance or occurrence;
  - Naïve. Pretend you do not know to hear how people narrate things themselves. Do not be afraid posing 'dumb' questions, as the answers might be surprising;
  - Open-ended. To stimulate conversation and stories, questions should elicit answers that require more than one word. Open-ended questions often start with 'what?', 'when?', 'where?', 'who?', 'how?', and 'why?'. Why-questions make brings about reasons, intentions, and motivations, but often result in more abstract answering. 'How'-questions stimulate straightforward storytelling.
  - Simple, short and to the point;
- *Avoid questions that are*:
  - Insensitive;
  - Offensive;
  - Ambiguous;

  - Biased. Questions with built-in assumptions are not always corrected by participants, who might answer the question to please you;
  - Leading, blaming, or oriented;
  - Abstract, consider to explain them through a story;
  - Multiple questions in one;
  - Hypothetical;
- *Mind terminology.* Properly word and ask questions:
  - Avoid jargon and tricky language;
  - Avoid vague language that makes no sense to the participants;
  - Avoid terminology with multiple meanings attached to them that might different things to different participants;
  - Use local indicators and terminology;
- *Start with easy questions that are important to them.* Start with themes and questions that the participants find important. For example, if family is important to them, ask them about their family members and how they are doing first, before diving into the other themes.
- *Pose follow-up questions*. Probe into issues before continuing with the next topic. To improve understanding of how the participants view the world, it is useful to ask them why they say or do things;
- *Pose questions that stimulate description, discussion and depth*. Ask participants to tell more about a certain topic, echo answers in a question format, or retell answers or stories in order to stimulate further explanation and to elicit additional information;
- *Mix questions with discussions.*
- *Pose verifying questions*. Pose different types of questions about the same topic to verify participants' answers. Summarize answers to check understanding. Pay attention to and check inconsistencies and discrepancies, as they may hide interesting information. Admit confusion and ask for clarification;
- *Verify interpretations*. To avoid misinterpretation, check your interpretations of answers or observations by sharing them during the interview. Checking interpretations is not only useful for verification, but might also provide participants a starting point for providing additional insight;
- *Do not suggest answers*. Let the participants come up with answers themselves.

Questioning techniques

The following questioning techniques can be considered during interviewing to aid the designer to obtain deeper insight into the behaviour and reasoning of the participant and to provide information about aspirations and desires. These techniques are not obligatory to follow and are therefore not explicitly part of the ODK, but they can be useful to consider.

These questioning techniques are:

- *The 'five why's'*. This technique means asking why five times in a row to probe deeper and detect underlying reasons for behaviour and attitudes.
- *'Directed storytelling'*. This technique means guiding the participant to tell a story about a certain topic with help from additional questions such as 'who?', 'what?', 'when?' 'where?' and 'how?'.

- *'Guided speculation'*. This technique means asking questions about hopes and fears for the future
- *'What-if-scenarios'*. This technique means putting forward scenarios or storylines for the participant to complete.
- *'Sacrificial concepts'*. If a question is abstract it can help to change the question to a concrete scenario with two options. For deeper insight the variables of the options can be changed.
- *'Talking diaries'*. Asking participants to describe important past events in their lives like reading from a diary.
- *'Thinking aloud'*. Asking participants to tell what they are doing and/or thinking when they are performing a specific task. This technique can, for example, be used during the scoring exercise.

4. Tips and tricks for 'What to pay attention to'

Basically, learn everything there is to know. Relevant knowledge is not only with the participants, it is also present in the context. Try to understand the details of people's lives and practices and detect patterns and structure. Specific things to pay attention to are:

- Everything that is seen
  Observations during the interviews are useful means to check and interpret answers and helpful to start and continue dialogue. Observe during the touchstone tour, but also observe the participant's behaviour and body language.
  - Things that are physically present
  - Objects participants care about
  - Body language
  - Factual behaviour and things that change behaviour
  - Interactions with the environment
  - Adaptations and work-arounds
- Everything that is heard
  - Language, vocabulary, words and categories
  - Expressions
  - Motivations
  - Perceptions
  - Issues, difficulties or obstacles
  - Interactions
  - Social actors
  - Unarticulated needs
  - Events and circumstances that shape experiences
  - Prior experiences, current experiences and how those are perceived and conceptualized
  - Intonation
- Everything that is felt
  - Emotions, moments or things that participant react upon emotionally
  - Feelings
- Everything that is smelled
- Everything that is tasted
- Anything surprising: that changes assumptions or seems irrational

- Observable and explicit needs, but also tacit needs – which cannot be expressed verbally, and latent needs- which are subconscious. These can be detected by exercises where participants create or perform tasks.

5. Tips and tricks for selecting, instructing and working with a translator

The recommendations for questioning are:

- Tips and tricks for selecting a translator: The translator should be selected based on his knowledge of the area, of the local language and of English. The translator should have sufficient time, be sufficiently educated or skilled to translate and should not have a stake in the research, but be interested in it. The translator's position and gender should preferably match the gender of the potential participant, it might therefore be wise to select both a male and a female translator. When the translator is familiar to the participants, but does not have a stake in the interview, it is easier for participants to open up. It is best to use one and the same translator for every interview, as this reduces training and interview time, a translator's availability is therefore an important selection criterion. Normally, a translator is paid for his or her services.
- Tips and tricks for instructing a translator: Designers should insist that the translator properly translates the questions and the participants answers, should not be afraid to pose 'naïve' questions, should not rush the interview, should not interpret questions or answers, and should not steer the participant by providing examples or indicating desired answers by tone or body language. The translator should however try to build rapport and show empathy. Designers should stress that a proper introduction and asking for consent are required. It might be wise to have food or a drink with the translator to build rapport with this person.
- Tips and tricks for working with a translator: It is difficult to decide at whom to look. Do not forget that the participant is the one you are interviewing, not the translator! Be aware of the way you pose questions to the translator, especially if the translator directly translates everything you say.

6. Tips and tricks for contextualizing visualizations

When visualizations are contextualised, the following guidelines should be kept in mind:

- Keep the audience in mind (Hodge 2008)
- Collect and review visualizations (Pettersson 2010)
- Consider the use of words, images and graphic forms (Pettersson 2010)
- Consider the size the visualization will be displayed at (Hodge 2008)
- Consider feedback expressed by participants (Pettersson 2010)
- Use bold and large enough picture elements (Pettersson 2010)
- Use one specific style (Pettersson 2010; Hodge 2008)
- Use a limited amount of perspectives (Hodge 2008)
- Pay attention to colour and contrast (Pettersson 2010)
- Make the lay-out clear and simple (Pettersson 2010; Hodge 2008)
- Avoid unnecessary detail, keep the amount of elements limited (Pettersson 2010)
- Emphasize what is important (Pettersson 2010)
- Make the photograph represent all the topics within the theme (team F2 and G)
- The photograph for one theme should not link to another theme (Team F2)
- Use pictures regarding the aspired yet achievable situation (Team F2)

- Stay “gender neutral, country neutral and age neutral” (team F2)
- Make the photographs recognizable for the participants (Team F2)
- Be aware that visualizations are perceived differently in different regions (Team F2)
- Be aware about local preconceptions to avoid overtone (Team F2)
- Do not use too many photographs (team G)

5. The Opportunity Detection Kit

The Opportunity Detection Kit is a toolkit that supports the designer to conduct step 3 of the CDD approach: obtaining deep insight by means of semi-structured individual interviews (see figure 29).

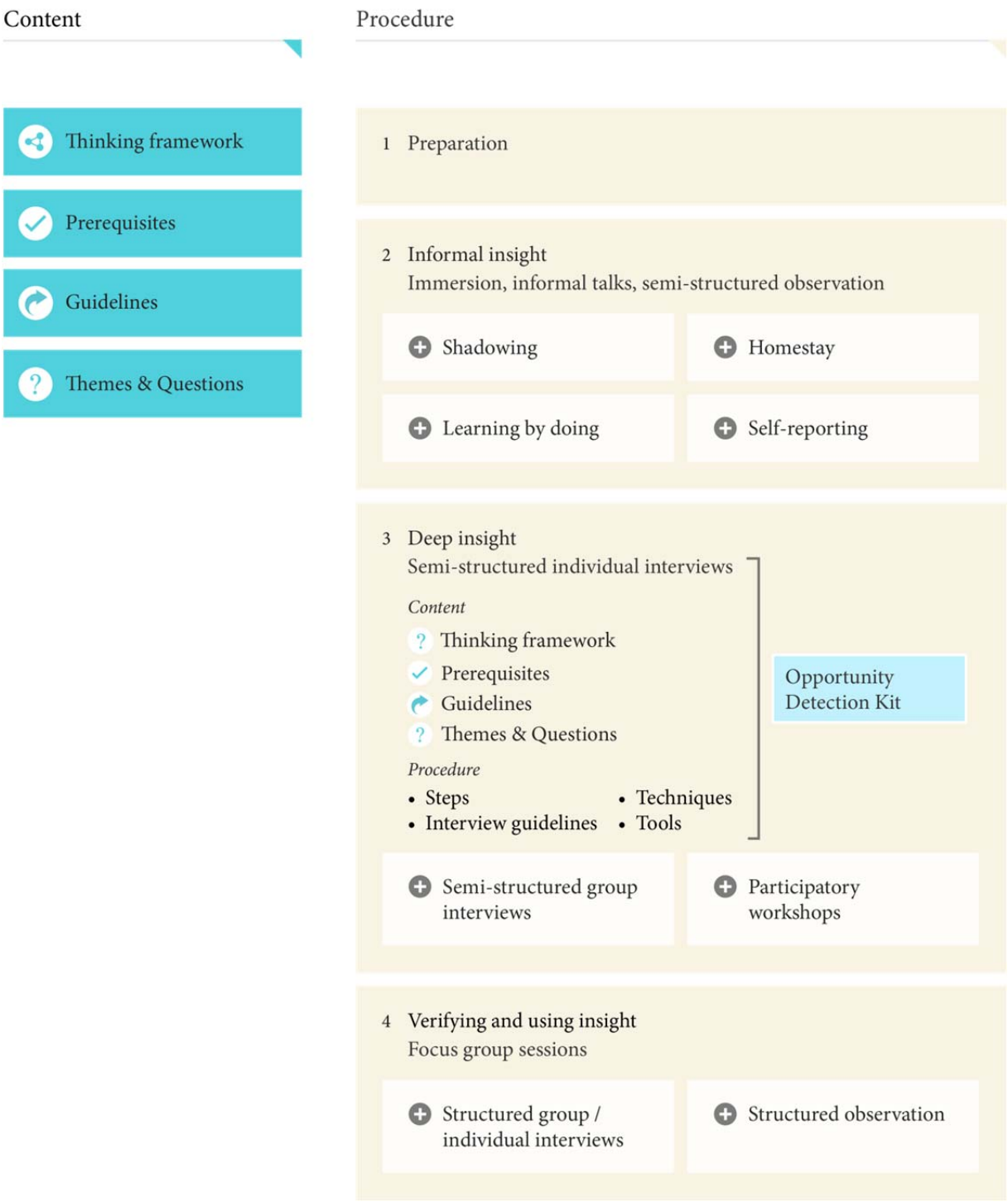


Figure 29: The Opportunity Detection kit as part of the Capability Driven Design approach

What is ODK? What benefits does it offer?

The ODK is a toolkit that comprises one of the essential methods within the CDD approach, semi-structured interviews, using the backbone of CDD and proposing several techniques and tools. The

techniques and tools can be used during the interview to start the conversation, stimulate participants to open up, make the activity fun, simple and participatory, address all the themes, provide an overview of the conversation topics discussed and provide the design team a basis to fall back.

How to use the ODK?
During the first few interviews, all themes should be addressed, but that the facilitator should follow-up on the unexpected and on issues that the participant finds interesting. During the latter ODK interviews, after iterative data analysis of the first interviews, the facilitator can go deeper and obtain more specific insight in emotions and feelings regarding to themes that seem of most interest.

Combination with product-related questions
During the ODK interviews, 'generic' product questions can be posed. Product questions can be added when certain themes are discussed that are obviously related to the product or service to be developed. For example, when a solar charging station for mobile phones needs to be developed, questions about mobile phones ('Products'), connectivity ('Mobility', 'Significant Relationships', 'Family' or 'Services') and energy ('Services') can be posed. Example questions could be: 'Do you own a mobile phone' and 'What do you use your phone for?' and 'How do you charge your mobile phone?'. More specific questions, for example about aesthetic preferences for the charging station, are not adequate to pose during the ODK interviews, they will make the interview too long and focused on the product, while it is meant for a comprehensive insight.

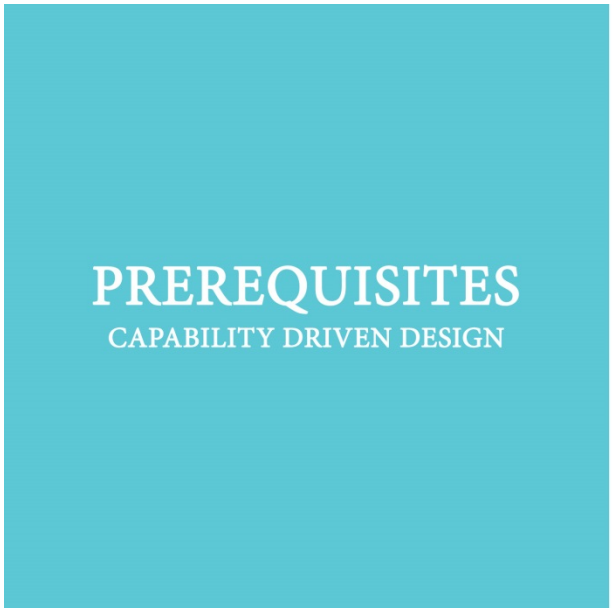
5.1 Techniques and Tools of the Opportunity Detection Kit

The ODK comprises several techniques and tools: reminder cards, pictograms, question cards, drawing and mapping tools, timelines to draw on and a sorting exercise. All these techniques and tools support the designer during the semi-structured ODK interview and are explained here.

Question cards
The question cards are presented above (in figure 22). For each interview, the design team can choose one pictogram or choose to contextualise the visualisation. Then, one set of pictograms can be printed to provide visual feedback to the participant about the theme being discussed and the interview progress, and one set of pictograms can be printed with the questions on the back, to guide the facilitator. The design team should cluster the selected question cards in sets of four, to keep a better overview.

Reminder cards
To further assist the design team in following the prerequisites and steps and remembering the most important behaviour and attitude to stick to, reminder cards have been developed, which are explained below.

Prerequisite reminder card
This card shortly states the prerequisites of the CDD approach (see figure 30).



PREREQUISITES CAPABILITY DRIVEN DESIGN

General

1. Triangulate for data reliability and validity
2. Establish a multidisciplinary design team
3. Establish local partnerships
4. Get the team, client and translator on board for obtaining comprehensive user insight
5. Follow qualitative research training
6. Learn the themes and questions by heart
7. Plan for conducting CDD activities

Activity specific

8. Select a variety of participants with different characteristics for a broad range of insights
9. Conduct activities in pairs and preferably record them
10. Conduct activities in participants' natural setting
11. Keep the activities engaging and interactive
12. Use insights of each activity to inform the next
13. Critically reflect on activity limitations
14. Discuss outcomes in a bigger group for data verifiication and improving reliability

Figure 30: Prerequisite reminder card

Ethics reminder card: ethical guidelines for Capability Driven Design

This card shortly states the most important ethical guidelines of the CDD approach (see figure 31).

ETHICS CAPABILITY DRIVEN DESIGN

1. Participants' interests are central to the study
2. Diminish bias in participant selection
3. Be open and honest, frank and realistic about the research, its constraints and outcomes
4. Obtain informed consent from participants
5. Respect and secure participants' privacy, dignity, rights and sensitivities
6. Limit inequalities
7. Appreciate varying contexts and be open to learn without judgement
8. Time is valuable. Properly thank and compensate participants and local assistants
9. Limit bias, preconceptions, assumptions and misinterpretation
10. Critically reflect on limitations of the data, the approach, the methods, the design team and the project
11. Outcomes should be transparent, genuine and honest and provided back to the community
12. Acknowledge the contribution of everyone involved
13. Keep the people involved in an accessible and understandable manner

Figure 31: Ethics reminder card

Facilitator reminder card: tips and tricks for facilitating ODK interviews

This card comprises the most important rules towards interviewing will be placed down on a card that will be added. Designers are free to add to this card. The standard 'rules' presented on the card can be seen in figure 32.

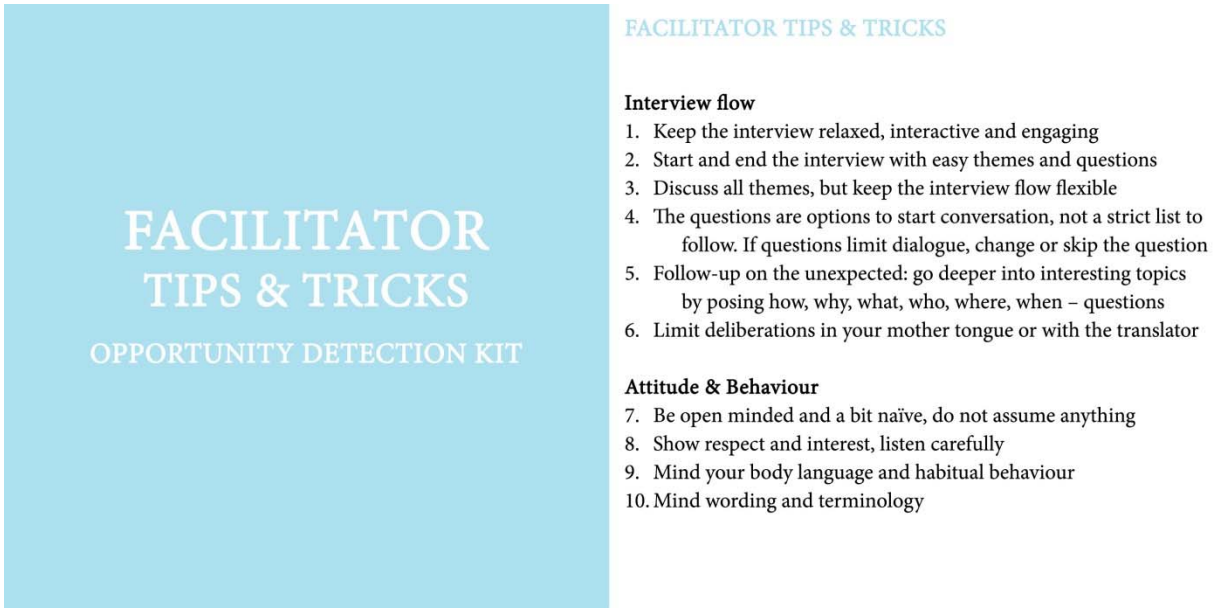


Figure 32: Facilitator reminder card

Note-taker reminder card: things to pay attention to when documenting ODK interviews

This card summarizes the things the note-taker should pay attention to and document during an interview (see figure 33). Designers are free to add to this card.

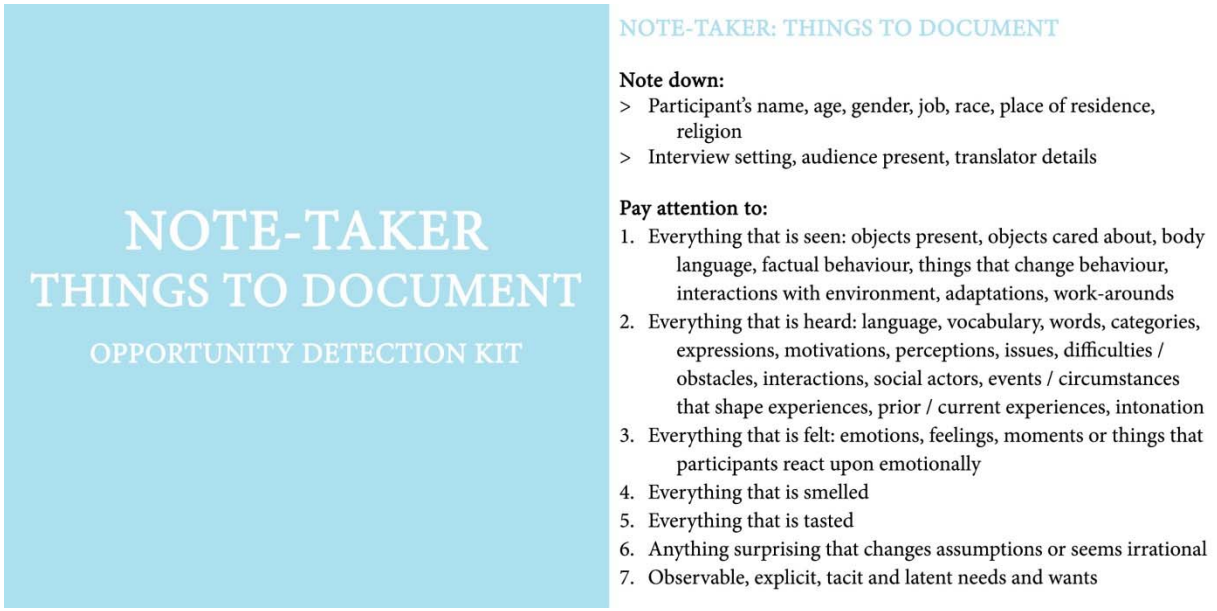


Figure 33: Note-taker reminder card

Steps reminder card: steps to follow when conducting ODK interviews

A card shortly stating the interview steps of the ODK will be added (see figure 34).

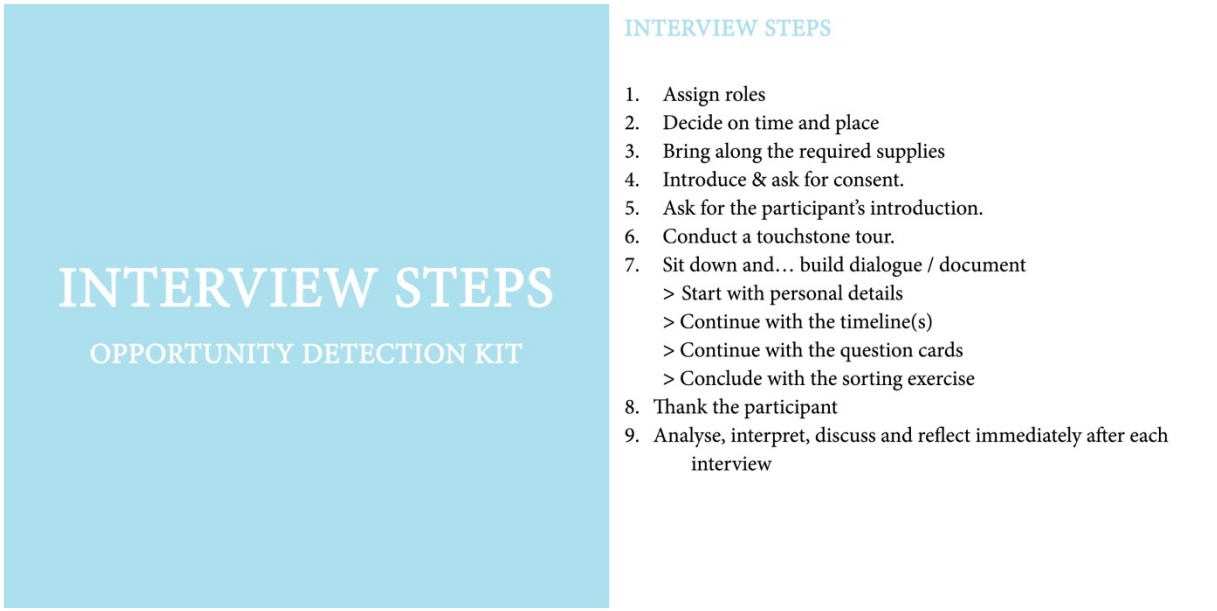


Figure 34: Interview steps reminder card

Drawing / mapping on timelines and mapping sheets

The timeline as presented below in figure 35, is meant for drawing a typical day of the participant. The timeline can be used on an electronic drawing device, or can be printed and laminated to allow for drawing with erasable markers.

Figure 35: Timeline for drawing

A timeline of the year can be used additionally to learn more about participants' activities throughout the year (see figure 36). A timeline of personal history can be used to learn more about participants' personal history by going back to past experiences (see figure 37).

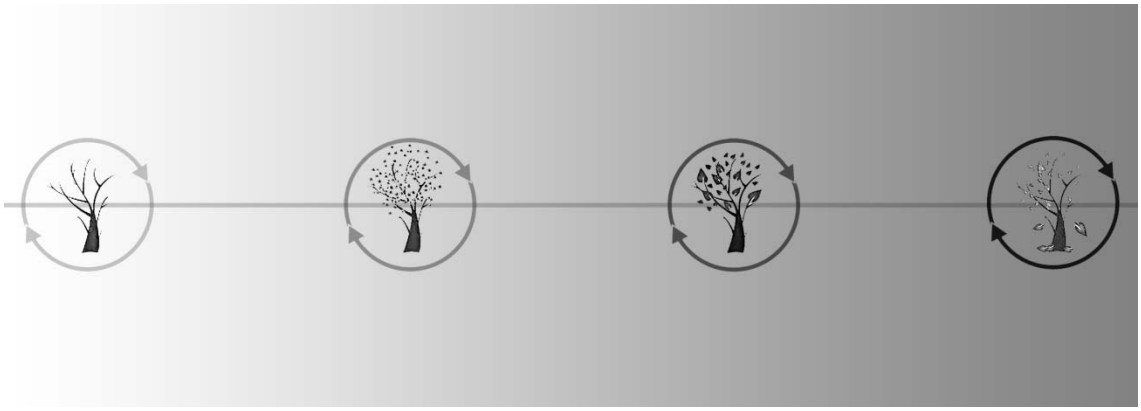


Figure 36: Timeline for activities throughout the year

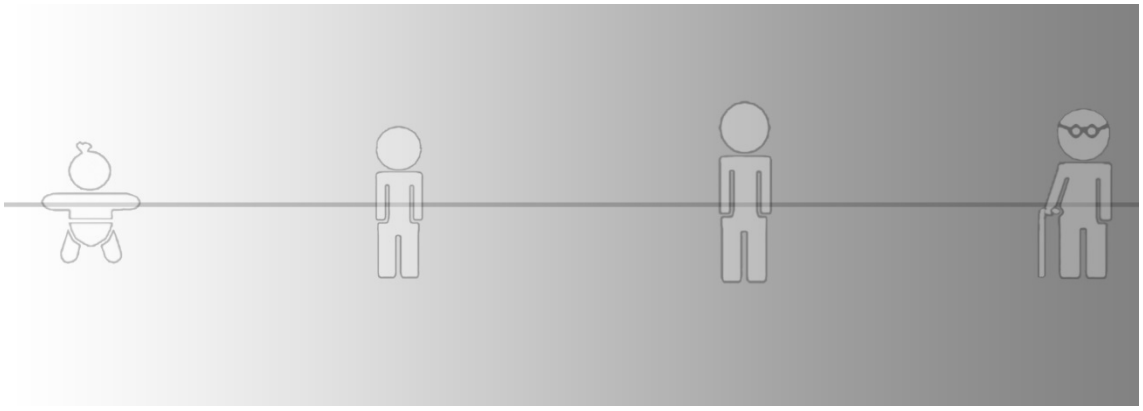


Figure 37: Timeline for personal history

Moreover, two drawing sheets are part of the ODK. One to enable mapping of participants' housing, surroundings and movement patterns, and one to map participants' appearance and social life (see figure 38 and 39).

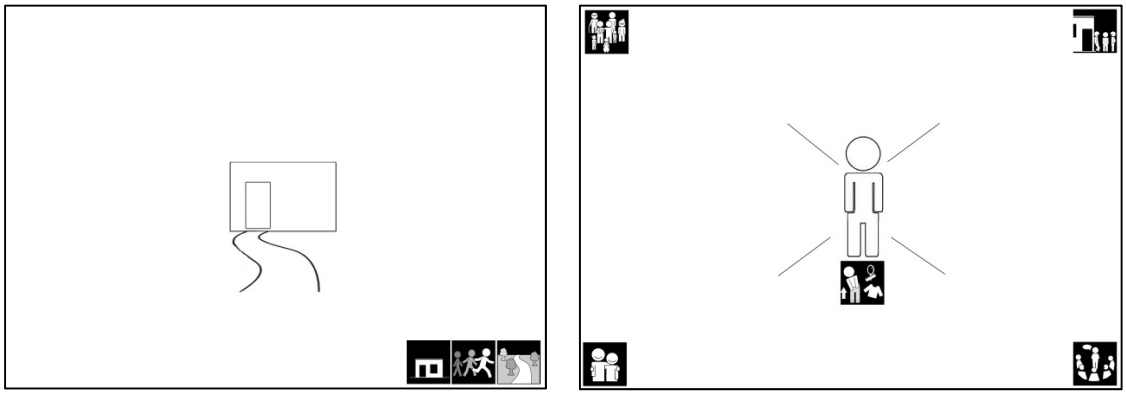


Figure 38 and 39: Mapping sheet for 'Living' and 'Movements' and Mapping sheet for 'Appearance' and 'Social Life'

Sorting

The sorting exercise is to understand how people value the different themes. Participants should indicate which sub-themes they value most in their lives. The sub-theme pictograms are available in a smaller size and can be placed on the sorting sheet. The exclamation marks indicate importance. The participants have to sort the sorting cards in six categories from very important (six exclamation

marks) to not important (represented by one exclamation mark) (see figure 40). To avoid confusion, this can be done best by providing the sorting cards one by one and let people sort them one by one.

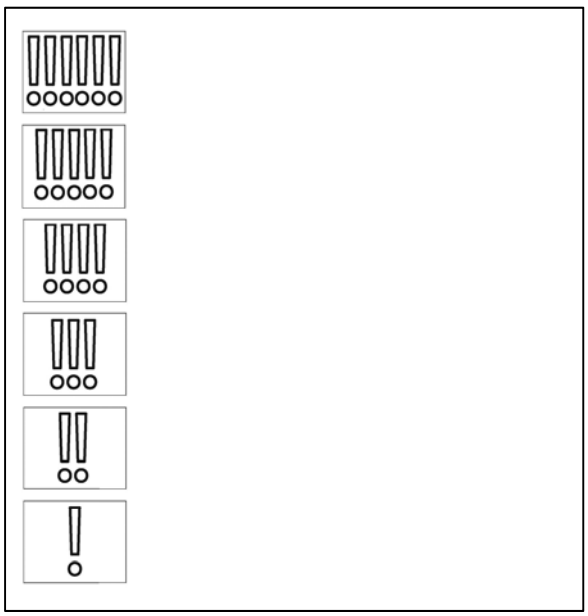


Figure 40: Sorting sheet

5.2 Opportunity Detection Kit Interview Steps

The steps that need to be executed in order to conduct semi-structured interviews are the following:

Prepare the interview

1. *Get familiar with the ODK procedure, techniques and tools*. The team members must become acquainted with the flow and structure of the interview. By being familiar to the themes and questions it is easier to switch between them, offering flexibility which improves the building of dialogue. Roleplay the interview in the team, pilot the interview and read the full manual to get the most out of the interviews.
2. *Include general product questions in the ODK.* During the ODK interviews, 'generic' product questions can be posed. Product questions can be added when certain themes are discussed that are obviously related to the product or service to be developed. For example, when a solar charging station for mobile phones needs to be developed, questions about mobile phones ('Products'), connectivity ('Mobility', 'Significant Relationships', 'Family' or 'Services') and energy ('Services') can be posed. More specific questions, for example about aesthetic preferences for the charging station, are not adequate to pose during the ODK interviews, they will make the interview too long and focused on the product, while it is meant for a comprehensive insight.
3. *Localize the content and conduct a local pilot*. Locally discuss the ODK contents beforehand. As accents, words, expressions, dialects and pronunciations might be different and words might mean different things in different regions, it is important to make sure the translator and the participant have the same understanding of the themes and questions. To adjust wordings to local dialects and to point out sensitivities it is important to discuss the themes and topics with people familiar to the potential users and their context. To improve participants' understanding

of the themes and build relationship, the pictographs can best be replaced by local visualizations. Be careful to select visualisations to which the participant can relate, but which do not steer the participant into a certain direction. Adjusting the ODK to the local context results in better dialogue and better outcomes. After adjusting the ODKs contents, a local pilot should be executed in the field. By conducting a pilot in the field, the designer becomes familiar to the ODK content and procedure. Moreover, sensitivities and terminology become even more clear. Especially when using a translator it is relevant to conduct the pilot locally, as in this way the translator also becomes familiar to the ODK content and procedure. Tips & tricks for contextualizing visualizations are provided in the manual.

4. *Carefully select and instruct a translator (if required)*. Follow the tips & tricks in the manual. The translator should be thoroughly informed about the task at hand and his or her role. Share the goals of the research and explain the rules. If step 5 (conduct a local pilot) is not feasible: go through all the themes and questions before the first interview to get the translator acquainted with the interview flow and structure, the themes and key questions. It is best to use one and the same translator for every interview, as this reduces training and interview time. Moreover, when the translator is familiar to the participants, but does not have a stake in the interview, it is easier for participants to open up.
5. *Select participants*. A local partner, translators or other participants can aid in selecting participants. However, the selection criteria should be followed. As stated in prerequisite H, a variety of participants should be selected, also outside the potential user group.

<u>Conduct the interview</u>

6. *Assign roles*. Conduct the interview with at least two (a facilitator and a note taker / photographer) and a maximum of three designers and assign roles beforehand to clarify the purpose for each researcher. Appoint a facilitator who resembles the participant most (e.g., in gender, age social class, religion and ethnicity), when possible.
7. *Decide on time and place*. Time and place of the interview should be at convenience of the participants and preferably in their local context. Try to prevent to conduct interviews with participants who are busy and distracted (e.g. because of work, time limitations), and interviews that suffer from interruption by audience. Try to not bring employees from the client organization, as they have a stake in the research outcomes and might influence the participant's answering. Make sure there is sufficient space to use the ODK techniques and tools.
8. *Bring along the required supplies*. The materials for the activities, recording devices, a notebook and pen should be brought along to the interview. Consider to bring along pictures of yourself and your surroundings and food for the participant as well.
9. *Introduce & ask for consent*. Introduce the research, the interview, the translator and yourselves. Be honest and explain the research goals and why comprehensive user insight is required to be able to develop a product and / or service that suits the people's needs and wants. Explain that they are the experts and that the interview is to learn from them. Giving your introduction in the local language helps to build rapport and to establish a more relaxed atmosphere. Participants should be informed about the research and its goals and about the activity. Ask for consent to record the interview, to take pictures and to use the data. Stress that participants are not obliged to participate and can withdraw from the activity at any time. Clarify how much time the interview will approximately take, based on the local pilot. It is very

important to be clear about compensation to set the right expectations for participants. Communicate openness and being non-threatening, stress that there are no wrong answers and that not all questions have to be answered. Explain the participant that he or she is free to leave. Make the participants feel relevant as participants by sharing yourself, verbally or with help from pictures.

10. *Ask for the participant's introduction*. Asking participants to tell something about themselves provides an easy start and shows interest. Learn participants' names, age, place of residence, job and religion and note this down, in order to acknowledge the participant and make him or her feel relevant.
11. *Conduct a touchstone tour*. Let the participant show you around in their house or the environment where the interview is conducted. Use the show me technique: let the participants show you objects, spaces and tools. Conducting a touchstone tour results in better outcomes, as the observations made can be used to establish dialogue and to cross-check the information that participants share.
12. *Sit down and…*

    When multiple team members are present, try to not sit together and do not discuss things in your mother tongue. Also try to limit discussions in English with the translator. The participant should be the one talking.

    a. *For the facilitator: …build dialogue*.

    - *Start with personal details.* Ask the participant's name, age, place of residence and religion. Share pictures that you brought from your home country. Look at the tips & tricks for appropriate behaviour and attitude to help you to build a comfortable and relaxed atmosphere.
    - *Continue with the timeline*. Ask what the participants do during a day. The timeline can be combined with the visualization cards and erasable markers to create an overview of their day. Try to let participants create, if they are unwilling let the note taker create.
    - *Continue with the question cards*. Use the drawing sheet, the visualization cards and the erasable markers to visualize the answers. Start with the current situation for one theme and from that point ask about changes in the past and aspirations for the future, before continuing to the next theme. When discussing a theme, explain what the pictograph/local visualization is about. Again, try to let participants create, if they are unwilling let the note taker create. There is no indicated order for discussing the themes, but start with an 'easy' theme or topic and also end with an 'easy' theme or topic (which themes are 'easy' can be found out by discussing the themes with a local partner and / or conducting a local pilot). The questions for each theme are mere options for starting conversations than exact questions that need to be asked. However, the questions should be kept general enough to stimulate conversation, and focused enough to reveal the desired information. Questions can be left out and for each theme it is also important to ask questions in different ways, to pose questions about topics and experiences that come up during the conversation. Pose follow-up questions to follow-up on the unexpected, and on topics that the participant finds interesting. When participants have difficulty opening up, fall back to 'easy' topics or use drawings to elicit more response. When certain topics are clearly sensitive or close down the participant, switch topic. Any question affecting the dignity of participants must not be pursued. It is important to consider and respect people's privacy, and their personal

space. If participants do not allow the designers to enter that personal space, that should be respected.

- *Conclude the conversation with the sorting exercise*. Use the sorting cards and let participants place these cards on the ranking sheet, based on their importance: not important (.), less important (!), important (!!) or very important (!!!). For each sorting card, explain what the pictograph/local visualization means. The ranking exercise works as a confirmation of the things being told during the interview and provides insight in what and how participants value.

b. *For the note-taker: …document*. Let the interview preferably be recorded by a recording device (but be aware of the possible effects of recording devices: participants becoming shy or holding back) and take notes to document anything surprising and participants' behaviour, attitude, body language and interpretations. The note-taker can also draw, and capture photographs and video. Look at the tips & tricks about 'what to pay attention to'.

13. *Thank the participant.* Thank participants for their invested time and effort and for sharing personal information. Bring a small gift, food and / or money to show appreciation and compensate for time and costs (see ODK guideline C).
14. *Analyse, interpret, discuss and reflect immediately*. Analyse and interpret the data after each interview and discuss the interview outcomes, the most striking insights and perceptions with the design team directly after each interview, before things become 'normal'. This aids to verify insights and detect design opportunities. The insights can also be discussed with the translator and the local partner(s). Reflect on the insights (see prerequisite N) with the full team and use the outcomes during the following interviews.

When using the ODK, all fourteen steps should be followed and step five to thirteen should be repeated for each interview.

5.3 Guidelines of the Opportunity Detection Kit

The presented guidelines provide support to designers for conducting ODK interviews:

A. *Start broad, then go deeper.* During the first interviews it is important to touch upon all themes and topics. After some initial interviews, some of the topics and questions can be left out in order to deeper investigate the topics and questions that seem surprising or interesting for the design project.

B. *Time and place of the interview.* It is useful to conduct interviews at homes to combine interviews with observation and to create a comfortable setting. However, if the home setting results in shyness, embarrassment, is too hot, or results in a lot of audience or other disturbances, it might be better to conduct the interview in a more contained space.

C. *Flexible but focused individual conversations*. The ODK provides steps, themes and guiding questions, but there is room for flexibility and unexpected turns in order to stimulate dialogue. There is no indicated order indicated for addressing the themes. Do not ask questions from a script, and feel free to add or change questions. The interview should feel like an open-ended, dynamic conversation to make participants feel comfortable. It is important to continue dialogue regarding topics that seem to be of interest to the participant, and regarding surprising, idiosyncratic or contradictory responses or behaviour from the participant. It might be useful to hide the list of questions and to learn the key questions by heart or keep them out of sight. Do, however, exert some control over activity topics. Use the question cards and drawings to keep

an overview of the themes and topics discussed and preferably start and end with 'easy' to discuss themes.

D. *Duration of interviews.* The interview should be sufficiently long to make participants feel to make participants feel they are being heard, but should not continue too long resulting in participants becoming tired and disinterested. Follow up on answers, but also keep focus: if focus is lost, the interview can become overly long without obtaining useful information. End the interview when no questions are left, or when you feel like delaying a participant. The ODK interview is scheduled to last between 1.5 and 3 hours. The participants should be properly informed before the interview about how much time the activity will take, before they give their consent. Participants can be compensated for their time, for example by providing food or compensation for expenses, and a gift can be provided. If an interview takes longer, participants should be informed and asked for additional consent. The participants can be offered a compensation for continuing the interview. If the participant is not willing to continue longer, the interview should be concluded. When being familiar to the themes and questions, interviews can be conducted quicker. When more drawings are being made and more follow-up questions are posed, interviews become longer. Decide, based on the participant's behaviour and attitude, how to approach the interview.

E. *Number of interviews.* The objective of the ODK interviews is to get to know people's available and valued beings and doings, and to become inspired. The amount of interviews is not fixed and it is up to the team to decide when sufficient insight is obtained. The context, the project, the participants, the translator, the variety of participants that can and should be included, and the skills of the facilitator all influence the outcomes and therefore the number of interviews required. It is not the intention to obtain statistically generalizable data, and after the first few interviews the amount of new insights will decrease. The 'quick scan' program includes at least five interviews, to be conducted in three days. However, it depends on the amount of insights if this is sufficient or that more interviews are required. The 'extensive scan' allows for conducting more interviews in combination with other methods.

F. *Consider to use specific questioning techniques.* As mentioned under 'questioning techniques'.

G. *Dealing with sensitive questions*. Sensitivity differs per culture, so it might be that the questions you think are sensitive, are not sensitive to the participant. Your own assumptions and feelings towards questions should not be leading. Discuss the questions beforehand with a local partner to identify sensitivities. Start with more general and easy to answer questions, and later in the interview, when rapport has been build, it might be possible to pose sensitive questions and probe broader and deeper. However, be understanding and sensitive towards the feelings of participants and the potential of causing psychological harm for the participant. Try to rephrase a question when the participant is hesitant to answer it, or ignore the question if it leads to an uncomfortable situation. Sensitive questions should not be forcefully asked, just because they are in the ODK. It is not always possible to obtain answers to all questions, but that is also not required. Participants must be free to share what they want and remain comfortable. An unwillingness to answer questions also provides valuable information. It might be wise to let sensitive questions to male participants be posed by male facilitators and translators and to female participants by female facilitators and translators. Sensitivities can be pointed out beforehand by local partners and / or the translator, but the information provided by them should not be leading.

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The prerequisites, guidelines, tips & tricks have been derived from the following sources:
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