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Master Thesis

Identifying and preventing 'ICT4D-washing'

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'The road to hell is paved with good intentions'
- *English proverb*

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Abstract

For decades projects for digital development have been carried out, aiming at improvement of people's lives in poor countries and regions of the world. While a large part of these initiatives are being set up with good intentions, there are also many examples of projects that have negative side-effects for stakeholders or that are based on unethical principles or practices. Some of these projects may not even have development as their main goal, we identify this as ICT4D-washing.

In this thesis we ask the question whether we can identify patterns of unethical approaches in ICT4D projects and how these projects can be designed such as to prevent doing harm to local stakeholders or their environment. Based on qualitative analysis of experts interviews and existing literature, we propose five pillars: collaboration, context, ownership, intent and sustainability. These five pillars can help to organise and design ICT4D projects and solutions in such a way that risks of doing harm to local stakeholders or their environment are minimized.

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1. ‘Development’ around the globe

Countries and world-wide organisations have been working on development of rural parts of the world for decades. The Sustainable Development Goals (United Nations, 2020) set up by the United Nations are a good example of this ongoing process and commitment. While a large part of these initiatives are being set up with good intentions, there may also be examples where so-called development projects lead to other outcomes than can be glanced at first hand. An example of this is the dumping of free clothing in the Global South, which disrupted local economies and almost bankrupted local businesses. In turn, this made the target countries of this initiative more reliant on large clothing companies from the Global North. Different studies (Koyi, 2006; Majtenyi, 2010) have linked the decline in African clothing manufacturing to this substantial import of second-hand clothing from the Global North. The intentions of these initiatives may appear noble, but in the end it did more harm than good. Potter et al. (2008) discuss the word ‘development’ critically and look at the implications that lie within it as a concept. They explain that the ‘development of the Global South’ implies that the Global North has a privileged position that makes their interventions appropriate and desirable, even though the outcomes of these projects can leave much to be desired when actually applied. Perhaps development as it is often presented has its flaws, and leaves the Global South at the mercy of so-called development projects organized from richer countries in the Global North.

In the Global North, we can see a lot of development which stems from the application of Information and Communication Technology (ICT). However, the rapid development of new technologies falls upon some criticism as well with regards to the implications of this development. A recent example is the initiative of Apple of using AI to scan people’s private photos for child pornography (NU.nl, 2021). The intention of fighting child pornography may be noble, but it also raises many concerns with regards to privacy. Gordijn (June 2021) explained how Amazon uses AI to improve their own market services, to the extent that they have an unfair advantage and try to dominate (and maybe even monopolize) the whole market. Other platforms like Uber, Netflix and Facebook have similar approaches to cornering the market and eliminating competition. They invest heavily to get a big market share and once they have this dominant position, they start to increase their prices at the consumer’s detriment. Another example of the use of ICT for undesirable ends is the Facebook Cambridge Analytica scandal (Schneble et al., 2018). US voters were paid a small amount of money to take a personality test that required them to log in with their Facebook account. Besides taking the test, the app also collected personal data of the voters without their consent. The personality quiz results were then paired with Facebook data to determine psychological patterns. Eventually algorithms would combine the data with other resources (e.g. voter records) and create hundreds of data points per person. Using this data, highly personalised advertising was targeted to influence these people for the next elections. These examples are clear cases where ICT did not produce desirable results for society (in hindsight), even though they are initially presented as such.

The same may be the case for the application of ICT to further the goal of developing the Global South. Such initiatives are classified as ICT for development (ICT4D), which is

defined as implementing technological innovation and information and communications technologies in low-resource contexts. Bon et al. (2016) define low-resource contexts as 'rural regions, where infrastructure is poorly developed (e.g. no electricity grids, no internet connections), levels of literacy are low, and economic conditions are demanding'. ICT has brought a lot of wealth and development to the Global North, making it easy to think the same will apply in the Global South. However, many attempts of *bridging the digital divide* have failed (Bon, 2019; Marais, 2011; Heeks, 2008). The approach and motivation behind some of these ICT4D projects may lead to similarly undesirable outcomes as with regular development or ICT projects.

An example of a failed ICT4D project which seemed well-intended is the 'One Laptop Per Child' (OLPC) project, which intended to provide children with affordable laptops for education purposes. Robertson (2018) explains how stakeholders of the project were sceptical even before it began. One of the critiques was that the children would rather want clean water and actual schools than a laptop. However, the biggest critique to be found in the project is that it was another example of an American marketing ploy, where 'under the guise of non-profitability, hundreds of millions of these laptops will be flogged off to our governments'.

When the OLPC project actually started and the laptops were being produced, these critiques became reality. The development costs were higher than expected and the laptops were not practical in use (Robertson, 2018). There was little contextual research, no collaboration with the eventual users (the children) and little to none repairability or reusability of the materials other than from the manufacturer (making the laptops unsustainable). Kraemer et al. (2009) add that the laptops also put a considerable dent in the governmental education budget. Even though the laptops were meant for education, training on how to use them for teachers and students was never provided. Kraemer et al. (2009) explain that OLPC was focussing too much on developing innovative technology in its products, and not enough on the actual implementation of the technology and its potential development impact. One could even state that development was used as an excuse to perform other activities, such as developing and selling laptops.

Another example of a project with seemingly good intentions but little consideration for the actual development consequences is an initiative by Google (Vanguard, 2011). Google set up an initiative to let women in Nigeria put up websites for their businesses. The websites helped the women gain a wider audience and resulted in more sales. The women were approached by other local women by means of their websites, which helped build trust. However, the initiative by Google was on a project-basis, so when the project stopped, the funding stopped as well. The project was not a sustainable development solution as the women did not have ownership over the websites. In the end, a good initiative stopped existing because there was little consideration for the future of the project. The question arises why exactly Google did this project if it had zero interest in ensuring its effects, aside from the positive light such a project sheds on the company in terms of public opinion.

1.2 Analyzing the problem of ICT4D-washing

When ICT4D projects have an undesirable impact this can be a problem. The eventual implementation of a system can even do more harm than good, for example with the OLPC system that actually absorbed most education budgets of countries in return for barely used laptops. The goal of ICT4D projects seems noble, but this can also be used as a smokescreen for actually relevant outcomes. In sustainability oriented projects, we can see a similar well-documented phenomenon to this, called 'greenwashing'. Greenwashing is defined as "*disinformation disseminated by an organisation so as to present an environmentally responsible public image*" (Oxford English Dictionary, 2009). Mitchell and Ramey (2011) specify that for something to be considered greenwashing the 'act' must be deliberate. Therefore, greenwashing implies the intentionality of the deceit (Nyilasy et al., 2012).

Looking at the previous examples of ICT4D projects with undesirable outcomes, it appears that at times companies, NGO's, research institutions and other organizations from the rich Global North sometimes use ICT4D projects as a means to their own ends, whatever those may be. For example, a company can do an ICT4D project in order to polish their image of social responsibility, like in the Google example. It may also be the case that ICT4D is used to further an entity's own agenda but make it look like you are helping, like in the OLPC project. Since the main goal of such organizations is not to actually bring about meaningful progress with their ICT4D project, they often fail and do not improve the lives of people targeted. We define such practices as **ICT4D-washing**; *when entities perform ICT4D projects to further their own ends, and not to necessarily add to development and better people's lives*. This does not have to be malintended. It may simply be because insufficient action is taken to make the project impactful, for example with regards to its sustainability as was the case for the Google project in Nigeria. However, as is the case with greenwashing (Mitchell & Ramey, 2011; Nyilasy et al., 2012), there may often be an element of deception involved.

Means for identifying and preventing ICT4D-washing could be useful in an effort to make ICT4D as a whole more impactful on actual development efforts: actually doing good. This raises the question: 'if we want to do good, how do we know that we will actually do good?' This is an ethical question, since it also raises the question of what 'doing good' means. Oosterlaken (2015) explains that the general stance in development ethics is **not about economic growth, but to make people's lives better**. If we look at the 'ethical way' of doing things we need to look beyond the intentions and noble facades; we need to look at the outcomes of the actions. In this research, we research what unwanted side-effects can occur for users or other stakeholders or to their environment, in order to identify and avoid ICT4D-washing. We refer to development here as 'progressive and effective development which represents change that is intended to lead to the betterment of people and places around the globe and to enhance the common good', as defined by Potter et al. (2012).

The aim of this research is to help anyone working on an ICT4D project to make sure that the system that is implemented will actually make people's lives better and add to development. We want to help people working on ICT4D projects recognise and avoid ICT4D-washing to this end. To do so, we need to find out what common issues are that occur during ICT4D projects and what we can do against these issues. The following research question is used to

conduct this research: *How can we identify and prevent "ICT4D-washing" in projects of digital development that target people who live in low-resource environments?*

First, we look at the existing ethical frameworks in literature. We summarise a set of frameworks and discuss for each framework to what extent they address the issues that arise with ICT4D-washing, like contributing to actual development, improvement of people's lives and the avoidance of undesired outcomes. This can be found in chapter two. Next, we take a look at the first sub-research question: *Can we identify patterns in unethical approaches in ICT4D?* In order to answer this research question, we conducted nine interviews with people who have experience working on ICT4D projects. From the interviews, patterns of unethical approaches in ICT4D projects are identified. The patterns can be found in chapter three. These patterns lead us to the next sub-research question: *How can ICT4D projects be organized, and ICT4D solutions be designed such as to minimize the risks of doing harm to local stakeholders or their environment?* In order to answer this sub-research question, we look at the solutions and practices that were used by the interviewees to minimize the risks of doing harm to local stakeholders or their environment. From these solutions and practices, we set up a set of five pillars. These pillars will help identify and prevent ICT4D-washing. The five pillars can be found in chapter four. Lastly, we assess to what extent these five pillars are present in two ICT4D use-cases and to what extent it is possible to assess these five pillars. The assessment can be found in chapter five. To answer the MRQ, we look at the answers to the sub-research questions. We look at the existing patterns, we see how we can offer a solution to these and to what extent the patterns are present in use-cases. We can find this discussion and conclusion in chapter six.

2. Existing ethical frameworks

In this chapter, we look at existing ethical frameworks and we discuss to what extent they address actual development, improvement of people's lives and the avoidance of undesired outcomes. We want to know if the existing frameworks already answer the question on how to avoid ICT4D-washing. Do these frameworks help identify and prevent unwanted outcomes? For each framework, we look at the proposed guidelines and see to what extent these frameworks answer this question.

2.1 Existing frameworks

Below, you can find a table that shows a selection of relevant ethical frameworks, including a summary of the framework. After the summary, we discuss for each framework to what extent it offers a consideration to unwanted outcomes and ICT4D-washing.

Table 1: *Summary of existing ethical frameworks*

Frameworks & methods	**Author(s)**	**Summary**
Ethical Model of Internet Integration	Brunet, Tiemtoré and Vettraino-Soulard (2004)	• taking into account the broader economic context • engaging politically, implementing a telecommunications infrastructure • setting up literacy and internet-training programs, creating internet community centres • developing support programs for the creation of domestic internet content • setting up business-assistance programs • encouraging international communication and the coordination of international projects • developing an awareness-raising program covered by the media such as radio
REAL approach	Krauss (2009)	• Respect the people and their customs • Encourage residents to share their knowledge and ideas • Ask questions and give feedback • Listen carefully
Ethical factors in decision making	Mason (1995)	• Who are all stakeholders who ought to partake in making the decision? • Who should benefit from the choices made? • The decision should be carried out in a humane and honest manner • Sustainable procedures should be put in place
Ethical Development Research	Brydon (2006)	• informed consent • funding and funders • power, change • contexts and their importance • doing research: before, during and after • deviations from the 'ideal'

Ethical practice in ICT4D	Mthoko & Pade-Khene (2013)	• collaboration and participation • socio-economic context • cost and benefits • stakeholder interest
Ethically aligned design	How (2018)	• Human rights • Prioritizing Well-being • Accountability • Transparency • Technology Misuse and Awareness of It
Minimal ethical guidelines	Dearden & Kleine (2018)	• to do no harm • to act with honesty and integrity in dealing with research participants • to report findings openly and accurately, this includes in particular (where feasible and appropriate) to report findings back to the participants and communities who have engaged in the work, in a form and in language that is useful and accessible for the participants and partners involved • to act with fairness and without discrimination so that no individuals or groups of people are unfairly excluded from participation in research or from deriving the benefits of research • to show respect for all entities (persons and communities, as appropriate) involved, recognising their inherent dignity and not simply seeing them as means who can be exploited to achieve the researchers' ends • to show sensitivity to the diversity of cultures, values and experiences • to respect our shared global natural environment
Principles for digital development		• Design with the user • Understand the existing ecosystem • Design for Scale • Build for Sustainability • Be Data Driven • Use Open Standards, Open Data, Open Source and Open Innovation • Reuse and Improve • Address Privacy & Security • Be Collaborative

Ethical model of internet integration

The first framework we look at is the ethical model of internet integration by Brunet et al. (2004). The model is built for internet integration in rural contexts. We can see in the steps that the model aims at an approach that is more than superficial; the broader economic context is considered and initiatives to engage and educate the community are suggested. With these initiatives we might argue that the model wants to build a sustainable solution that is actually usable for the local community. However, the model does not consider actual participation from the local community, but rather focuses on educating the community. This implies that the local communities do not have any say in what they will learn and how they will learn it. The model also does not address defining management or ownership of the integrated internet. This implies that the ownership can still lie outside of the local community, leading to an unbalance in power over the internet. The intent of internet integration, besides integrating the internet, is also not specified. With the undefined management and/or ownership, the question remains who will have a say in what will actually happen with the internet and who will benefit from it. The model does not address preventing unwanted outcomes and actual development of a community in a low-resource context, other than integrating the internet there.

REAL approach

The second framework we look at is the REAL approach as discussed by Krauss (2009). The REAL approach aims at having collaboration with the local community in a project. They suggest asking and using feedback, listening to the local community and respecting them. However, the REAL approach does not address how the new system will actually tackle a problem, contribute to development and improve people's lives. Besides working with a community to implement a system, there needs to be a reason for the system that will actually help development. There is no call for context research and there is no push to look for an intent of a system. Next to that, there is nothing suggested to make a system sustainable. The REAL approach also does not address defining ownership of the system. The lack of context research, no actual definition of an intention or ownership and no consideration on sustainability of a system, make the REAL approach only suitable as an approach for good collaboration, but it does not actually address improving people's lives and preventing unwanted outcomes.

Ethical factors in decision making

The ethical factors in decision making are suggested by Mason (1995). These factors address how a new system will actually make people's lives better and it mentions systems should be sustainable. The need to make people's lives better is clearly considered by Mason (1995). However, more practical elements of implementing a system are not addressed. The factors consider how the system will improve someone's life, but they do not address in what way these determinations can be made. Defining who will own a system, what the actual intent of the system is (besides it making people's lives better) and looking at the context of a system are not considered. The practical implications that are paired with development or preventing unwanted outcomes are not addressed by Mason (1995).

Ethical development research

Brydon (2006) proposes a framework for ethical development research. The framework looks at how to carry out respectful research that considers the context in which the research is carried out. Looking at the intent of the framework, it does not take into account the effects of the research on the development of the involved community. The framework does address working with the local context, using informed consent, looking at the funding, funders and power balance of the context. While considering these factors is beneficial and might lead to good research, the framework does not suggest how it will help development and make people's lives better. Furthermore, the framework also does not mention how to prevent or address unwanted outcomes.

Ethical practice in ICT4D

The framework 'ethical practice in ICT4D' is proposed by Mthoko & Pade-Khene (2013). The framework takes into account the context and encourages collaboration and participation. It also suggests looking at the stakeholders interests and the costs and benefits. The framework does not address sustainability or ownership, so we can argue that it mostly looks at the implementation of a system, but not the continuation of a system. However, looking at the continuation of a system is a crucial part of ensuring the systems are actually used. We can argue that the framework by Mthoko & Pade-Khene (2013) considers more than a superficial ICT4D project, but it lacks the ability to look at the continuation of a project. Since the continuation of a project is also a crucial part of actually improving people's lives and contributing to development, this framework does not suffice to answer how it will help prevent unwanted outcomes.

Ethically aligned design

How (2018) proposes a set of principles in his book, 'ethically aligned design'. The principles serve as guiding principles for designing autonomous and intelligent systems. Looking at the guidelines, the focus lies on considering the impact of autonomous and intelligent systems on people's lives. They vouch for respecting human rights, prioritizing well-being, defining accountability, having transparency and making people aware of technology misuse. We can see that these principles really focus on the impact of people's lives, however, the guidelines are not about the development of the system in a low-resource context. There is no call for collaboration with local communities, no guidelines on defining the ownership of a system and there is no consideration on the sustainability of a system. In the end, ethically aligned design does not address how a new system can contribute to the development of a low-resource context, which is needed to avoid ICT4D-washing.

Minimal ethical guidelines

Dearden & Kleine (2018) propose a set of minimal ethical guidelines. These guidelines help researchers act ethically in ICT4D research. The guidelines focus on fairness, honesty, respect and sensitivity from the researchers working on ICT4D research. Looking at unwanted outcomes that can occur in ICT4D research, Dearden & Kleine offer no guidelines on this. To prevent ICT4D-washing, we need to have a critical look at what the new ICT4D system does for development and improving people's lives, but no such thing can be assessed using Dearden & Kleine's guidelines. The guidelines focus only on the researchers and their intent, but we can argue that these guidelines mostly serve as a way for researchers to wash their

hands of any consequences that the research may have. If we look at overcoming ICT4D-washing, we want to see what to do to prevent and overcome unwanted outcomes. Even though the minimal ethical guidelines are clear guidelines for researchers, they do not address the actual development of communities in low-resource contexts and how to better these people's lives.

Principles for digital development

The last framework that we will discuss are the principles for digital development. The principles for digital development is a set of nine principles that serve as a guide to help practitioners apply digital technologies to development programs. The principles suggest working together with the user by designing with them and being collaborative. They suggest looking at the context by understanding the ecosystem. They address sustainability by 'building for sustainability' and reusing and improving existing technologies. They also suggest being data driven and use 'open' technology (e.g. open data) and they address privacy and security. These principles serve as clear guidelines on how to actually work on development. However, the principles are not built for ICT4D purposes, so are not adapted to a low-resource context. The principles also do not address how digital development will make people's lives better. There is no guideline on defining ownership and there is no guideline on clarifying the intent of the digital development. Whilst the principles for digital development address development very clearly, the actual improvement of people's lives and avoiding unwanted outcomes are not addressed.

2.2 Do existing ethical frameworks help identify and prevent ICT4D-washing?

In this chapter, we discussed existing ethical frameworks and assessed to what extent they address the issues that arise from ICT4D-washing and if they help avoid undesired outcomes. We can see that all frameworks could still be susceptible to ICT4D-washing to a certain extent. Some frameworks focus on the ethics of the actions in/for research only and don't mention the impact of the research or project on the development of the community and the context. Other researchers only focus on having an ethical approach, like the ethical model of internet integration, but do not address the impact and/or development of the community. The focus lies on successful implementation, but not on successful continuation. Because of that, none of the frameworks performs perfectly at identifying and preventing risks that could result in unwanted outcomes after implementation.

For this research, we need to identify patterns in unethical approaches in ICT4D and we also need to find out how ICT4D projects can be organized, and ICT4D solutions can be designed such as to minimize the risks of doing harm to local stakeholders or their environment. To find out how to address ICT4D-washing in its entirety, we will interview nine people who have experience with setting up ICT4D systems in low-resource contexts in the next chapters.

3. Identifying patterns in unethical approaches in ICT4D

In order to answer the first sub-research question: *Can we identify patterns in unethical approaches in ICT4D?* we conduct interviews with nine people with experience in ICT4D projects. The interviewees are people from different continents and backgrounds that all have experience with working on ICT4D projects. The exact setup of the interviews can be found below. Out of these interviews, a qualitative data analysis came forth. The different interviews all provided informative qualitative data, which is analysed in an inductive approach. First, the interviews were annotated while re-reading them. Patterns of issues or approaches were collected in a table. After identifying the issues and patterns, we look at the interviews to see how we can minimize the risks of doing harm to local stakeholders or their environment. This will be discussed in the next chapter. The table used for identifying patterns can be found in appendix A. The methodology used for this qualitative data analysis was as follows:

1. Transcribing interviews.
2. Annotating interviews while re-reading them.
3. Identifying patterns from the interviews.

3.1 Interviews

For this research nine semi-constructed interviews were conducted with various experts on ICT4D or closely related topics. As you can see in the table below (table 2), the interviewees all have different backgrounds. However, all interviewees have worked on ICT4D projects and have the experience to provide us with the needed information to identify patterns of issues in ICT4D projects. The interviewees were selected based on their experience in ICT4D projects. The interviews are semi-constructed interviews, meaning there was a fixed set of questions but there was room to elaborate on their answers. Most interviews were conducted by two students, where one student asked questions and the other wrote down the interview. Most interviews were recorded. Video recordings of the interviews are available upon request. Summaries of the interviews and notes that were made during the interviews can be found in appendix B. The table below shows a list of all interviewees, including their experience and the length of the interview. In addition to the interviews, some lectures on ICT4D projects were also used as resources for quantitative data.

Table 2: *Overview of the interviewees, their functions, experience and duration of interview*

Nr	Function	Based in	Experience	Duration of interview
I1	Founder ICT non-profit for women in Nigeria	Nigeria	Working on many ICT4D projects in Africa, focus on inclusion of women.	46 minutes
I2	Senior researcher in ICT4D	Ireland	Worked on many ICT4D projects in Africa.	28 minutes
I3	Senior researcher in economics	The Netherlands	Working on a project in Africa for a more transparent supply chain (project CARPA).	34 minutes
I4	Former teacher, now IT professional	The Netherlands	Working on a healthcare project in Africa from New Nexus.	54 minutes
I5	Professor Business Informatics, founder ICT4D organization	The Netherlands	Working on many ICT4D projects in Africa & South-East Asia at W4RA.	49 minutes
I6	Founder ICT business	Kenya	Building different types of systems for different (small & large scale) African organsiations at Dew Cis Solutions.	32 minutes
I7	Geographer & lecturer	The United Kingdom	Working on mapping projects in Africa and South-America for Open Street Map.	48 minutes
I8	Designer, project leader and researcher	The United Kingdom	Working on mapping projects in Africa for Open Street Map.	62 minutes
I9	Director of a non-profit	The USA	Working on digitalising farming projects in South-East Asia and Africa at Digital Green.	21 minutes

3.2 Identifying patterns

One pattern that was discovered in all interviews is not engaging in *collaboration* or participation with the local community. I4 explained how his first project failed because of a lack of collaboration. In his project, the whole ICT4D system was designed without the participation of the eventual users, which resulted in a product that was not used by the users. I3 explained how one should not see a project or a system as an intervention, but as a collaboration between all involved parties. I6 explained that working together with his clients is the key to his success and explained how having a 'one fit for all' solution by some other companies (with little collaboration when designing the systems) resulted in failed projects. I8 mentioned that the success of his open mapping project lies in the fact that people from the local communities were mapping everything, not people from Northern Europe. The only Northern European person there was I8 himself, to help with training the people there to use the mapping systems. I7 explained he prefers the same way of working,

by having the locals participate and contribute to the ICT4D system. I7 also explained the solidarity model: 'There is no structure for recognising different actors but working together.' I5 mentioned how village-wide meetings were an essential part of the projects he worked on. I1 also explained how the women only wanted to participate in a project with Google if they were approached in a personal way.

Another pattern that was often discussed is *context*. All interviewees mentioned that a system is heavily subjected to its context and can only be considered after a thorough context exploration. I2 and I3 explained that in order to find a good solution, no assumptions at all should be made in order to build a fitting system. The story by I4 illustrates how assumptions about the context can lead to a product that can not be used in the local context. The game that was designed for the ICT4D project was never tested in a rural context, so when the implementation of the game in the context had to happen, it became clear the game could simply not be played because there were no computers to play the game on. A good context analysis is the beginning and a requirement of any project according to him. I3 explained that one should have great listening skills and should not be arrogant whilst researching the context. Respect and sensitivity to a community and its culture was also mentioned by Prof. Narayanan Kulathuramaiyer in his lecture (May 11, 2021). Looking at prof. Saa-Dittoh's (June 11, 2021) plug in principle, the new system can only work if it is built according to the context it will be used in. To do a good context exploration, field research is needed. A story by I7 shows the importance of good context exploration again. The village there had three wells, but no school. When asking the community leaders what happened, they explained that the village did not have a well a long time ago, and that it was registered somewhere in a database. Later on, not one but three projects for building wells had started in that community, but no one actually came to the village beforehand if there still was a need for a well. With a simple visit to the village and a conversation with the community, the need for the school would have become clear. However, because it was once registered that there was no well, only wells were being built. This also touches the needs of the people; what is actually needed in the community where the project is conducted? Context is also important in the way that a system always needs to be adapted to the needs of the context. If a system is not easily adapted to its context, it is possible it will be used less, or not, because it simply is not usable in its context. I6 illustrated this well by explaining how big private companies sometimes had very good selling tactics, but systems that were not fit for the solution. The systems were too big and bulky, because the companies wanted a 'one fit for all' solution.

Another part that connects to the context is building on what there already is. I9 explained that the systems she built were based on the systems that were already present, but just adapted with more technological options. This corresponds with prof. Saa-Dittoh's plug in principle, of simply improving a system without implementing a completely new system. I9 also explained that there must be a human element in the technology and that one needs to work with what is already there. I6, I9 and I5 also mentioned the importance of agile development. This approach consists of developing something quickly, having good feedback loops, and adapting quickly accordingly. They all explained that the feedback was immensely valuable for the further development of a system. I4 showed with his first project how a linear approach to an ICT4D can easily lead to a system that is simply not used.

A more difficult pattern to uncover is the one of *ownership*. It was mentioned by all interviewees, albeit in different wording. I4 explained the ownership should be clearly defined and should lie with local parties. I5, I8 and I7 all mentioned ownership as an important consideration too, data ownership specifically as to avoid data colonisation. Data colonisation is a more complex subject that is difficult to describe. An example explained by I8 is the one of taking pictures with satellites of rural communities. The data can be managed and saved in the Global North, but that is a very dangerous road into data colonisation. To counter that, he explained that all data was owned and managed by the local parties. T.K. Kang (June 24, 2021) vouched for the children to have ownership of the laptops. I9 also explained how Digital Green had new initiatives that focus on data empowerment that helped with defining data ownership and working with shared data. For small, local systems this is fairly easy to accomplish, but this becomes more difficult when working on bigger, international systems. I1 also explained that Google had a project to empower female entrepreneurs by allowing them to make websites for free. The ownership of these websites was still at Google. When Google stopped that project, the support of the project and the websites stopped. This dependence on Google is what made the project cease to exist, even though it had a good impact on development. This is not a sustainable solution, which brings us to the next issue.

Sustainability of a system, in the broadest sense of the meaning, is another important pattern mentioned by the interviewees. I2 explained that many of his projects simply 'stopped' once the funding stopped. We can also trace this back to the last pattern, the ownership. Not having a plan for how the project will continue after implementation is not sustainable. A solution to making a system more sustainable according to I9 is co-creation. Co-design and co-creation are ways of collaborating and participation in which the local community is actively involved in the design and creation of a system. These approaches can also be used to counter the first issue, not having collaboration. We can see that the sustainability of a system depends on the other uncovered patterns.

The last pattern that was addressed by I6 and I3 was the *intent* of a system. The intent of a system which needs to be defined. I3, I6 and I8 all vouched for transparency of systems, e.g. with the use of open source coding. I6 explained the importance of clarity of what is done with the code and how the code is developed. The use of such techniques helps to clarify the intent of a system. A related issue is privacy, mentioned by several interviewees. Prof. Narayanan Kulathuramaiyer (June 3, 2021) vouched for storing knowledge offline instead of in the cloud as a way to empower the owner of the knowledge. An important factor with the intent of a system also lies in the stakeholders, who can be defined in the context exploration. When defining who wants what in/from a system, the intent of a system also becomes more clear. Fundings and funders are also part of the stakeholders and should be discussed when looking at the ownership of a system too. Next to that, the question or need for a system needs to come from a community itself. Those needs can only be found if the context is considered and there has been a form of collaboration, which takes us back to the first pattern.

3.3 Existing issues in ICT4D projects

To answer the sub-research question *'Can we identify patterns in unethical approaches in ICT4D?'* we look at the patterns identified in the interviews. **No collaboration** with the local community leads to systems where the local community does not have a say in it. This can lead to systems that are not used because they are not understood. **Not looking at the context** of a system results in systems that can not be used (like the computer game) or that do not answer to the people's needs (like the wells). Another pattern that was identified was little to **no indication of ownership** of the systems. If the systems are not owned by local parties, the responsibility towards the systems falls away and the systems are not used or maintained. The next pattern that was identified was **not building a sustainable system**, so not making a system that would endure. This is closely connected to the other patterns, since a system that does not work in its context is not sustainable. A system that has no clearly defined ownership from local parties is not maintained, which can lead to the system not being used. The last pattern that was identified was systems that have **no intent to add meaningful development**. If there is no clear intention to add meaningful development, or there is a malicious intent, the system will not contribute to improving people's lives. A presence of these patterns in a project indicates unethical approaches.

When looking at an ICT4D project and we can recognise these patterns, the project might be a case of ICT4D-washing. The patterns indicate that no sufficient consideration has been made regarding the subject of the pattern, and that there is no real consideration for the development or improvement of the people in the rural context. In the next chapter, we will uncover how ICT4D projects can be organized, and ICT4D solutions be designed such as to minimize the risks of doing harm to local stakeholders or their environment and avoid ICT4D-washing practices.

4. Minimising risks of doing harm to local stakeholders and their environment

4.1 Five pillars

In the last chapter, we identified five patterns that indicate unethical approaches in ICT4D projects. Recognising these patterns in an ICT4D project could indicate a case of ICT4D-washing. In this chapter, we answer the next research question: '*How can ICT4D projects be organized, and ICT4D solutions be designed such as to minimize the risks of doing harm to local stakeholders or their environment?'* As explained in the previous chapter, a qualitative data analysis was conducted to find these patterns. In order to find an answer to these patterns, we look at the interviews again to see what the interviewees suggest to avoid these patterns. Combining these suggestions with the uncovered patterns, we can set up five pillars. These five pillars serve as guidelines on how to organise and design ICT4D projects so that the chances of doing harm to local stakeholders or their environment is minimized.

The first pillar is **collaboration**, the second pillar is **context**, the third pillar is **ownership**, the fourth pillar is **intent** and the fifth pillar is **sustainability**. Below, we elaborate on each pillar. First, we explain what the pillar encompasses. We also include possible methods and tools that help someone incorporate the pillars in an ICT4D project.

Collaboration

The first pillar that helps identify and avoid ICT4D-washing is collaboration. Collaboration entails participation, building relationships that work both ways and no hierarchy in the collaboration.

'It's very colonial of us to think that we can do better than them.' - I8

To set up a system ethically, collaboration is necessary. Collaboration for building systems contains many different elements. The dynamics between the actors in the group is one element. These dynamics need to be clear, as to avoid handling the building of a system as an intervention. Participation, meaning the local stakeholders and the end users need to participate in the development of the system, is a form of group dynamics. The solidarity model is a perfect method for handling the dynamics, as there is no structure or recognising different actors but working together. One can organise living labs, where a research is carried out at a community and the community is treated as co-researchers. Organising living labs does ask for a lot of time and might include obstacles like language issues. Another form for collaboration dynamics is guidance, where the development of a system is carried out completely by the local parties, but some guidance is given where needed. An important element of collaboration is peer-to-peer involvement, meaning people can work with people that they know and/or treat them as equals. Another element of this collaboration is a feedback loop. The users need to know that their input and feedback is actually used and processed. To facilitate collaboration, methods like co-design and

co-creation can be used too. Co-design also proved to be fruitful for a more sustainable system. If there is no collaboration in the project, an instance could simply use the context only for its own agenda and not actually help the local community, increasing the chances of ICT4D-washing.

Context

The second pillar that helps identify and avoid ICT4D-washing is context. The context in which a system is set up needs to be explored before building the system. A context exploration consists of engaging with the local community and doing field research.

'Just go there and talk with the people there. You have to start the conversation with an open mind.' - I5

The context exploration of a system entails engaging with the local communities and doing field research. Engaging with the local community can be done in different forms. One can conduct conversations with the local stakeholders, but village-wide meetings are also a possibility. It is important that these conversations are done carefully, with no assumptions and arrogance. Most successful engagements with the local communities start with trust, which is based on (long-lasting) relationships. Field research consists of going to the location where the system will be implemented and looking at what is there. To ensure working on what is already present in the community, one can use the plug-in method. One can not have any assumptions on the context, because the most basic facilities one would expect could not be present in a rural context.

It is important to keep in mind that there is not one solution to all problems. Every system is implemented in a different context and needs to be adapted to its context. No context is the same, especially in a development context. Generally, thorough context research takes up a lot of time. The field labs discussed at collaboration are also a great method for conducting a context exploration, but they are also time consuming. If there is no consideration for the context, the system might not work, before or after implementation. If an instance would not mind looking at the context and if the project has succeeded, this could indicate ICT4D-washing.

Ownership

The third pillar that helps identify and avoid ICT4D-washing is ownership. The owner of the system, the data, and the other elements involved in the system must lie with local parties.

'The management of the systems should be kept with local parties.' - I4

The owner of a system must be assigned. However when looking at a system, there are different elements that can be owned. First, the full management of the system needs to be defined. Preferably, that management lies with an organisation or someone in the local context. Next, the development (and maintenance) of the system needs someone responsible. Furthermore, the data ownership needs to be defined too. The data that is collected and/or

used by the system needs to be in the hands of the people who the data is about. If the data is about things, the people who own the things need to own the data. However, this is not always as easy to accommodate. Data can be stored offline, not in the cloud, and given to its owner in order to avoid data exploitation, security issues and privacy issues. It is dangerous to assume that people do not care about data ownership, but it is also difficult for some people to understand what data ownership entails. Efforts to explain the importance of data ownership need to be made. One tool here is using education to teach the value and importance of data ownership, privacy and security.

'The move towards data-driven technology is actually creating a dependency again.' - I7

Another part of the ownership lies in the financing and funding of the system. If the funding of a system lies with a party that is not further involved with the system, the power over the continuation of the system actually lies far away from the users. This leads to a lopsided balance of power. One thing we need to avoid for any ICT4D project or ICT4D system is creating a dependency on one party. If the project or system is heavily dependent on a partner that profits a lot from the project or system, this might be an indication of ICT4D-washing. All stakeholders of the project need to be clear to everyone involved. It needs to be clear to everyone who owns what in the system and what the intentions of these owners are. The intentions of the owners is also important for the intent of the project and the system, which is the next pillar.

Intent

The fourth pillar that helps identify and avoid ICT4D-washing is intent. The intent of a system should be that the system adds to meaningful development of the local stakeholders and its environment. It is important to keep in mind that ICT is just part of a facilitation to make something work better. The true intention of the system needs to be to make people's lives better.

'ICT can be seen as the solution, but it's just a tool. People forget the development and only focus on ICT.' - I3

'The most important thing is that IT companies need to be focussed on a business solution. They need to know they are part of a facilitation, to make the organisation work better. They need to be an important addition for the company; ensuring more profit and not reselling products.' - I6

The intent of a system is an important part of the whole. We need to ask ourselves why we are doing this and that the eventual goal is to better the lives of the people and/or the local community. The first question is to see what needs are addressed by the system, since that is part of the intent. To find out these needs, the needs of all stakeholders are to be found and addressed, which can happen during the context exploration or when defining the ownership. It is always important to keep in mind that for ICT4D systems, the ICT is part of the solution, but it can not be the sole answer. ICT is the means, development is the end. To understand the true intent of a system, it needs to be unequivocal what is done in the

system, who works with the system and who owns the system. Using open source software (instead of black-box or closed-source software) is a way to facilitate the transparency of a system and allows people to see the true intention of the system. Not having a clear intent of the project might be a deception to only further an instance's end, which contributes to ICT4D-washing. Another consideration for the intent is that in the end, the true intention needs to be to better the lives of the people in the communities. If that is not the true intent of the system, this might also indicate ICT4D-washing.

Sustainability

The fifth pillar that helps identify and avoid ICT4D-washing is sustainability. The sustainability of the whole system needs to be assessed, meaning looking at the durability of the system itself and the impact the system has on the social, economical, environmental and technical context.

'The way philanthropies work needs to change; they need to increasingly work on long-term solutions and sustainability; not on interventions that disrupt the markets and push out other market players.' - I9

To measure the sustainability of the services that are carried out by the system and the involved actors, one can use the e^3-value model. The model serves to select the best possible scenario and optimize the service from the stakeholders' perspective, which helps in researching social sustainability and gives insight into strengths and weaknesses of a value network, which helps economic sustainability. The sustainability of a system also depends greatly on how well considered the other pillars are. If a system is not developed with collaboration, the system might simply not be used by the local parties, because they were not involved in making it. If the context of a system is not considered, including the long-term context, the system might simply *not work* in the implementation. If the ownership of a system is not well defined, nobody will be responsible for funding, managing and maintenance of the system. This will cause the system to stop growing and not be useful anymore. If there was no consideration for the sustainability, we can argue that there was no consideration for actual development, which can indicate ICT4D-washing.

4.2 Minimizing the risks of doing harm to local stakeholders or their environment

Collaboration, context, ownership, intent and sustainability are the five pillars that can be used to organise and design ICT4D projects and solutions in a way that the risks of doing harm to local stakeholders or their environment are minimized. As the five pillars are based on the uncovered patterns from the last chapter, one can use the five pillars to identify these patterns and as a way to address and overcome them. If the five pillars are considered in an ICT4D project, there is a higher chance of the project being actually helpful for the development of people in low-resource contexts and improving people's lives. This would go further than only furthering the project leader's own ends and thus avoid ICT4D-washing.

5. Assessment of the five pillars

The five pillars that were set up in the last chapter are now assessed using two ICT4D use cases. The assessment serves to see if the five pillars are identifiable in use cases and to assess to what extent their presence helps minimize risks of doing harm to local stakeholders and their environment. We assess the identifiability of the five pillars using two use cases; the seed value chain in Mali and the e-Bario project in Malaysia. Based on the assessment of the identifiability and the impact of the presence of the pillars, we can decide if the five pillars are helpful to counter ICT4D-washing.

5.1 Seed value chain in Mali

The first use case is the seed value chain case in Mali. The project started officially in October 2015 as a cooperation between W4RA and AOPP. W4RA is the Web Alliance for Regreening Africa; a network devoted to developing in a more sustainable and inclusive method.[1] The network is an interdisciplinary collaboration of scientists and professionals AOPP is the association of farmer organizations in Mali[2]. The goal of the project is 'to improve the resilience of food security for the benefit of the rural communities in Mali' (First Report VUA-AOPP, 2015). This is done by implementing new technical systems that improve the existing systems. These new technical systems are all systems fit for rural contexts and serve to share information needed to improve food security.

The seed value chain in Mali is explained by the AOPP: at the base you can find the farmers who produce grains. Then you have animators, technicians, coordinators and the AOPP in the center. The animators, technicians and coordinators are people between the farmers and the AOPP. The AOPP gathers all information on the seeds and centralises it, but the information does not flow back to the base (the farmers). There is a need for a system that helps the information flow back to the farmers, so that the farmers know when to plant, what to plant and what others will plant.

For this research we have received documentation on the trips and visits over the years undertaken for this project. The documentation consists of trip reports and presentations on the projects, technologies and systems. The visits are from groups of researchers and professionals that visit Mali, Burkina Faso and Ghana. During the visits workshops, discussions and interviews are conducted by these researchers. In the trip reports are detailed explanations of what is done during the visits, like for example the technical implementation of a pluviometer or transcriptions of interviews or gatherings.

Presence of the five pillars

When looking at the seed value chain use case, the first report on this project (report October 2015) already mentioned the importance of tight collaboration between the developers and the local users of the system. This corresponds with the 'collaboration' pillar. One can also

[1] https://w4ra.org/w4ra/
[2] https://www.upadi-agri.org/association-des-organisations-professionnelles-paysannes-aopp/

see the collaboration in the amount of visits undertaken for the project and the activities undertaken during these visits (i.e. conversations, workshops, demos and meetings). Another activity undertaken during the visits is evaluation and adaptation, which suggests the iterative approach in this project. With the same names and people being involved in the project, one can also see that we are talking about a long-term collaboration method, which is also better for all parties involved.

The next pillar, context, can also be found in the project. As mentioned above, the W4RA group had made frequent visits to the rural villages and communities to test, develop and discuss the systems with the local users in its actual context. This corresponds with the context pillar. A good example from this use case that showcases the importance of context exploration is the implementation of a pluviometer. The meter was initially developed and tested in the Netherlands, but it was configured to Dutch temperatures. With an increased temperature, the pluviometer did not work correctly. After adjusting the system and adapting it to its new context, it did work. The Kasadaka system (a small raspberry pi that is used for rapid prototyping,) is another system that is clearly adapted to its context (Report May 2016). It is built in such a way that is able to cope with the rural context. Another way in which the systems are adapted to the context is because they are implemented in local languages and are mostly vocal, because many of the system's users only speak one (local) language or are illiterate.

The next pillar is ownership. The ownership and the management of the systems lies with local parties like AOPP, the local radio and other involved parties. The voices that are used in the systems are local voices and the people managing the systems are also people that live in Mali. The visits from the W4RA delegation are mostly to discuss progress, help where needed and assess what new systems can be developed. In this use case, ownership lies with local parties and is clearly defined.

The intent of the system(s), another pillar, is also defined and clear in this project. All systems that are implemented in this use case have the clear goal to help development of the rural area and to improve people's lives. The systems also are built with open source software (Report May 2016), which helps make clear that the system is not built with intentions other than the ones agreed on by all parties.

Sustainability, the last pillar, is also discussed in this use case. In the report of October 2015, the importance of having a sustainable approach from the beginning is mentioned and linked to using local resources, so having sustainable technologies. In the report of October 2016 the Green Climate Fund is mentioned, so using technology for sustainability.

An important line in all visits is that the use case sometimes changes a bit. In the report of May 2016, it is clearly stated that there are many different problems and that it is impossible to address all of them at once. In some of the presentations of the project, we see that three clearly defined problems are chosen and worked on. We can also see how all problems change and the information becomes more detailed. This also shows the importance of the long-term collaboration, adaptability and sustainability of the systems. This also illustrates how the specific needs and systems can change, but that the eventual goal of helping

development remains. In the report of February 2019 a visit to a company that works on small, local, decentralised ICT4D projects is described. During that visit, it is explained how with the turmoil in the country, many ICT4D projects have stopped or are only worked on superficially. This way of working eventually harms the projects and thus the local communities, which proves how ICT4D projects that are conducted sloppily, do more harm than good. The trip report of January 2020 also mentions a story of how a research group wanting to do an experiment prioritised doing research above actual development. The research group asked to stop local initiatives for development because it wanted to test its own hypothesis. These cases indicate that the projects are ICT4D-washing projects. The goal is not to contribute to development, but to further their own ends.

The five pillars are present and identifiable in this use case. In the description of the pillars, more profound considerations are described to see if the pillars are actually answered to. In order to verify if the pillars are thoroughly considered, we set up an overview of these more profound considerations and assess if they are present in the seed value chain project.

Table 3: *Assessment of more profound considerations in the seed value chain project*

Element	**Present?**	**Description**
Listen to community	Yes	Many group discussions with different actors and stakeholders.
Field research	Yes	Field trips & location visits.
Sustainability of the services	Yes	The relations and the systems are maintained continuously.
Addressed needs	Yes	The questions for the systems come from the people who need them. The needs are assessed during workshops and interviews.
Intent of the system	Yes	The intentions of the systems are well defined, assessed and discussed with the involved stakeholders. The true intent is to better the people's lives and contribute to development.
Use of open-source technology	Yes	The software is open source, which offers transparency to the involved parties. The intent of the system remains clear this way.
Assign owners & managers	Yes	The systems are built by and with the local users. A good example is the use of local radio voices for the voice systems.
Privacy & security	Partly	This is not the highest priority in this project, but is considered and mentioned in different reports.

Peer-to-peer involvement	Yes	In all reports it is clear that everyone is involved in the creation and development of the systems.
Group dynamics	Yes	The groups involved in the projects work together and have a good dynamic. There is a good balance of power.
Feedback loop	Yes	The reports mention how the systems are continuously evaluated and adapted based on the feedback given from the users.

Most considerations that are needed for the pillars are present in the use case. The two considerations that are not (or partly) present are privacy and security.

5.2 E-Bario

Bario is a remote community in Sarawak, Malaysia. The e-Bario project was initiated by the government, but is coordinated by UNIMAS and financially supported by Canada's International Development Research Centre (IDRC) and the Malaysian Institute of Microelectronic Systems (MIMOS)[3] (Songan et al., 2004). There are many online resources and academic papers available about this project that we will use for this assessment.

Tarawe & Harris (2009) explain in their paper that the goal of the e-Bario project is to demonstrate how ICTs can provide opportunities for sustainable development and solve problems for ethnic minorities in a remote and rural community. To obtain this goal, school computer labs, a communication center (with a printer and a fax machine) and a few public payphones were set up. Until 1998, the only form of communication for the community was a two-way radio connected with the national telephone system, only answered during office hours (Tarawe & Harris, 2009). The stories presented by Tarawe & Harris show how the e-Bario project has improved the lives of the people in Bario. Besides technical benefits, like improved communication with the outside world, the socio-economic situation in Bario has improved as well. There is more tourism, festivals are set up (e.g. the Bario Food and Culture festival) and other initiatives are now more easily possible because of the new ways of communication. The telecenter is also strategically set up at a central location close to the market and cafés, which eventually also improved the economy for those cafés. One of the interviewed people in Tarawe & Harris (2009) explains that with the increase of job opportunities, they believe the population of Bario will increase too.

The project was coordinated by UNIMAS, the university of Sarawak. It was initiated in the late 1990s. Gnaniah at al. (2004) explain that the project started with research that determined whether or not Bario was a good place to start such a project. Bario is situated in a remote area and the people living in Bario were keen to have access to more forms of communication. After the initial exploration, a framework was set up in order to carry out the e-Bario project in a successful way. To this day, the e-Bario project (specifically the

[3] https://www.itu.int/osg/spuold/wsis-themes/ict_stories/themes/case_studies/e-bario.html

approach taken for the project) serves as an example for other projects (Songan et al., 2004; Tarawe & Harris, 2009; Yeo et al., 2011).

Presence of the pillars

The first pillar, collaboration, is present in this project. The project was set up with a participatory development model, meaning the community was always involved in the project. The community leaders played important roles in the development and gave constant input for the project (Songan et al., 2004). The framework that was identified by Bala et al. (2003) for setting up the e-Bario project contains multiple steps for collaboration. The second step in the framework was community discussion, which means a discussion would be held with the community to share ideas. The next step was community participation, for which workshops were held in which they could help planning and sharing ideas. These steps show a clear presence of collaboration with the local community in the use case.

The next pillar, context, is well worked on in this project. Before even starting to set up the project, research was carried out to discover and understand the cultural, social, information and economic dynamics of Bario (Songan et al., 2004). Yeo et al. (2011) also explain that for the e-Bario project needed a context research to address the people's needs. Gnaniah et al. (2004) explain that the methods used for the approach are all built on a thorough context exploration, taking time to discover and prepare the community before implementing a new system. As mentioned above, a framework was also set up specifically for this project (Bala et al., 2003), which would lead to systems that are adapted specifically for this context. The first step of the framework is a feasibility study. This step is important for this research because there was a top-down push to implement this project. In order to make sure that the project would actually be useful and doable, the feasibility research was conducted.

Ownership, the next pillar, is explicitly mentioned in the framework (Bala et al., 2003) of this project. In the community participation step, the goal is to engage the community in planning and sharing ideas in order to give them a feeling of ownership. However, if we look at the experiences of the community in a later research, we see that ownership is not well arranged in the e-Bario project. One example in Tarawe & Harris (2009) of bad ownership is that the phones that were set up in Bario are not owned by the local people, but are owned by the telecom companies. **This way, the phone companies earn a profit from the communication that the local people have.** The management of the project started with UNIMAS, but was transferred to local parties. Financially, the project is still dependent on donations and subsidies.

The sustainability pillar is addressed in the e-Bario project too. The implementation of the computers is paired with training and education in IT. (Songan et al, 2004). This is different from just 'dropping' ICT systems in an area and not educating the local community how to work with the ICTs. The education and training was also seen as an investment in the future, in order to make sure the systems that would be implemented would actually be used later on.

The intent of the e-Bario project was very well defined; to demonstrate how ICTs can provide opportunities for sustainable development and solve problems for ethnic minorities in a remote and rural community. The intention came from the wish of the Malaysian government to become a fully developed nation with an emphasis on knowledge-based economy by the year 2020 (Gnaniah et al., 2004). Gnaniah et al. (2004), Bala et al. (2003) and Yeo et al. (2011) all explain that for the e-Bario project the eventual goal is development, not only implementing the technology. Yeo et al. (2011) explain that all researchers involved acknowledged that the context of the systems was most important in order to let the technology address the people's needs. Bala et al. (2003) also elaborate that the education and training organised for the community served to make the e-Bario project not only more sustainable, but also to ensure that it would be used and serve its purpose.

Table 4: *Assessment of more profound considerations in the e-Bario project*

Element	**Present?**	**Description**
Listen to community	Yes	The project has been carried out in a participatory way, meaning the community was involved in the project.
Field research	Yes	Before starting the project, research teams have carried out a context research.
Sustainability of the services	Yes	To ensure the systems would be used the people were educated in using ICTs.
Addressed needs	Yes	The context exploration showed needs from the community (e.g. computers in school and better communication tools) that were clearly addressed.
Intent of the system	Yes	The intention of the systems was to develop a rural community further and connect it to the rest of the country.
Use of open source technology	N/A	The specific use of technology was not specified in the documentation.
Assign owners & managers	Partly	Some of the studies made clear that the ownership of the systems was less well defined in this use case. The ownership of the phones still lied with the phone company, so they would still earn a lot from it. Besides that, the funding was still based on donations and not fully independent.
Privacy & security	N/A	There was little information on the privacy & security of the project.

Peer-to-peer involvement	Yes	The involvement from local people is clear from all research on this project.
Group dynamics	Yes	The participatory approach for this project serves as a good base for good group dynamics, in which there is no imbalance in power.
Feedback loop	Yes	The community leaders were asked for feedback during the setup of the project, meaning there was a feedback loop.

The assessment above shows that most pillars are considered more profoundly in the e-Bario use case. However, there was no information on the use of open-source software, privacy and security and how it was addressed in this case.

One element that was only partly present in this use case was clearly defined ownership. As mentioned above, a member of the community explained how the ownership of the telephones lies with the phone company and not with the local parties. **This could imply that the phone company wanted to participate in this project mostly to gain a profit from it themselves.** The company mostly wanted to further its own ends instead of actually contributing to development and bettering people's lives, which is defined as ICT4D-washing. Another problem with the ownership in this use case was that the general management of the communication center also lied with UNIMAS for a long time. It was passed on to local parties but could not be fully managed by them, because it was based on volunteers. The center was also still funded by donations, but this created a dependency on fundings, which created an imbalance in power.

5.3 Comparing the use cases

If we look at the use cases, we can see that the five pillars are present in both. Collaboration, context, ownership, sustainability and intent were addressed in both projects and worked on by all teams. However, the extent in which the pillars and the connected elements were actually applied was different in both cases. In both cases, we can see a clear case of collaboration. The communities were involved, could help and would have something to say about the projects. The context exploration was also carried out thoroughly for both projects. The ownership was better defined in the seed value chain use case. In this use case, the systems were owned, used and managed by local companies and worked in ways that would be easily sustained if the research group would leave. For the e-Bario case, the ownership was not badly defined, but certain elements could have been improved. The sustainability was addressed in both use cases. The systems were built to last and the projects still continued after implementation. The intention of the projects was clear in both use cases. The need for the systems came from the communities and was actually assessed before working on the system. In both cases, the eventual goal was development and to improve a certain situation, rather than implementing a superficial system.

Table 5: *Comparison of considerations in both use cases*

Element	**Seed Value Chain**	**e-Bario**
Listen to community	Yes	Yes
Field research	Yes	Yes
Sustainability of the services	Yes	Yes
Addressed needs	Yes	Yes
Intent of the system	Yes	Yes
Use of open-source software	Yes	N/A
Assign owners & managers	Yes	Partly
Privacy & security	Partly	N/A
Peer-to-peer involvement	Yes	Yes
Group dynamics	Yes	Yes
Feedback loop	Yes	Yes

If we look at the table, we can see that most elements are present in both use cases. Privacy and security issues were mentioned by all researchers as important, but were not clearly discussed in these use cases. It might be difficult to implement this right at the start, if there is not even a working system.

One important difference in both use cases was the source that started the projects. For the seed value chain, the initiatives came from the farmers themselves, who were working on new initiatives by themselves, so it was a bottom-up approach. For the e-Bario project, the push for development came from the Malaysian government, so it was a top-down approach. Despite this difference in drive from where the project started, the community was very involved in the process in both use cases. For the e-Bario case, the researchers have involved and asked the local communities what would help them to improve their lives and they were actively involved in creating and planning this.

Assessment of the five pillars

The five pillars helped us identify the patterns we uncovered in chapter three. Identifying these patterns helped us see if there were any unethical approaches in the projects. Gnaniah et al. (2004) compare the e-Bario use case with the Long Bedian use case. In this case, a similar approach was taken to build a communication center in a rural community. However, in the e-Bedian project the process was sped up because a government official would visit the center. The local users were not involved in building it and were not educated on using it. Because of this, steps like collaboration and education were skipped,

which eventually led to the ‘alienation’ of the communication center. These unethical approaches led to a less successful project.

We have seen that even though ownership was less defined in the e-Bario use case, there was still a lot of development and people's lives were actually improved. We want to know to what extent ICT4D-washing can be present and to what extent we want to allow companies to further their own ends. If a company gains a good image from helping in an ICT4D project, that is not harmful. However, **if the company only helps to further its own ends and does not contribute to or even jeopardizes actual development, that's where we need to draw the line**. The five pillars serve as a tool to assess to what extent ICT4D-washing is present in a use case. We can use the five pillars to identify necessary elements of an ICT4D project. If a pillar is not present, the blind spot of an ICT4D project can be identified and simultaneously shows an opportunity to improve and prevent (further) ICT4D-washing.

6. Discussion

In this research, we conducted a series of interviews and analyses to identify and prevent ICT4D-washing in projects of digital development that target people who live in low-resource environments. First, we uncovered patterns that indicate unethical approaches in ICT4D projects. Then, we looked at the solutions that the interviewees used to counter these and to minimize the risks of doing harm to local stakeholders or their environment. By combining the uncovered patterns with the solutions from the interviewees, we have set up five pillars that help identify and prevent ICT4D-washing: collaboration, context, ownership, intent and sustainability.

The importance of collaboration and involvement from local parties is what makes or breaks a project, as explained by the uncovered patterns. When looking at the assessment in this research in chapter five, we see that top-down or bottom-up approaches can both have desirable development outcomes. Context research proved to be fundamental for ICT4D projects, since not researching the context might result in a product that simply can not be used in the envisioned context. The importance of ownership (by the people targeted) is also apparent, as shown in the e-Bario case. The ownership of the phone remained with phone companies, because they 'donated' the devices. The phone company looks good, but the local parties felt like they were being exploited when using these phones. The company looked good because it contributed to the project, but in the end their contribution was mostly for their own agenda, as they could profit a lot from it. This also shows us that the intent of a project should always be clear, and should go further than gaining a profit from a solution. The true intent should always be to improve people's lives and contribute to the development of the community. To make sure that the development goes further than initial implementation, the sustainability of a solution should always be considered. Like the Google project discussed in the interviews, if there is no plan for further expansion of a project, it will just stop existing and not continue to contribute to development anymore.

Nine experts were interviewed to discuss their experiences when setting up systems in the Global South. Most people who were interviewed had a lot of experience in the Global South, but still were from the Global North. More people in and from the Global South could have been interviewed to gather insights and expand the pillars. This work is an inductive research based on other people's observations, experience and expertise, which has some limitations. Future research could be an evaluation of these pillars, so performing deductive research to test, rebuild or expand the pillars.

The OLPC project discussed in the beginning of the thesis is a clear case of ICT4D-washing, where the goal was creating and selling new laptops. In the OLPC project, there was no collaboration, context research, ownership definition, true intent to make people's lives better and no eye for a sustainable laptop that could be used for a long time. This is how the critiques became reality and the OLPC project failed. The laptops that were bought from the much-needed education budget were not used by the people in low-resource contexts. The project did not improve people's lives and eventually there was no contribution to actual development because of the ICT4D project.

If a general lack of consideration for the pillars is suspected, it does not always indicate that ICT4D-washing is taking place. A badly planned project with undesirable outcomes may be just that, and could very well have had mostly good intentions. Like with the definition of greenwashing, **ICT4D-washing has to contain some element of deception or malintent**. So, an organization should still have profited in some way from an otherwise failed ICT4D project (e.g. when they can still promote with it) for it to become ICT4D-washing, or at least have attempted to do so.

7. Conclusion

As mentioned in the discussion, the five pillars from this research serve as a way to identify and prevent ICT4D-washing in projects of digital development that target people who live in low-resource environments. The goal of the pillars is to make sure that an ICT4D project actually benefits the people in the low-resource environments, and not (only) the entity that engages in the ICT4D project. We want to make sure that an ICT4D project actually adds to development and is not just a way to further an entity's own ends.

We looked for generic signs to identify ICT4D-washing. Having provided an answer to all the research questions, we can now answer the main research question: *How can we identify and prevent "ICT4D-washing" in projects of digital development that target people who live in low-resource environments?* We identified patterns that indicate unethical approaches in ICT4D projects to answer the first sub-research question: *Can we identify patterns in unethical approaches in ICT4D?* We saw that not engaging in collaboration, not considering the context, not defining ownership to local parties, having no intent to work on development and not building a sustainable system indicate undesirable outcomes in ICT4D projects. Then, the second research question: *How can ICT4D projects be organized, and ICT4D solutions be designed such as to minimize the risks of doing harm to local stakeholders or their environment?* was answered by looking at these patterns and how they were countered in ICT4D projects. Five pillars were set up to identify and prevent ICT4D-washing in projects of digital development that target people who live in low-resource environments: collaboration, context, ownership, intent and sustainability. The five pillars help ensure a project will improve people's lives and add to development. To clearly identify and prevent ICT4D-washing, we need to make sure that there must be no deception or malintent in the project and the organization has not attempted to profit from an otherwise failed ICT4D project. The achieved goals must be that the people's lives are improved and that a contribution to development efforts was delivered.

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Documentation for the seed value chain was personally entrusted and confidential.

Appendix

A Patterns and issues in ICT4D projects

Table a: *issues and patterns in ICT4D projects mentioned by interviewees*

Issue or pattern	**Elaboration**	**Mentioned by**	**More information**
No intervention	The question for a new piece of technology must come from the people who need it/will use it, or must be thought of with the people who need it/will use it.	Rob, François, Hans, Rupert	You have to start the conversation with an open mind (Hans).
Ownership	An owner of the product must be assigned. The owner should be someone who is close to where it's used, so preferably not a big company that only provided (part of the) funding.	Rob, Hans, Doug, Rupert	This ownership is not only about the product itself (e.g. intellectual property) but also about the data ownership, in order to prevent data colonisation. It is also about the ownership of the app, who gets the revenue etc.
Collaboration (at most); community involvement (village-wide meetings etc)	The best way to develop a system, is by doing it through collaboration at most, preferably with guidance only.	Rob, Dennis, Doug, Hans, Rupert, Shreya	Concept: 'Solidarity'. There is no structure or recognising different actors but working together. Understanding the dynamics between different actors in the groups. His work is building relationships that work both ways (building and working together). It's never perfect, but it's an attempt at it. The solidarity model is stronger than a participatory project (that involves power etc).
			Shreya mentioned peer-to-peer involvement and looking at the feedback.
No assumptions (really, none) & thorough context exploration	The context needs to be described very clearly and no assumptions should be made. The needs assessment takes time and needs to be very elaborate.	PJ, François	

Field research	Context exploration is the key to a more successful approach. Doug has the anecdotes on people coming to build a well while a school was needed. Conversations with the local stakeholders is important, what are their needs and why? You need to go there to see and listen about what is needed.	PJ, Rob, Doug, Hans, Martha, Rupert, Shreya	Every implementation/context differs, there is no one solve for everyone. Shreya mentions that Field Research is needed to check out and use what is needed.
Sustainability	If the funding stops, the project stops is not a good approach to your research. The system itself should be himself.	PJ, Hans, Martha, Rupert, Shreya	Martha explains that some of the projects were super useful but not long term. Rupert explains we also need to look at the sustainability of the system itself.
Transparency	Open source coding (Dennis), clarity of what is done with the code and how it's developed.	François, Dennis, Rupert	
Agile development; quick & adapting	Be quick and agile; adapt quickly.	Dennis, Shreya, Hans (conversation)	The feedback is super important to further develop a system.
Government involvement	Government involvement can be a good thing, but is not necessarily a key to success.	Martha, Dennis, Doug, Shreya	Building in the community rather than working with the government. (Doug)
Investments	Investments can be useful, but a project should not be dependent on these. When funding or investments stop, the project should not stop running.	PJ, Dennis	
Private companies	Private companies have huge budgets; companies have people purely for sales etc. They have a very unfair edge for local solutions.	Dennis	They have bulky solutions because they are too big; They have many problems once invested. The government is aware of this problem; but there are very little other companies that can do the same and the lobbying is unfair.

Data storage		Dennis, Rupert, Doug	How much do people understand 'Informed consent'?
NGOs	NGOs are often involved in projects but it does not always go well. Having reflection sessions and feedback sessions is very important to ensure that this involvement is not only 'throwing money somewhere'.	Shreya	
Education (from literature)	Education is mentioned as part of the solution to many development questions in Vos et al and Mthoko & Pade-Khene.	Vos et al. Mthoko & Pade Khene	Some papers also discuss that because there is little internet use in certain communities, they don't care about ethics etc (as became clear in the interview with Martha)

B Interviews

Video recordings of the interviews are available upon request.

Interview with I1

Summary of the interview

The first interview was conducted with Martha Alade. In our interview, Martha explained how she has worked on many women empowerment projects and how they went. One project that stood out was a project organised by Google[4], where websites for small women entrepreneurs were set up. These websites served for promotion and actually helped many women get more clients. The interesting thing here was that in order to get the women on board to upload a website and their personal information, Martha and her team had to have a very personal approach. They approached these entrepreneurs through family members and showed how these websites had helped other entrepreneurs too. Even though some women were less convinced in the beginning, having this **personal approach** actually helped them a lot to make these websites. To this day, some of these websites are still online and generating clientele for these entrepreneurs even though Google has stopped this project.

Interview notes

Interview introduced by Anna Bon and conducted online by Angel Lokasa & Zoë Coenen through Zoom on 4 March 2021 at 11:00-12:00 Amsterdam time.

Before the interview starts, we ask a set of practical questions.
Can we record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

Q: What inspired you to start incorporating women in IT?

A: She started with these projects growing up in STEM. Realising that the STEM gap has created a burden in her heart. The higher she goes in the bigger the gap. Internet adaptation in Nigeria was poor. Her first breakthrough of reaching out to women was with Google for women empowerment. Google gave a platform where women could bring their businesses at no costs. On their sites, you could find physical addresses, phone numbers and contact details. The services were for women that can not read & write. When they went out to the field, it looked too good to be true. For the non-english speakers, they had an interpreter. The sales of the women skyrocketed, some could not keep up with the demand.

Q: How did they persuade the women ?

[4] https://www.vanguardngr.com/2011/09/google-launches-domain-for-nigerian-businesses/

A: They started with family and distant friends. And they used these examples as a way to approach other women that were reluctant.

Q: Was this a long-term project?
This project would be a long-term thing, but Google decided to stop the project due to things that happened along the way. The name of the project was GNBO (Get Nigerian Businesses Online). They stopped supporting it, but it is still online (2011).

Q: What happened? Which issues did they encounter?
A: This is not super clear, there was a clash with someone that was a representative of Google.

Q: What do you think of the Federal Government's Gender responsibility in IT?
A: Martha was very visible at the Federal Government. She always communicated with them, she attended events and programs related to them. She also volunteered during these events.

Digital girls club with the minister (2014). She worked with the Lagos state and Osu state government. They have 17 centers for ICT4D. They have special arrangements for women in those 17 centers.

Q: What ICT4D projects did you participate in?
A: Digital Girls Club (2002) - one of her most successful projects. She is a consultant for this project now.

WAPA is under women affairs of Lagos state affairs. They train young people, those who do not have advanced education. Minimal requirements - high school. They train them on fashion designing, arts, and skilled acquisition. They have a very strong ICT department. These centers accommodate thousands of students.

Federal government is partnering with IBM, the other stakeholders also do their part. Non governmental partners, they have various organisations trying to stimulate. Also international organisations doing their own stuff and trying to impact people with ICT4D.

International businesses concerning ICT4D:

- Google
- IBM
- INTEL
- U.S Embassies.
- Andela in Nigeria (Funding from various companies)

They are all partnering with governments. These projects are all engaging.

Q: What are you doing as a PhD project at this moment?
A: Martha realised that in The Nigerian states, 36 states, there is no continuum, it is differential when it comes to ICT4D. Ratio of the meaningful internet use in Lagos is very

high, in comparison to other states. Out of every 50 people, 1 uses the internet meaningfully. They need more digital illiteracy projects. Most projects target high end internet users. It is not a continuum, but a spectrum. In the Eastern part of Nigeria the gender gap is very small. The reason behind this is the Nigeria civil war - Nigerians vs Biafra. Eastern part of Nigeria learned how to be self-reliable. The IGBo men are very entrepreneurial, because the men are more in the field. The women have more time for education and the internet.

She is working on time series statistics (machine learning). Over a period of 10 months, she is trying to extract facebook data. How many women are using facebook in the 36 states in Nigeria. She already showed that there is a high correlation, illiteracy and facebook users (0.9). Every sunday for 18 months, she is now extrapolating. Before Covid and after covid things have changed. She started on the post-covid research. Martha is also following the reports of the affordability of the internet. She is now consulting the stakeholders on ICT4D projects. Not all projects work in different areas. She wants to document a guide that stakeholders can use.

Q: Why do you think that Nigeria grows faster in IT than other countries in Africa?
A: They have policy makers and ministers that love technology. It plays a huge role in advancement.

That was the last question of the interview. We thanked Martha for her interesting insights and wished each other a good day.

Interview with I2

Summary of the interview
The second conversation was with PJ Wall. PJ has worked on many ICT4D projects and has been looking at the ethical side of it a lot too. He has realised that a lot of the time, the **funding model** of projects is what causes them to stop or fail. Many times, a project is built based on a budget and when the money is all used, the project simply ceases to exist. PJ explained that looking at a way to overcome these budget issues and critically look at revenue would make a project **more sustainable**. Another problem PJ has seen in a bigger part of the projects is the **assumptions** that are made when developing a system. We have a set of rules and standards we are educated with here in the Global North, but these simply don't always apply in the Global South. We can try to be aware of these, but we will never be fully aware of our assumptions. He does explain that one can overcome this to some extent by performing a good **context analysis**.

Notes of the interview
Conversation conducted online by Zoë Coenen through Zoom on 5 March 2021 at 10:00-11:00 Amsterdam time. The conversation is not recorded. The notes below are a summary of what was said during the conversation, since it was only Zoë conducting the conversation and there was no recording.

Before the conversation starts, I ask a set of practical questions.

Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

Ethics is a broad topic. It encompasses values of someone, but these change depending on cultures. PJ suggests choosing a specific framework from a philosopher about ethics and using that as a basis for ethical ICT4D. The project can then be 'setting up a framework for ethical ICT4D systems based on x's ethical beliefs'.

The problem is the funding model; projects can be set up as sustainable as possible, so that when funding stops, the projects don't stop.

Another problem is the high standards we have for data collection, ethical conducts etc. We have different rules that are not applicable to all other countries in the world. These problems are sometimes because we simply can't put up a data center because there is no electricity for data centers.

Working as a developer, we have assumptions that we make. We can try to be aware of them, but we will never be fully aware of all of our choices. When going to different countries, we will always be astounded by other values, beliefs, etc. Before setting up a project, you have to find out a lot about this country and the values in that country.

Possible questions:
- How do you intervene in a way that does not do any harm? (This is a PhD project)
- Make a cross comparison between perception of data safety in the EU and in Africa.

Interview with I3

Summary of the interview
The third interview was with François Lenfant, about project CARPA. He explained that there was a need for unbiased and independent data about supply chains in Africa. François had many contacts in Africa because of earlier work there, which has helped him a lot in the CARPA project. François explained how a participatory approach was key in this project. This **participatory approach** consists of being a great listener, not being arrogant (seeing a project as an intervention), taking the time, being open and transparent and having village-wide meetings. The basic needs assessment and the context exploration takes a lot of time, but not doing this thoroughly will let the project fail. François concluded the interview by explaining how in ICT for Development many people see ICT as the solution for problems, while it is in fact only a tool. ICT is the means, development is the end.

Notes of the interview
Interview conducted online by Angel Lokasa & Zoë Coenen through Zoom on 5 March 2021 at 13:00-14:00 Amsterdam time. The interview was not recorded.

Before the interview starts, we ask a set of practical questions.

Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

Q: What were the reasons behind starting Project CARPA?

- Started from Michele (Business & human rights)
- Very few cases of reports in Africa
    - So an absence of unbiased, independent data
    - Most data was from NGOs
- NWO funding for project
- Francois worked on Business and Human Rights in Africa for his PhD and has a large network there
- There's many dimensions in the CARPA project
    - What platforms are there and do they work?
    - Through the platform, the transparency increases
- People are entering cases on different platforms.

What are concrete steps for participation?

- Great listening skills
- Stop being arrogant, it shouldn't be an intervention
- It depends
- Community involvement, differences in values
- Time, open, transparency, village-wide meetings
- It will be messy & chaotic
- It's like democracy
- You will be involved in power etc.
- The context needs to be described very clear
- Basic needs assessment will take a lot of time; otherwise a project will fail

According to Francois, there is a constant issue for ICT4D:

- ICT is the means
- D is the end
- ICT can be seen as the solution, but it is just a tool, people forget the D and focus on the ICT.

Landscape of Multi stakeholder projects

- Many initiatives have been started in the last years (tech solutions)
- Looking at the whole value chain
- Are all these tools actually helpful? Where are we now?
- To what extent do these applications work? Are they improving traceability?

CARPA project -> stakeholders & end-users
He is looking more from a stakeholder perspective & conflict perspective.

Experiences with the project; Were stakeholders left out?
Buzz words, participation and empowerment from the 80's. Mining companies in Congo, community engagement practices. Talk to the leaders and population about their participation. Participation is one thing, it is all about involving. For any type of project, time is of the essence. An effective project will have to involve extensive field work.

Carpa Project:
It is not a development project, it is a research project. A side effect: maybe a CARPA project will be used as a tool around the world. Parameters are there, the project is funded by the government. Platform where stakeholders are engaging.

More than 80 procent in the developing world are failing, due to lack of participation.

Example: Women Empowerment project in Afghanistan
Leadership -> Men were walking in front and women were walking behind the men. Why?
The project leaders thought that the project failed, because of this observation.
But the men were walking in front to protect the women for the land mines.

Why did the project start?
The idea came from Michel, she is involved in human rights business. There were very few cases reported in Africa. Take the NGO's for example. There was an absence of data, too much dependence of NGO's. In Africa there is a lack of capacity and interest in journalism. Due to the lack of data, they started the research based on human rights and businesses. Research program -> To what extent do these platforms work, sustainable, contributing to human rights? Does it increase transparency and does it lead to improvement of business?

Privacy and ethics
Post under a pseudonym (default value). If someone hacks the database the data can lead to the persons posting the data -> they are still researching this. This can be dangerous, because the cases involve highly influenced people.

ICT4D he is interested in
Is the whole landscape of multi stakeholder initiative, maybe something with Blockchain. He is looking at all the initiatives. All the stuff aims from the mines to the end product. Scoping study on all these tools? ICT solution linked to due diligence tools. To what extent are they helpful? Feasibility, and where we are now. Improve traceability.

Interview with I4

Summary of the interview
The fourth interview was with Rob Willems. Rob has worked on different ICT4D projects in Africa, from which he has learned a lot. The first project he worked on was a project organised at the Hanzehogeschool in Groningen. Together with a group of students, he developed a game for teaching children about health care. The game was tested in a school in a rural community after which the game was published and distributed. Sadly, the game

was not successful at all and Rob has learned a lot of lessons from this. First, he explained that the game was developed mostly in the Netherlands, with little **context research** and a lot of **assumptions**. The game was **developed** in a **linear** way, with little involvement from the communities, which is, according to him, probably the reason that people did not play the games. Another thing is that the **ownership** was not clear. The game was developed by Hanzehogeschool, but a new owner of these games was never assigned after development, so it was never updated and/or maintained later on. Luckily, Rob said that this project never felt like an actual failure, because he had learned a lot from it. He started working on a new project which is still in development at the moment and he explained how he can do way better now that he has also defined ownership better and is doing better context research. It is not a linear project developed in the Netherlands anymore, but a collaborative project in Kenya.

Notes of the interview
Interview conducted online by Angel Lokasa & Zoë Coenen through Zoom on 9 March 2021 at 16:45-17:45 Amsterdam time.

Before the interview starts, we ask a set of practical questions.
Can we record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

Wat was je eerste ICT4D project en wat deed het project?

- Spelletje met vaste computer om kennis over Malaria bij te brengen.
    - Wat is het? Hoe voorkom je het? Wat moet je doen als je het hebt?
    - Is gebeurd vanuit de Hans Hogeschool met 20 internationale studenten verdeeld over 3 teams.
        - Hebben eerst deskresearch gedaan
        - Daarna gesprekken met NGO in Kenya (Help Heal)
        - Aan de slag gegaan
            - Eerst games ontworpen
            - Dan geprogrammeerd
            - Ter plekke getest op scholen in Kenya
            - Games op CD uitgebracht en naar Kenya gestuurd
            - Niet heel veel gebruikt uiteindelijk
    - Wat ging er fout?
        - Niet iedere school heeft een computer. Sommige scholen moesten tijdens de testfase met geleende computers werken.
        - Is het een mislukking? Ja ergens wel, MAAR ze hebben ervan geleerd.
            - Niet uitgaan van vaste computers & stroom
        - Belangrijke vraag: Wie is eigenaar van het geheel?
            - Wie voelt zich eigenaar?

        - Wie heeft de middelen om eigenaar te zijn?
    - Volgende stap: Spelletjes voor mobiele telefoons.
        - Opnieuw geen eigenaar voor aangeduid. Er waren heel veel verschillende

Wist de NGO niet van die lokale problemen?

- Ze hebben zich waarschijnlijk ook niet gerealiseerd wat ze nodig hadden. Hebben ze gewoon niet bij stilgestaan.

Nu achteraf, met meer informatie? Wat zou je anders doen?

- Lessons learned (laatste project wel toegepast):
    - Beter onderzoek op voorhand
    - Eigenaren wel vastgelegd
- Adherance app is veel beter gebeurd
- Welke punten specifiek?
    - Lokale informatie: doe dat gewoon daar. Ga dit uitzoeken.

De nieuwe app komt vanuit een focus groep bij ICT bedrijf in Nederland (New Nexus). Die focusgroep is opgezet door Rob Willems (hij heeft ook een netwerk in Kenya).

- 'Wat kunnen we met IT doen om jullie te helpen?'
    - Wel binnen kader (e.g. gezondheid).
- 'Waarmee kunnen we jullie helpen?'
    - **Is dit anders gegaan bij de Hanzehogeschool dan?'**

<u>Butterfly works Amsterdam & Nairobi</u> design institute gingen op zoek in Kenya:

Kunnen we community health workers helpen met HIV patiënten onderhouden met ICT?

- health workers krijgen weinig contact en kunnen moeilijk monitoren
- vrij ruraal gebied; allemaal moeilijk
- Ze hebben functionele eisen opgesteld
- New Nexus team is daar naartoe gegaan
    - Gezamenlijk de app ontworpen
    - Ontwerpen gebeurde niet door New Nexus, maar gewoon door de mensen zelf
    - Bouwen van de app hebben ze ook zelf gedaan
    - Ze hebben wel kritisch gekeken naar de app
    - De app is ook door de ziekenhuizen getest, eerste verbeteringen zijn uitgedacht & veranderingen zijn uitgevoerd
    - Pilot zou gebeuren maar COVID
- Android & Google is vrij open, dus makkelijker voor ontwikkelen
    - Als mensen een mobiele telefoon hebben is het Android.
- Er is nu druk bezig met nadenken over beheerders (technisch, functioneel etc.)
- Er is regelmatig overleg/afstemming
    - Call met Help Heal (zijn de ziekenhuizen en de partner nog steeds gecommit?)
- Eigenlijk zijn de lessen heel snel geleerd na het mislukte project

Wat Rob gezien heeft (ook op andere vlakken)

- Ga vragen of ze een ziekenhuis willen in een dorp (tuurlijk!)
- Als de funding stopt dan houdt het project op;
- De regie moet bij de lokale partijen gehouden worden

Angel: Werken jullie met richtlijnen of gaan jullie gewoon samen zitten?
Rob komt vanuit ontwerpen van systemen: Design thinking methode

- 5 stappen
    - Empathise (voor wie maken we dit? Wat missen zij en willen zij?)
    - Define (de scope bepalen)
    - Ideate (hoe gaan we dat doen)
    - Prototype
    - Test

De website: ICT works is interessant; veel projecten met ICT in Afrika.

Wat is een goede verwoording voor Global South? Emerging economies.

Vraag over nieuwe applicatie

- Hoe zit het met patiënten die geen smartphone hebben?
    - Nu nog geen middelen voor; gesprekken zijn wel gevoerd
    - Ook met LakeHub (IT partner)
    - LakeHub zei dat de ontwikkeling daar zo snel gaat, dat ze verwachten dat mensen toch relatief snel een smartphone zal hebben
    - Al zal het in het begin misschien maar een deel zijn, dan is er iig een deel afgevangen
- Zoë's vraag: Weet je hoe de data daarvoor geregeld wordt?
    - Data colonization
    - Vertrouwelijke informatie over HIV patiënten
    - Lokaal wordt het opgeslagen, alles ligt bij Lake HUB
    - Aandacht voor privacy, het is geadresseerd maar niet opgelost.
- De invloed van China in Afrika
    - Gaat ook over data
    - We kunnen het Westen niet vertrouwen, maar kunnen we China wel vertrouwen?
    - Eigenlijk is het gewoon een herhaling nu.

We willen heel ver weg blijven van White Supremacy etc, maar dat is heel lastig en in die valkuil val je heel snel.

- Vandaar dat het gefaciliteerd is, maar dat New Nexus het niet doet
- Het bouwen van kennis, alles ligt bij lokale partijen
- Het is eerder een kwaliteitsrol dan een bepalende rol

Wat zijn jouw bevindingen over data projecten in Afrika? Vind je dat de lokale overheden daar meer betrokken in moeten zijn?

- Rob heeft er weinig mee gedaan. Eigenlijk alleen voor deze app gedaan.
- De lokale wetgeving is aangekaart, maar die details kent Rob niet.

Project Google Nigeria:

- Als je weinig hebt, ben je al blij dat je iets krijgt. Kan dit wel en mag dit wel?
- China en Afrika

Vragen:

- Goedbedoelde computers uit Europa?
    - Verkeerde stekker

Hofstede dimensies; werkt bij IBM

- Tussen verschillende kantoren gaat communicatie slecht (door culturele verschillen)
- Hofstede heeft onderzoek gedaan hiernaar; wat zijn dan die verschillen? Is er een clustering te maken van culturele eigenschappen? Culturele dimensies?
- Het zijn wel stereotypes. De vraag 'In hoeverre accepteer je die hiërarchische eigenschappen?' Misschien staan ze daar anders tegenover in Nigeria?
- (Angel merkt dat al met haar eigen moeder.)

Cultureel Sensitief zijn

- Mensen kritische vragen stellen moet gewoon 1 op 1 zijn
- Musungu (Swahili voor Westerling) of Obruni

Digital Education African Network

- Project in Kenya, met LakeHub
- Met afgestudeerden van de LakeHub academy
    - Gaan een onderzoek doen
    - In het begin waren er bijna geen vragen;
    - Dit kan zijn dat het stellen van een vraag onbeschoft kan overkomen

Ownership in ICT4D

Interview with I6

Summary of the interview

The fifth interview we conducted was with Dennis Gichangi. He has explained a lot about his workway at Dew Cis solutions, an IT company in Kenya. Dennis is one of the three founders and they have some principles they keep to when developing for clients. One is to have everything open source, to ensure **transparency**. Next, he explains how the goal of his products is to **make the organisation better** and help to get more profit, but not trying to sell or resell a product. He explains how he can make solutions for companies that can benefit from IT, but not build and maintain IT solutions all by themselves. He also explains that his **small-scale approach** helps make fitting solutions, instead of trying to build a *bulky* all-in-one system. Lastly, he explains that a **quick and agile** approach also helps with the constantly changing market.

Notes of the interview

Interview conducted online by Angel Lokasa & Zoë Coenen through Zoom on 16 March 2021 at 8:00-9:00 Amsterdam time.

Before the interview starts, we ask a set of practical questions.
Can we record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

To ask or explain at the beginning

- Is it okay if we record this conversation?
- This interview/conversation will be processed for both our theses.
- Can we refer to you by name or would you rather have it anonymised? Name is fine.
- One of us will be taking notes, the other one will lead the conversation.

Questions

- Can you tell us something about yourself?
    - My name is Dennis Gichangi. Director in charge of Development at Dew Cis Solutions. He is one of the founders (of three) (founded in 2000).
    - He is a graduate in electrical and communication engineering.
    - Most basic information is on LinkedIn
    - Main role: coding & coding skills; also in charge of HR
    - Main thing: writing code and making system
    - Main project: open source project.
        - openbaraza.org
        - hcm.co.ke

- What kind of company/project are you working on?
    - We work with different clients, we write open source code. The system will be given to the client. Part will be open source, part is not. They work mostly with open source towards the clients.

- What kind of clients do you have?
    - Are these small or medium businesses?
    - Basically all of them. We have a lot of solutions and different brands; but basically we have had everything.
        - Most clients are small clients (hosting; around 300 clients)
        - We have 3 universities: academic systems. Two in Kenya, one in Nigeria.
        - We have worked for the government too (2-3 systems).
        - Our HR system is being re-sold in Hong Kong.
        - We did an integration for the domain.

        - Also a project in Morocco.
        - Technical Support for a travel company (rather big).
        - Really big mix of companies and projects.

- Are the IT projects in Kenya stimulated by the government or from the private sector?
    - Most of his projects are from the private sector (90%) but the rest is 10%. The government continues to be the primary spender.
    - Government also depends on the president; but they are substantial spends so they are important.

- Were you involved in the setup of the company?
    - Around 2000 they were still studying engineering. There were 2 types of IT projects: support & software writing.
    - In 2002 they had a small company;
    - Main area: client centric solutions (end-to-end)
        - Need to consult the client during the whole project
        - They have their own solutions that they outsource to the clients
        - Anything possible to ensure the need of their clients
        - Consulting, infrastructure, etc. (https://www.dewcis.com/services/)

    - Did you experience any issues during the setup or after?
        - Yes; too many issues.
        - We had no capital and no capital investments. There was a very slow growth because of this.
        - We had to do everything ourselves, from programming to making coffee. It was both a capital and knowledge challenge.
        - Sales and marketing continue to be a challenge.
        - There was a lot of growth in the company.

- What do you think is important when setting up (or working at) a company in the Global South?
    - The most important thing is that IT companies need to be focussed on a business solution. They need to know they are part of a facilitation, to make organisation work better. They need to be an important addition for the company; ensuring more profit (instead of being resellers or retailers).
        - They are not interested in the impact of the business of their product.
        - It's mostly important for small companies that can not buy their own IT personell;

- How do you know Andy/The Fair Trade Software Foundation? What is your connection with them?
    - We are part of the founders; but more as a local partner. We met Andy in 2012. They were looking at making IT investments in Africa and outsourcing in Africa.
    - CodePamoja (staat online) is still the most important company.

- How do you compare the government companies with the private companies?
    - Private companies have huge budgets; companies have people purely for sales etc. They have a very unfair edge for local solutions.
    - They have bulky solutions because they are too big;
        - They have many problems once invested.
    - The government is aware of this problem; but there are very few other companies that can do the same and the lobbying is unfair.

- Where do you store and protect your data?
    - We have a data center. There we store the data from our company; it is physically located in our own premises. For many of the companies their data is stored on their own premises. Sometimes it is located on the cloud, but that requires a bigger internet demand.
    - Most (or all) of the servers are on Linux.

- Do you consider ethics in your IT services?
    - Yes. We deal with very sensitive systems (e.g. grading systems for universities).
    - We have mail systems and HR systems and flight information from travel agencies.
    - We treat our data with ultimate ethics. Breaking those rules would be losing our company.

- What kind of developments do you observe on the African Continent concerning IT services?
    - If you consider the last 20 years; the biggest has been the mobile phone. Both voice and data are important here. Everyone can use their phone for any IT thing. The phone has pushed pretty much everyone to use IT, even very small companies. It has also helped everyone to upload and use media. YouTube and Netflix are quite big.
    - IT is now usable for everyone (through the phone), not only big companies and governments.

- What kind of advice would you give to someone who wants to start an IT company in Africa?
    - Start by figuring out what value you can create or provide. Figure out what needs you are meeting or gain you are creating.
    - Don't try and invest or take a long time to build.
        - Be quick and agile; adapt quickly.
    - Be involved in the market and look at the market; look at what they need.

Interview with I7

Summary of the interview

The next interview was conducted with Doug Specht. Doug works on digital map making projects and has worked on many projects in the Global South. During these projects, he came to some realisations and best practices. The first principle he holds to is that he would rather have locals add data to the maps, because he wants to develop these maps **from the community up**. He explains how the **local stakeholders** are of great importance and can not be overlooked. One story to sketch this importance is the story of Doug going to a remote community in South America. The village there had three wells, but no school. When asking the community leaders what happened, they explained that the village did not have a well a long time ago, and that it was registered somewhere in a database. Later on, not one but three projects for building wells had started in that community, but no one actually came to the village beforehand if there still was a need for a well. With a simple visit to the village and a conversation with the community, the need for the school would have become clear. However, because it was once registered that there was no well, only wells were being built. This story showcases the importance of giving a community access to data about their own village. Doug explains that when data is collected individually for a private party, its transparency and the worth of it become doubtful. Data that is extracted, cleaned and processed is a powerful tool and gives the owners power. If that data is about someone or somewhere else, one can have power over that person or place. If that power falls in the wrong hands, who knows what can happen? **Data protection** laws could protect this data, but initiatives like the GDPR are barely sufficient in a well-functioning place like Europe. Given this, how can we expect such an initiative to work in countries where there sometimes simply isn't a clear government? **Open data** can serve as an answer to these questions, but that still needs to come with a certain degree of protection.

Notes of the interview

Interview conducted online through Zoom on 16 March 2021 at 16:00-17:00 Amsterdam time.

Before the interview starts, we ask a set of practical questions.
Can we record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

Questions for during the interview

Who are you?

- Dough Specht
- Director teaching of learning media and communications

- He does research concerning development projects
- Digital map making with communities

Digital map making with communities: what is this and how?
- University of Toronto (2012/2013)
- Catalog of mining issues (how bad they were etc), he used to map these matters.
- Showed how the soil was more or less lost to big multinationals
- That was the fundamental of the project
- He rather would have the locals to add data
- Add the time there was no platform where you could add data easier than the Google platform and where the data was protected.
- Working with the communities, how the mapping platform looks like for them
- It was a way for them to report issues safely (inherent power of maps), in this way the stories became more believable.
- From the community up

Why did Google stop the API?
- Google changed the platform.
- The data was not backed up and Google withdrew the API.

Issues encountered with Google?
- They mentioned it before.

What do you think is important when setting up a company in the Global South?
- "How do you do development?"
    - He thought that the move to data driven technology is a way of dependence, even beyond data colonialism.
- "What does the collection of the actual data look like?"
    - Data is getting between the community and development

What is meant by participatory?
- Local stakeholders are significant

Story:
He went visiting a community in South America (Northern Nicaragua) in a rural area.
Instead of the water wells, they wanted a school. Someone has data that there is no clean water, but that was not accurate. Because of this NGO's kept building water wells.

Conversations with the local stakeholders is important, what are their needs and why? (This is more participatory)
Instead of asking questions about water wells, ask questions about their water usage and accessibility.
- "Is someone in need or not?" It is not an external person to make this decision.

What kind of company/projects are you working on?

Did you experience any issues during the setup or after?

Have you ever worked on development projects in cooperation with European or American governments or companies?

- Most of the development projects, he worked as an outside researcher or he worked with communities on human rights issues. He did not work with governments. Building in the community rather than working with the government.
- Ideal situation would be that the government is more supporting.
  How did you experience working together?

Have you ever worked on development projects in cooperation with African governments or companies?

Angel: Could you elaborate a bit more on data colonialism?
He uses an image explaining that gold is worth a lot once processed and refined. Same goes for data; individual data is not necessarily worth a lot, but combined it is super useful and powerful. E.g. giving data to 'the other side' when there is a conflict. It can be used as a weapon. Data extraction makes you rich and powerful.

When data is collected individually, when the data is extracted, cleaned, processed it gets more useful and worth a lot (knowledge rich and financial rich).
62% no data protection laws that govern health data.

Concept: 'Solidarity'. There is no structure or recognising different actors but working together. Understanding the dynamics between different actors in the groups. His work is building relationships that work both ways (building and working together). It's never perfect, but it's an attempt at it. The solidarity model is stronger than a participatory project (that involves power etc).

Angel: Data protection laws; Do you think that when governments adopt data protection laws problems like data colonisation will stop?
Autonomy to control more data as a government.
Meh… It would make the government very rich. It is important that protection is taken into account either way; but it's still not even fixed in Europe, so we can't expect the same from governments in the Global South. 'They don't even have to pretend because there are no laws'.

Idea: Open data.
Very valuable; but it has to come with some protection. It's not a playing field whose data is open where. Even with 'official' data; the question remains who has control of data. Open data is not a level playing field. With open data we're asking them to open their data to us. It is not a democratisation of data. Is the data open if the people can't even get to it?

People can control the data when they have the right resources such as a computer, electricity, knowledge etc.

Do you think that data protection laws which are set out in Europe such as the GDPR could work for example in the African continent?

- They don't work in Europe… It's not even compliant on their own website.
- The idea is very good, the aim is very good. The implementation is done badly and creates confusion.
- There is interesting work on geospatial information
- Framework that ensures the data etc is all available and readable for everyone
- So basically; yes. It might happen, but it takes time and is difficult.
    - I don't know how to do it and what it looks like
    - The intention is good.

Zoë's questions

- Losing information because of the use of platforms?
    - Has that ever been an issue?
        - No, because they are good at telling it.

The move towards data-driven technology is actually creating again a dependency
Data is getting in between the community and development and participation

Defining what we mean by 'participatory' is very difficult
The local context; the communities are important

Book: Mapping Crisis

- Rupert and Doug know each other; met in Dar es Salaam
- Humanitarianism; the book has it.

Interview with I8

Summary of the interview

Our seventh interview was with Rupert Allan. Rupert started being concerned with development in the Liberian war, which he experienced first hand. He explains that his experiences in his life made him realise he can't be harmless when traveling, but that also motivated him to work for médecins sans frontières. He has also worked as a designer in film, looking at the visual representation of things. Rupert explained that he realised early on that it is very colonial to think 'we can do better than them', and that he wants to avoid that approach. He wants to use local ontologies and work with local people in order to make a system work. For community mapping the biggest challenge is to connect what is happening on the ground with the available data. He explains participation is the only way to overcome this challenge. He explains that for the community mapping in Uganda, only local people are working on gathering the 'ground' data. **Local people** were first trained on using the system and entering information. Then, these people go to towns in small groups and ask what is where and map that in **simple systems** that are **durable** and usable in rural contexts. All data that is gathered is **saved publically** and is actually at the disposal of the

locals, not owned by a private party and inaccessible. A problem Rupert noticed that is more difficult to solve is the issue of **informed consent**. We can inform the people about why and how the data is collected, but if the people understand very little of this, we can ask how valuable this informed consent is. However, Rupert vouches for local knowledge, local tech and local systems for a successful solution.

Notes of the interview
Interview conducted online by Angel Lokasa & Zoë Coenen through Zoom on 18 March 2021 at 14:00-15:00 Amsterdam time.

To ask or explain at the beginning
- Is it okay if we record this conversation?
- This interview/conversation will be processed for both our theses.
- Can we refer to you by name or would you rather have it anonymised?
- One of us will be taking notes, the other one will lead the conversation.
- Small introduction about ourselves and our projects.

Questions from Rupert
He asks about our background & education

Rupert has been in the humanitarian world since the '80s. It started with the Lyberian war; he was politically engaged and experienced that all first hand.
- He was seeing outcomes of colonial and post-colonial conflict.
- The war was fueled by consumerism and capitalism; that was very informative for him
- Rupert realised that he can't be 'harmless' when he travels the world
- He also experienced this in Wales; the English-speaking discourse
    - That's where he is living too
- Visual anthropology; visual approach to 'places'
    - Also with poetry, art and landscape desgin
- He started working for Artsen Zonder Grenzen
- He is quite political; that is also his approach

- Using LOCAL ontologies
- It's very colonial that we think we can do better than them
- He worked as a designer in film; looking at visuals (how people live in spaces)

- He is currently doing community mapping in South Wales (from Uganda)
    - He actually is using knowledge from the Global South in the Global North
    - He has a lot of practical experience;
    - The **biggest** challenge is connecting what is happening on the ground and with 'data' (in the biggest sense of that word).
- **Participation** is the answer for Zoë's research question basically.

- Knowing the difference between 'How many people need a hammer' and 'Know how to put a nail in a type of wood'

- We're lost if we are not participating. We need some kind of understanding of physical behaviour.

- Sheet: Ebola questionnaire form
- Connected to an app; usable on any app
- 'COBO' is used typically for disaster data collection
    - Based on a Geopoint. Without a geopoint it's not interesting. You don't need data about humans, geopoints only.

Main project in Uganda:
Hyper-Local community mapping
Settlement and non-settlement OSM data for Refugee Response Coordination
There's no escape for field presence
There's a video about how the maps works
'Charting the Uncharted'
Missing Map; Mapping of villages. They are mapped first using satellite images and then go to the actual village and ask questions to the locals. The roads, types of buildings etc are then identified. It's a communal collaboration; involving everyone on the planet basically.

The thing about participation is;
We don't map actually; Rupert was the only person from Northern Europe that was there. He was there training the local people. The local people are the ones doing the mapping.

There is a refugee crisis in Northern Uganda; (before Rohina)
- No one knew where the people actually where
- Money was pouring in, but there was no accountability
- There were also different communities in the refugee camps
- The advantage comes and goes to different parties
- UNHCR; could not map it all and map all the refugees
- There will be corruption; problem with top-down mapping
    - There also is colonial mapping and partisanship
    - Misrepresentation
    - Dark data (that you're missing)
- A lot of surveillance are female; because in the culture the women are seen less as a threat
- The resources are NGO & controlled by UN (and the world bank) (60%)
- The natural resources are running out of natural resources
    - The woods were important for their living
    -
- The data that is collected is not saved in a public spot (it's done by NGOs that are not sharing the data)
    - That's what OpenSteetMap does different; they let the locals collect the data and save it publically
- They wanted to ask <u>all</u> the questions (incl. one phone number from a representative)
    - It was asked in the open, so that the answers could be discussed and based on consensus. Also to check if the questions were asked well

    - They went to all different kind of places (villages, health centers, education centers, markets (CBIs) etc)
    - They asked questions to different people to reduce bias
        - e.g. asking a doctor about water points and not patients
    - Furthermore it is based on a Wiki format so that it's consensus based.
    - It's enabling; bottom up fixed
    - The data is **public** and gathered from local people
    - The data is also open for local projects; so you know the data is up to date and is not solely for this project.
- A lot of social cohesion; people would be paired up (for language reasons too)
- Open Data Kit: used for mapping
- People use the self-identified addressing system, not the one that was imposed.
    - Do you have another way of defining your own space?
- Using local motorcycle taxi service
    - They used OSM for themselves; for their own information
    - They also knew fuel stations, markets, repair stations etc
    - The motorbikes were also used for charging the smartphones
    - It's not about imposing a technology, it's about using local technology.
- The work is very fast and very complete (both formal and informal points were included).
    - Everything is also legible for local people
- The different types of surveys also helped seeing trends
- The maps are being brought back to the locals (to check) and they can use it themselves
- They also saw a lot of teachers were surveillors and the kids there were interested too; an education survey was set up too and OSM could be used as an education system
- You must believe the people, the people have the power.

- There also was a map about deforestation (because forests are used for sanitation)
- data2.unhcr.org

- Many people are trained from anywhere (government, NGO, communities, etc)
    - People in lower educated places would learn open source way quicker than people with formal education

- National bureau of statistics wanted to use OpenStreetMap
- The ebola outbreak was answered too

How much do people understand 'Informed consent'? Is highly misunderstood in these communities, not having their data rights. They are heavily watched, censored etc.

- It's still a probem; people just don't know to what extent their data is used (commercially or not)
- Data colonialism & data capitalism
- OpenStreetMap has the power to mitigate colonialism
    - It must be completely shared; open and with voluntary engagement

- The gifts from 'Humanitarianism' are trojan horses

Asking about local climate problems
- Sustainability - Disaster Risk
- The words used to express needs etc are different

No map in Open Street Map is never finished; it never is a truth

There are many communities around Africa that use OSM actively
It's also used in practice

Data ownership: Local stakeholders can make the data unreliable if they want to.
Rupert Allan :" Local knowledge, local tech, local systems"

data2.unhcr.org/

National geographic 'A city rises' Bidibidi
https://www.nationalgeographic.com/magazine/article/how-bidibidi-uganda-refugee-camp-became-city

There are also many blogs about this

Riley Champlene (?)
He collaborated on the national geographic episode
https://www.rileydchampine.com

Open DRI world bank (UBOS)
https://www.ubos.org noice thanks

Powerful map outputs (Uganda Rupert Allan)
See how data is represented visually

https://www.hotosm.org/updates/2018-04-14_some_powerful_map_outputs_from_the_ugandan_refugee_response

Questions for during the interview
1. Who are you?
2. What kind of company/project are you working on?
3. Did you experience any issues during the setup or after?
4. What do you think is important when setting up a company in the Global South?
5. Have you ever worked on projects in cooperation with European or American governments or companies?
    a. How did you experience working together?

To ask or explain at the end
- Thank you so much for your input!

- Would you like to receive the conversation and/or our theses once they are finished?

Angel's notes:
Ebola community vulnerability form
App you can use on any smartphone, open data
Customized by the organization cobo. It is a local tool, disaster environment -> which is also used for the mapping. Phone number, serial, Geo points (fundamental).
All the other questions can be analysed based on the geopoint. You don't need any identifying data, massive amount of analytics based on geopoints.

Main projects in Uganda:

- Field mapping
- They don't map, he was the only person from northern european doing that
- Led by a team of Ugandans, they were trained by Rupert in the global community.
- BidiBidi - no accountability, no accurate mapping (where are which tribes? Refugee communities? Host communities?

Training:

Anyone can change and participate globally.
Local stakeholders have the right expertise and knowledge and own this data
Their lives depends from this application

Interview with I5

Summary of the interview
The eight interview was conducted with professor Hans Akkermans. Hans has founded the Web Alliance for Regreening Africa (W4RA) in 2009 and that was also his official start with ICT4D projects. The W4RA was founded with Tim Berners Lee to work on making the WWW available for everyone. Together with other researchers, Hans had contacted the international office at VU Amsterdam and started looking for opportunities for projects. During this exploration, it became clear that many of the solutions were voice-based. This way of accessing the web is completely different from the way in the Global North, but fits the context and requirements better than solutions from the Global North. Hans explained how a lot of the projects are found because of the **field trips**. He underlined the importance of simply going there and talking to the people. **Collaboration** with the local people and teamwork are what will help overcome problems like low literacy and conflicts. Entering conversations with an open mind and open attitude are also of great importance to gather the most valuable information. In the end, you will probably discover a pattern that can help you with the development of systems. Like PJ, Hans also explained that the **funding model**, where the project stops when the budget is gone, is not sustainable and not the kind of solution they want to look at. He explains that **ownership** is the answer to this problem and will also help with the **sustainability** of the system. Hans does address that more often than

not, this ownership is still an issue in African countries. He explains that mobile telephony is very big in Africa, but that this actually gives the telecom providers a lot of power. Better government regulation is the answer, but that is easier said than done.

Notes of the interview

Interview conducted online by Angel Lokasa & Zoë Coenen through Zoom on 1 April 2021 at 15:00-16:00 Amsterdam time.

Before the interview starts, we ask a set of practical questions.
Can we record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

We also explain briefly who we are and what our research is about. We explain that one of us is taking notes too, while the other one is talking/asking questions.

To answer RQ1, I will have conversations and interviews with both people that have set up ICT4D projects (e.g. a woman that has set up a small business for farmers) and people that are working on ICT4D projects in rural contexts (e.g. PJ Wall and Andy Haxby). I will talk about the projects they are setting up and what issues arise during the projects. Here is a list of questions that I will ask, but these are mostly as a guideline for when the conversation is not flowing.

To ask or explain at the beginning

- Is it okay if we record this conversation? Yes
- This interview/conversation will be processed for both our theses.
- Can we refer to you by name or would you rather have it anonymised?
- One of us will be taking notes, the other one will lead the conversation.
- Small introduction about ourselves and our projects.

Questions for during the interview

1. Who are you?
    a. Hoogleraar bedrijfsinformatica aan de VU Amsterdam
        i. W4RA opgericht in 2009
        ii. Officieel begin met ICT4D
    b. Knowledge engineering en smart grids maar ICT4D is wel echt de passie
2. Aanleiding voor W4RA?
    a. Bij oprichting was hij hoofd van afdeling informatica
    b. Op die dag worden eredoctoraten uitgedeeld
        i. Van Tim Berners Lee
    c. Toen kwam Tim Berners Lee naar de VU voor ontvangst van dat doctoraat
        i. Ze wilden er toen eigenlijk iets meer dan een eenmalig iets van maken, maar gewoon een samenwerking maken.
        ii. Toen al wilde TBL dat het weg gewoon toegankelijk werd voor iedereen basically.

    iii. Toen plan gemaakt voor samenwerkingsproject met stichting van TBL
  d. Het plan concretiseren was dan de uitdaging. Hans heeft met Anna het international office gecontacteerd en mensen gevonden die konden helpen. Toen mensen gevonden die meewerkten aan regreening Africa.
    i. Toen ook op veldreis gegaan om contacten op te bouwen.
3. What kind of company/project are you working on?
  a. Dat zijn er een paar. Anna werkt nu met André aan het project in Mali (Seed Value Chain). Gebeurt samen met AOPP (boerenbond). Wordt gesteund door NGOs uit Frankrijk en België.
  b. Belangrijke conclusie: Je moet veel aan spraakdiensten en radio denken.
  c. Promovendus Francis: Mr Metéo en andere projecten in centrum & Noord Ghana.
  d. Ook een project in de universiteit: ICT4D in the field.
    i. Is ook met Ghanese en Maleisische universiteit.
4. Hoe komen jullie bij zulke ideeën?
  a. Het is op dit moment lastiger, maar de manier die we hebben ontwikkeld is *gewoon daar naartoe gaan en praten met mensen.*
    i. Praat met mensen, zie wat haalbaar is en wat niet haalbaar is.
    ii. Praat ook over hun problemen en wat ze nodig hebben.
    iii. Ook veel werken met demo's; vaak ook gewoon tijdens lange tochten door de landen heen.
    iv. De ideeën komen tijdens gesprekken tot stand.
  b. Waar we erg tegen zijn is het bedenken van een idee in het westen.
    i. Het zijn allerlei ideeën die in het Westen zijn opgezet.
    ii. Je moet beginnen bij de mensen daar.
    iii. We moeten wel een eigen inbreng hebben; **het is een dialoog** (het is niet 'U vraagt wij draaien'.
    iv. Er komt een soort portfolio van dingen die we moeten doen.
  c. Het begon met lokale NGOs waar ze in contact mee gekomen zijn. Het is voornamelijk contacten.
    i. Het is belangrijk om daar naartoe te gaan en met ze te praten.
    ii. Niet alleen handig, maar bouwt ook gewoon een relatie.
  d. Het probleem is ook dat het geld soms gewoon op is voor een project en dan ophoudt. Dat is niet hun doel.
5. Did you experience any issues during the setup or after?
  a. Technologisch kunnen er problemen opspringen (het is er gewoon niet).
  b. Het is niet zo dat ze geld meenemen; dus we moeten uitgaan van wat er wel al is. Mobiele telefonie is bijvoorbeeld is ontploft in Afrika, dus daarmee moeten we werken.
  c. Er worden heel veel talen gesproken
  d. Er is veel laaggeletterdheid (nog een reden voor spraakdiensten)
  e. Inhoudelijk en sociaal is het ook complex
    i. Er zit veel tijd en moeite in uitzoeken hoe dingen nu zitten
    ii. De seed value chain uitzoeken is al ingewikkeld (hoe die in elkaar zit)
    iii. Het moeilijkste is een compleet plaatje krijgen; daar moet je gesprekken over hebben.

    f. Het is ook geen homogene bevolking, je moet ook altijd kijken naar welke belangen er naar boven komen.
        i. Soms met vertalen was het moeilijk om goed te luisteren etc. (e.g. Tolks die hun eigen inbreng geven; genderongelijkheid…)
        ii. Daar moet je sensitief voor zijn.
6. Op wat voor manieren houden jullie rekening met deze *problemen*?
    a. Is een beetje onderzoeksjournalistiek
    b. Met een team gaan
    c. Goede verslagen maken (video, audio, schrijven…)
    d. Achteraf snel verwerken (bespreken met het team)
    e. Met het team spreken.
7. What do you think is important when setting up a company in the Global South?
8. Have you ever worked on projects in cooperation with European or American governments or companies?
    a. How did you experience working together?

Hans zegt dat je gewoon behoorlijk open het gesprek in moet gaan. Je moet even je eigen ideeën aan de kant zetten. Je moet ook gevoelig (sensitief) zijn voor de sfeer. Verder ook heel veel observeren en bespreken met iedereen.

Waar zou men werkelijk iets aan hebben? Waar liggen de prioriteiten?

Vaak na een tijdje komen er ook patronen in.

Sommige projecten lijken ook heel erg op elkaar (bijvoorbeeld Radio Marché). Talen en spraakdiensten komen ook terug.

1. Over het project Radio Marché: Het project is al een tijd geleden geïmplementeerd, doen jullie daar nog wat mee? Of hebben jullie het aan de mensen teruggegeven?
    a. De levensvatbaarheid is belangrijk. Het project moet op zichzelf kunnen staan (wij moeten dit niet onderhouden).
    b. Sustainability van het systeem
    c. Je hebt een organisatie nodig die het draagt. Je bent afhankelijk van de stevigheid en stabiliteit van de organisatie (soms ook gewoon mensen).
    d. Het is gebeurd dat sleutelfiguren gewoon weg zijn gegaan na projecten en dan houdt het op.
        i. In Mali proberen ze ook heel nauw te werken met de boerenbond.
    e. In Maleisië is het wel heel goed gegaan, dit project is ook bij de faculteit in Maleisië gebleven. Zoiets willen ze ook in UDS (Ghana) doen.
    f. Je moet in een vroeg stadium al nadenken hierover (organisatorisch, financieel en technisch), maar je hebt het gewoon niet in de hand.
2. Het is een probleem met big tech bedrijven en mobilie telefonie bedrijven.
    a. Het is tamelijk kostbaar om die gesprekken te hebben met al die bedrijven. Uiteindelijk dingen doen (afspraken maken of initiatieven neerzetten) gebeurt gewoon niet.
3. Vindt u ook dat de overheden moeten doen?
    a. Ja, maar dat doen ze niet. Er zit niet veel wil en power achter.
4. Wat voor initiatieven zouden Afrikaanse overheden dan kunnen starten om de boel op gang te krijgen omtrent ICT?

    a. Vanuit de overheid zou je moeten zorgen dat mobiele telefonie maatschappijen toch gedwongen worden om ten behoeve van lokale bewoners en toepassingen de projecten te faciliteren.
        i. Dingen zijn eigenlijk heel erg duur; duurder dan zou moeten om het land te ontwikkelen.
        ii. Ze roepen wel over corporate social responsibility, maar ze doen dan niks, de overheid zou dit kunnen faciliteren en financieren.
    b. Goed onderwijs is ook van groot belang.
    c. Goede infrastructuur is ook belangrijk.
    d. Zijn vrij basale dingen, die wel heel belangrijk zijn.
    e. De mobiele telefoonmaatschappijen krijgen ook gewoon een bank functie. Die worden dan mobile money players (er is geen groot centraal bankensysteem in Afrika). De overheid moet dit ook beter reguleren.
5. Welk project vindt u het meest succesvol en waarom?
    a. Dat is heel moeilijk te zeggen. *U mag ook meerdere kiezen.*
    b. Er zijn een aantal projecten waar we heel tevreden over zijn of waar we heel veel van hebben geleerd.
    c. Radio Marché was echt goed geslaagd. Dat project heeft ook prijzen gewonnen.
    d. Ook de truc van het aan elkaar plakken van woorden om aankondigingen te doen (zoals bij de trein omroepen).
    e. Ander project wat nog steeds een beetje leeft; FloroBla Blon (journalistiek).
6. Welke projecten zouden jullie graag nog aan willen werken?
    a. Puur informatiediensten (bij Regreening bijvoorbeeld)
        i. 'Van wie is een boom en wat mogen we ermee doen?'
        ii. Deel van corrupte ambtenaren maken misbruik van het gebrek aan kennis en op die manier boeren afpersen.
        iii. Door het maken van radioprogramma's en/of spraakdiensten kunnen die rechten gedeeld worden.
        iv. Dit is een groot project op zichzelf dus de resources zijn er niet voor. Er moeten prioriteiten worden gesteld.
7. Wat doen jullie eigenlijk met de data die jullie verzamelen?
    a. We doen eigenlijk niets met de data
    b. Er zijn sowieso wel spreadsheets beschikbaar (die relatief simpel zijn) voor dingen als SevoSem of Radio Marché.
    c. Wordt gewoon gebruikt door de mensen zelf.
    d. De data van de interviews wordt wel gebruikt.

Interview with I9

Summary of the interview

The last interview was with Shreya Agarwal, the director of strategy at Digital Green. Shreya explained how Digital Green works with farmers in India and Ethiopia to help farmers with modern technology. This is done with three important considerations in mind. First, there must be a **human element in the technology**, e.g. by making videos with humans in it to not lose the human touch. Second, it is important to **work with what is already there** and not to reinvent the wheel. You want to optimise the workways, not disrupt them. Third, **feedback**

from the farmers needs to be taken into account and processed when making a new iteration of the system. Furthermore, Shreya stressed the importance for a system to be **local and contextualised**, i.e. the system needs to be **adapted** to the local language, culture, economy, etc. She also explained that the feedback and learning sessions are not only of great importance when working on the system, but also for the organisations behind the system. Failures need to be discussed and learned from, in order to improve the approach and work better the next time. Lastly, Shreya explained that Digital Green has been working a lot on **data empowerment** too in order to define **ownership** and work with **shared data**.

Notes of the interview

Interview conducted online by Zoë Coenen through Zoom on 9 April 2021 at 15:00-16:00 Amsterdam time.

Before the interview starts, I ask a set of practical questions.
Can I record the interview? Yes.
Can we mention your name in our theses? Yes.
Would you like to re-read the interview afterwards? No.
Would you like to receive the final versions of our theses? Yes.

I also explain briefly who we are and what our research is about.

To answer RQ1, I will have conversations and interviews with both people that have set up ICT4D projects (e.g. a woman that has set up a small business for farmers) and people that are working on ICT4D projects in rural contexts (e.g. PJ Wall and Andy Haxby). I will talk about the projects they are setting up and what issues arise during the projects. Here is a list of questions that I will ask, but these are mostly as a guideline for when the conversation is not flowing.

To ask or explain at the beginning

- Is it okay if we record this conversation?
- This interview/conversation will be processed for both our theses.
- Can we refer to you by name or would you rather have it anonymised?
- One of us will be taking notes, the other one will lead the conversation.
- Small introduction about ourselves and our projects.

Questions for during the interview

1. Who are you?
    a. Shreya Agarwal. Director of strategy at the non-profit Digital Green. Global development organisation that works with farmers at the intersection of famers and grassroots technology. Work on income and resilience. Most of the work is in India and Ethiopia, so far 2 Million farmers have been reached.
2. What kind of company/project are you working on?
    a. Digital Green, see above.
3. Did you experience any issues during the setup or after?
    a. It was started as part of Microsoft research in 2008. The issue that they want to solve is in the Global South, there is a large amount of rural population. They don't have access to useful information like market information etc.

Normally the government is in charge and there are garden informers; people from the government helping and training farmers. The issue here is that it was cost effective, time consuming and the quality was not consistent. The idea was to implement elements of technology. Using videos could be a solution. However, videos aren't an end-to-end solution. Technology needs to be embedded into a human element (i.e. farmers need to be in the videos). The human-facilitated element should be there. Peer-to-peer learning.

b. There are two other considerations
    i. Not reinventing the wheel; they built on the work of the government that was already there.
    ii. In order to be responsive to the needs of the farmers; data is important. Farmer's feedback for next curriculum & content. *Extension agents.*
c. There has been some innovative work with data sharing (FarmStack)

4. What do you think is important when setting up a company in the Global South?
    a. Some things are already mentioned; but the first thing that comes to mind
        i. It needs to be local & contextualised.
        ii. The people have different cultures, economies, languages, they operate in different contexts. Digital Green works in Ethiopia and India, and although it's similar work, there are a LOT of differences between the technologies.
        iii. The farmer feedback
        iv. User feedback is an important component in any work. Technology is an amplifier, not the main star in the system.
5. Have you ever worked on projects in cooperation with European or American governments or companies?
    a. Digital Green is a network placed in different countries.
    b. DG has worked with the USAID, the Bill Gates Foundation etc
    c. How did you experience working together?
        i. All of these organisations have a partnership way of working, they provide funding and technical support.
        ii. On the whole, the experiences have been positive.
        iii. The way philanthropies need to change; they need to increasingly work on long-term solutions, sustainability, interventions are not disrupting the markets, not pushing out other market players.
            1. They also need to provide longer-term funding and create resilient systems.
            2. There are ways to collectively improve this.
        iv. These issues are discussed quite often with philanthropies.
    d. So do you discuss these issues?
        i. Yes, we have learning sessions
        ii. The ICT4D world is coming together in working together.
        iii. DG will be having a three day half day event; it's a community of practitioners and donors, talking about the future of ICT4D.

To ask or explain at the end

- Thank you so much for your input!
- Would you like to receive the conversation and/or our theses once they are finished?

Notes during conversation
Data empowerment - worked a lot on it with Digital Green
And then there is GODAN's Open data work along with FAIR (findable, accessible, interoperable, reusable data).

Links from conversation
https://www.digitalgreen.org/about-us/
https://www.forbes.com/sites/afdhelaziz/2018/08/08/how-omidyar-network-is-building-a-digital-code-of-ethics/?sh=31dd7a2549c2
https://farmstack.digitalgreen.org
https://www.agrilinks.org/events/dlec-annual-community-practice-convening