Ethics of designing ICT systems in low-resource environments

Master Thesis Information Sciences VU Amsterdam
Zoë Coenen - Supervised by Anna Bon
“The road to hell is paved with good intentions.”

- English proverb
Ethics

‘the study of what is morally right and what is not’

➔ Try not to do harm
➔ Finding universal values
Research questions & strategy

**MRQ**
What are ethical implications of developing ICT systems in rural areas?

**RQ1**
What ethical questions arise in ICT and ICT4D projects?

**RQ2**
How can we tackle the ethical questions for ICT4D systems?

**RQ3**
How can we know the implemented systems are beneficial for all parties involved?

**Interviews**
Nine interviews with ICT4D experts

**Pillars**
Five pillars as the main considerations

**Literature**
Literature & lectures on ICT4D, ethics, etc.

**Framework**
Combining pillars with tools and further issues

**Validation**
Validation framework with use cases
Interviews

Rob Willems  
Doug Specht  
Martha Alade  
Rupert Allan  
Dennis Gichangi

PJ Wall  
Shreya Agarwal  
François Lenfant  
Hans Akkermans
## Interviews

<table>
<thead>
<tr>
<th>Nr</th>
<th>Function</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Senior researcher in the Netherlands</td>
<td>Working on project in Africa for more transparent supply chain.</td>
</tr>
<tr>
<td>12</td>
<td>Former teacher, now IT professional in the Netherlands</td>
<td>Working on healthcare project in Africa.</td>
</tr>
<tr>
<td>13</td>
<td>Professor Business Informatics in the Netherlands, founder ICT4D</td>
<td>Working on many ICT4D projects in Africa &amp; South-East Asia.</td>
</tr>
<tr>
<td></td>
<td>organization</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Founder ICT business in Kenya</td>
<td>Building different types of systems for different (small &amp; large scale) African organisations.</td>
</tr>
<tr>
<td>15</td>
<td>Founder ICT non-profit for women in Nigeria</td>
<td>Working on many ICT4D projects in Africa, focus on inclusion of women.</td>
</tr>
<tr>
<td>16</td>
<td>Geographer &amp; lecturer in the UK</td>
<td>Working on mapping projects in Africa and South-America.</td>
</tr>
<tr>
<td>17</td>
<td>Designer, project leader and researcher in the UK</td>
<td>Working on mapping projects in Africa.</td>
</tr>
<tr>
<td>18</td>
<td>Director non-profit in the USA</td>
<td>Working on digitalising farming projects in South-East Asia and Africa.</td>
</tr>
<tr>
<td>19</td>
<td>Senior researcher in Ireland</td>
<td>Worked on many ICT4D projects in Africa.</td>
</tr>
</tbody>
</table>
“It’s very colonial of us to think that we can do better than them”

—Rupert Allan
<table>
<thead>
<tr>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td>Personal, participatory, small-scale, quick &amp; agile</td>
</tr>
<tr>
<td><strong>Make the situation better</strong></td>
</tr>
<tr>
<td>Not reselling, adding value</td>
</tr>
<tr>
<td><strong>Context</strong></td>
</tr>
<tr>
<td>No assumptions, context analysis, work with what there is</td>
</tr>
<tr>
<td><strong>Community</strong></td>
</tr>
<tr>
<td>Involved, community-up, local stakeholders</td>
</tr>
<tr>
<td><strong>Ownership</strong></td>
</tr>
<tr>
<td>Local parties, transparency, data, privacy, empowerment</td>
</tr>
<tr>
<td><strong>Durability</strong></td>
</tr>
<tr>
<td>Sustainability, funding models, adapted</td>
</tr>
<tr>
<td><strong>ICT as a tool</strong></td>
</tr>
<tr>
<td>Human element in technology, means to an end</td>
</tr>
<tr>
<td><strong>Adaptable systems</strong></td>
</tr>
<tr>
<td>Systems that are somewhat simple and can be adapted</td>
</tr>
</tbody>
</table>
5 Pillars
Collaboration

**Definition**
Participation, building relationships that work both ways and no hierarchy in the collaboration.

**Tools & methods**
- Living Labs
- Peer-to-peer involvement
- Guidance
- Co-creation & co-design
- Feedback loop

**Quote**
‘Treat the community as your co-researchers’ - Prof. Narayanan Kulathuramaier

**Considerations**
- Long-term collaboration
- Solidarity model
- Participation
The context needs to be explored before building the system. This consists of engaging with the local community and doing field research.

**Tools & methods**
- Context exploration
- Engaging with community
- Plug-in method
- Field labs

**Quote**
‘Just go there and talk with the people there. You have to start the conversation with an open mind.’ – Hans Akkermans

**Considerations**
- No assumptions
- No arrogance
- Trust
Ownership

Definition
The owner of the system, the data, and the other elements involved in the system must be defined and must lie with local parties.

Tools & methods
➢ Defining (data) ownership
➢ Local parties involvement
➢ Storing data locally & offline

Quote
‘The management of the systems should be kept with local parties.’ – Rob Willems

Considerations
❖ Transparency
❖ Privacy
❖ Education
Purpose

Definition
The purpose of a system needs to be clear. The true intention of the system should be to make people's lives better.

Tools & methods
➢ Stakeholder analysis
➢ No black-box approach in system
➢ Open-source software

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

Considerations
❖ Transparency
❖ Be an important addition
The sustainability of the whole system needs to be assessed, so looking at the various dimensions of sustainability.

**Definition**

- Decision maps
- E³-value model
- Other pillars (collaboration, context, ownership & purpose)

**Quote**

‘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.’ – Shreya Agarwal

**Considerations**

- Various dimensions
- Long term solutions & relations
- Durability
- Rebound effects
“I am convinced that the best way to do it is with the mood of joy, by which I mean the kind of joy that is uniquely African”

—Capurro, 2007
### Frameworks

<table>
<thead>
<tr>
<th>Ethical Model of Internet Integration</th>
<th>REAL approach</th>
<th>Ethical factors in decision making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical Development Research</td>
<td>Minimal ethical guidelines</td>
<td>Ethical practice in ICT4D</td>
</tr>
<tr>
<td>Ethically aligned design</td>
<td>PAPA framework</td>
<td>Principles for digital development</td>
</tr>
</tbody>
</table>
Ethical ICT4D systems

"Treat the community as your co-researchers"

Conversations

Living labs

Plug-in method

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

Field research

Sustainability of the services

Four dimensions

Decision maps

Rebound effects

e3-value model

Purpose

Addressed needs

Purpose of system

Context exploration

Context

Sustainability

Ownership

Assignment & owners & management

Transparency

Financing & funding

Open data

Open source

Education

Participation

Solidarity

Feedback loop

Group dynamics

Peer-to-peer involvement

Collaboration

Listen to community

Living labs

"The management of the systems should be kept with local parties."

Guidance

"The ultimate goal is to better people's lives"

"ICT is the means, development the end"
Validation

Seed Value Chain

Project conducted by W4RA in Mali, Africa. Project aims to improve the Seed Value Chain in Mali for food security.

e-Bario

Initiative from the Malaysian government (led by UNIMAS) to connect rural and isolated communities from Bario to the Internet.
Validation

1. Describe projects
2. Apply framework
3. Compare results
Discussion

Complexity of ethics
Providing one answer is extremely difficult; how can we answer to all ethical questions when contexts differ so much?

Evaluations
Applying the framework in the field - trying it out in field research and see what applies

Adaptations
Adapting the framework where needed - make low-level frameworks for specific systems & contexts
Conclusion

**Interviews**

In-depth interviews showed different considerations

**Framework**

Combining pillars, tools, methods & considerations into one framework

**Pillars**

Five pillars that serve as the base for more ethical research

**Validation**

Will validate the framework on two ICT4D projects

Picture: town meeting in Siby, Mali
THANKS

Are there any questions?

z.coenen@student.vu.nl

CREDITS: This presentation template was created by Slidesgo, including icons by Flaticon, infographics & images by Freepik