

# **Ethics of designing ICT systems in low-resource environments**

Master Thesis Information Sciences VU Amsterdam

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The image features a white background with decorative elements in the corners. Top-left: A pink flower with black 'x' marks and green leaves with yellow dots. Top-right: A green shape with black dots, a pink shape, and yellow diagonal lines. Bottom-left: A yellow and green abstract shape, a green leaf with white dots, and a pink shape. Bottom-right: A green leaf, a yellow flower with black 'x' marks, and a green shape with yellow dots.


**“The road to hell is paved  
with good intentions.”**

- English proverb

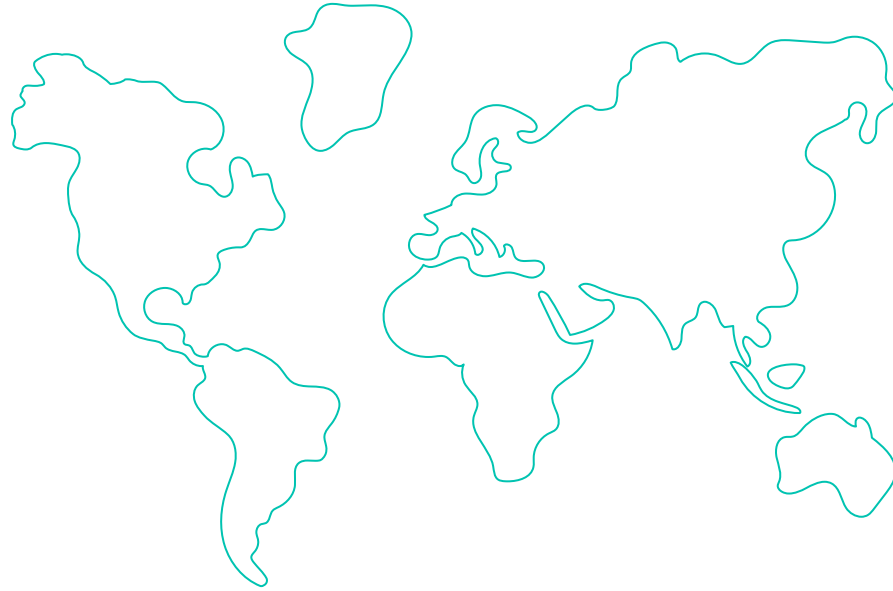


# Ethics

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

- Try not to do harm
  - Finding universal values
- 

# Ethics & Development



# 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.

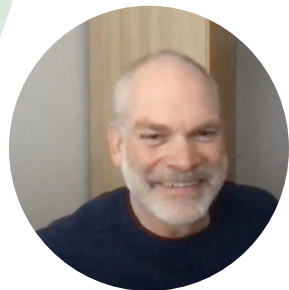
## Framework

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

Nr	Function	Experience
I1	Senior researcher in the Netherlands	Working on project in Africa for more transparent supply chain.
I2	Former teacher, now IT professional in the Netherlands	Working on healthcare project in Africa.
I3	Professor Business Informatics in the Netherlands, founder ICT4D organization	Working on many ICT4D projects in Africa & South-East Asia.
I4	Founder ICT business in Kenya	Building different types of systems for different (small & large scale) African organisations.
I5	Founder ICT non-profit for women in Nigeria	Working on many ICT4D projects in Africa, focus on inclusion of women.
I6	Geographer & lecturer in the UK	Working on mapping projects in Africa and South-America.
I7	Designer, project leader and researcher in the UK	Working on mapping projects in Africa.
I8	Director non-profit in the USA	Working on digitalising farming projects in South-East Asia and Africa.
I9	Senior researcher in Ireland	Worked on many ICT4D projects in Africa.





The image features a central text quote surrounded by decorative floral and leaf patterns in the corners. The top-left corner has a pink flower with black 'x' marks and green leaves. The top-right corner has a green leaf with black dots and a pink abstract shape. The bottom-left corner has a yellow abstract shape and a green leaf. The bottom-right corner has a green leaf and a yellow flower with black 'x' marks.

**“It’s very colonial of us to  
think that we can do better  
than them”**

—Rupert Allan



# Considerations

## Approach

Personal, participatory,  
small-scale, quick & agile

## Context

No assumptions,  
context analysis, work  
with what there is

## Ownership

Local parties,  
transparency, data,  
privacy, empowerment

## ICT as a tool

Human element in  
technology, means to an  
end

## Make the situation better

Not reselling, adding  
value

## Community


Involved, community-up,  
local stakeholders

## Durability

Sustainability, funding  
models, adapted

## Adaptable systems

Systems that are  
somewhat simple and  
can be adapted





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

# Context

## Definition

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

# Sustainability

## Definition

The sustainability of the whole system needs to be assessed, so looking at the various dimensions of sustainability.

## Tools & methods

- Decision maps
- E<sup>3</sup>-value model
- Other pillars (collaboration, context, ownership & purpose)

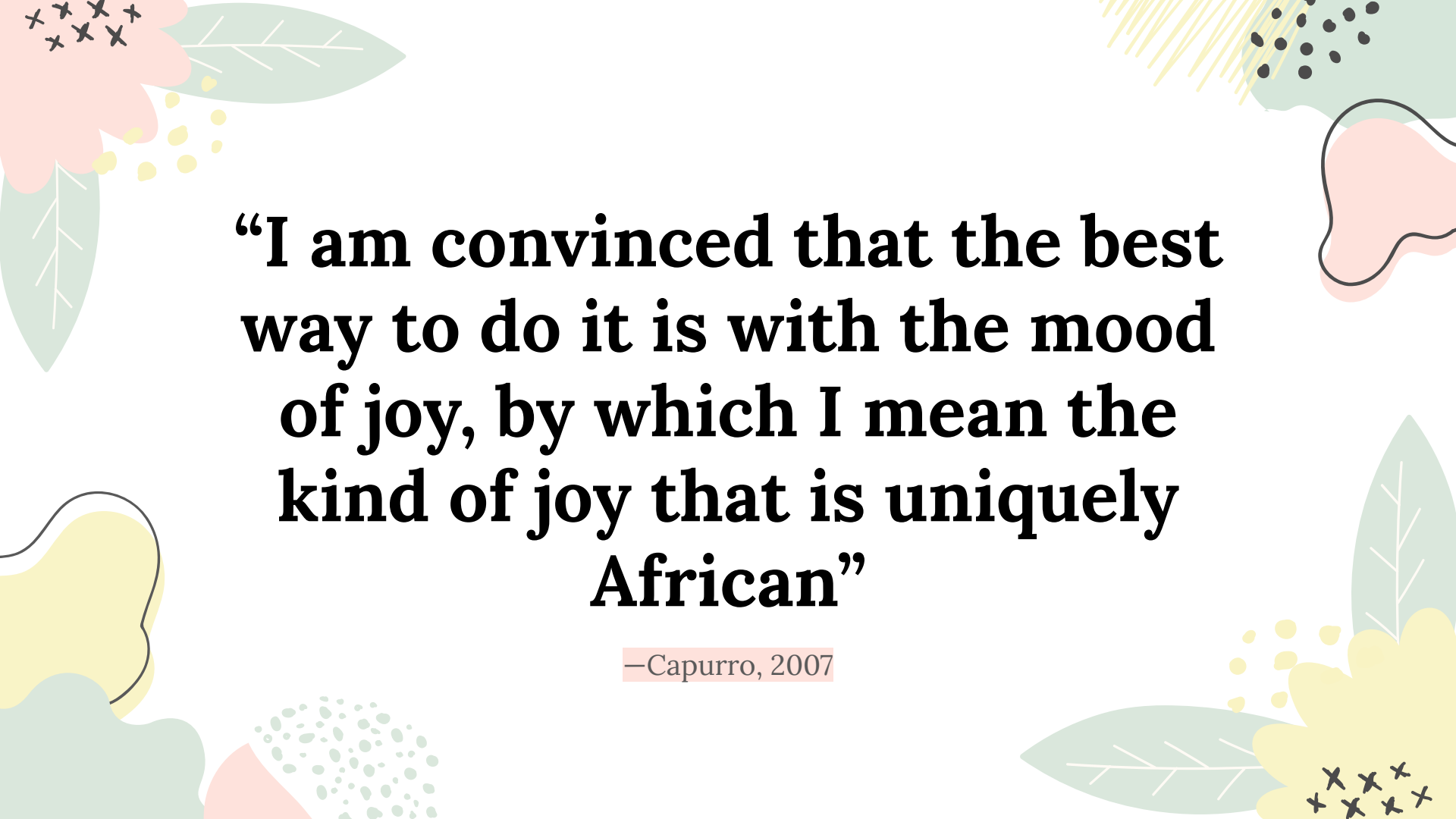
## Quote

‘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



The image features a central text quote surrounded by decorative elements. In the top-left corner, there is a pink flower with yellow dots and green leaves. In the top-right corner, there are green leaves with black dots and a pink abstract shape. In the bottom-left corner, there are yellow and green abstract shapes. In the bottom-right corner, there is a yellow flower with green leaves and black dots. The text is centered and reads: 

**“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

**Ethical Model of  
Internet Integration**

**REAL approach**

**Ethical factors in  
decision making**

**Ethical Development  
Research**

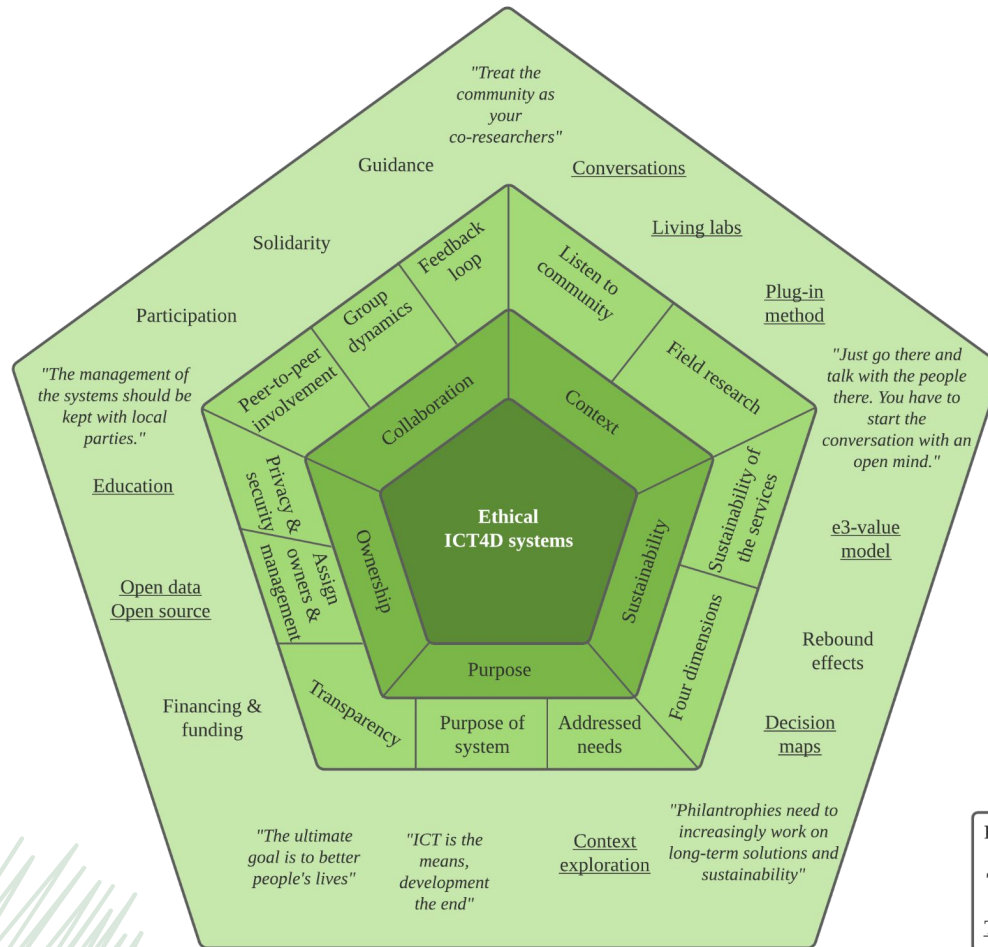
**Minimal ethical  
guidelines**

**Ethical practice in  
ICT4D**

**Ethically aligned design**

**PAPA framework**

**Principles for digital  
development**



### Legend

*"Text"* refers to a quote

Text refers to a tool




# 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

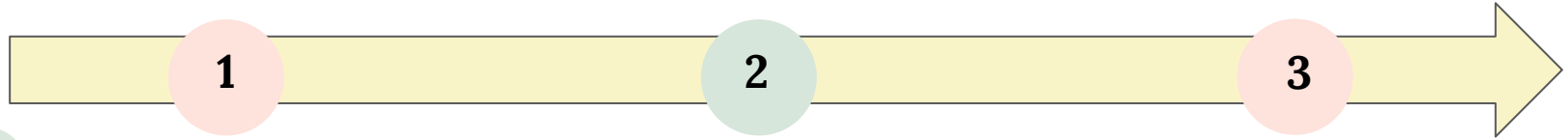
Initiative from the Malaysian government (led by UNIMAS) to connect rural and isolated communities from Bario to the Internet.



# Validation

**Describe projects**

**Compare results**



**Apply framework**

# Discussion



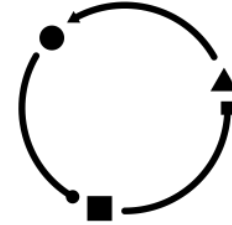
## Complexity of ethics

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



Picture: town meeting in Siby, Mali

## Pillars

Five pillars that serve as the base for more ethical research

## Validation

Will validate the framework on two ICT4D projects



# THANKS

Are there any questions?

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