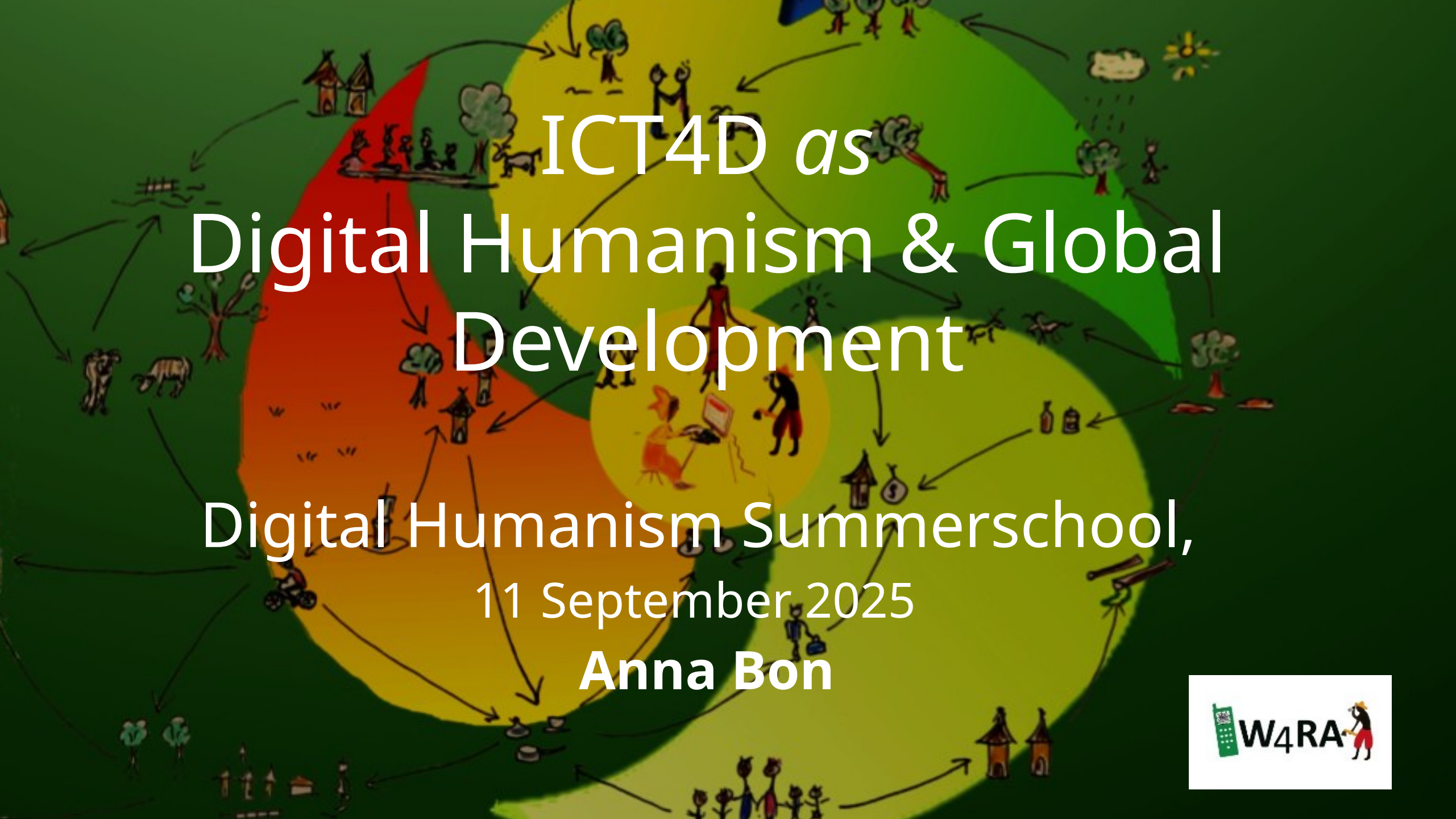

ICT4D *as* Digital Humanism & Global Development

Digital Humanism Summerschool,

11 September 2025

Anna Bon

A first question ?

- A few questions before we start:
- Who are we ?
- Who is familiar with the SDGs?
- Which Grand Challenges do they address?

2006 – present: a short narrative of ICT4D research

ICT4D research and education in West Africa, Latin America, SE Asia
2006 - 2022

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Introducing our core team





Anna Bon – VU
Cheah WaiShiang - UNIMAS
Francis Saa-Dittoh - UDS
André Baart - Babafla
Hans Akkermans -
VU, UNIMAS, UDS

And many more people…

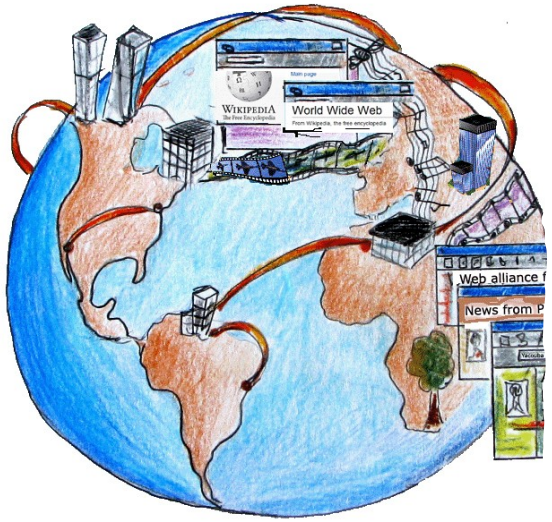
Digital Humanism and SDGs: similarities and differences

The **Sustainable Development Goals** are a *"shared blueprint for peace and prosperity for people and the planet, now and into the future".* [1]

Digital Humanism is "*a mindset, a philosophy, a political driving force, a scientific approach, and most of all – a promise to society. That we are determined to build, regulate and develop technology for people, for a better future.*" [2]

The problem: what is the Digital Divide and what can we do about it?

"Everyone has the right [...] to seek, impart information and ideas through any media and regardless of frontiers..."



Article 19 :Universal Declaration on Human Rights by the United Nations ,1948

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Digital Divide: many different realities

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Bridge the gaps: between countries, regions; within countries, people ?

Gaps in access to information and communication

Urban – rural digital divide

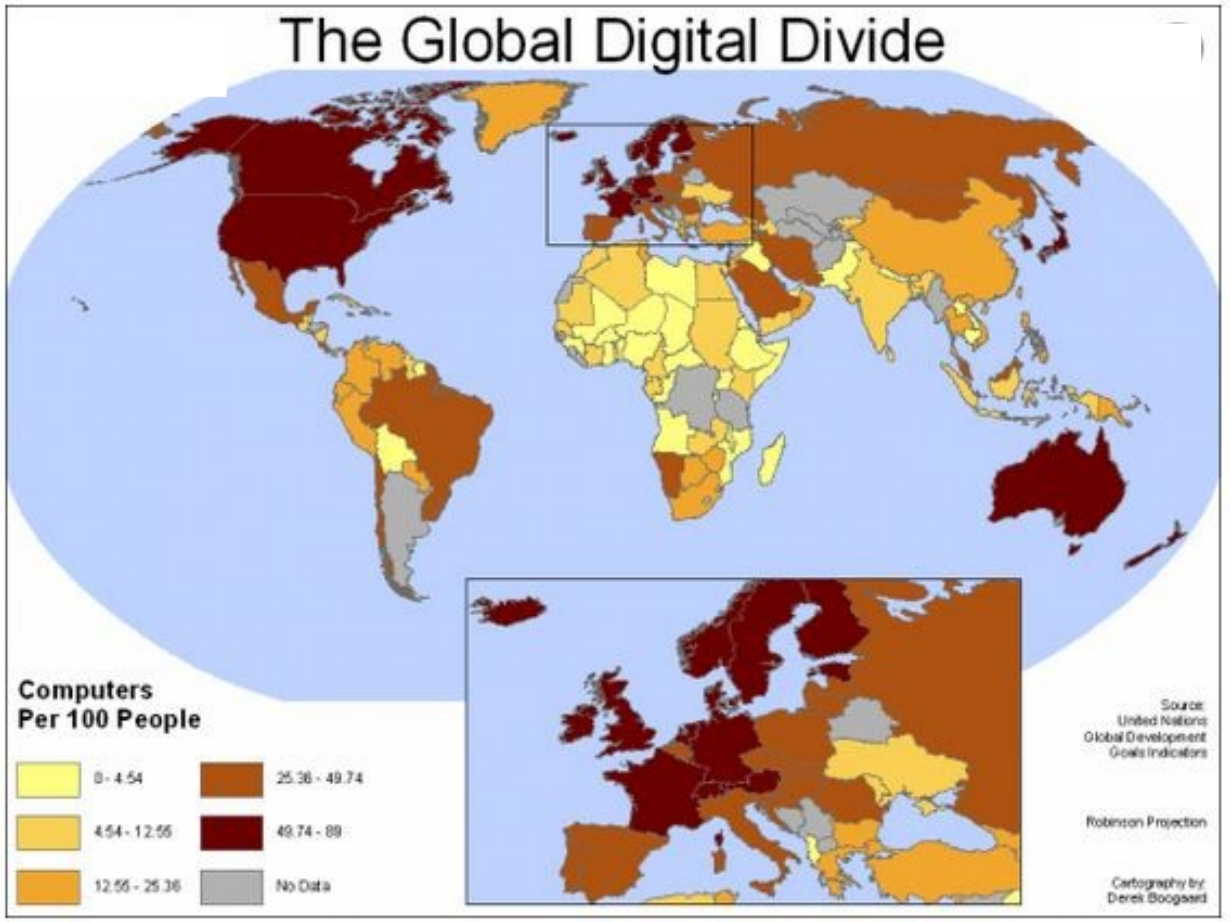
North – South

Wealthy – poor

Education – no education

Modern – traditional

Scientific - indigenous



Sustainable Development Goals

- launched in 2015 by UN; endorsed by all member countries
- Goals and targets for People Planet and Prosperity
- Addressing Grand Global Challenges -
- Are they internally consistent – are there trade-offs?
- How is the state of the achievements in 2025 ?
- Is something missing?
- …… ?

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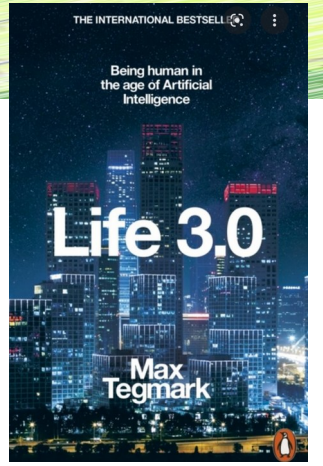
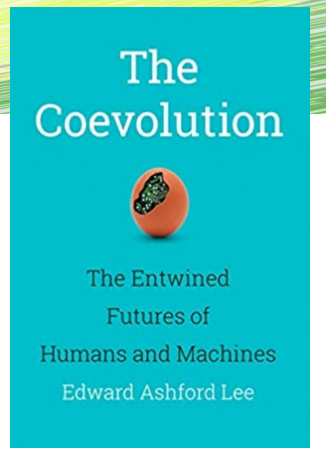
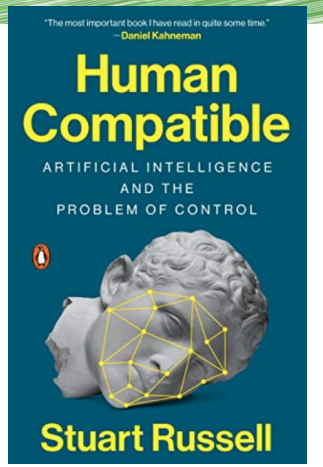
18
FAIR AND INCLUSIVE
DIGITAL SOCIETY

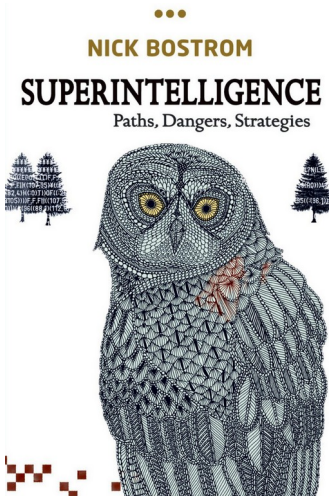
A blind spot: in the Digital Society
Who are “we”?

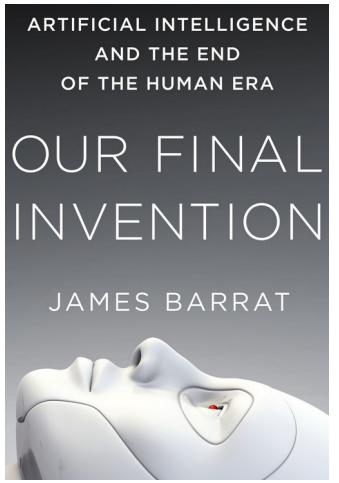
- “…are *we* humans defining technology or is technology defining *us*?” – Edward A. Lee
- *“We* humans have great influence over the outcome – influence that we exerted when we created the AI” – Max Tegmark
- “Perhaps, most important, AI, unlike aliens is something over which *we* have some say” – Stuart Russell
- When will the machines get this power and will they get with *our* compliance? – James Barrat
- In principle *we* could build a kind of superintelligence that would protect human values. *We* would have certainly strong reasons to do so. – Nick Boström











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Who are “we” in the Digital Society?

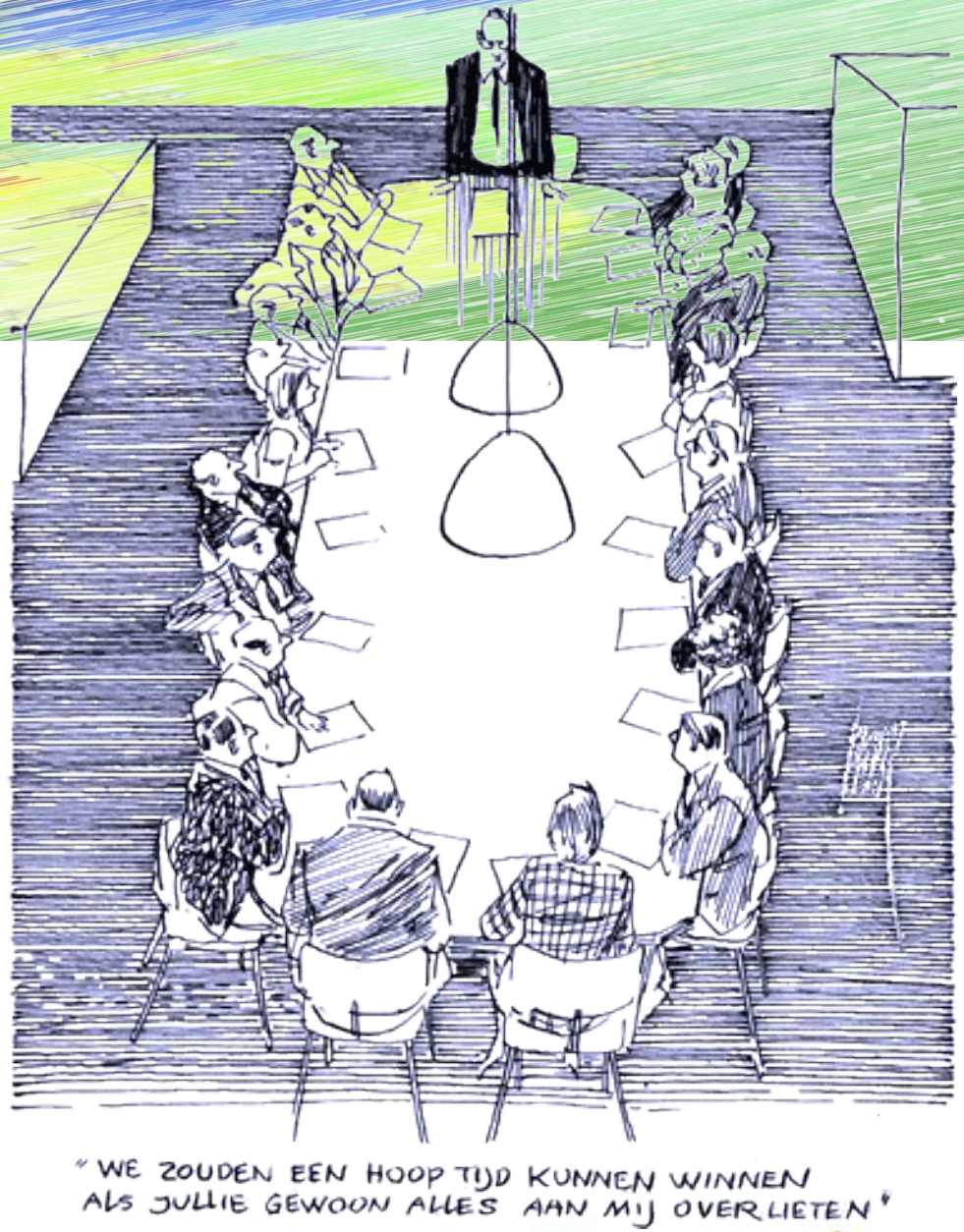
- AI/ICT researchers
- ICT professionals
- Politicians
- Policymakers
- ICT entrepreneurs
- Users

  In the *urban, wealthy, industrialized, western, connected* world

Grand global challenges and vulnerability: people in low resource environments

Who decides ? Who is in charge of the future of the Digital Society?

Despite the huge impact of digital technologies on the lives of *all* people on the planet, *many (peoples, communities, countries) are not included* in the debates about the future of the Digital Society.



"We could save a lot of time if you would just leave everythimg to me"

*) Quoting the cartoon by the famous late Dutch cartoonist Peter van Straaten

The Digital Society through a decolonial lense: a hegemonic system

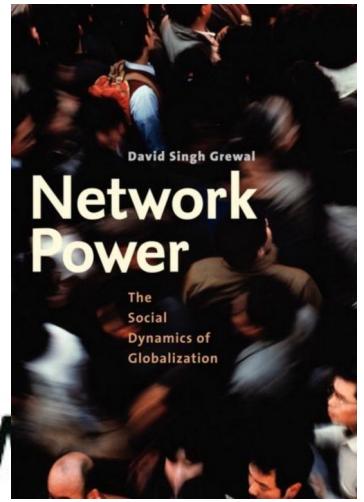
mnipresent Internet is seen as the solution for the Digital Divide (See SDGs. SDG-9)

he networked, omnipresent nature of Internet and Web hold a number of characteristics which make into a hegemonic system.

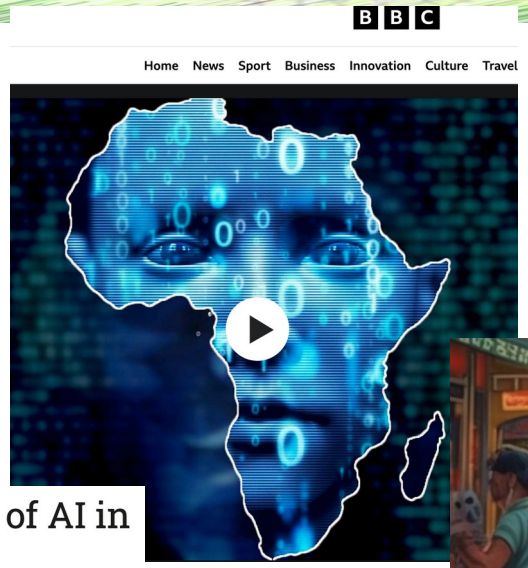
egemonic in the sense: joining it becomes unavoidable
s a successful innovation it expands exponentially
fter a certain tipping point is reached it becomes a standard
here is no alternative
ou cannot avoid it, if you try to avoid it you become excluded.

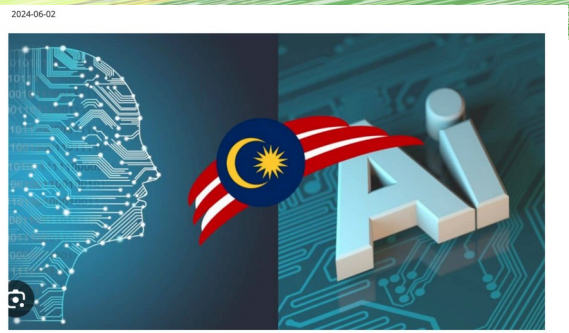
ther types of hegemonic systems: language (e.g. English), monetary system, etwork standards, software systems, communication systems, fashion, etc.

e also: David Singh Grewal 2009. Network Power, The Social Dynamics of Globalization.
e University Press.



Attention on AI has recently exploded, and increasingly also for the Global South e.g. Africa





A New Era of Innovation: The Rise of AI in Africa

20 FEBRUARY 2023

A representation of generative AI in Southeast Asia, as generated by Midjourney, an AI art generator

AFRICA TELECOM Review AFRIQUE
THE TELECOM INDUSTRY'S MEDIA PLATFORM
LA PLATE-FORME MEDIA DE L'INDUSTRIE TELECOM
telecomreviewafrica.com

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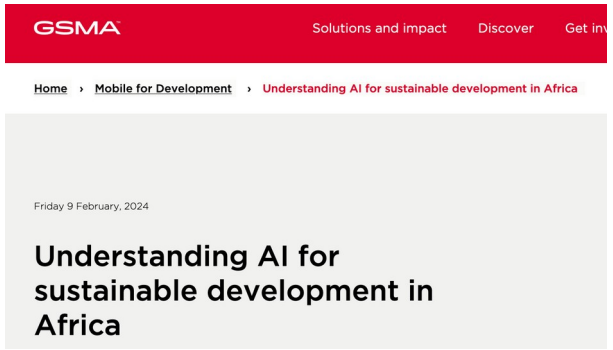
Techno optimism

AI for Good



https://www.inspiritscholars.com/blog/ai-for-social-good-projects/

Artificial intelligence (AI) can help developing economies diversify

- Saurabh Mishra
- Andrea Zaccaria
- Israel Osorio Rodarte

January 30, 2024

https://blogs.worldbank.org/en/trade/artificial-intelligence-ai-can-help-developing-economies-diver

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Development through *modernization*: industrialization, automation

One of the Goals of the UN World Summit for the Information Society, Tunis November 2005

- *"…people-centred, inclusive and development-oriented **Information Society** so that people everywhere can **create, access, utilize and share information and knowledge…** to attain the internationally agreed development goals and objectives, including the Millennium Development Goals. "*

IDRC CRDI

UNDP

THE NEW PARTNERSHIP FOR AFRICA'S DEVELOPMENT
NEPAD

USAID
FROM THE AMERICAN PEOPLE

WORLD TRADE ORGANIZATION

nuffic

Sida

DFID Department for International Development

ASSOCIATION OF AFRICAN UNIVERSITIES
ASSOCIATION DES UNIVERSITÉS AFRICAINES
اتحاد الجامعات الافريقيه

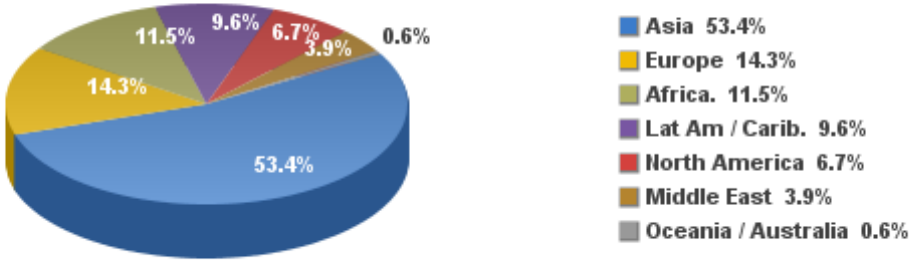
International Monetary Fund

Internet: all about numbers

WORLD INTERNET USAGE AND POPULATION STATISTICS 2021 Year-Q1 Estimates						
World Regions	Population (2021 Est.)	Population % of World	Internet Users 31 Mar 2021	Penetration Rate (% Pop.)	Growth 2000-2021	Internet World %
Asia	4,327,333,821	54.9 %	2,762,187,516	63.8 %	2,316.5 %	53.4 %
Europe	835,817,920	10.6 %	736,995,638	88.2 %	601,3 %	14.3 %
Africa	1,373,486,514	17.4 %	594,008,009	43.2 %	13,058 %	11.5 %
Latin America / Carib.	659,743,522	8.4 %	498,437,116	75.6 %	2,658.5 %	9.6 %
North America	370,322,393	4.7 %	347,916,627	93.9 %	221.9 %	6.7 %
Middle East	265,587,661	3.4 %	198,850,130	74.9 %	5,953.6 %	3.9 %
Oceania / Australia	43,473,756	0.6 %	30,385,571	69.9 %	298.7 %	0.6 %
WORLD TOTAL	7,875,765,587	100.0 %	5,168,780,607	65.6 %	1,331.9 %	100.0 %

NOTES: (1) Internet Usage and World Population Statistics estimates are for March 31, 2021. (2) CLICK on each world region name for detailed regional usage information. (3) Demographic (Population) numbers are based on data from the United Nations Population Division. (4) Internet usage information comes from data published by Nielsen Online, by the International Telecommunications Union, by GfK, by local ICT Regulators and other reliable sources. (5) For definitions, navigation help and disclaimers, please refer to the Website Surfing Guide. (6) The information from this website may be cited, giving the due credit and placing a link back to www.internetworldstats.com. Copyright © 2021, Miniwatts Marketing Group. All rights reserved worldwide.

Internet Users Distribution in the World - 2021



Source: Internet World Stats - www.internetworldstats.com/stats.htm
Basis: 5,168,780,607 Internet users in March 31, 2021
Copyright © 2021, Miniwatts Marketing Group

INTERNET USAGE STATISTICS
The Internet Big Picture
World Internet Users and 2021 Population Stats

ICT4D early projects : the Case of OLPC

- Presented in 2005 at the WSIS by Nicholas Negroponte
- OLPC One Laptop per Child – every school child in the world a laptop
- Targeting developing countries
- 100 US$ per laptop
- Presented as an ed[illegible]t –
- not a laptop projec[illegible]

ource image laptop: https://nl.wikipedia.org/wiki/OLPC_XO

The Case of OLPC - II

- XO novel functions: power supply, energy consumption (solar battery)

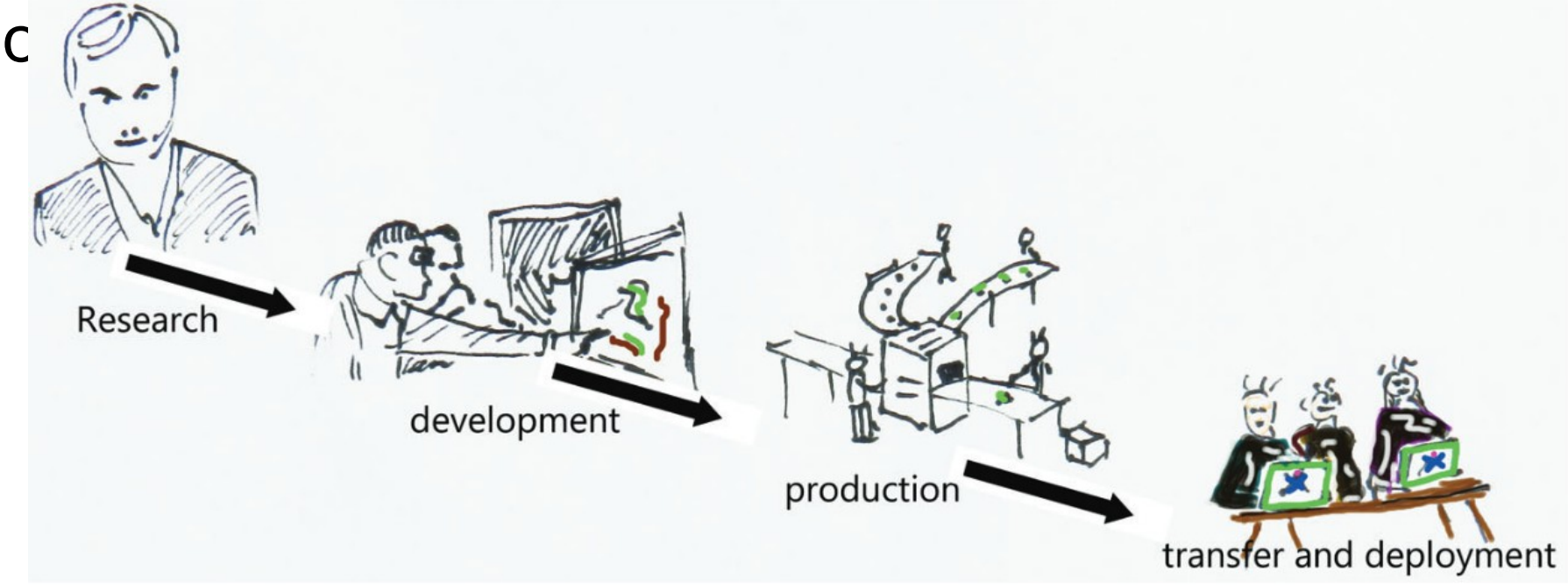
mash networking, keyboard, touchpad, Sugar Operating System

- Special software based on constructionist theory of learning by doing
- Minimum order 1.000.000 laptops – lowered to 250.000 laptops
- Expected to sell 150 M laptops by 2007
- Peru 225 million US$ spent on laptops
- Uruguay spent 395 million US$ on XO laptops delivered in

Theories behind ICT4D – e.g. OLPC case

- OLPC followed the logic of linear model of innovation (Schumpeter 1911, Usher 1954)
- Theories: Logical Framework Approach, Theory of Change
- These follow a cause – effect logics; evaluation studies monitor outcc

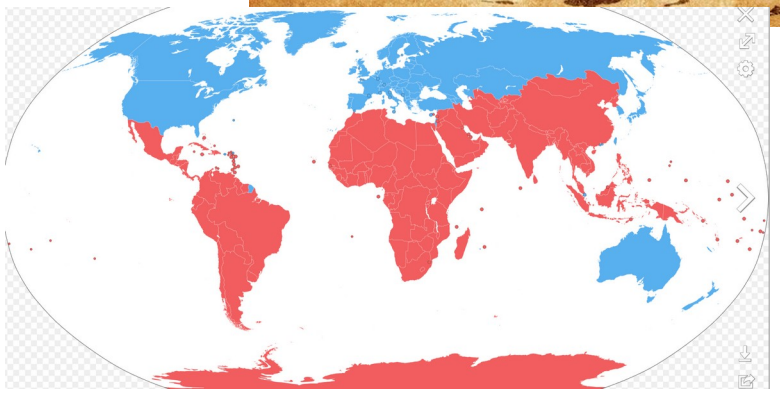
“attribution”

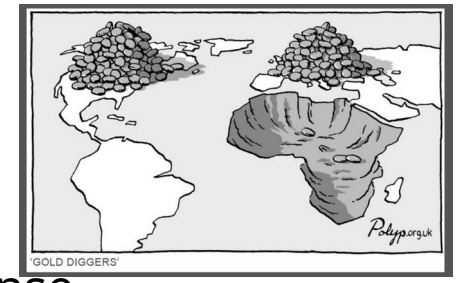


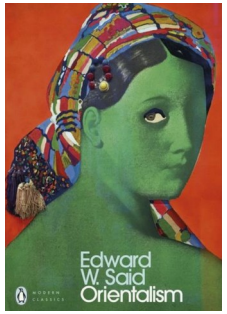
What is decolonial theory and why do we use it?

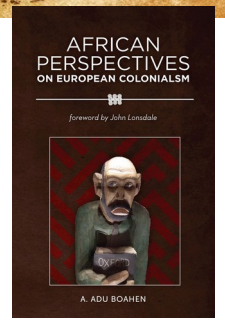
Historical patterns in the Digital Society

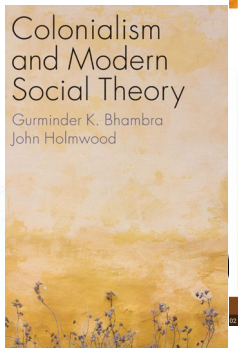
- Digital Society is a space of human interaction, the digital *Agora,* but not older than about two decades.
- It has inherited historical patterns of the “real” social world, while also introducing new ones.
- These are many positive social aspects but also bias, power structures and painful historical patterns such as discrimination and colonialism.

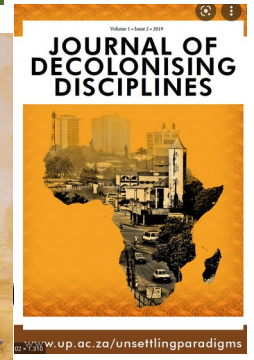






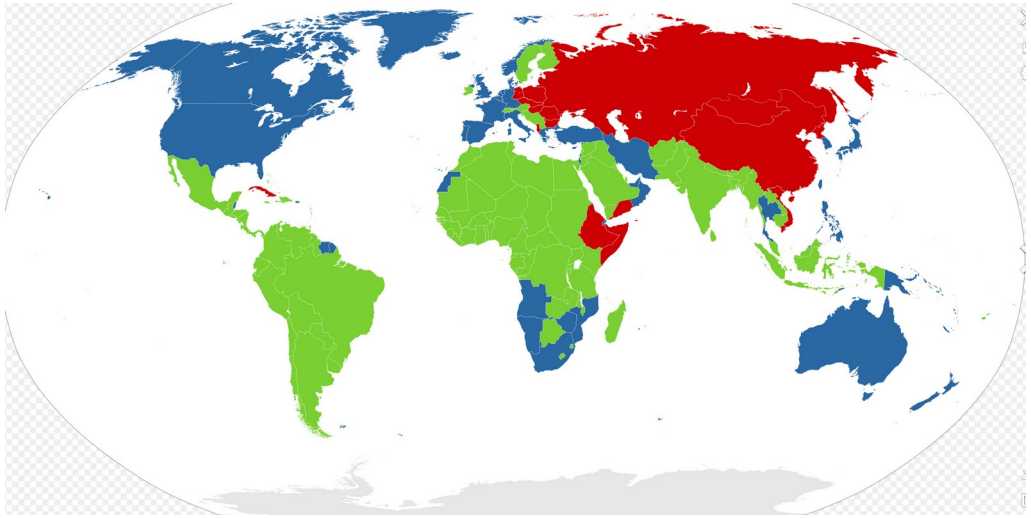


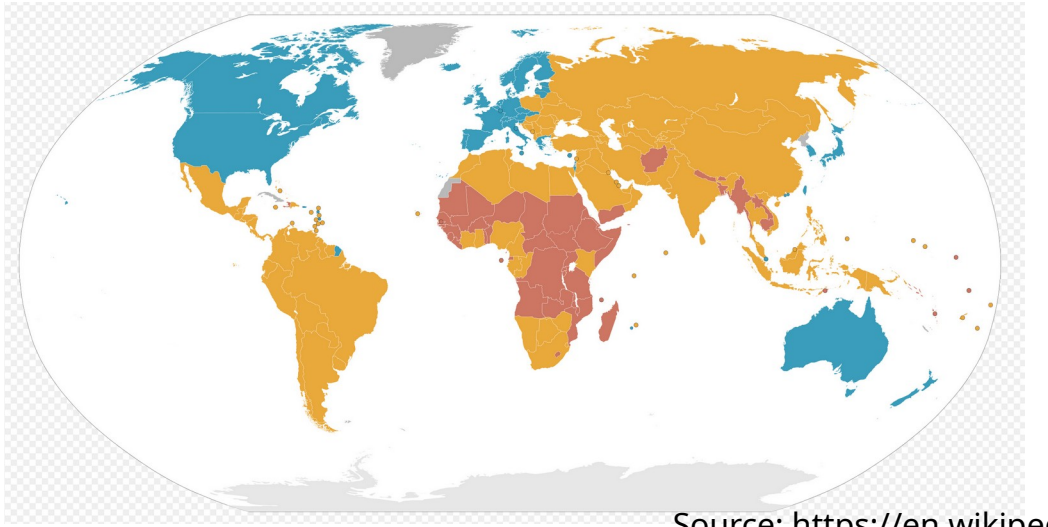


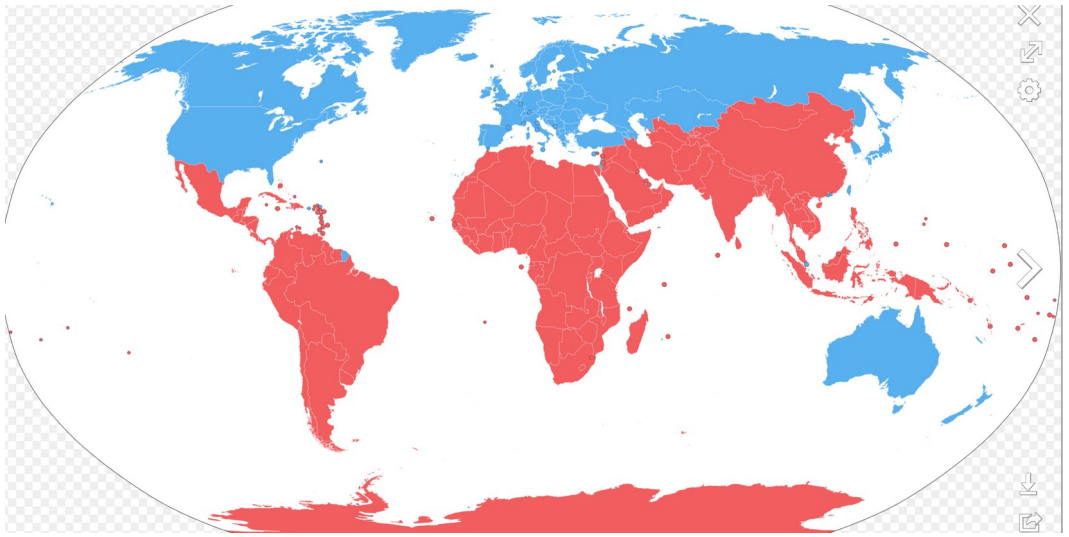


Let’s now analyze the Digital Society through a decolonial lense

(Short Intermezzo) crash course about international “development” over time





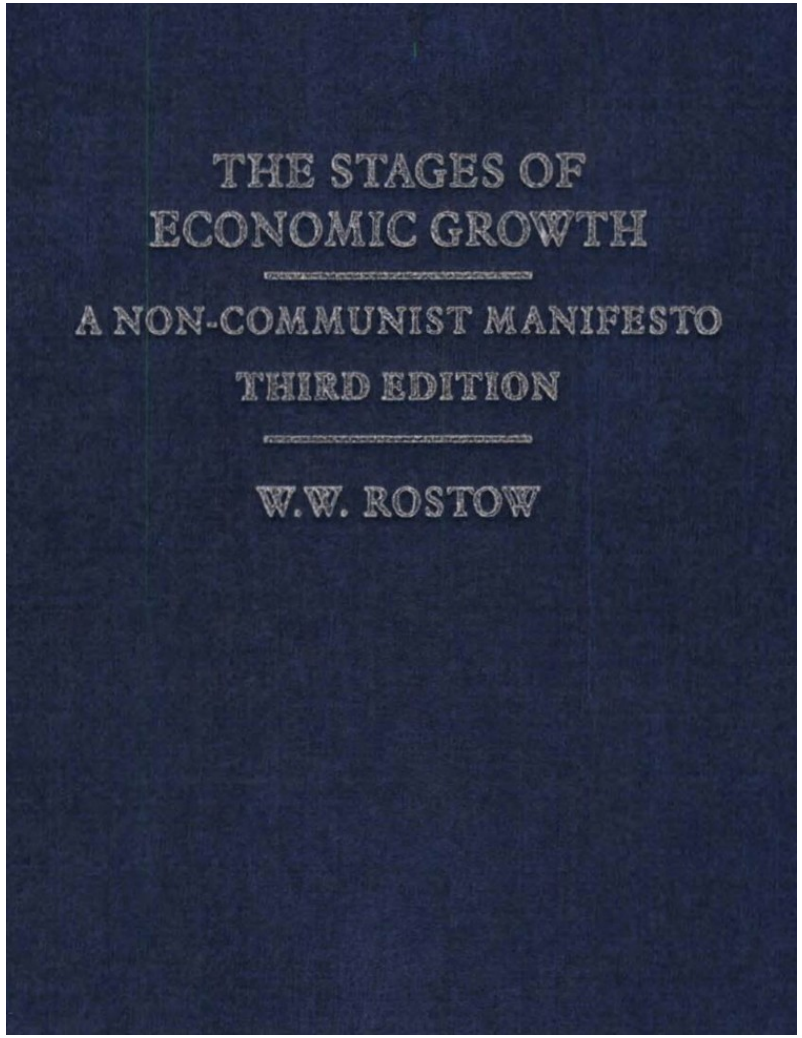


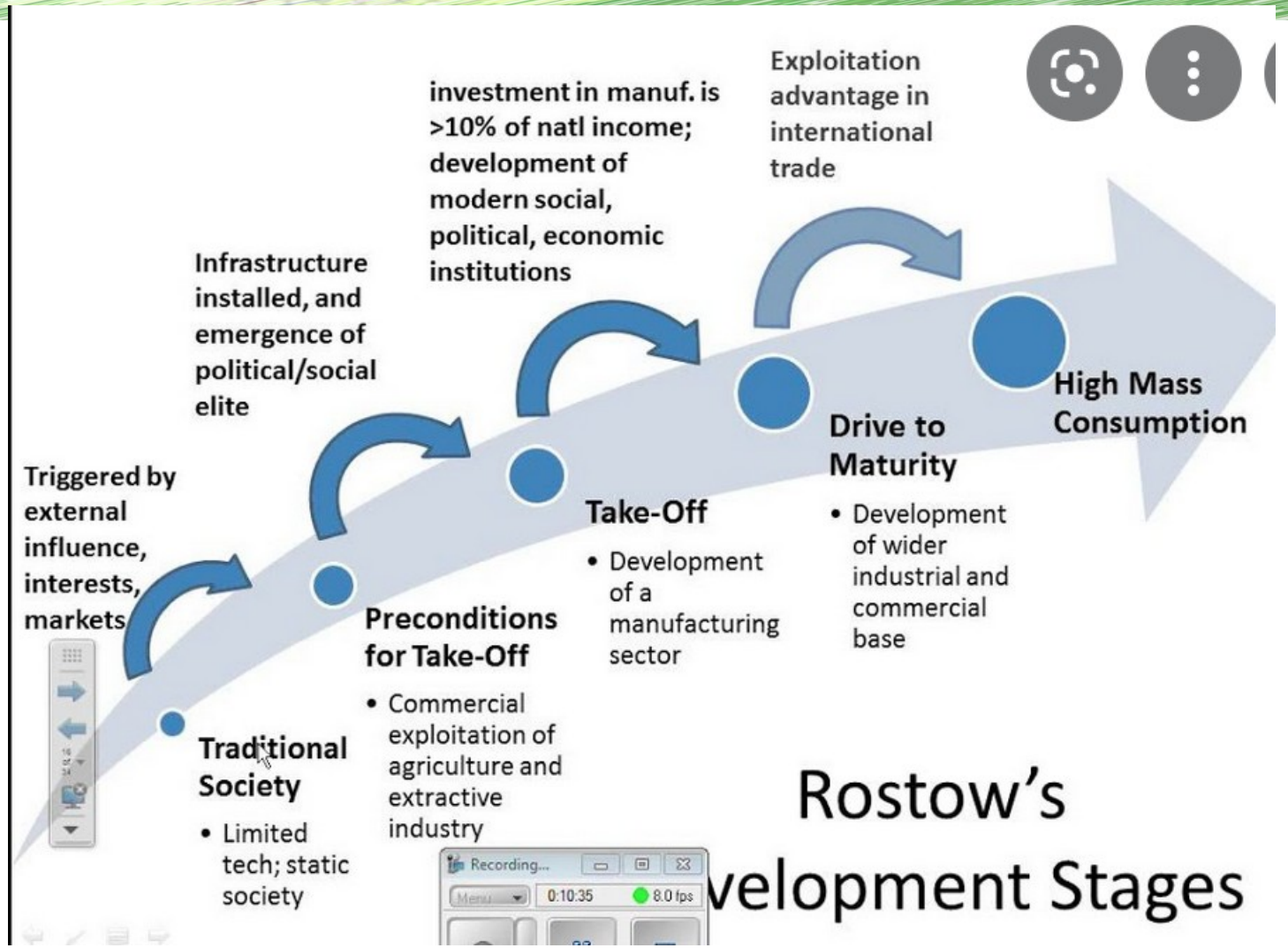
A few concepts:

- “Third World”
- “Developing world”
- “Global South”

Source: https://en.wikipedia.org/wiki/File:Imf-advanced-un-least-developed-2008.svg

The dominant theory in international development since the 1950s





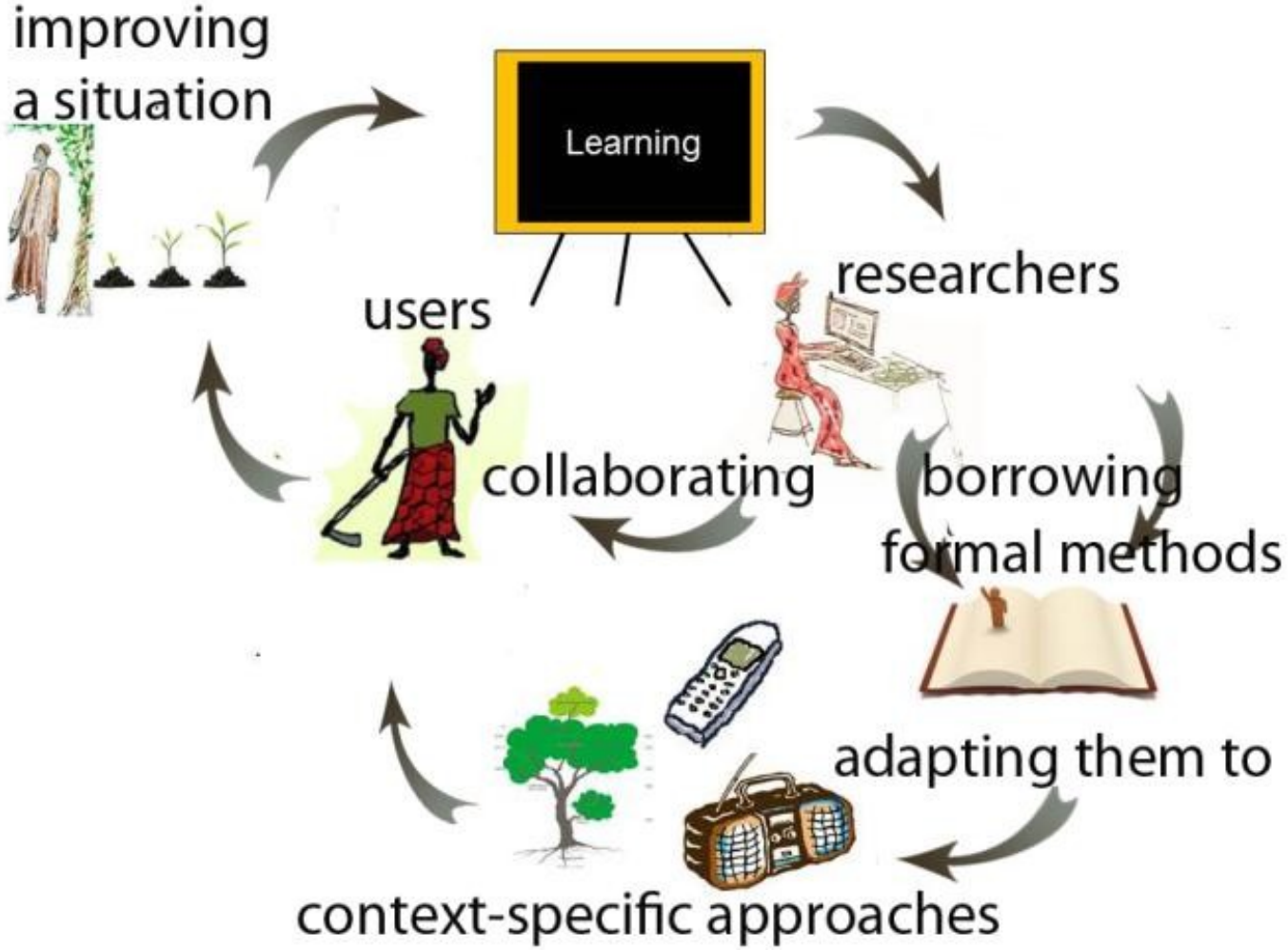
How does it work? ICT4D in a community approach (From real world use case to ICT4D artefact)

Iterative process
In which collaboration and context analysis
Take place in a space of Interaction, debate, co-design.

Relationhip is very important for the successful Deployment of ICT4D.

A structured ICT Artefact Adapted to context

Community Service Learning: an iterative approach

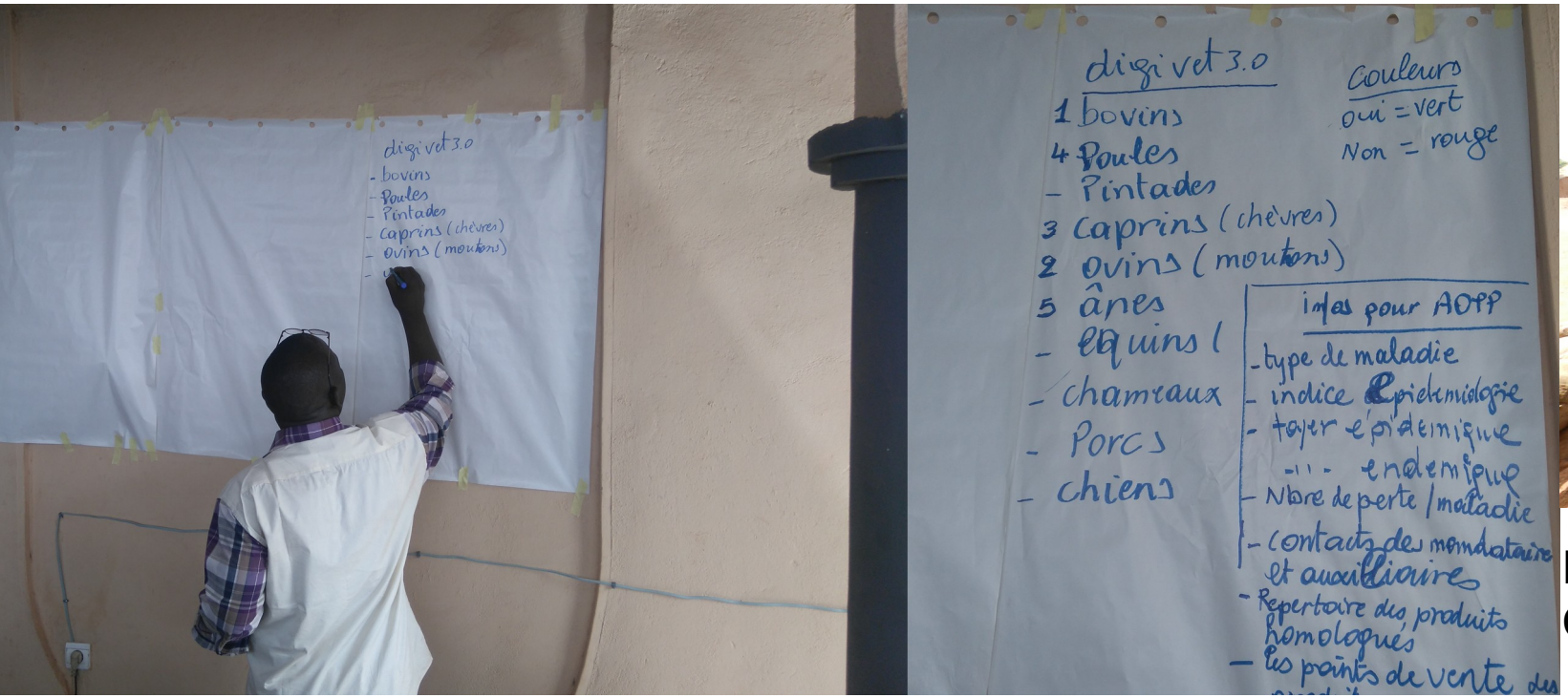


Collaborative – transdisciplinary
User centered – what users want
Context-aware – e.g. rural regions
Action – oriented – design & deploy
Learning by doing – iterative, adaptive

Context analysis and needs assessment: workshop + Field visit (ICT4D 3.0)

Needs assessment and *collaborative* goal construction, with the users

- Who are the users? What are their operational goals?



Example of collaborative workshop in Bamako, AOPP office, Mali, 2016, designing animal health application

Example of collaborative workshop in Gua
Ghana, exploring user goals for voice-bas

W4RA

Example of ICT4D 3.0

History of Kasadaka/W4RA research project

Adama Tessougué – key user

EU funded VOICES project in 2010-2013
Voice technologies in W4RA
Orange Emerginov platform
In search for more sustainable solutions

With a large research team since 2010:
Christophe Guéret
Victor de Boer
Gossa Lô
Hans Akkermans
Stephane Boyera
Amadou Tangara
Adama Tessougué
André, Francis, Anna (still actively involved)

Kasadaka & News

BBC

Home News Sport Business Innovation Culture Travel Earth Video Live

'Siri, will talking ever top typing?'

20 March 2018

Share

By Padraig Belton, Technology of Business reporter

Anna and Francis interviewed by BBC

W4RA was interviewed for the Dutch television on 11 November 2022. This short clip was broadcasted on 11 March 2023 in the program "How its done" at RTLZ.

André Baart pitches Kasadaka project

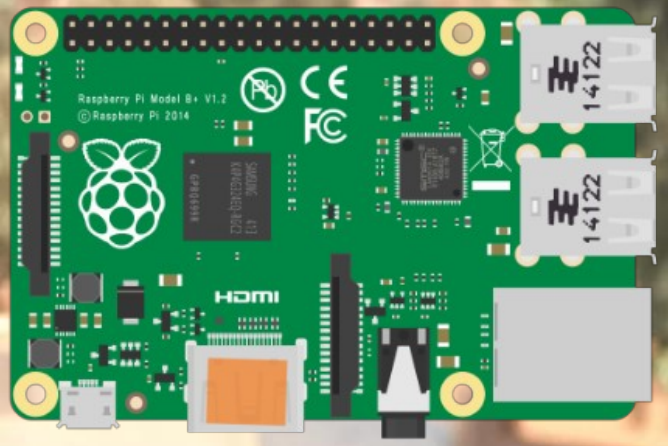
Andre winner of Amsterdam Innovation Award

Our user communities:
Tingoli, Ghana Northern Region

User needs/ use case: weather/meteo/rainfall information
Market information
Information about animal health

Challenges:
Infrastructure/ internet
Languages: e.g. Dagbanli
Literacy
Costs

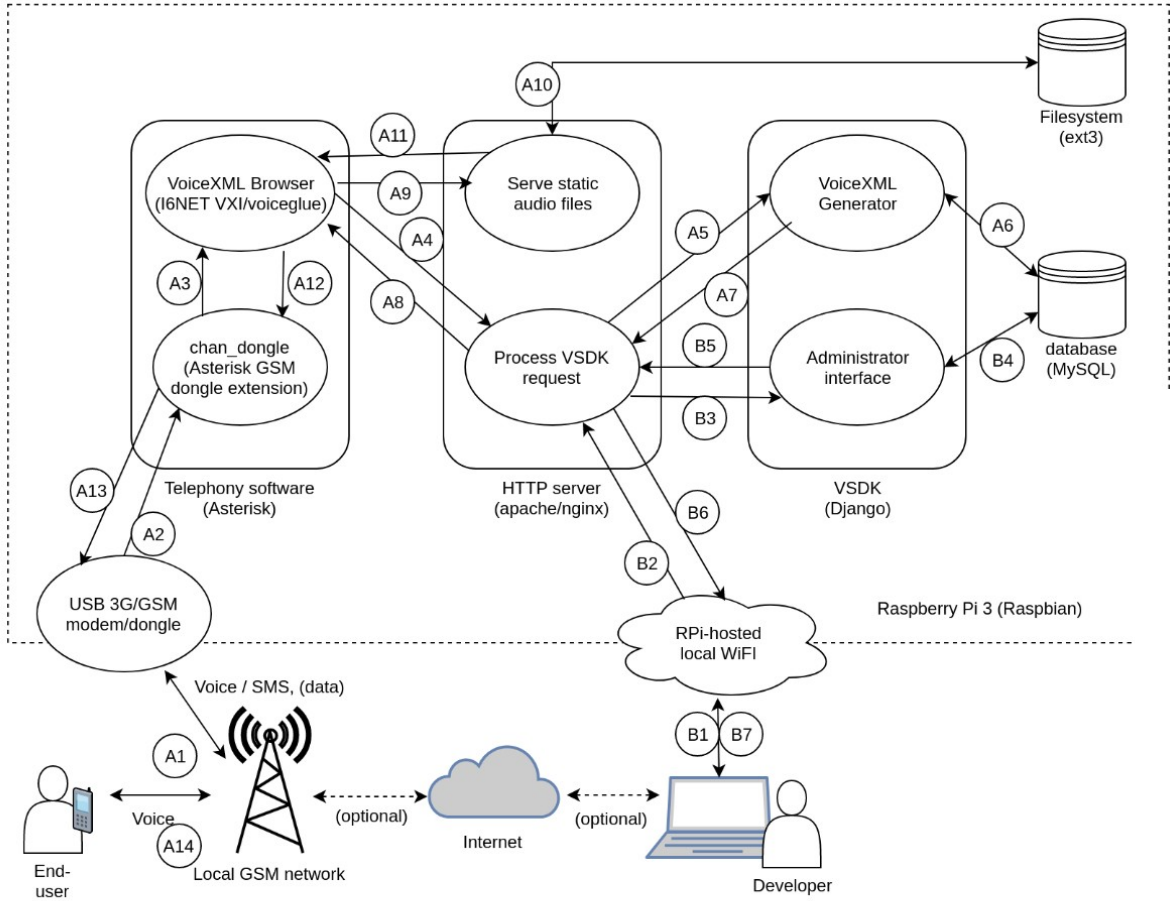
KasaDaka – ‘Talking Box’



Raspberry Pi +
RTC

GSM connection

Voice platform Kasadaka



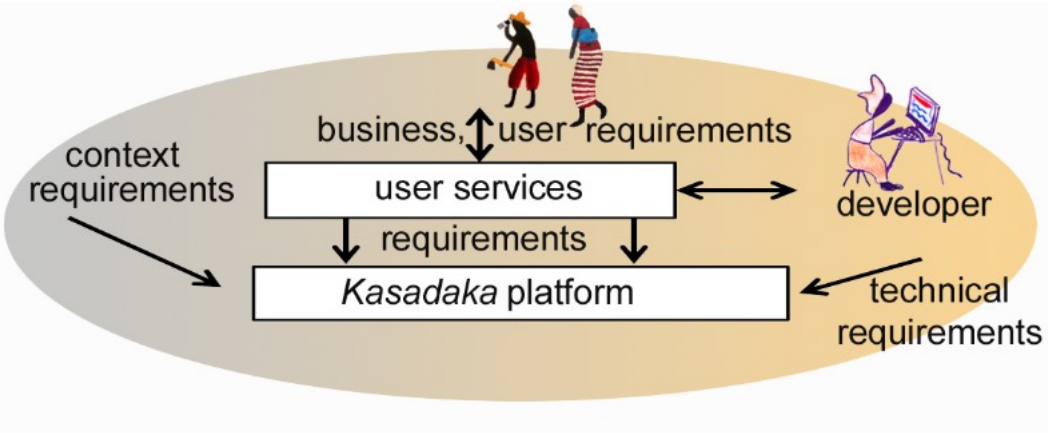


Fig. 3. Overview of the Kasadaka system architecture.

Source:

Ney Yibeogo - Hello World: A Voice Service Development Platform to Bridge the Web's Digital Divide

André Baart[1], Anna Bon[2], Victor de Boer[3], Wendelien Tuijp[4] and Hans Akkermans[5]

Use cases

Tiballi project – Ghana

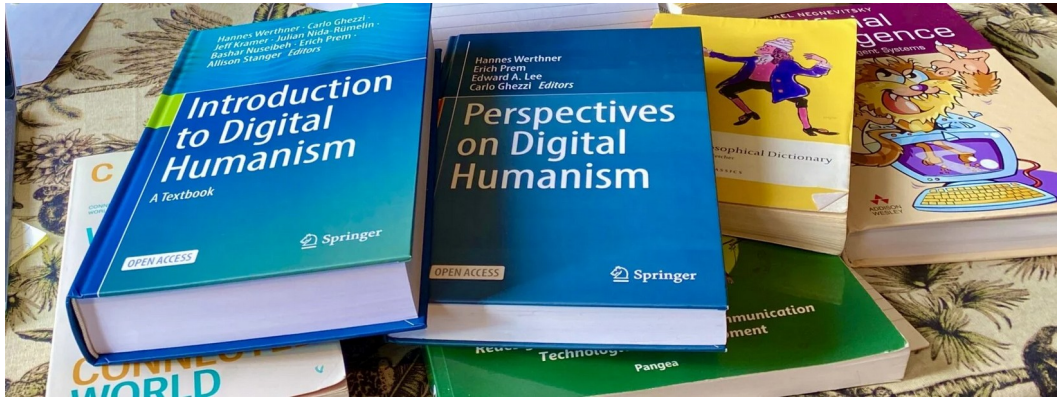
Internet Society

Bottom line…

- ***Digital Sovereignty*** – small scale initiatives with small data, using what is already there.
- **Inviting people** from low resource environment to participate in the debate about the future of the Digital Society
- **Support/collaborate with HE institutions**/researchers in the Global South – ICT4D curriculum development in and for the Global South
- **Open Source**, independence of Big Tech, initiatives to give autonomy back to the user
- **Community-centered** ICT4D – focus on small data solutions, contextual solutions, local entrepreneurship, local solutions to local problems, work what is already there.

More reading...

his is a lecture based on the two chapters we contributed to the two books on Digital Humanism.



Bon, A., Dittoh, F., Lô, G., Pini, M., Bwana, R. M., Cheah, WaiShiang, Kulathuramaiyer & Baart, A. (2022). Decolonizing Technology and Society: A Perspective from the Global South. In: *Werthner et al. Perspectives on Digital Humanism.* 2022 Springer pp 61-67.

Bon, Anna, Francis Saa-Dittoh, and Hans Akkermans. "Bridging the digital divide." In: *Hannes Werthner· Carlo Ghezzi· Jeff Kramer· Julian Nida-Rümelin· Bashar Nuseibeh· Erich Prem·Introduction to Digital Humanism.* (2024) pp 283.

https://w4ra.org https://euridice.eu https://tiballi

DIGITAL HUMANISM

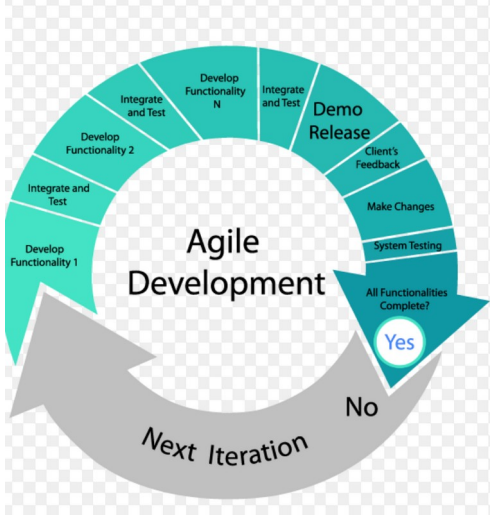
W4RA EURIDICE TIBALLI

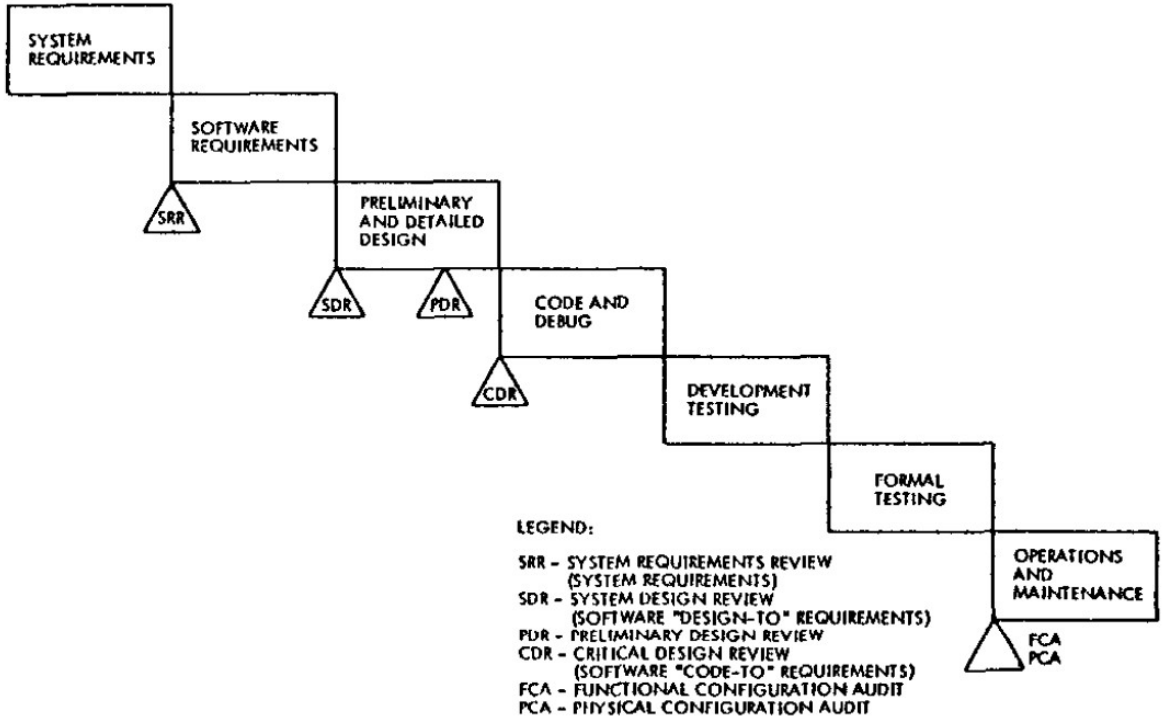
Co-funded by the European Union

Thank you !

What did we learn from all these ICT4D projects

- Waterfall model (1)
- Agile model





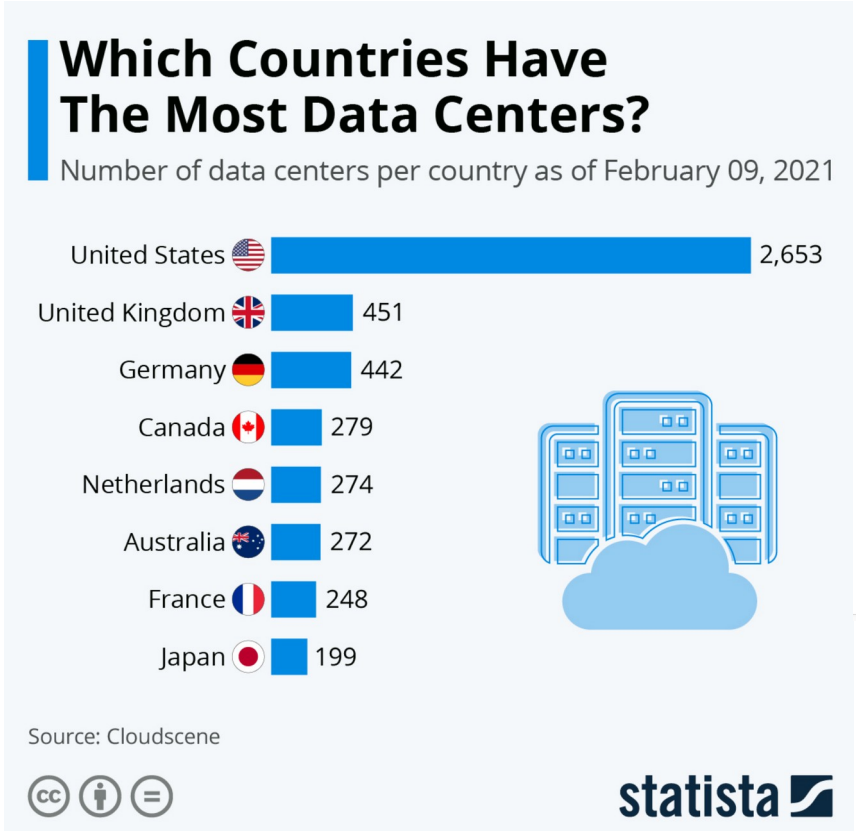
(1) From: Bell, Thomas E., and T. A. Thayer. Software requirements: Are they really a problem? *Proceedings of the 2nd international conference on Software engineering.* IEEE Computer Society Press, 1976.

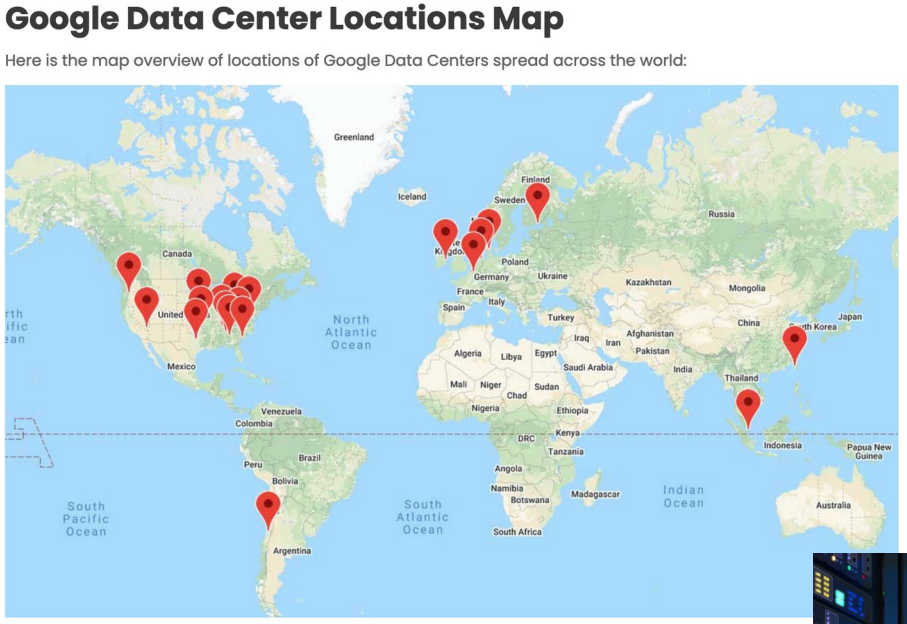
(2) From: https://github-wiki-see.page/m/younasgithub/UTMAgileRep/wiki/UTM-AGILE-PAGE

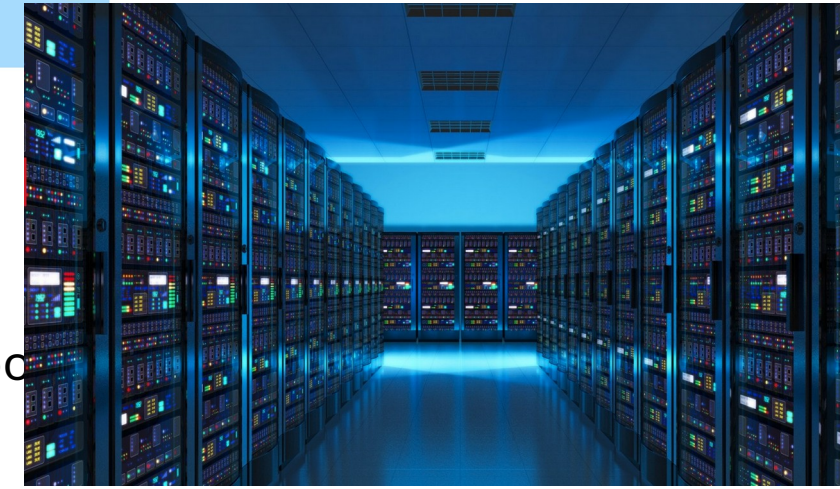
The importance of education

- Teaching the new generation of Digital Society/ICT4D Professionals – interdisciplinary approaches
- Mekimng thgem aware of the problems of the Digital Society and the Global South
- Working with HEs in the Global South in education and research
- Co-designing curricula, co-teaching
- Bringing students together in joint ICT4D/ Digital Society programs
- Doing Community-oriented, practical education & research

Location of datacenters reveal the centers of digital power





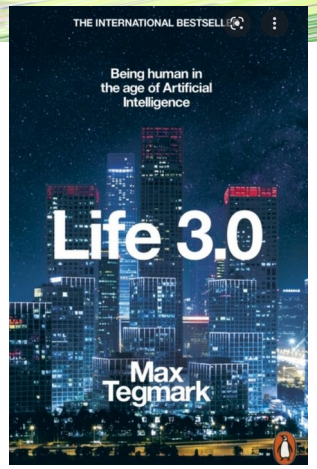


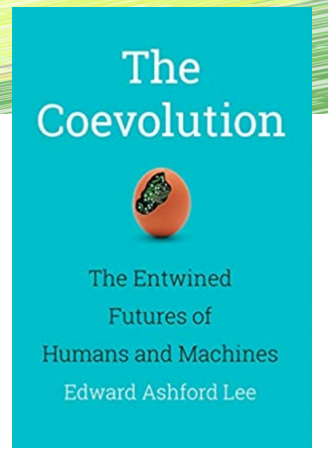
https://datacenterlocations.com/goo

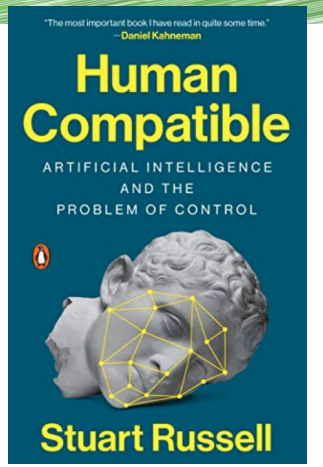
- https://www.statista.com/chart/24149/data-centers-per-country/

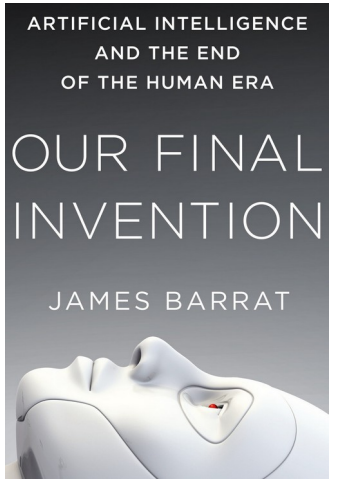
Artificial Intelligence – *t*
the most powerful technology ever built?

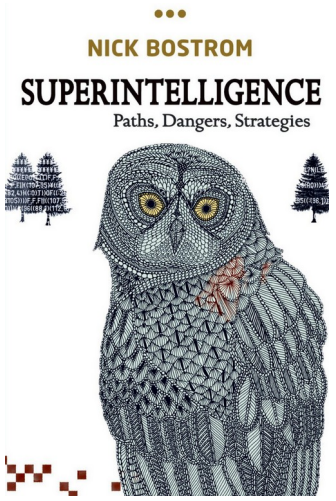
- "…are *we* humans defining technology or is technology defining *us*?" – Edward A. Lee
- *"We* humans have great influence over the outcome – influence that we exerted when we created the AI" – Max Tegmark
- "Perhaps, most important, AI, unlike aliens is something over which *we* have some say" – Stuart Russell
- When will the machines get this power and will they get with *our* compliance? – James Barrat
- In principle we could build a kind of superintelligence that would protect human values. We would have certainly strong reasons to do so. – Nick Boström











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How to include also people from low resource environments in the design of the Digital Society

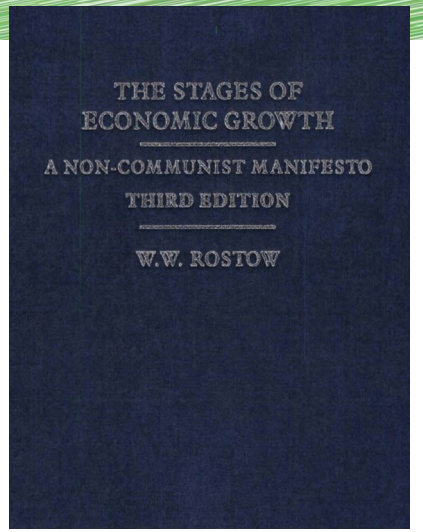
Conclusion: Towards a more fair and inclusive Digital Society…

what to do?

- Alternative models to *ICT in and for the Global South* should be further explored.
- Involve more people, diverse perspectives, in the debate/design.
- Education is extremely important (e.g. north-south cooperation in HE)
- Concerns about the Digital Society are truly global and must be addressed collaboratively (cf. Global Climate Debate, IPCC report)
- General awareness, policy and action needed

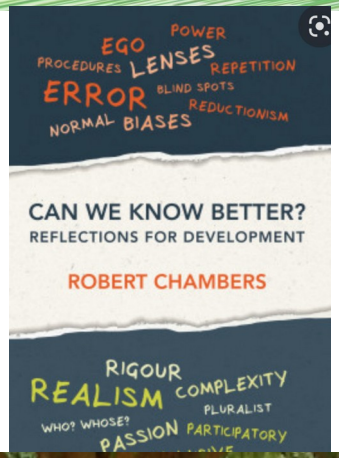
Fortunately, the future is not carved in stone

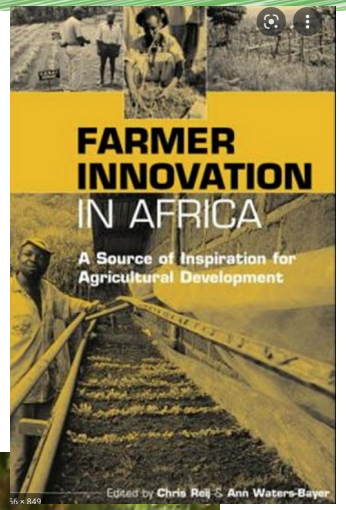
Development according to a “blueprint”



https://nieuws.nl/economie/20220210/bedrijven-op-de-zuidas-gooien-kantoren-open-als-het-ka
https://www.theedgemarkets.com/article/cover-story-no-consensus-definition-developed-nation

Participatory, community-centered, approaches to ICT4D, often originating from the grassroots, to solve local problems

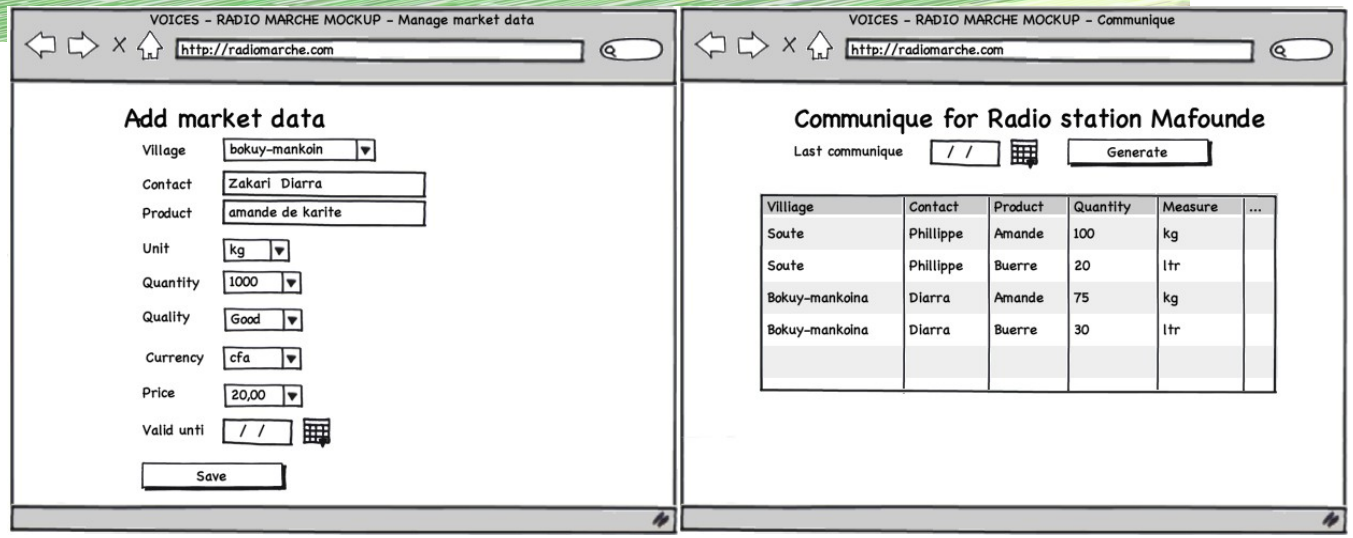


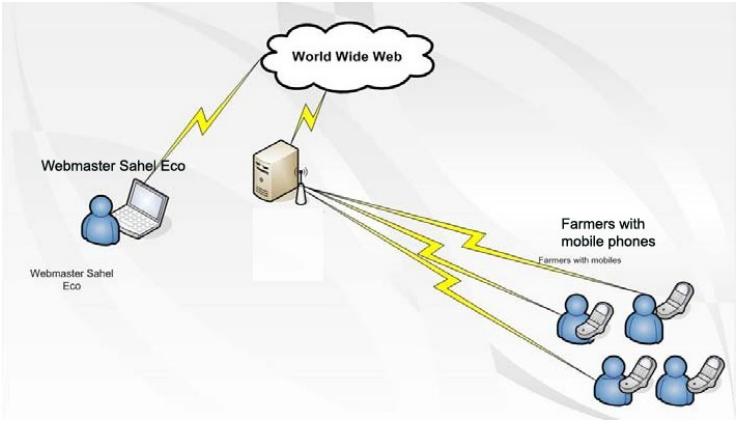


N4RA

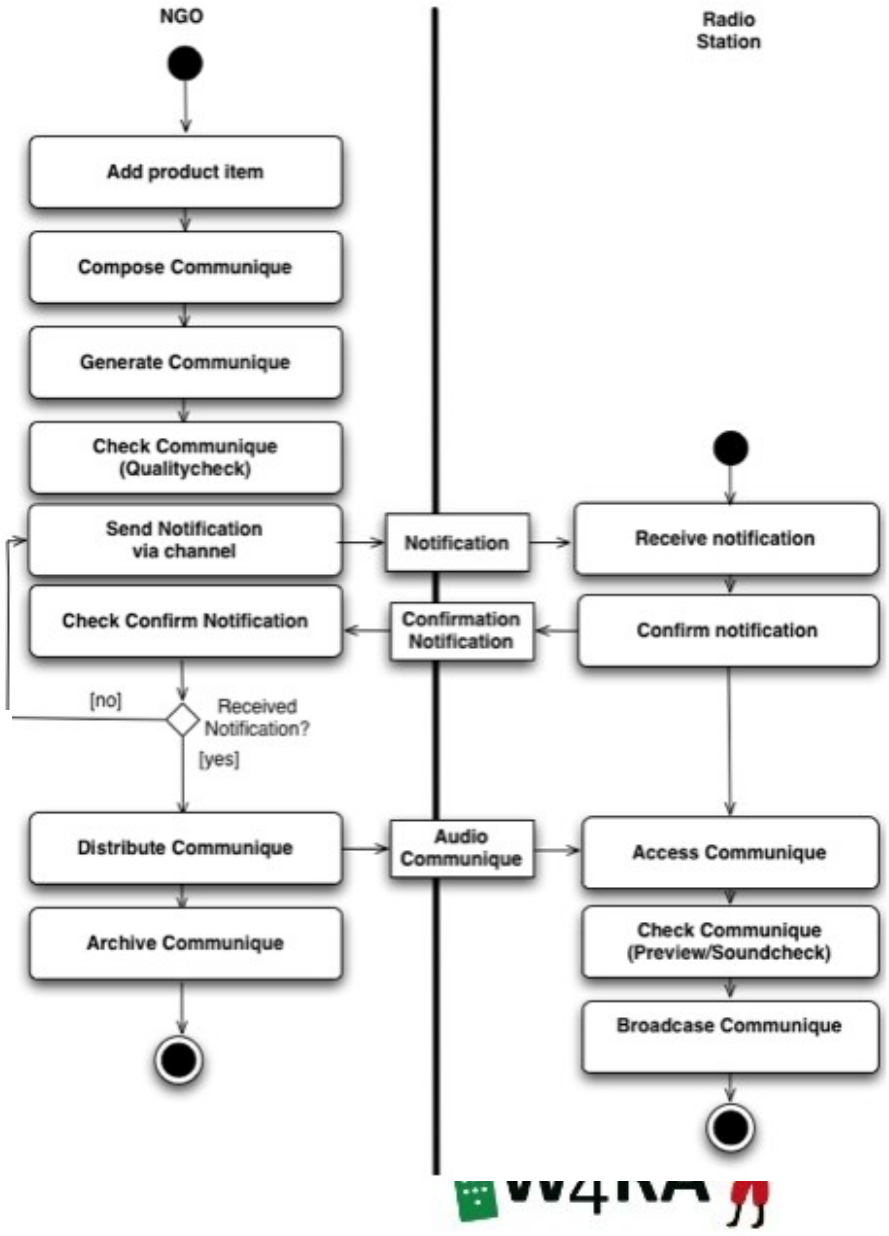
E.g. participatory approaches – bottom up initiatives

Build, test, evaluate – iteratively





Nom du produit	Unité de mesure	Quantité disponible	% quantité	Qualité du produit	Prix Unitaire moyen en F CFA	Montant Total FCFA	Nombre de communiqué
amande de karité	kg	15 900	67,30	amande ébouillanté	160	2 544 000	6
Beurre de karité	kg	1 880	7,96	Beurre issu des amandes ébouillantées	1 000	1 880 000	10
Graine de néré	kg	120	0,51	Graine propre	450	54 000	1
Miel liquide	litre	320	1,35	Miel non brulé et pressé avec les soins d'hygiène alimentaire	2 000	640 000	3
Tamarin	kg	5 405	22,88	tamarin décortiqué propre	250	1 351 250	14
TOTAL						6 469 250	34



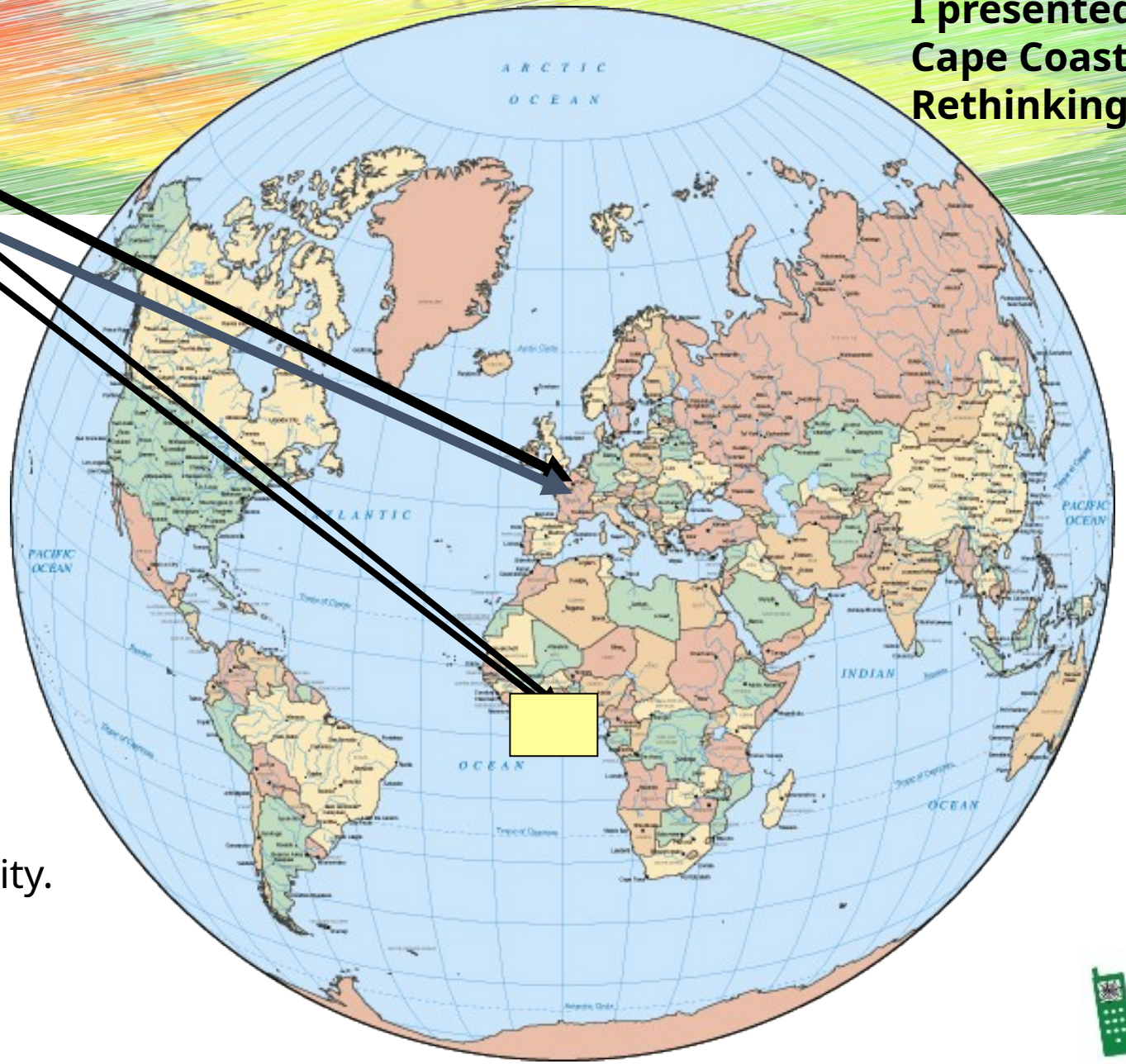
Ghana 2006

In 2006, as I started my ICT4D Program in Ghana, the first Concernn seemed to be the Lack of infrastructure
And the extremely high price For an Internet connection, Even for a University as e.g. The University of Cape Coast.

I showed them two animations to Illustrate why the Internet was

In e.g. 2006 the internet was still extremely expensive
In Africa. A 2 Mbit Internet connection was around 500 EUR/month at that time.
The internet was mainly provided through VSAT dish.
Case: Mr Kwame and Mr. Kwasi send each other an email

I presented this slide in 2008 in Cape Coast, Ghana at a conferenc Rethinking Development Studies.

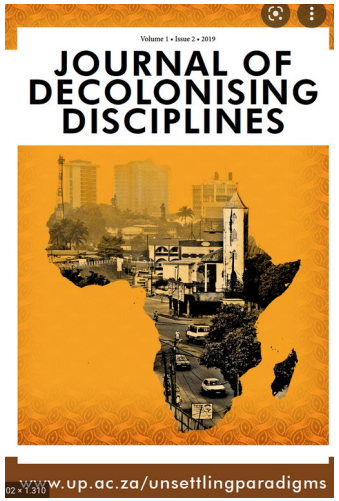


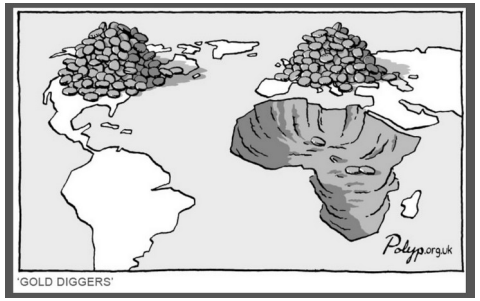
Since the two friends in Accra and Wa are using VSAT, the data travels through satelite (in total a voyage of 4 x 36000 km distance), s exchanged in a datacentre n e.g. Europe and returns to Ghana to be delivered. The whole travel will take a few seconds or minutes, but it illustrates the cause for the high price of connectivity.

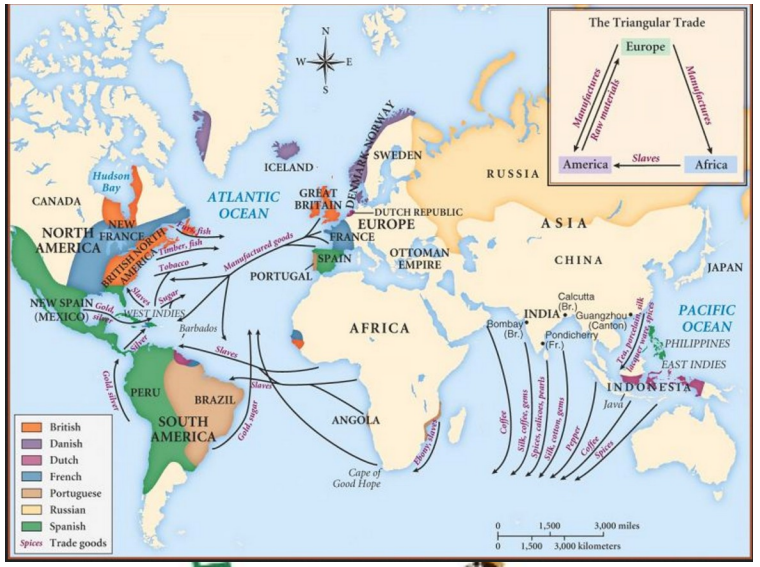
W4RA

the theoretical framework:

Studying the Digital Society through a decolonial lense







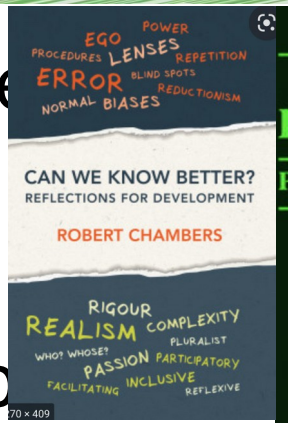
W4RA

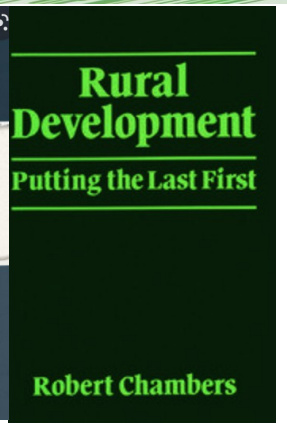
https://haver.blog/2019/04/19/cool-classes-decolonial-theory-indigeneity-and-revolt/

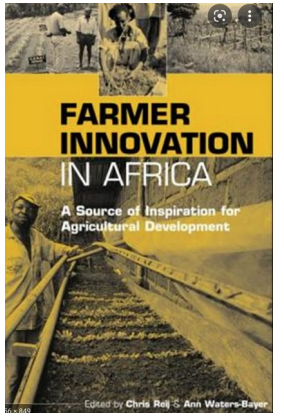
https://emilylorajames.wordpress.com/tag/dependency-theory/

Alternative models for ICT4D, inspired by participatory action research

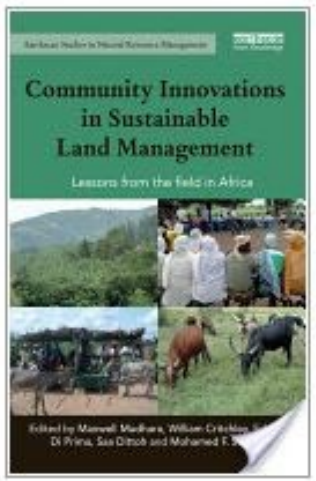
- User-centered design, collaboration, adaptation, ite
  - Living labs, Agile development methods
- Action research/design science
- Local innovation, Participatory Technology Develop
- Transdisciplinary action research (e.g. working with local communities, farmers, women groups etc). E.g: Robert Chambers, Saa Dittoh, Mathieu Ouedraogo, Chris Reij and others.







Analogy between digital technologies and agricultural technologies



New trends (e.g. Via Campesina)
Large-scale agriculture versus Community-based agriculture

Food Security versus Food Sovereignty

Climate-resilience, local production,
Farmer innovation, African Regreening Initiatives

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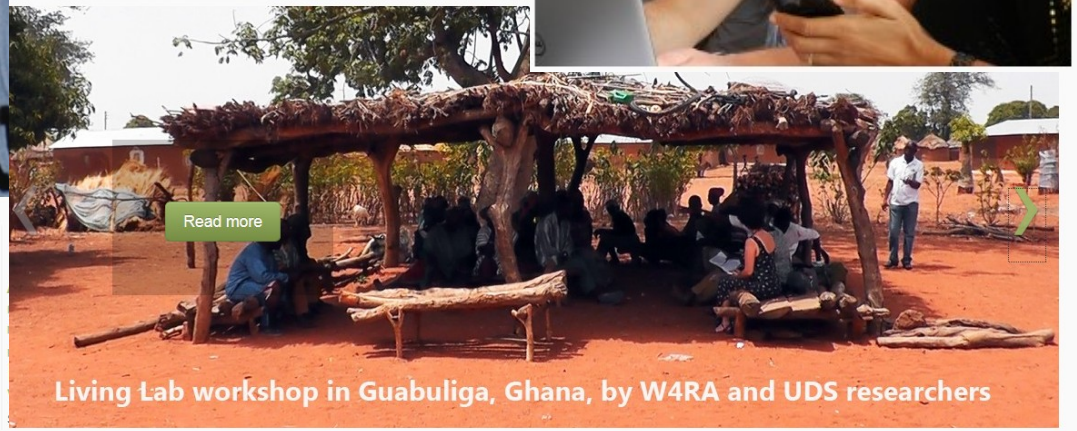
Since 2009 W4RA program – inspired by African Regreening Initiatives



Web alliance for
greening in Africa

rvices, especially mobile ones,
he potential to play a major role in
ing social and rural development in
ping economies. Market penetration
ral community adoption of basic
telephony and services have been

Apps for Food Security in Mali – W4RA and AOPP team up

From 9 to 14 October 2015, W4RA team visited Mali, to kick-start a new research project to support farmers to improve resilience and food security. This project,

How does it work? ICT4D in a community approach (From real world use case to ICT4D artefact)

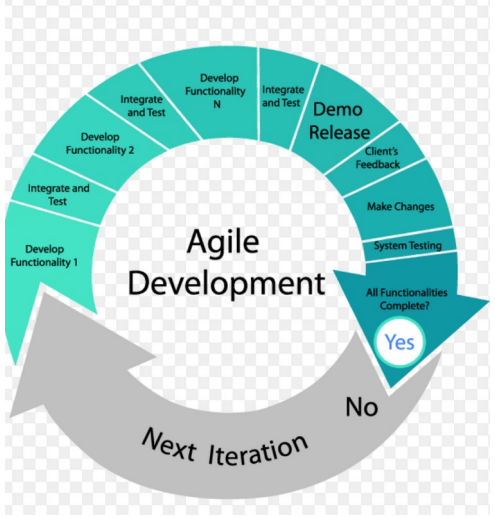
Iterative process
In which collaboration and context analysis
Take place in a space of Interaction, debate, co-design.

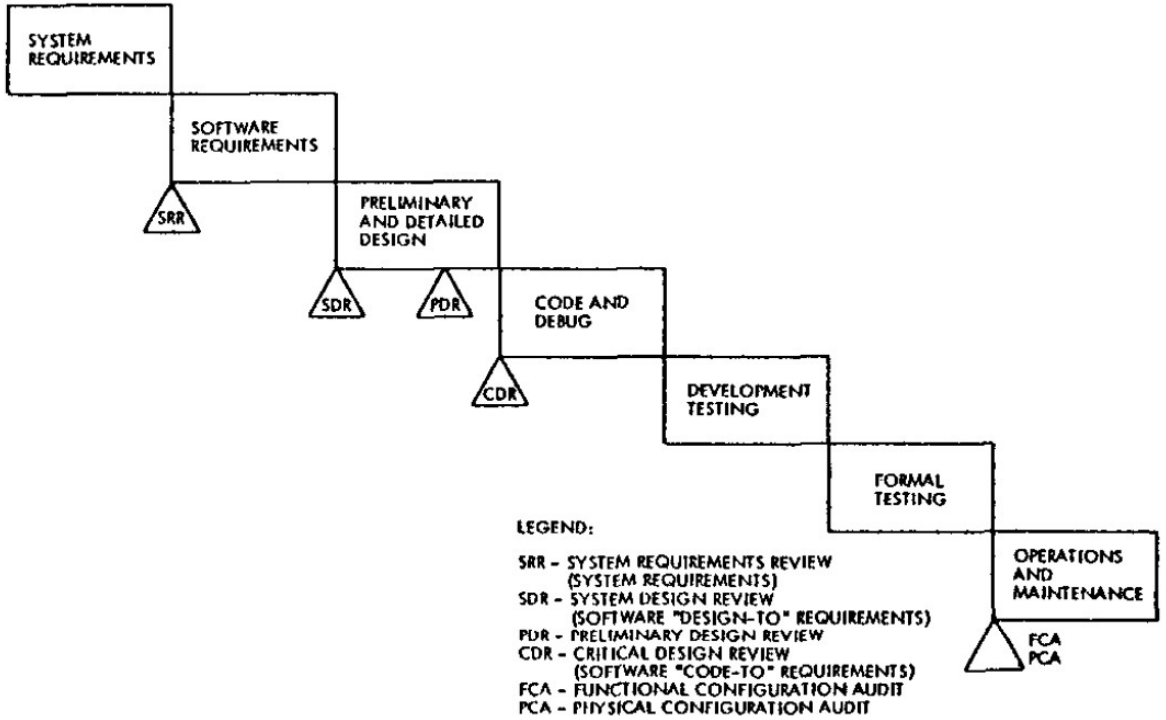
Relationhip is very important for the successful Deployment of ICT4D.

A structured ICT Artefact Adapted to context

What did we learn from all these ICT4D projects in the field?

- Waterfall model (1)
- Agile model

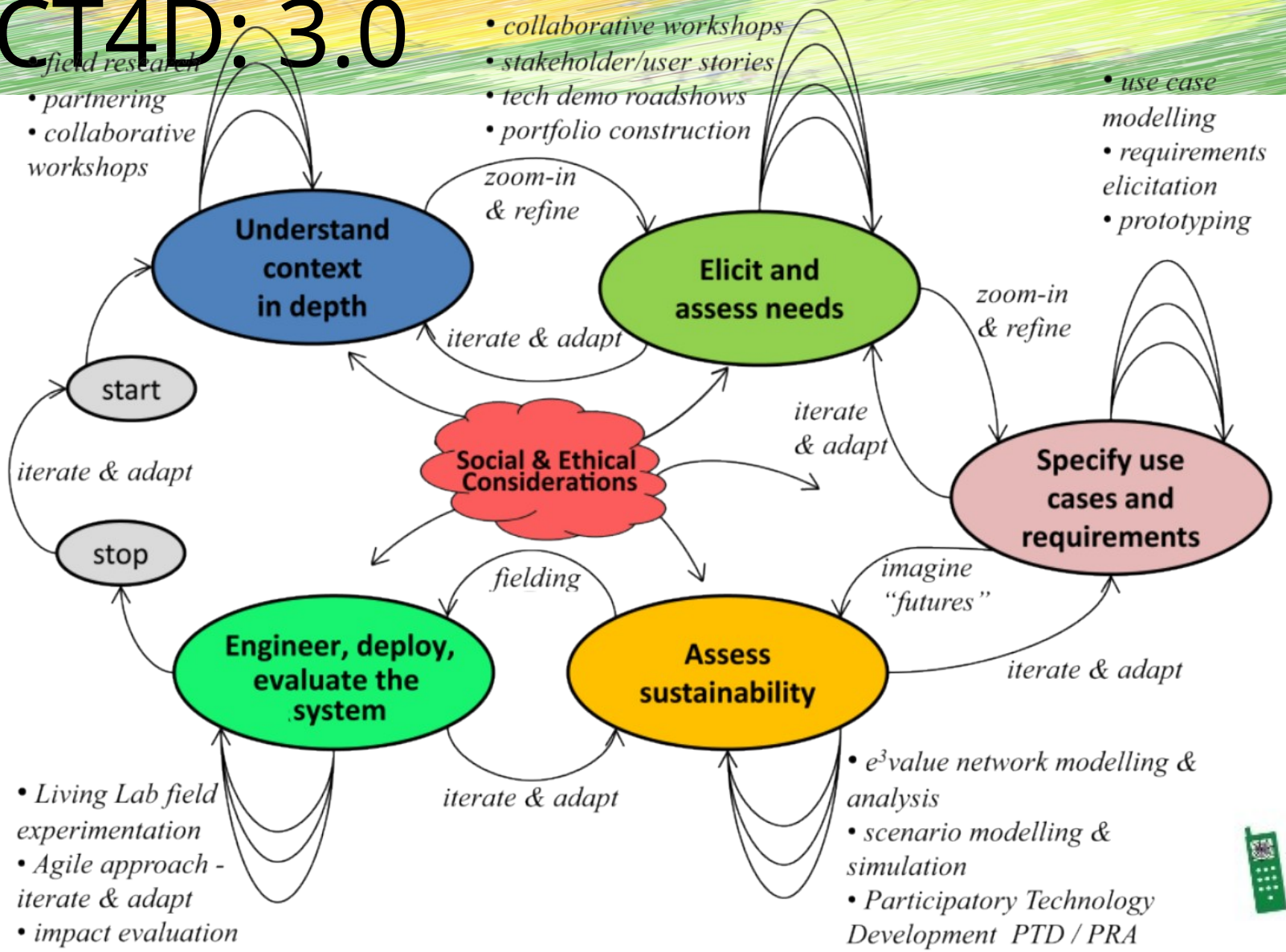




(1) From: Bell, Thomas E., and T. A. Thayer. Software requirements: Are they really a problem? *Proceedings of the 2nd international conference on Software engineering.* IEEE Computer Society Press, 1976.

(2) From: https://github-wiki-see.page/m/younasgithub/UTMAgileRep/wiki/UTM-AGILE-PAGE

Agile/collaborative development model for ICT4D: 3.0



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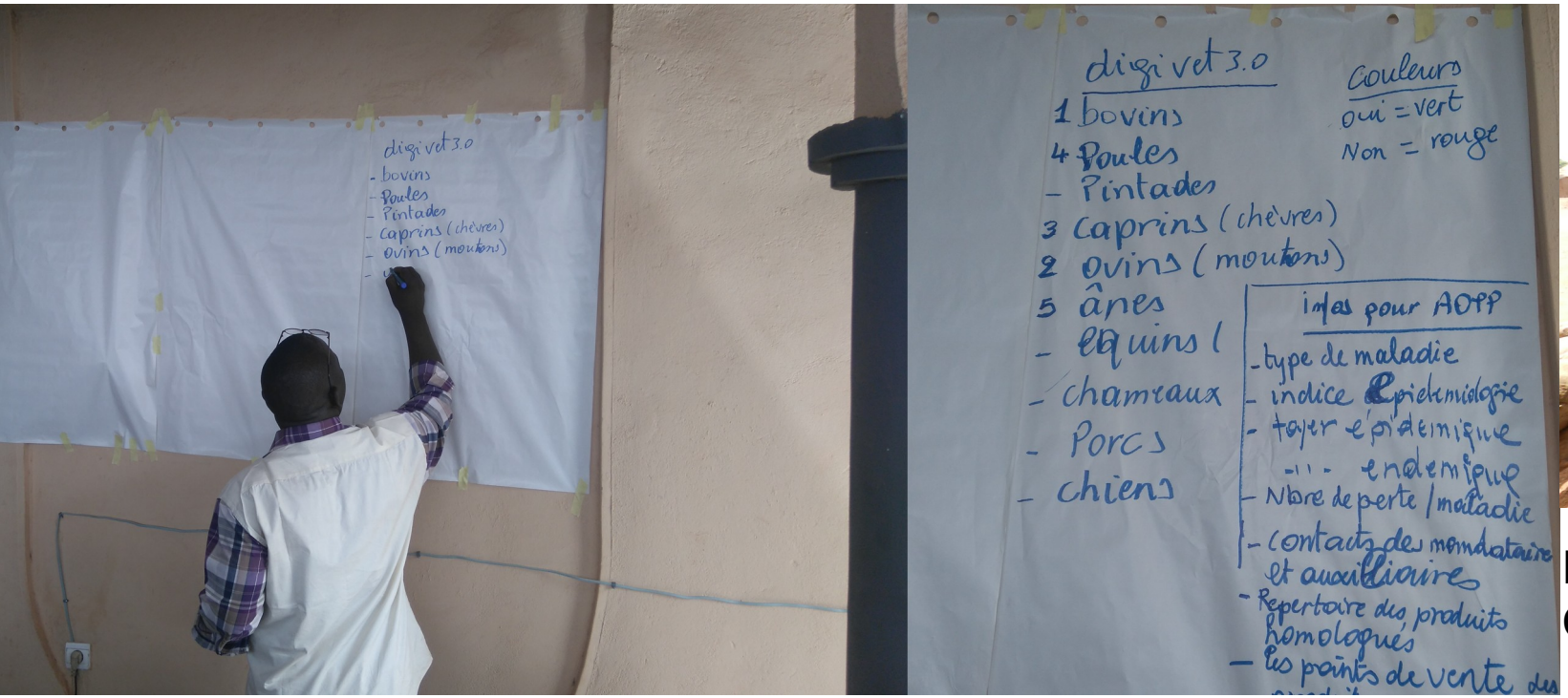
Needs assessment and *collaborative* goal construction, with the users

- Who are the users? What are their operational goals?



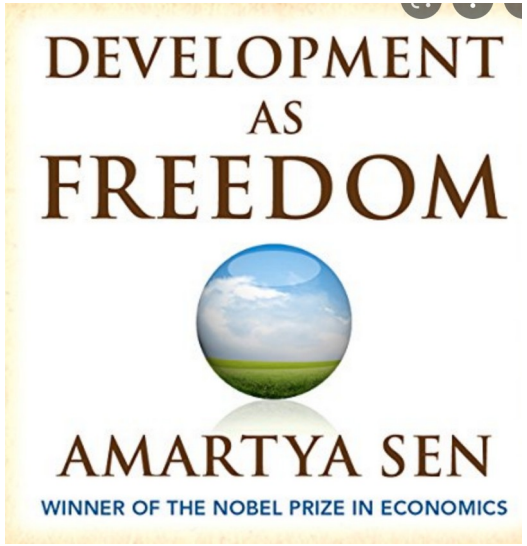
Example of collaborative workshop in Bamako, AOPP office, Mali, 2016, designing animal health application

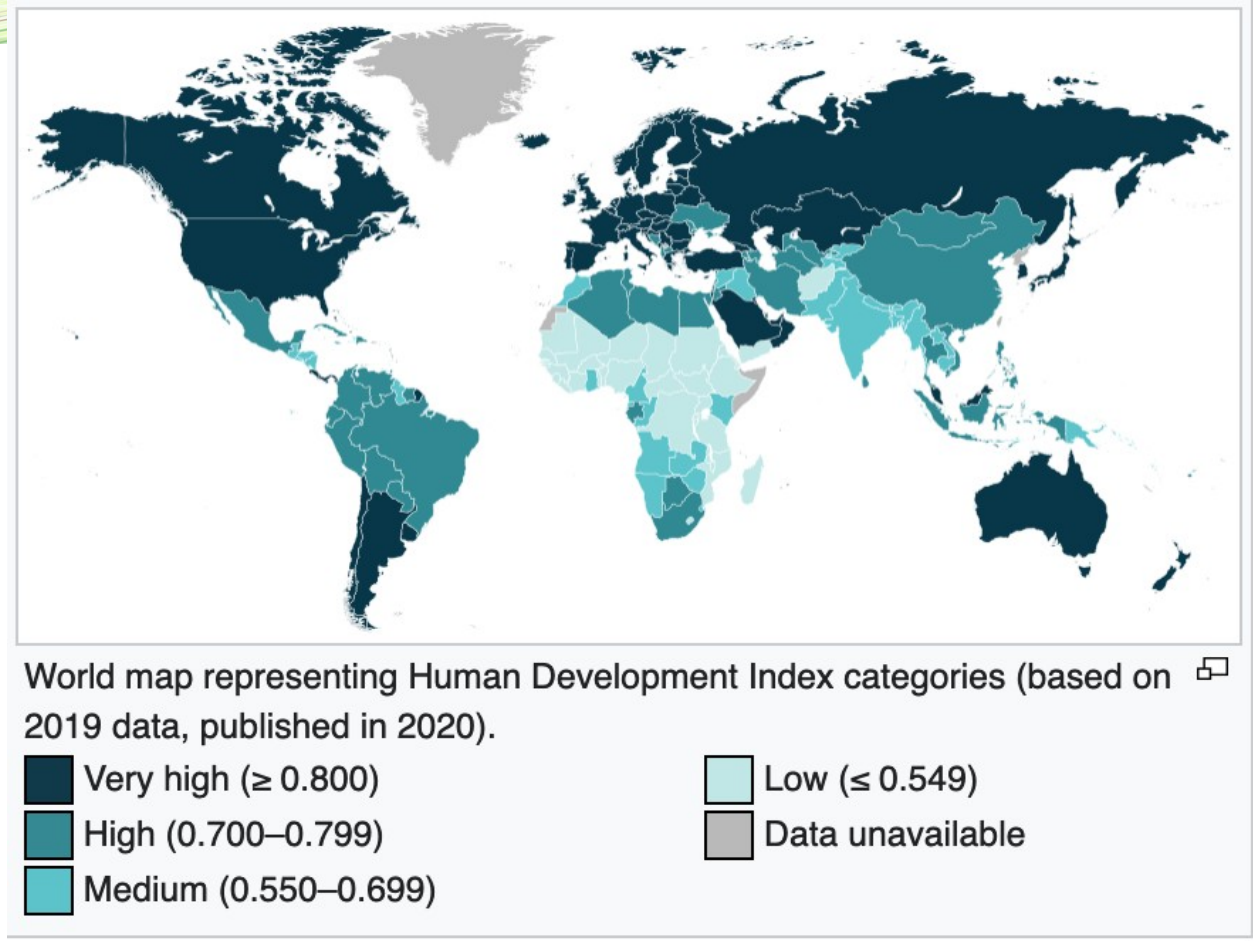
Example of collaborative workshop in Gua
Ghana, exploring user goals for voice-bas

W4RA

Development as *Freedom*

- UN Human Development Index UNDP





Source: https://en.wikipedia.org/wiki/File:Imf-advanced-un-least-developed-2008.svg

2006 – present: a short (personal) narrative of ICT4D research

ICT4D research and education in West Africa, Latin America, SE Asia
2006 - 2022

W4RA

SDGs not on track – report 2023

"Four years have passed since the 2019 Global Sustainable Development Report (GSDR) was published and even then, the world was not on track to achieving the Sustainable Development Goals (SDGs)..[..]..

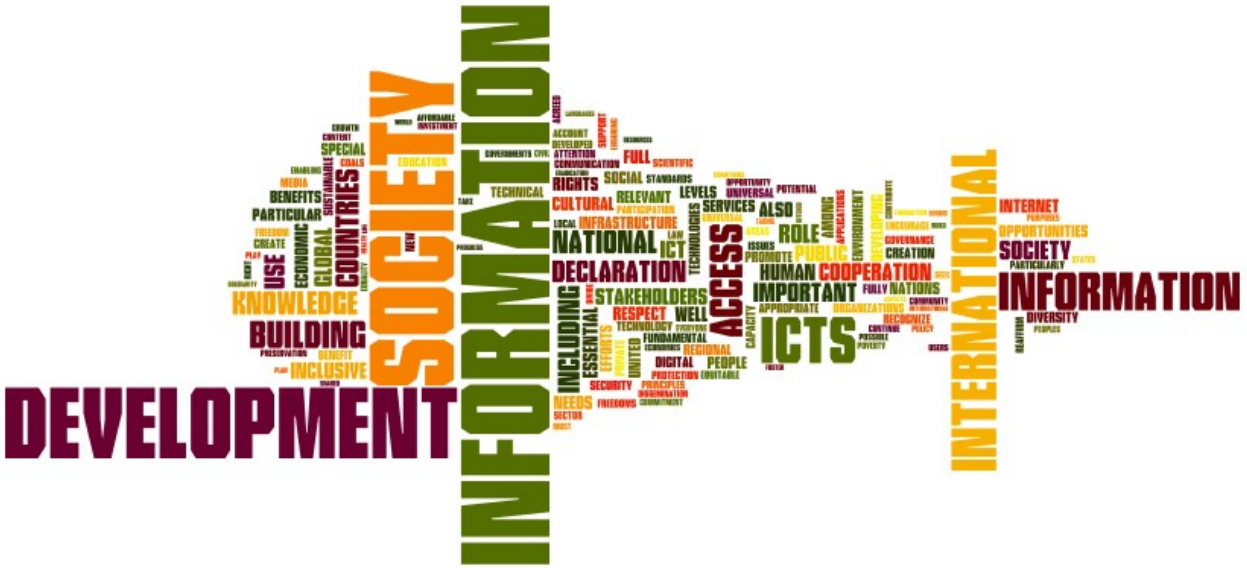
Since 2019, challenges have multiplied and intensified..[..]..

Progress has been halted in many areas partly as a consequence of a confluence of crises. [..]

As a result, overall progress towards the 2030 Agenda and the SDGs has been severely disrupted in the last three years, yet every inch of progress matters and counts. "

Source: Global Sustainable Development Report Advance, Unedited Version 10, 14.06.2023

Digital Society concerns for the Global South 2005 – 2022 have evolved



*) Word cloud of Declaration of Principles of the World Summit on the Information Society, by the United Nations, Tunis, November 2005

*) Concens of the Digital Society in 2022

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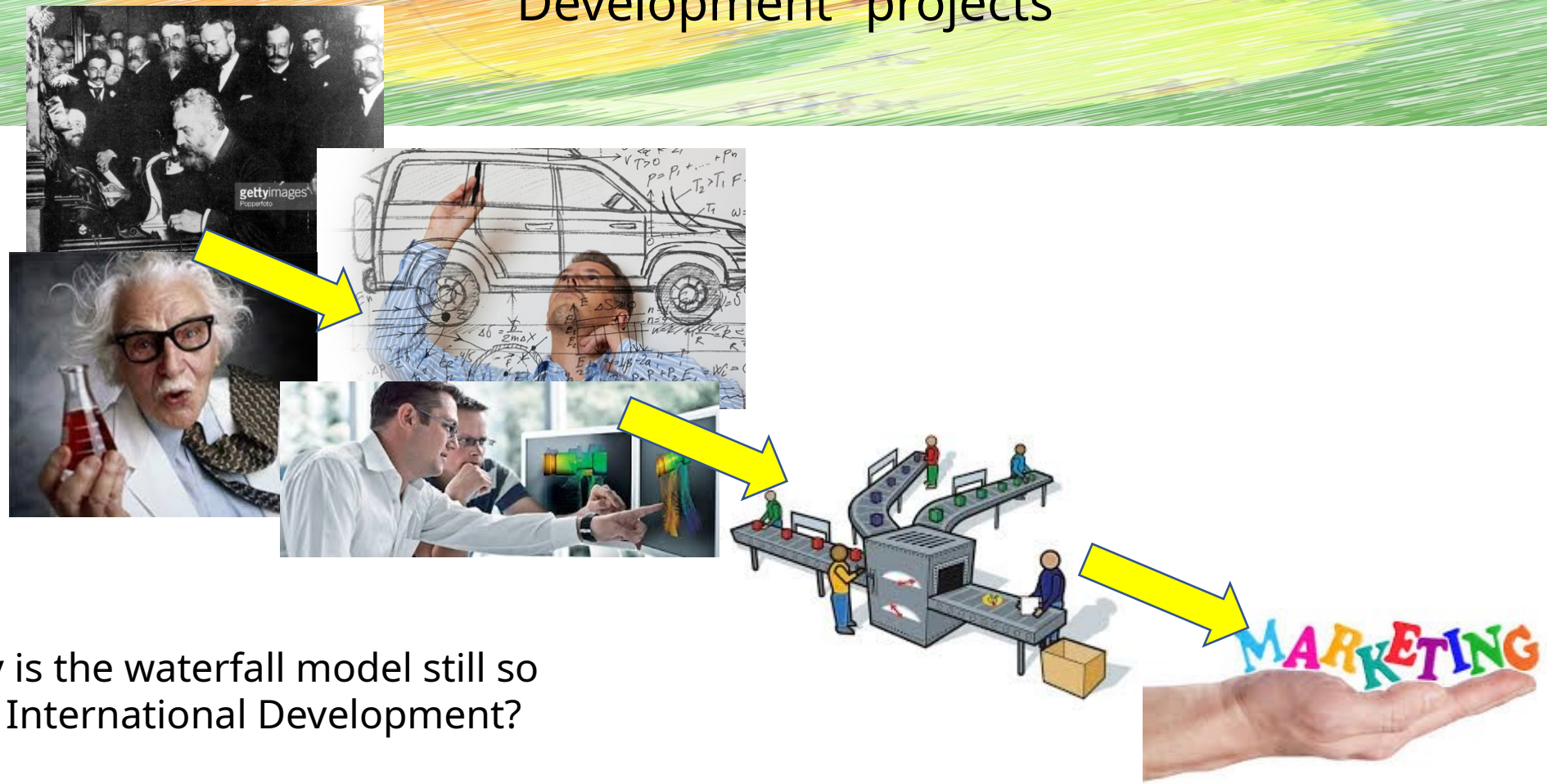
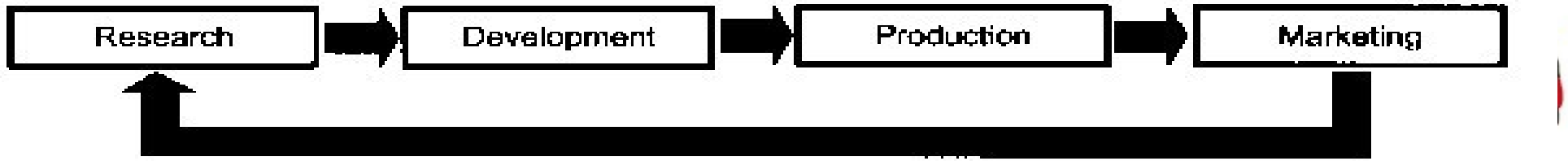
A case study: the OLPC -

- *Presented by Kofi Anan in 2005 at the WSIS in Tunis.*
- *OneLaptopPerChild persuaded many governments of developing countries to commission large-scale deployments of XO laptops for primary education.*
- *The largest deployment took place in Peru: the national government spent 225 million US$ on OLPC's XO laptops.*
- *In Uruguay 395.000 XO laptops were delivered to 2332 public primary schools, in 2009.*
- *OLPC wanted to deliver the XO laptop in bulk only, with a minimum of 1.000.000 laptops per order, but this figure appeared too optimistic. In April 2007 OLPC lowered the minimum order to 250.000 laptops.*
- *The XO was nicknamed the $100 laptop, but its actual unit price was 160 US$, not including deployment costs, maintenance and training of teachers [220].*
- *Nicholas Negroponte estimated that, by the end of 2007, 150 million of these laptops would be shipped annually….*

How is our model different from the linear model of innovation used in “Conventional International Development” projects



Question: Why is the waterfall model still so widely used in International Development?



How to bridge the Digital Divide: different models

In International Development programs/actions - **interventions**
Free market ideology – private sector led **market development**
Participatory – grassroot/**bottom up initiatives**; open source movement