

HCI and Design

Admin

Assignment 3 is DONE! (Phew!)

Assignment 4 is posted, due April 13th

- Solo or in pairs (your choice)
- I am giving you three weeks for a reason 😊
- Do NOT start late, you will run out of time

In-class activities

- A few people have submitted files with no NetID 😞

Paper prototype vs. Storyboard



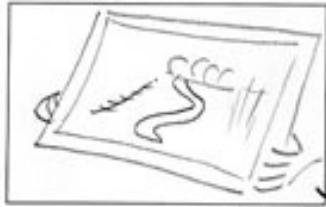
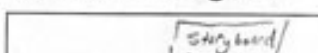
1. Wide shot of both Sarah and Callum illustrating where they are and what the film is about
Props: Megaphone, Clapper board



2. Close-up of Sarah speaking directly to camera
Script: Sarah
One thing you must remember...



3. Low angle camera pointing up at Callum
Props: Moustache, Paintbrush
Script: Callum
'Oops! Sarah is right...'



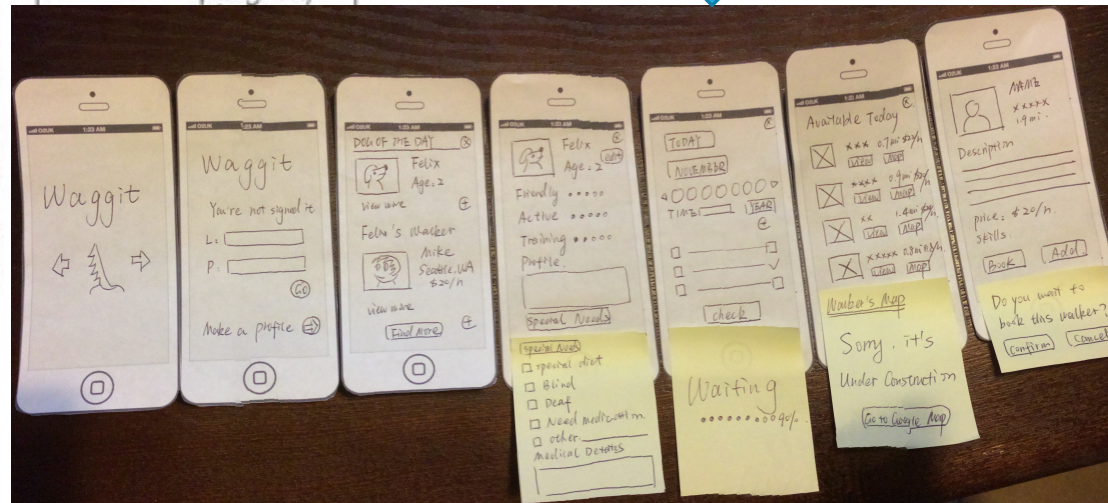
4. Close up of Sarah holding photograph



5. Camera zooms out to a wide shot showing Sarah speaking about using photographs to plan your storyboard.

← Storyboard

Paper Prototype

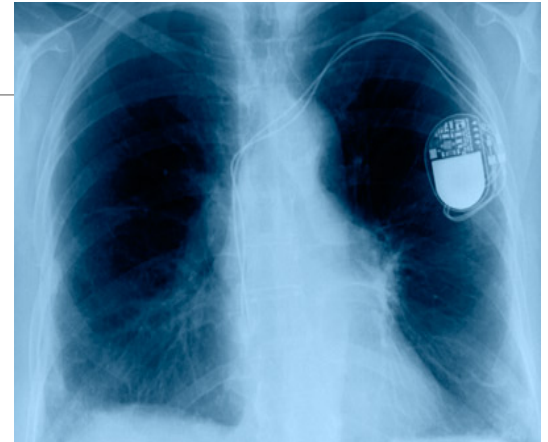


Today

Design for Marginalized Communities

Practice with InVision

New technologies provide new benefits

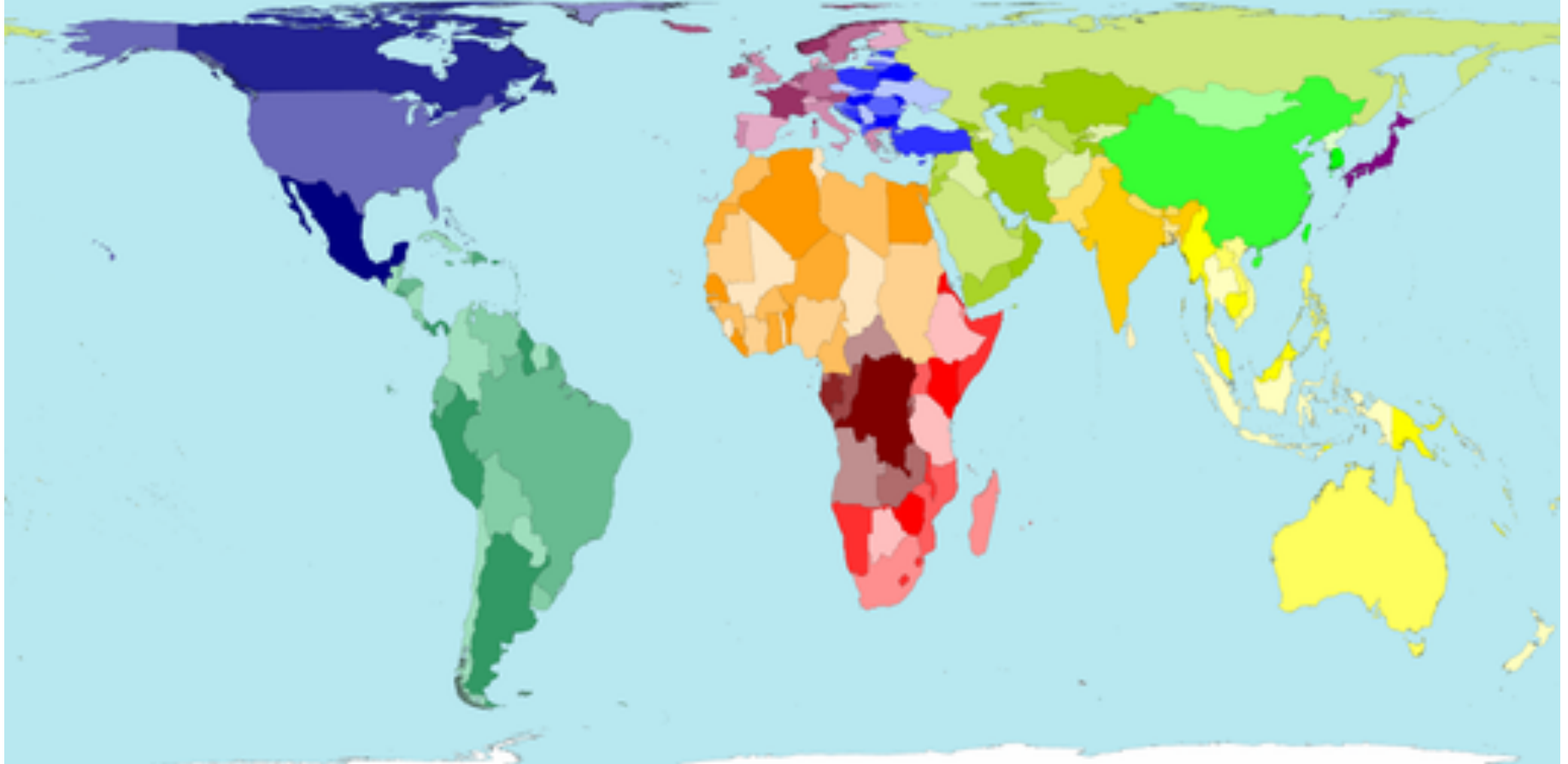


Most new technologies benefit a small fraction of the global population

80% of world's population lives in developing regions

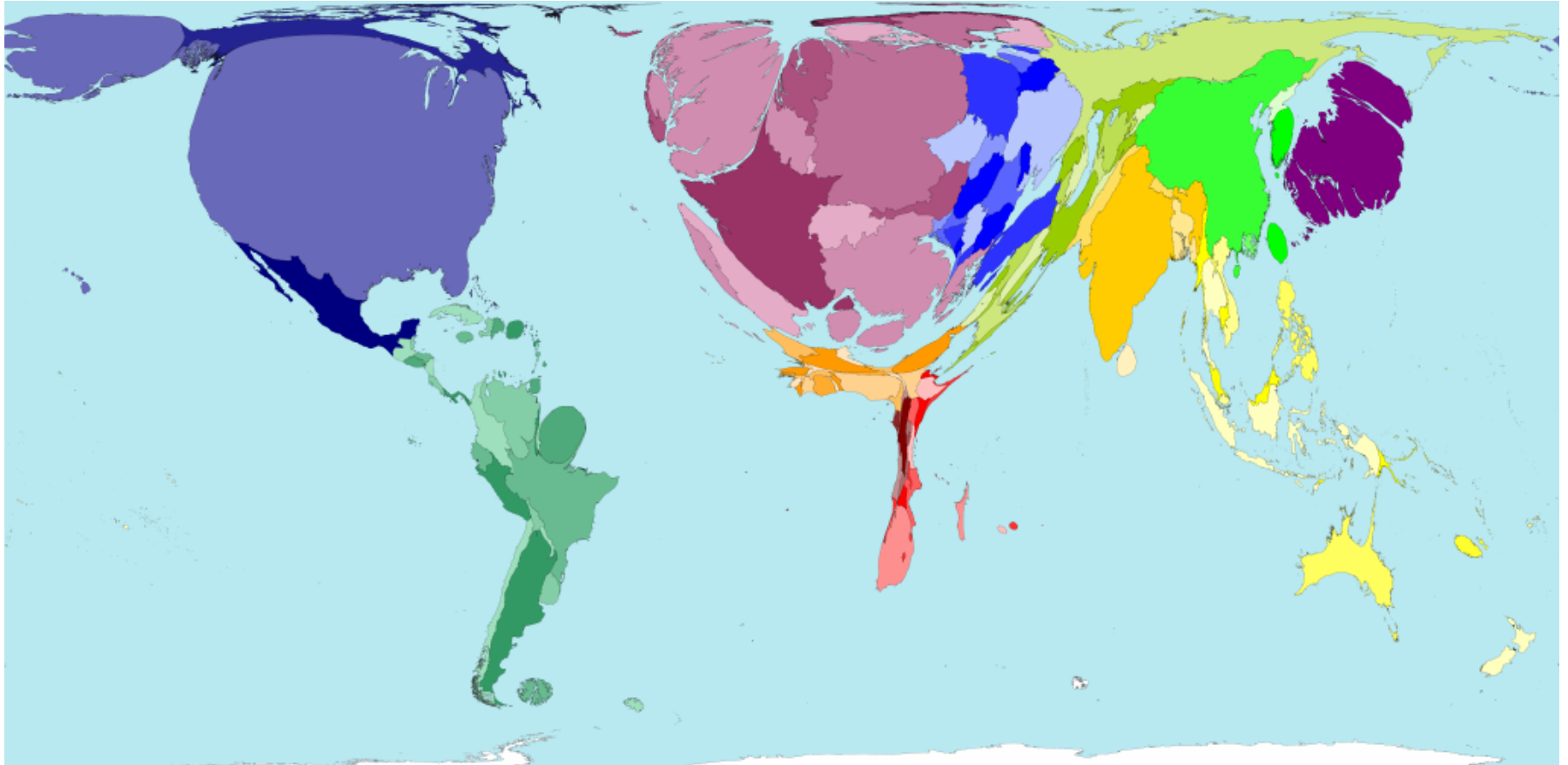


A Map of the World



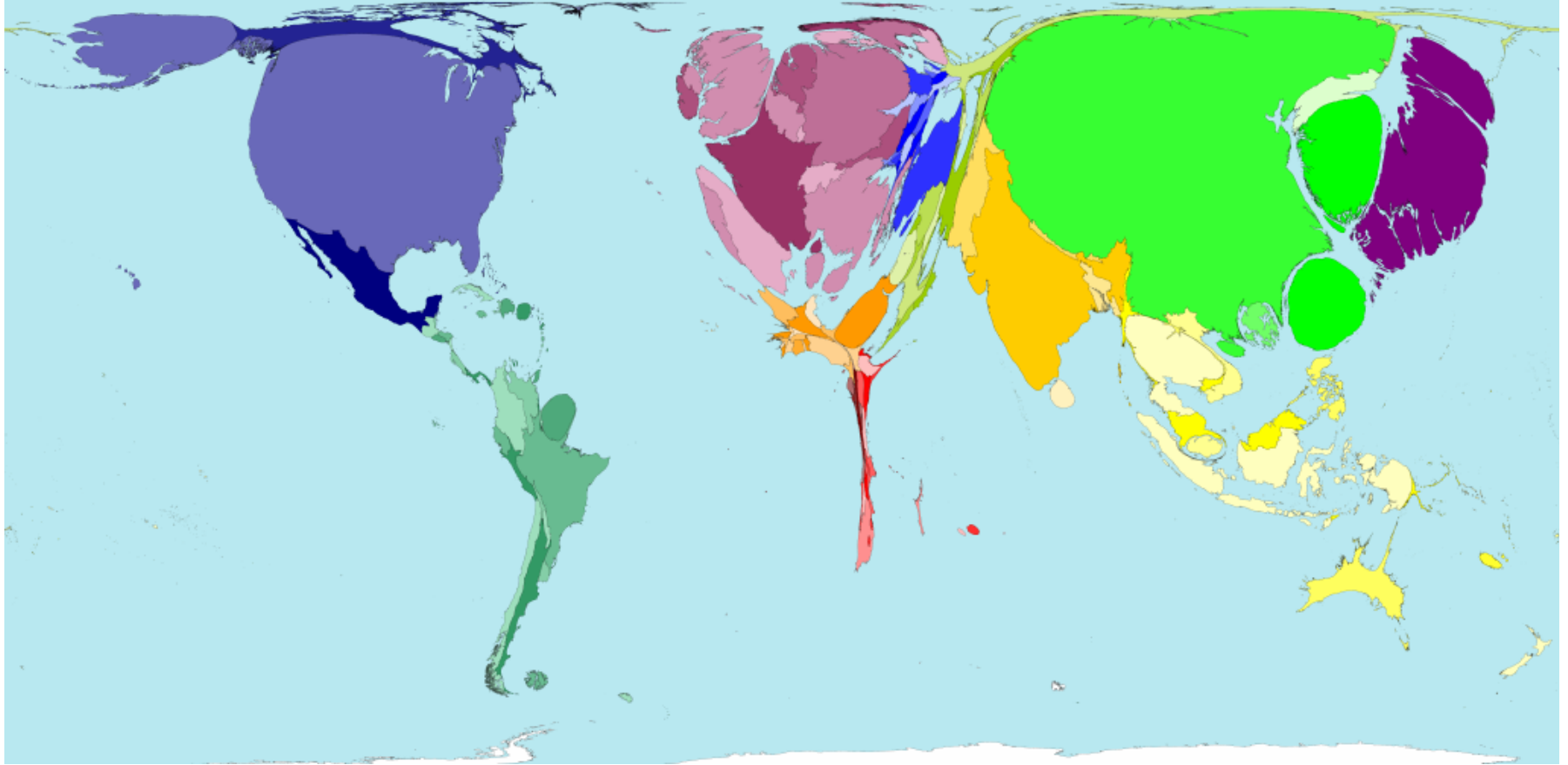
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Global Wealth Distribution: circa 1960



Worldmapper, "Wealth Year 1960", Worldmapper,
<http://www.worldmapper.org/display.php?selected=160>, (C) Copyright SASI Group (University of Sheffield) and Mark Newman (University of Michigan), CC: BY-NC-ND

Global Wealth Distribution: circa 2015



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<http://www.worldmapper.org/display.php?selected=164>, (C) Copyright SASI Group (University of
Sheffield) and Mark Newman (University of Michigan), CC: BY-NC-ND

Design for Marginalized Communities

Goal: Create technologies that empower underserved or marginalized communities to overcome global challenges



There are marginalized communities everywhere!

Three defining characteristics

Global problems

Poverty
Education
Gender equality
Infant mortality
Maternal health
Human rights
Conservation

Technology constraints

Computers
Cell phones
Mobile devices
Networks
Connectivity
Energy and power
Transport

Diverse challenges

Culture
Gender
Politics
Language
Literacy
Social structures
Communication

What platforms make sense?

ICT developments in Africa, 1998-2008 penetration rate

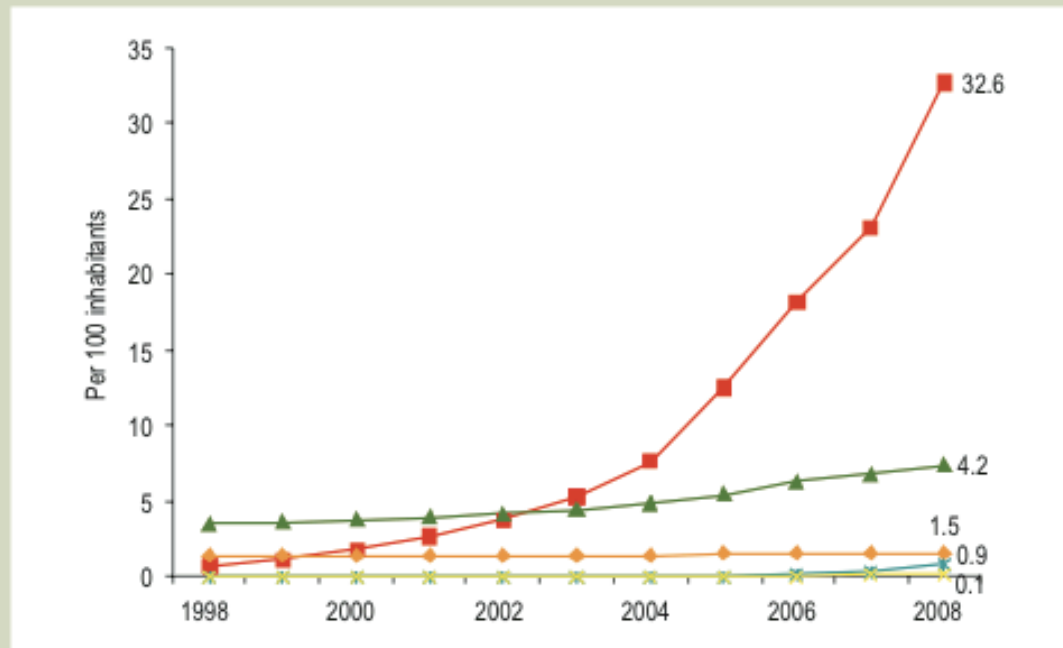


Chart 1.1

- Mobile cellular subscriptions
- Internet users
- Fixed telephone lines
- Mobile broadband subscriptions
- Fixed broadband subscribers

Source: ITU World Telecommunication/ICT Indicators database.

A billion mobile subscriptions in Africa by 2015!

Why target mobile devices?

Portable

Battery-powered

Familiar

Intuitive touchscreen

Built-in sensors

Network interfaces

Storage capacity



Built-in sensors provide many opportunities

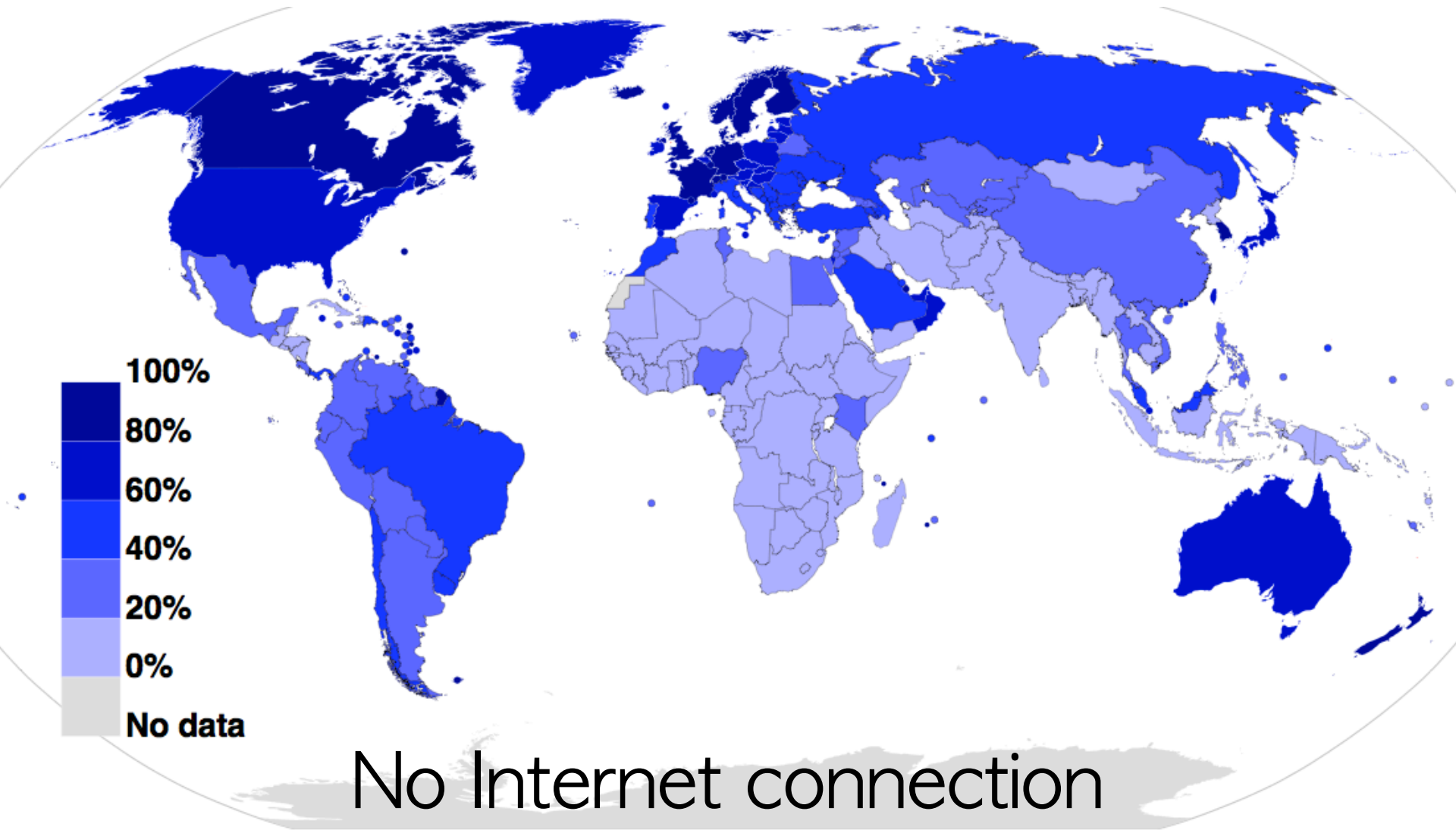


Can we just use the same apps and systems that we use in the US?



Internet users in 2010 as a percentage of a country's population

Source: Percentage of Individuals using the Internet 2000-2011, International Telecommunications Union.



Many other constraints

No or intermittent electricity

Low levels of education

Low levels of literacy

Unfamiliar with technology

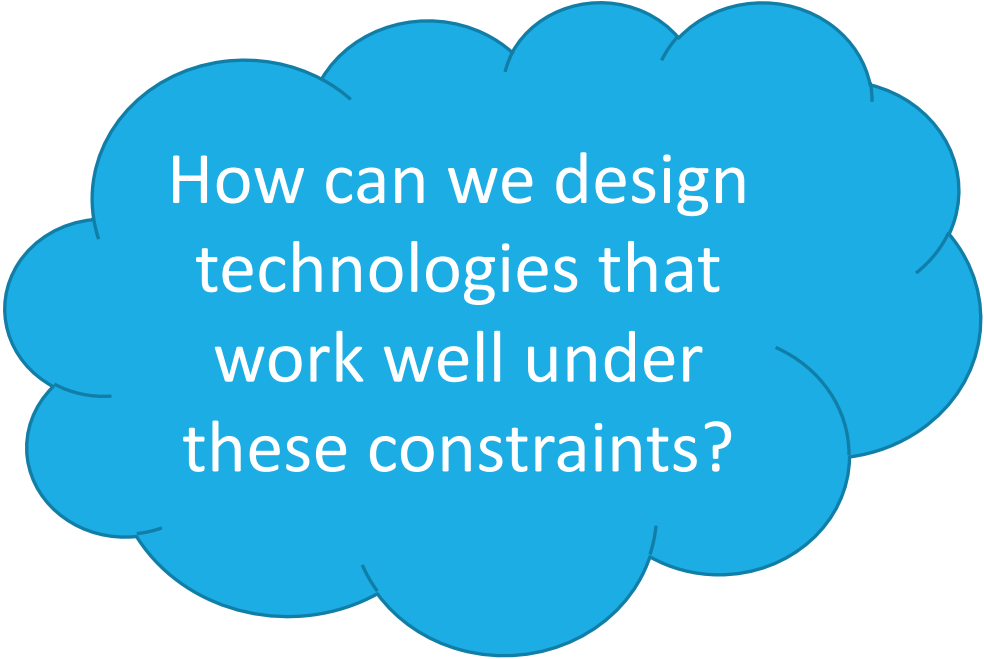
Linguistic challenges

Social and cultural challenges

Poverty

Political challenges

Many more....



How can we design
technologies that
work well under
these constraints?

In the beginning....

Technology will save the world!

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How technology can help us eliminate, not alleviate, poverty

THE BLOG

Technology to End Extreme Poverty

🕒 09/24/2012 10:48 am ET | **Updated** Nov 24, 2012

Example: One Laptop per Child

Originally the \$ 100 Laptop

Later OLPC, finally XO (\$399 for 2)

Technological Innovation

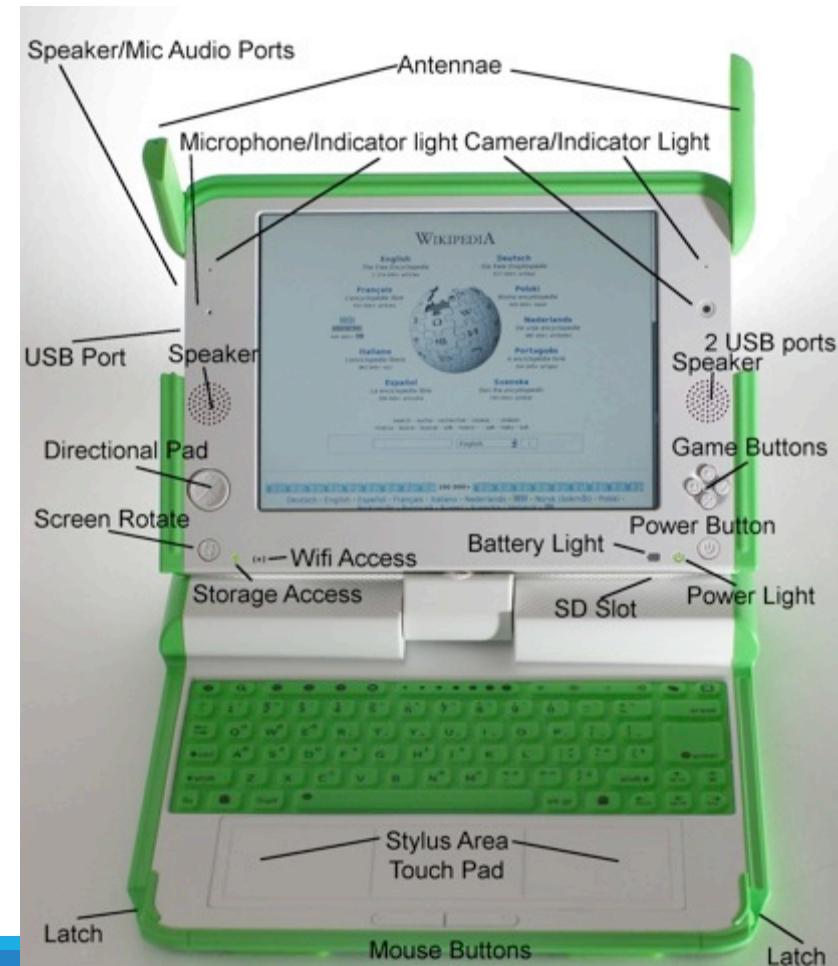
Learning approach

Constructivism

Take laptops home, play with them

Critiques

“Little or no sustained and scaled effects on teaching, learning, and achievement” (Bain and Weston)



Problems with OLPC

Technology centric approach – no focus on humans

Did not fit people's actual needs

Did not pay attention to local contexts and challenges

Did not provide on the ground support

Did not plan for sustainability



The Failure of OLPC:

<http://hackeducation.com/2012/04/09/the-failure-of-olpc>

How can we do better?

Amplification theory

- Technology can only amplify human intent (Toyama)

Key idea: Technology on it's own won't do anything

People have to want to change the situation, solve the problem



Example: Digital Green



Problem: Teach poor farmers better farming practices

Solution: Digital Green

Mediation / Mediator

Highly formatted, targeted video content

Contextual content: local presenter, not “well-dressed” scientist

Supporting organizations on the ground

Outcomes: 55% adoption of new practice over 8% in old system

Why it works

Pays attention to local culture and context

Specifically designed to suit the needs of target population

Gives people tools so they can solve their own problems

Provides support through organizations on the ground



Design for Marginalized Communities

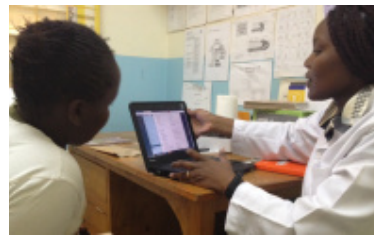
Everything you know about good design still applies!

- Pay close attention to user needs, understand the context, iterate

Design process often requires extensive fieldwork with target communities to understand the space

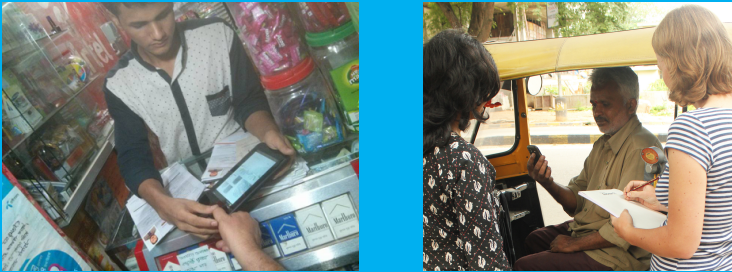
The work often requires input from multiple organizations and communities: strong partnerships are essential

If done right, there is great potential for positive impact!



Design for Marginalized Communities (My Approach)

Analyze the entire ecosystem
Many stakeholders, different needs

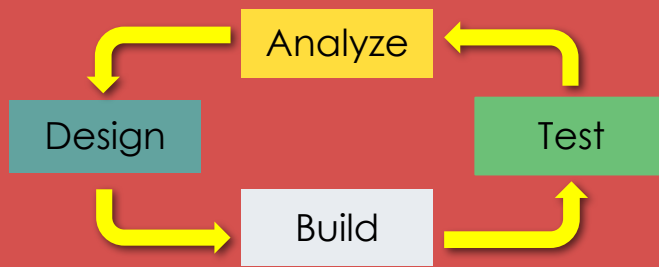


Technology hand-off
Broad impact



Bangladesh, India, Kenya, Kyrgyzstan, Mozambique, Pakistan, United States, Zimbabwe, etc.

Invent robust and usable systems
Iteratively design, build, test



Longitudinal deployments
Partner with organizations



A few example domains

Healthcare

- Low-cost diagnostics and telemedicine
- Disease prevention and education
- Healthcare informatics

Agriculture

- Supply chain efficiencies
- Agricultural education
- Market and pricing information
- Geophysical sensing

Education

- Low cost computing
- Computer sharing
- Distance education

Governance

- Information organization
- Information communication
- Detecting and reporting corruption
- Activism

Design

- Interfaces for low-literacy
- Interfaces for low education
- Assistive technology

Financial services

- Microfinance information
- Mobile money
- Financial literacy

Summary

Global problems

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Literacy
Social structures
Communication

Technology alone is not enough, focus on the humans!
Everything you have learned about good design/HCI still applies
BUT the context and complexities are often fundamentally different