

A photograph of a person, possibly a woman, wearing a blue, textured net or mesh garment. The person is looking down and to the right. The background is a similar blue mesh texture.

I AM NEXT

Introduction to NextLab I

Designing Mobile Technologies for the Next Billion Users



Wednesday, September 3, 2008



Welcome to NextLab I !

- **Designing Mobile Technologies for the Next Billion Users**
 - 6.976 / MAS 965 / SP.716
- **Instructors**
 - Jhonatan Rotberg, Lecturer, Media Arts and Sciences
 - Luis Sarmenta, Research Scientist, MIT Media Lab
- **Team Mentors**
 - Gari Clifford, Principal Research Scientist, HST
 - Rich Fletcher, Research Scientist, MIT Media Lab
 - Andrés Monroy-Hernández, RA, MIT Media Lab
- **Teaching Assistants**
 - Yoni Goldwasser (RA, HST)
 - Paul Yang (RA, ESD)
 - Luis Blackaller (Alumnus, MIT Media Lab)

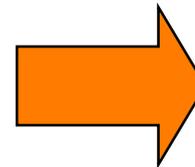
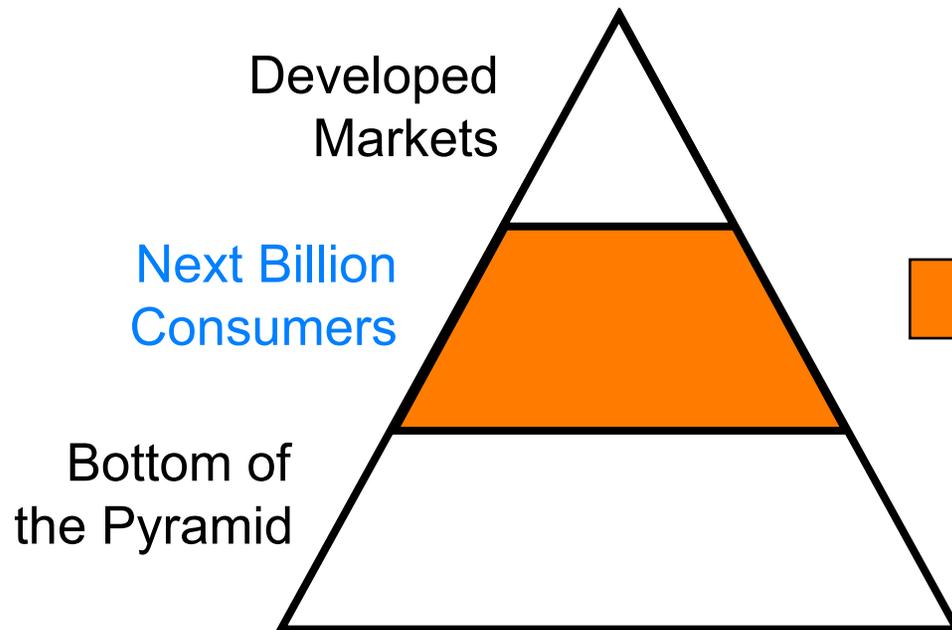


Overview: Mobile Technologies for the Next Billion



The Next Billion

One billion of newly connected individuals within the next 3 years, throughout the developing world



Courtesy of Joseph Bamber. Used with permission.

World Mobile GSM Coverage (Jan 2005)

Source: <http://www.coveragemaps.com/gsmposter.htm>

Four slides of World Mobile GSM Coverage Maps removed due to copyright restrictions.
2005, 2006, 2007, and 2008 versions, from <http://www.coveragemaps.com/gsmposter.htm>.



The Mobile Phone Revolution

- **Before ...**
 - no phones
 - no PCs
- **Now ...**
 - mobile connectivity almost everywhere!
 - even lower-income people have it
- **Result ... developing countries are leapfrogging traditional technologies**
 - even “simple” tech like SMS can have huge impact
 - innovations are happening in the developing world

Mobile Phone Application Areas for the Next Billion

- Economic Empowerment
- Education
- Health
- Community and Citizen Journalism
- Environment

- Some recommended web sites
 - <http://ShareIdeas.org>
 - <http://textually.org>

Examples: Economic Innovation

- **Just having communication helps!**
 - e.g., Fishermen in Kerala, India
- **Tools for Micropayments and Microfinance**
 - Mobile-to-Mobile transfer of cash and/or pre-paid credit via SMS
 - Empowers the unbanked
 - Empowers microbusinesses
 - Remittances
- **Other Mobile Services**
 - e.g., job ads, classifieds, etc.



Example: SMS Job Finder Service

- **User texts FINDJOB <JOB> to 123**
 - e.g., *FINDJOB DRIVER*
- **Service responds (via SMS text message) with ...**

*Agency: JobsRUs. DRIVER needed as of 9/1/08,
Call (987) 654-3210*
- **Or, user can subscribe to alerts**
 - e.g., *FINDJOB SUBS DRIVER*

* based on a gov't service in the Philippines (ca. 2004)



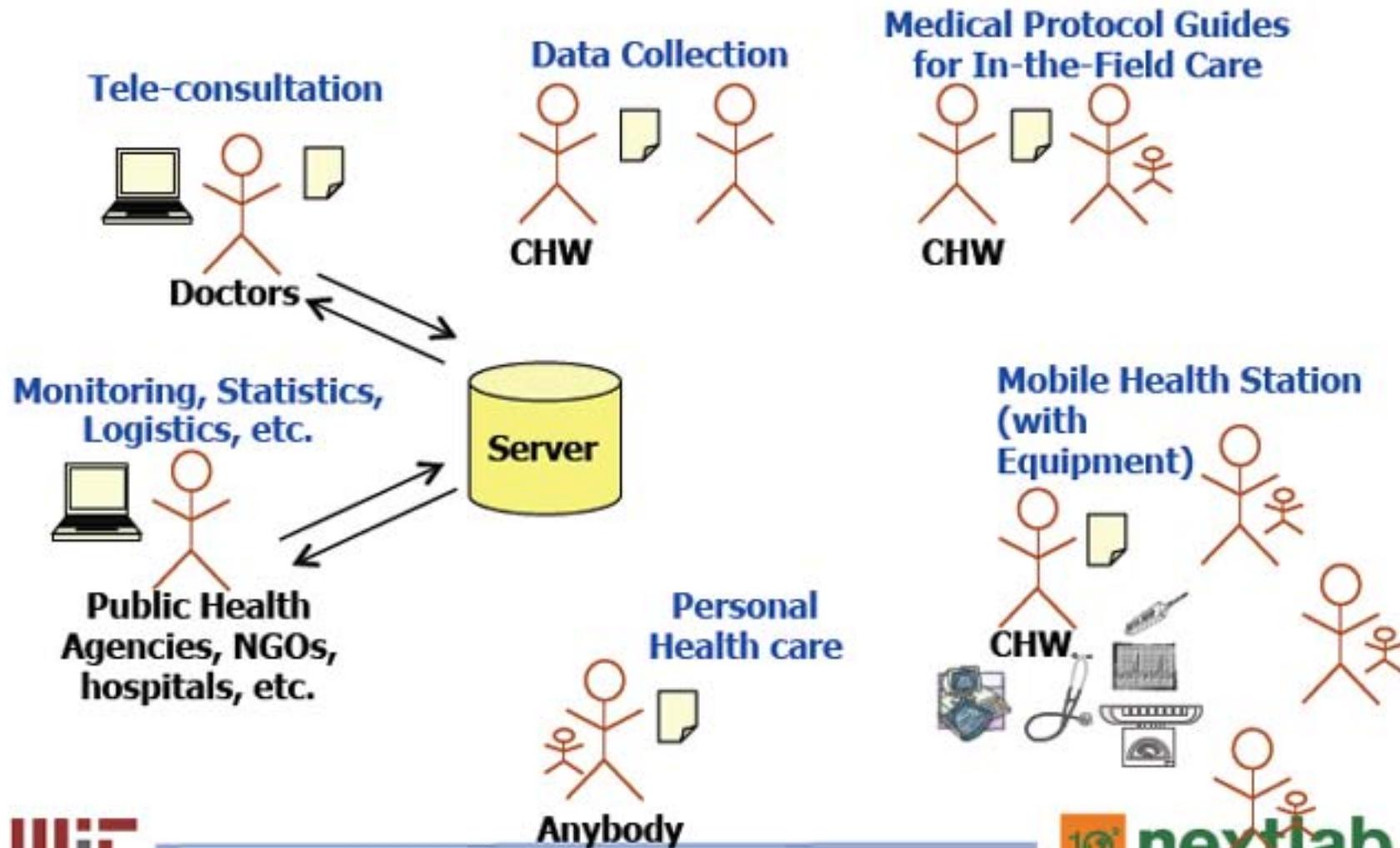
Example: J2ME Applications

- **Runs locally on the phone**
 - but can include online component too
- **Educational Games**
- **Tools**
 - e.g., calculators for health workers, as well as personal use

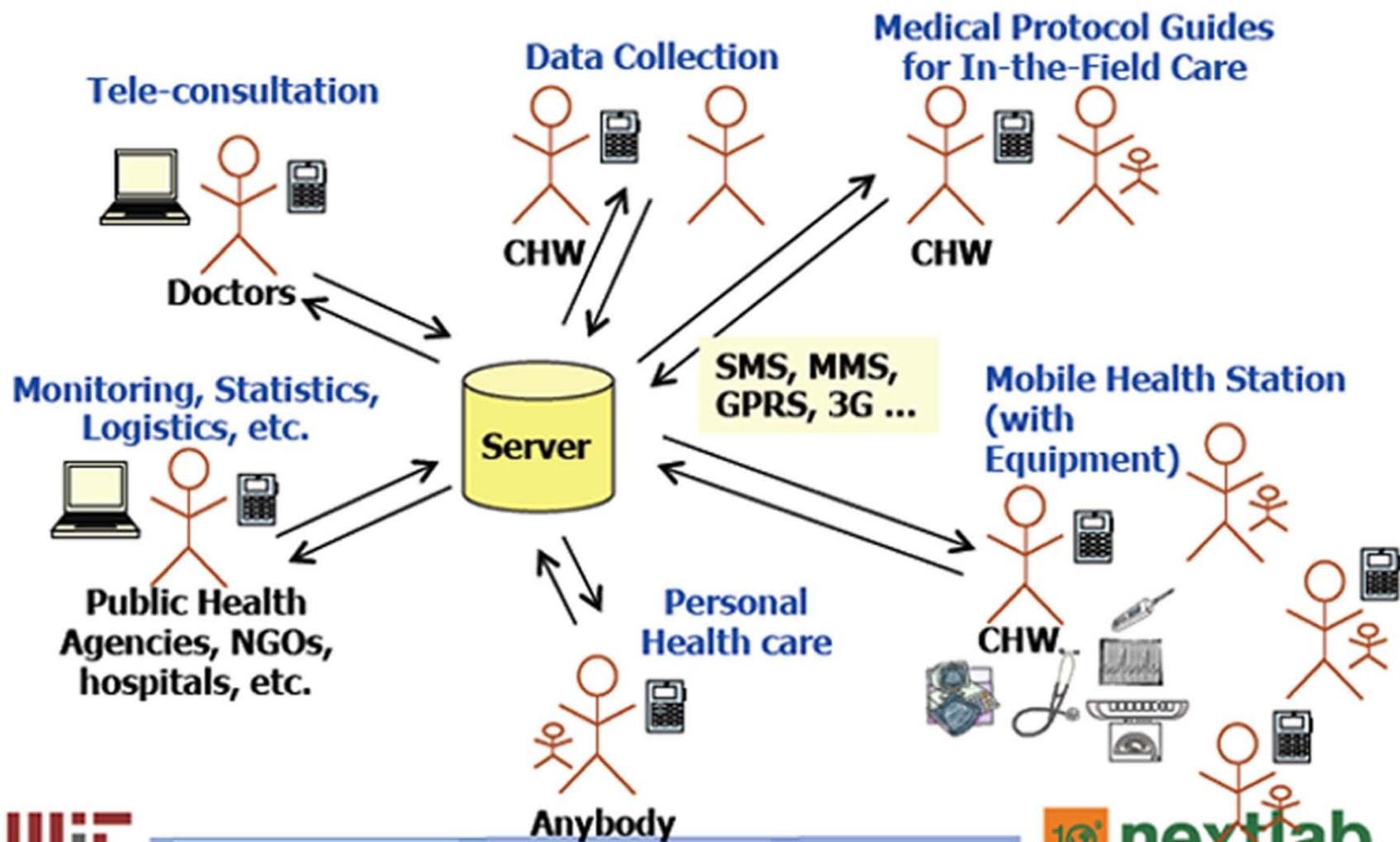


Image: Luis Sarmenta

Mobile Phones for Health



Mobile Phones for Health



Example: Mobiles Reducing Infant Mortality *



- Pesinet project in Mali and Senegal
- Local staff transmit infants' weights and symptoms via a Java app on their cell phones
- In Senegal, infant mortality rate fell from 120 per 1000 to 8 per 1000
- Self-financing, after installation costs covered by donors

* Reported July 20, 2007 by Balancing Act, Africa, issue 364



NextLab I, F'08, L1 slide 16

Social/Community Engagement

- **Mobile phones as a medium for coordinating community action**
 - e.g., Philippine “people power” in 2001 initiated by massive SMS chain – protest against Estrada
- **Mobile phones for democracy**
 - monitoring elections
 - reporting human rights abuse
- **Donations via SMS**



Environment

- **Surveying and Reporting**
 - including SMS and multimedia reports
- **Using cell phone network as a cheap and widely available data channel for sensor data**
- **Disaster Reporting and Management**
 - (e.g. Sahana)

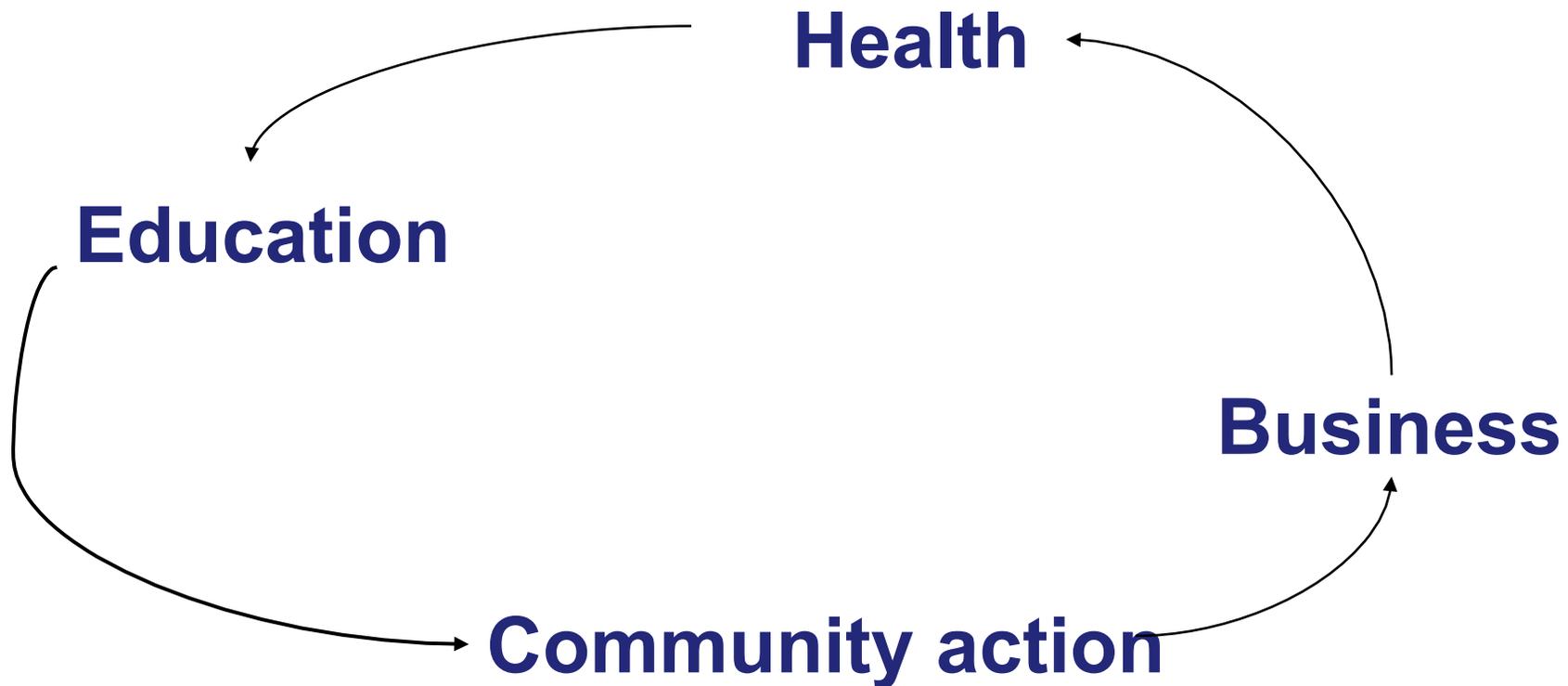


E-government

- **Replace paper applications and unreliable/expensive/slow snail mail**
- **Access info and/or services from local/nation government**
- **Report info to the government**
 - e.g., smoke belching cars in Manila
- **Electronic I.D.**
- **Voting?**



A Virtuous Cycle of Development



BUT ... Some Issues

- **Technical**
 - bandwidth
 - user interface
 - memory
- **Social and Cultural**
 - Is it socially / culturally appropriate?
 - How to design services for shared phones?
 - Literacy?
 - Government and Political Environment
- **Economic**
 - Coverage?
 - improving
 - Cost?
 - of phones
 - of service
 - relative costs (e.g., SMS vs. voice vs. 3G)
 - Cut-throat business environment
 - Sustainability

Recommended Reading

- **“Can the Cellphone Help End Global Poverty”**,
by Sara Corbett, New York Times, 4/13/2008

Image removed due to copyright restrictions.

See photo at <http://www.nytimes.com/2008/04/13/magazine/13anthropology-t.html>



NextLab I @ MIT



Conclusions so far ...

- **Mobile phones have a lot of potential impact**
- **Even “simple”-looking applications (e.g., text-based SMS apps) can be very powerful**
- **But ... also need to be aware of other issues, both technical and non-technical (social, economic, literacy, cultural, etc.)**

NextLab I @ MIT

- **Discuss papers on the topic of mobile phones, and ICT in general, for Development**
- **Produce a solution using mobile phones to address a real need of real people in the real world**
- **Collaborate with an on-the-ground partner to get feedback, and develop a relevant solution**
- **Plan the sustainability of your technology**



Mobile Phone Labs

- You are expected to develop a working prototype of your solution
- We will not teach programming during class hours
- But, we will have a NextLab wiki contain tips
 - SMS (and MMS) services
 - J2ME applications
- Nokia hardware (phones) will be made available to borrow, as needed
- But ... we will emphasize learning platform- and manufacturer-independent concepts and techniques



Mobile Phone Labs Kit

(thanks to Nokia Research Center Cambridge)

- **N82 and N95**
 - cameraphone, GPS, TV out
- **E61i**
 - phone with QWERTY keyboard
- **6131 NFC**
 - mid-range phone with NFC (contactless RFID) reader
- **N810**
 - Internet tablet (not a phone)
 - big screen, GPS, camera, and QWERTY keyboard
- **2610**
 - low-end phone
 - (refurb pay-as-you-go phone for only \$9.99!)

Images of phones removed due to copyright restrictions.



Why High-End Phones?

- You can always simulate a low-end phone with a high-end phone ... but not the other way around
- For some projects, only a few people (e.g., health workers) need to have these phones to serve many
- But also plan for the future
 - prices for these are likely to continue to go down
- In any case ... we will emphasize designing solutions that can be used even without these phones
 - e.g., SMS-based services and platform-independent J2ME



MIT ICT4D Projects (Spring '08)

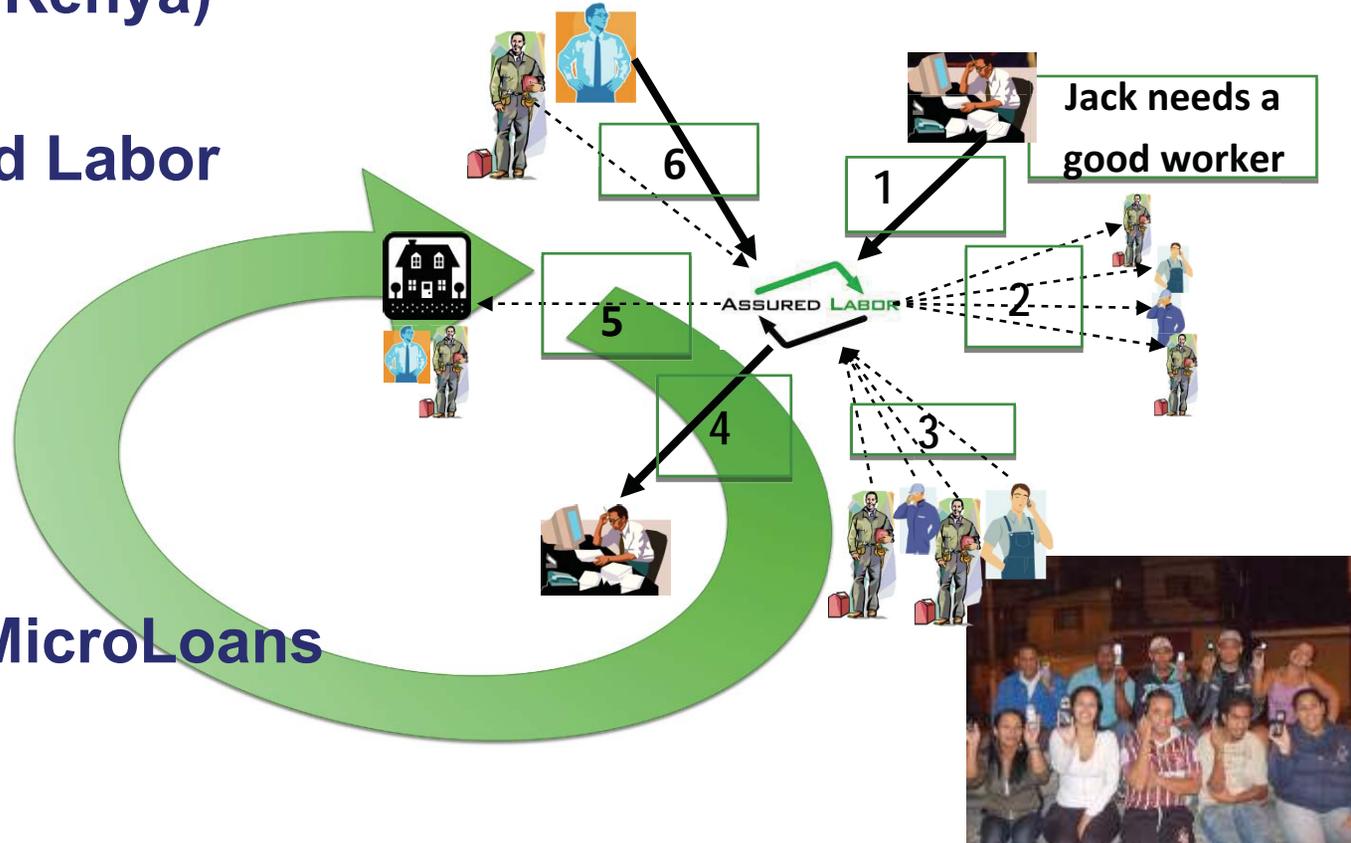
(Instructors: Gari Clifford, Rich Fletcher, Jhonatan Rotberg, Luis Sarmenta)

- **Economic Empowerment**
 - Mosoko Mobile Marketplace (Nokia, Kenya)
 - Efficiency in Labor Markets (Assured Labor, Brazil)
 - Smart MicroLoans (ISF, India)
- **Health**
 - Pediatric care for Urban Poor (J. Hopkins & IRD, Pakistan)
 - Cervical Cancer Prevention (Dimagi, Zambia)
- **Education**
 - Knowledge Box “Virtual Internet” (Beehive School, Malawi)
- **Community Action**
 - Disaster Management (CRS, India)
 - FreePress (Hanantek, Bolivia)



Economic Empowerment

- Mosoko Mobile Marketplace (Nokia, Kenya)
- Assured Labor (Brazil)
- Smart MicroLoans (India)



Health

- **Pediatric care for Urban Poor (Johns Hopkins & IRD, Pakistan)**
- **Cervical Cancer Prevention (CIDRZ, Zambia)**



Courtesy of Aamir Khan. Used with permission

Education

- **K-Box “Virtual Internet”
(Beehive School, Malawi)**

Photo of students working on a computer removed due to copyright restrictions.



Community/Citizen Journalism

- **Disaster Management**
(Catholic Relief Services,
India)
- **FreePress**
(Hanantek, Bolivia)



Photos courtesy of Vijay Umapathy. Used with permission.

Course Projects and Partners



NextLab I, F'08, L1 slide 34

NextLab Projects: Fall 2008

Economic Empowerment

PlaNNet Finance: Mobile pre-screening for microfinance, Argentina

Macosa: Multilevel marketing for microfinance, Ecuador

ITESM (Monterrey Tec): Agriculture pricing for market efficiency and disintermediation, Mexico/Nicaragua

United Villages: M-commerce interface, India

Health

GE Healthcare: Tele-radiology with Ultrasound on Mobiles, Belize

CIDRZ: Mobile diagnostics for cervical cancer, Zambia



NextLab Projects: Fall 2008

Education

Telmex: Mobile social network for students in low-income communities, Mexico

ITESM (Monterrey Tec): M-learning for rural literacy instructors, Mexico

Environment and Community

Flow, Inc: Mobile/GIS InnovGreen Technology, Vietnam

Catholic Relief Services: Mobile Early Warning System for Disaster Management, India

The Next Billion in Our Neighborhood (with City of Boston)

Thrive in Five: Mobile services for parents of 0-5 year olds

Eat or Heat: Can we help people manage their money better?



Course Logistics



Basics

Class Meetings

Period: Fall 2008

Term: Monday, Wednesday from 1:00 - 2.30pm

Units: 3-1-5 (9 H-level units, 6 EDPs)

Class size: Maximum 30 students

Cross-listings

Graduate: MAS.965, 6.976

Undergraduate: SP.716 or 6.976

Prerequisites: Permission of instructor for undergraduates.



Course Deliverables and Grading

- **Class participation and leading an in-class discussion of one of the papers designated for the course (20%, individually graded)**
- **A working prototype that addresses the real needs of low-income community in a given developing country (40%, team graded)**
- **A simple sustainability plan to ensure the project's long-term success (20%, team graded)**
- **An end-of-term public presentation of all work performed during the semester (20%, individually and team graded)**



Project Trips

- **Teams who have matured their projects during the term will have the opportunity to send one or more of its members for free during IAP to spend time in their target communities**
- **The decision to finance the trip will be based on:**
 - Technical and conceptual advancement during term
 - Overall maturity of project
 - Justification for trip
 - Agreement on designation(s) between team members
 - Travel restrictions/political upheaval/safety concerns
 - Limitations on course resources

Course Format

Monday: In-class Discussions

- In-class Discussions consist of an 80 min session, once a week, wherein individual students will be designated one research paper to read and facilitate discussion during class.
- We expect to designate an average of three student-led discussions every class (20-30 mins each).

Wednesday: Guided Design Process

- Guided Design Process consists of a separate 80 min. session, once a week, in which student teams are expected to present completed project milestones to the class and submit their work to structured sessions of expert and peer reviews.
- We expect half of all teams to present each Wednesday, with the other half presenting the following Wednesday



Project Selection

Monday, September 8

- Projects will be presented to students during class
- Students will have until midnight to rank projects in order of preference, using [surveymonkey.com](https://www.surveymonkey.com)

Tuesday, September 9

- Course staff will assess student preferences, individual skills and specific project needs, and will assemble the teams

Wednesday, September 10

- Course staff will announce teams in class, and students will get together to plan their contacts with project partners and overall strategy. They will hear about needs assessment, and advice from students in previous semesters.

Note: we will make every effort to accomodate top student preferences, but we cannot guarantee top choice for everyone



NextLab Media Component



MIT OpenCourseWare
<http://ocw.mit.edu>

MAS.965 / 6.976 / EC.S06 NextLab I: Designing Mobile Technologies for the Next Billion Users
Fall 2008

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.