Technology, Social Context, and Milestone #2
Agenda

• Announcements
• Quick Overview of Mobile Technology
• More on Milestone #2
• Social and Cultural Issues
Announcements
NextLab Technical Sessions
(with Luis Sarmenta)

• **Weekly on Tuesdays 3:30-5pm**
  – Open consultations, 3:30pm-5pm
    • Come to share your technical problems / progress
    • Get advice and feedback from Luis and other teams
  – Common time, 4pm-5pm
    • Time for “lectures” on common-interest topics
    • More open consultations
  – Location TBD (check your emails)

• **Software Dev Managers should go**
  – not absolutely required, but a good way to keep on track

• **But also open to everyone interested in more technical discussions**
Team Web Resources

• Each Team should have these external resources:
  – External blog (see under “Projects”)
    • Includes Emerson videos, Milestone presentations, etc.
    • Public can view and comment
  – External Technical Documentation
    • Part of NextLab Wiki
    • documentation, notes, and "stable" versions meant for public use

• We can also provide you these internal resources:
  – SVN repository
  – internal forum
  – Internal wiki or Trac
Milestone #3: System Design (Oct. 20)

• **What are the components of the system?**
  – block diagram

• **How is it used?**
  – Use-cases
  – User interfaces

• **How does it work?**
  – What happens in different use cases
  – What data moves where?
  – What computation needs to happen?

• **Any potential difficulties?**
  – e.g., certain assumed functionality not being available

• **Initial implementation results**
  – Progress report
  – Crude quick demo, if possible
Quick Overview of Mobile Technologies
Mobile Phone Capabilities

- **Network Technologies**
  - GSM vs. CDMA

- **Voice**
  - Person-to-Person
  - IVR (interactive voice response)

- **Messaging**
  - Text Messaging (SMS)
  - Multimedia Messaging (MMS)
  - Email
  - IM

- **Internet / Web access**
  - 3G, GPRS, WiFi, WiMax

- **Phone-side Applications**
  - J2ME, Windows Mobile, Symbian, Python on Symbian, Android, iPhone, BREW, etc.

- **Phone-side Networking**
  - Bluetooth, IR, WiFi

- **Location**
  - GPS and AGPS
  - detecting cell towers from phone
  - operator-provided

- **Camera**
  - For photos and videos

- **TV Output**
  - e.g., Nokia N95 / N82

- **NFC**
  - as tag / card
  - as reader

- **Other sensors**
  - Accelerometer
  - Attaching other devices
  - using analog I/O

- **SIM card**
  - SIM toolkit text-based menus

- **Micropayments**
  - Bank-based
  - airtime credit-based
Milestone #2: Preliminary Needs and Context Assessment
Milestone #2 (Oct. 8)

• **Preliminary Needs and Context Assessment**

• **What does your partner think about your proposed solution?**
  – present your plan (e.g., Milestone #1 report and other materials) to your project partner (on Sept. 24, regardless of whether you are called)
  – Get their feedback

• **Does this affect your proposal?**

• **On-the-ground needs assessment**
  – What questions do you want to ask your target users?
  – (You don’t need to have answers right now, but show your questions.)
Social Context

• **See Rachel Hall-Clifford’s talk**
  – Contact her for feedback on needs assessments surveys

• **Who generated your idea and why?**
  – Technologically interesting? Perceived need?

• **Does your target population NEED your product or intervention?**
  – Who determines this?

• **Does your target population WANT your product?**

• **How open are you to changing your idea or product to correspond with local input?**
Technology

• **Cell-phone signal in your target locations?**

• **Do the target users have cellphones?**
  – How many have their own cellphones?
  – How many have access to one (e.g., village phone)?
  – Do people who have stores/shops/businesses, government offices, hospitals/medical facilities, schools, etc. have cellphones?

• **How about PCs?**
  – Do individuals have PCs? Laptops?
  – Internet? Dialup or High-Speed?
  – How about public offices (gov’t, hospitals, etc.)?
  – How about internet cafes?
Economics of Technology

• **How much?**
  – Cheap phones (contract vs. no-contract)
  – Cheap cameraphones
  – SMS and MMS sending
  – voice
  – Internet / Web access (GPRS & 3G)
  – value-added services
  – Do you pay to receive?

• **What percentage of a family’s income is spent on cellphone costs?**
  – What is the average income of a family?
User Behavior

- **How literate are your target users?**
- **How often do people use their cellphones and what for?**
  - (Text, chatting with relatives, conducting business, finding out if roads are blocked etc.)
- **What type of people are generally using cellphones?**
  - (Women, children, rich, middle-income, poor?)
- **What special/advanced uses people give their cellphones?**
  - paying for goods? Person-to-Person payments? Websurfing? Gaining local information?
  - Note: there's a difference between what services are available and what services people actually use!
- **Where do they go to top cellphones up?**
- **How often have people had cellphones stolen?**
  - Are people afraid of having their cellphones stolen?
- **Do people pay for goods and services with their phones?**
  - (If so, what? and where? Why do they not use real cash?)
- **Do people find them difficult/easy to use?**
More Questions

• **Think of the largest piece of information you might want to send (image, video, form).**
  – How long does it take to send it?
  – How much does it cost?
• **Details on other modes of use.**
  – What they do currently?
• **What social factors might prevent them from using the phone?**
• **In what situations is it rude to use a phone?**
• **How do people feel about you taking their picture with a cellphone?**
• **Does carrying a cellphone make you feel more successful?**
• **Do you share a phone or ever lend you phone to anyone - if so, for how long?**
  – (This is important if the phone is used as an identifier, or carries private info).
General Tips

• “High-Tech” / not-so-cheap solutions may be OK if solution/application is such that such solutions only need to be used by a few, and not by the random public
  – “Target users” are NOT always the same as “beneficiaries”
  – e.g., apps to be used by health workers for data collection / surveying, in a context where funding is available to provide workers with higher-end smartphones

• If solution is meant to be used by end-users themselves, then need to support lowest common denominator

• More challenging, but also more potential for scalability and impact
Again ...

• What is the problem we’re trying to solve?
• How do we know that's a real problem?
• Does this problem really need a technological solution?
• Could this problem be solved **without** any digital technology?
Don’t Forget

• Be aware of all these things and try to gather as much information as you can from the partner before and while you are designing your system

• You will almost certainly make mistakes

• The important thing is to be alert and be able to adapt and learn (“Fail early and Fail often”)
A Near Miss: The Importance of Context in a Public Health Informatics Project in a New Zealand Case Study

Stewart Wells and Chris Bullen

Journal of the American Medical Informatics Association
Volume 15 Number 5
September / October 2008
Health Informatics Project in New Zealand

• Management of Hepatitis B
• Maori, Asian, and Pacific Islander populations have very high rates of HBV (5-13%) vs. European New Zealanders (0.4%)
• Health Informatics system
  – Help with screening
  – Lab results
  – claims / payments
  – Keep track of immunization
  – Etc.
Problems

• **Premature implementation**
  – Start of project was delayed because of need to establish ethnically representative governance
  – Left insufficient time to develop software

• **Low Primary Care IT capacity**
  – Designers over-estimated user skill
    • interviewed experts
  – Limited availability of terminals, printers, phones

• **PCIS modification difficulties**
  – Software maintenance and compatibility issues

• **Identity Management**
  – Problems with Unique Patient Identifiers
  – Different ways to write name leads to different UPI → rejected claims → backlog

• **Poor Design**
  – batch rejection of claims if one claim fails
  – Limited user access to participant tracking system
Solutions

• Standardized naming conventions
• Individual claim rejection (not batch)
• Access enabled via website
• Barcode specimen identification
• Data matching requirements significantly relaxed
• Dedicated IT support staff from primary care nursing backgrounds recruited to liaise with software developers, and to provide on-site IT support
Context behind problems

• **Too much dependence on UPI**
  - Turned out not to be essential
  - Relaxed system still worked

• **Primary Care Environment**
  - Mostly private practices and morale was down
  - A lot of primary care providers did not invest in IT equipment
  - Also, not computer-saavy
  - Problem was designers interviewed computer-saavy “experts”

• **Political Context**
  - Delays due to political needs (e.g., ethnically representative governance)
  - Also … negative results (or fear of negative results) of solutions can shut down project due to political implications

• **Poor Testing of Software**
• **Conclusion … be aware of your context**
Stages of Design in Technology for Global Development

Jonathan Donner, Rikin Gandhi, Paul Javid, Indrani Medhi, Aishwarya Ratan, Kentaro Toyama, Rajesh Veeraraghavan

Stages of Design in Technology for Global Development

• Read this paper, and read Mike Gordon’s slides

• Five Stages
  – Wonder
  – Exuberance
  – Realization
  – Adaption
  – Identification

• Several Examples

• Watch yourself go through these stages!

• “Fail early, fail often”
Other Papers Today

