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 your 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

Computer, vol. 41, 2008, pp. 34-41.

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

- John C. Caldwell, "Cultural and Social Factors Influencing Mortality Levels in Developing Countries," The ANNALS of the American Academy of Political and Social Science 510, no. 1 (July 1, 1990): 44-59.

- Robert A. Malkin, "Design of Health Care Technologies for the Developing World," Annual Review of Biomedical Engineering 9 (July 25, 2007): 567-587.

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