

Computing and the Developing World

CSEP 590B, Spring 2008
Lecture 10, Part II
Text Free UI

Announcements

- Last day of class, no final exam, have a great summer!
- Grades available about June 16
- Course evaluation tonight

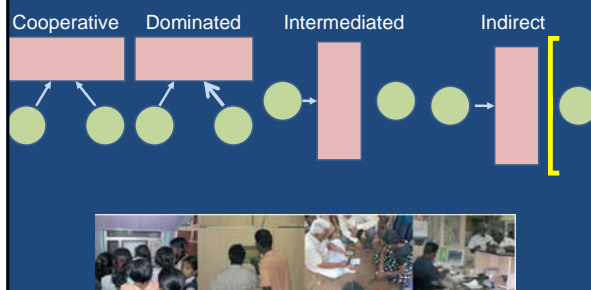
Highlights from Lecture 9

- Tapan Parikh
 - UW PhD 2007
 - Assistant Professor, UC Berkeley
- Contributions
 - Design of developing world applications
 - Mediated use of technology
 - Information Agents
 - CAM Platform
 - Cell phone based data capture

Adoption of localized software

- Why don't people use Nepali Software?
- My answers:
 - Technical issues
 - Desire to advance through knowledge of English
 - Networked effects of widely used platforms
 - People with background to work with systems software will have knowledge of English

Taxonomy of Intermediated Tasks (Parikh)



Today

- James Utzschneider
 - Microsoft Unlimited Potential Group
 - <http://www.microsoft.com/unlimitedpotential/>
- Text Free User Interfaces
 - Design guidelines
 - Usability Testing
 - Speech
 - Applications
- Design examples

Text Free UI

- Tapan Parikh, UW, UCB
- Indrani Medhi, Kentaro Toyama et al., MSRI
- TIER Group, Berkeley, Participatory design studies

Broader issues

- Participatory design
- Focus on application
 - UI only one factor in developing a solution that delivers value
- Intermediated interaction must be considered
- Different user populations
 - Education, Gender, Culture, Class, Occupation, Language, . . .

Design Observations I

- Text Free is not Number Free
- Local language text should be used (even if people can't read it)
- Audio is important

Design Observations II

- Tabular Data organization
 - People are familiar with paper forms and ledgers, even if they can't read
- Use of color is important

Icon Design

- Realistic sketches or photos

- Action cues



- Icons subject to misinterpretation



Negative Observations

- Use of numbers for task flow

- Abstract representations



Geography

- Pictures for navigation to augment maps



User Assistance



- Audio help files on each screen
- Audio prompts on meaning of buttons
- Practice area

Text free UI: Sugar, OLPC, XO

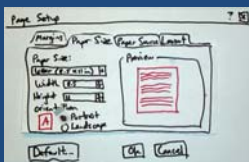


Applications of Text Free UIs

- Where do Text Free UI's make sense (as opposed to an intermediated application)?

Participatory Design

- Paper Prototyping



Giving users a task

- Job search application
 - We first began with a (very) basic overview of computers, and introduced the application to the user. Once we were satisfied that they understood the capability of the application, we then told them the following story: A friend of theirs who lived in their neighborhood was in trouble and desperately looking for a job. Their objective was to find the best paying job in a nearby neighborhood and to be able to report the address of the potential employer.

Making users comfortable with using the device

- Fear of using the device is common
 - Damage, embarrassment, novelty
- Safe practice areas
- Group settings
- Several researchers have reported that Tablet PCs are effective

Cultural issues

- Communication barriers
- Selection of participants – researchers connections very likely to be upper class
- Location of user testing can be complicated
- Participants may be uncomfortable with outsiders
- Working in groups

Speech Based Interfaces

- Speaker independent, unconstrained dialog
 - Recognition
 - High quality sound capture
 - Speech model
 - Language model
 - Natural language processing
- Speech dialog system
 - “State the commodity that you want the price of”

Challenges of SDS

- Plauche et al., ICTD 2006,
 - Study in Tamil Nadu
- Wizard of Oz test of Market Information Dialog system
 - Can users with limited exposure to technology use a speech dialog system
 - Results basically positive: if the recognition can be done, then the approach might work

Constructing an SDS

- Collect a large data set of target words
- Significant regional variation in speech
- Significant variation based on economic levels
- Challenge in explaining the data collection task
 - Protocol for illiterate users

	Pondicherry	Coimbatore	Madurai
zero	1.5	4.8	10
seven	1.5	4.4	6
other digits	1.5	3.5	4

Error rates for recognition of digits

Training data collected in Pondicherry

Audio output (much easier than input)

- What are the main challenges of audio output for a widely deployed application

Text Free UI Work, MSRI

- Text Free UI, ICTD 2006
 - UI Guidelines for semi-literate users
- Full context videos, ICTD 2007
 - Videos to instruct users on application
- Challenges of Computerized Job Search, CHI 2008
 - Case study of job referral system

Full Context Videos

- Problem – teaching illiterate users how to use a job search application
- The problem was much deeper than the UI
 - users did not understand how job information could be on the computer since they usually relied by word of mouth information
- Solution – videos showing the full job search process with the computer.



Job Search Application

- Initially, test application for Text Free UI
- Target a public kiosk
 - Potential Issues:
 - Kiosk placement
 - Kiosk operation
 - How would employers sign up
 - How would disputes be resolved
 - How would employers / employees meet



Paper based pilot

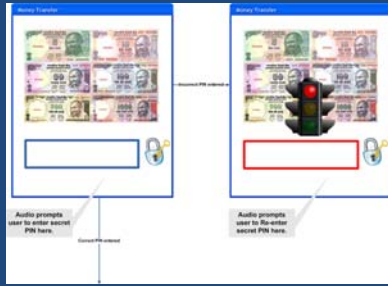
- Develop a job search system using paper instead of computer
 - Ledger + coordinator
 - NGO working in the slums ran the project

Challenges

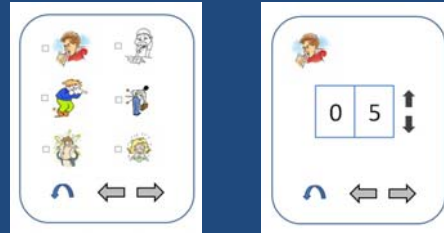
- Need formal organization
 - Registering participants
 - Standardized Taxonomy of Work
 - Trust and Accountability
- Build Human Capacity
 - Employees needed additional skills
- Value proposition
- Ensure steady demand
- Efficient communication between employers and employees
- Need to address legal issues

Text Free UI

Money Transfer Urban bank to rural location



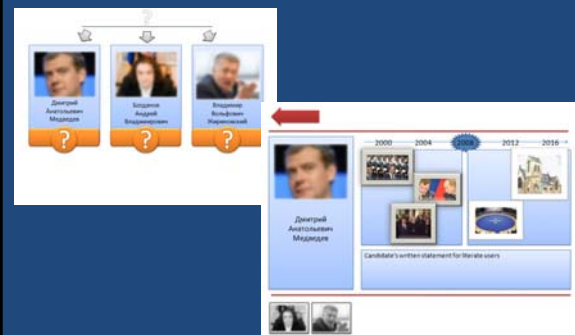
Ez-IMCI



IMCI

THEN ASK ABOUT MAIN SYMPTOMS: Does the child have cough or difficult breathing?		SIGNS	CLASSIFY AS	TREATMENT
IF YES, ASK: LOOK, LISTEN, FEEL: • For how long? • Observe breath in and out. • Look for chest retractions. • Look and listen for stridor.	CLASSIFY COUGH or DIFFICULT BREATHING CHILD MILD OR SEVERE	• Any general danger signs? • Chest indrawing or • Stridor at rest (day)	SEVERE PNEUMONIA OR SEVERE DYSPINOEA	• Give first dose of an appropriate antibiotic. • Refer (IMCI?) to hospital?
		• Fast breathing	PNEUMONIA	• Give an appropriate antibiotic for 5 days. • Give the 2nd dose before the next visit. • Refer (IMCI?) • Advise mother when to return immediately if follow-up in 5 days.
• No cough or • No chest indrawing or • No stridor at rest	NO PNEUMONIA COUGH OR COLD	No signs of pneumonia or very severe disease	NO PNEUMONIA COUGH OR COLD	• If coughing more than 10 days, refer for assessment. • Advise the mother and return the child with: • A safe remedy. • Advice on when to return immediately. • Follow-up in 5 days if not improving.

Voting



Transportation



Medicine Tracking



Class summary

- Rapid technological change in developing world
- Connectivity: Cell phones & Broadband
- Economics of kiosks and other projects
- Information technology and markets
- Application focus – support information tasks
 - Medical delivery and data collection
 - Dissemination of agricultural knowledge
 - Capture of financial transactions

Opportunities

- University of Washington
 - iSchool, Technical Communication, Social Work, Global Health, Public Health
- UW CSE
 - change mailing list
 - cse590f
 - cse477 – developing world capstone projects
- Reading list – finished all the books?
- Job / internship opportunities
 - Teaching Java in Rwanda, Grameen App Center, . . .