Project Idea Pitches

- Two (or at most three) ppt slides
- Components
  - Basic problem that is being addressed
  - Overview of technological solution
  - Technologies that are involved
  - What would be built
  - Major challenges
  - How it would be evaluated

Andy Peck

Radio Craigslist

- Problem:
  - Very little communication infrastructure in rural Africa
  - Difficult to spread information on the macro level
    - Weather updates, disease outbreaks, etc...
  - Trading partners must meet via word-of-mouth or via chance encounters

Radio Craigslist

- Solution
  - Create an automated radio station with user content submitted via cell phone
    - Takes advantage of the prevalence of cell phones and radios in rural Africa
  - Allow users to post ads or announcements
  - Allow official organizations to post announcements with high priority

Radio Craigslist

- Technologies:
  - Radio (abundant, and available in human powered version)
  - Cell phones (abundant, limited use required)
field worker management

Clint Tseng

promote easier and more frequent collaboration between different NGOs

increase environmental awareness and capability of NGO field workers

field worker management

Guy Bordelon

application

mobile app
any device with GPS
no limit on data
strong communication tools

challenges

connectivity
initial dataset
trust?

evaluation done by consumer

CSE 477 Project Idea Part 2

• Undependable weather forecasting in developing world
• Up to the minute weather report from neighbors
• Custom device for collecting data
• SMS for up/downloading weather data
• Server collecting (maybe processing) data

CSE 477 Project Idea Part 2

• Build a device to collect pressure, humidity, altitude, windspeed, temperature data (or an interface for a cheap device that already exists?)
• Stationary or mobile device powered by battery (solar cell?)
• Cellphone/device communication, device maintenance, learning if it’s even useful...
• Could be evaluated using local field testing
### Jennifer Hanson

**Development for X**

- **Issue:**
  - There are relatively few devices made to accommodate the needs of the developing world.
  - Finding and fixing affordable and attractive phones is a challenge.
  - The cost of the phones, such as the larger display screens, make computers too expensive for the average person.
  - However, cell phones are relatively inexpensive and common and provide for end and relevant handles of information.
  - Software for discrete applications undergoes extensive development and testing. Much time is spent individualizing it with regard to elements such as language and cultural symbols.
  - As outsiders, much time is spent learning the needs of smaller communities and just learning what problems exist and could be potentially solved.
  - Having software that could be placed in communities to help those communities know the culture, language, and politics. They could be extremely useful.

- **Solution:**
  - A platform for creating cellular applications could be formed. Similar to how Visual Studio abstracts
  the code behind with components or forms applications, this platform could abstract the network
  and hard coding behind the applications.
  - This would allow people less versed in Computer Science to create applications tailored to their
  needs or the needs of the communities from which they come.
  - The applications could be stored in a database which they study.
  - Applications could be individualized for specific languages and cultures.
  - The platform could be placed on an open source website and the application generated could be
  placed in a database that could be accessed by other phones.

- **Technologies**
  - The technologies would involve several software components and hardware for testing. It would
  have to be generalized for use on many types of phones.
  - The website could be available in English, Spanish, French, Hindi, and other larger languages for
  developers to use.

### Development for X

- **Product would:**
  - Have a platform for design similar to V5 with several pictorial elements
  - Have a database that stores the applications created
  - Have a way to get the apps on the database to the people in related
    geographic area

- **Challenges**
  - Offering an incentive for people to contribute to the platform
  - Showing the apps to people in the developing communities so they will
    actually know and use them
  - Storing the apps for usage

- **Evaluation**
  - Initial testing could be done with a small local set of phones and apps
  - Larger tests could encompass a larger group of people and a few starter apps
    in different languages
  - An evaluation could be added to the website or a feedback cellular
    application could be added

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### Charlotte Robinson

**Reducing Gov’t Corruption: Food Distribution**

**Problem:**

- Economy growing, malnourishment rampant. Starvation and
  malnourishment are result of the failing administrative system in India.

- Licensing procedure for running a Public Food Distribution
  (PDS) shop is plagued by corruption. Licenses are awarded by
  the respective state governments and the authority
  to issue them is delegated to the district administrations,
  which are often corrupt.

- Ration card distribution

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### Reducing Gov’t Corruption: Food Distribution

**Solution:** A program that tracks the locations/
statistics of PDS distributors, or, on a smaller scale, software for PDS’s to record orders.
Such software may not be able to absolve corruption or be able to solve problem single-handedly, but it can move in right direction, increase accountability and give access to statistics.
Reducing Gov’t Corruption: Food Distribution

Technologies Involved: Software program on pda/cell phones (what does typical PDS magistrate have access to power-wise?)

What Would Be Built: Focus on simplicity for UI- minimize room for misinterpretation/skewing of records.

Major Challenges: Finding cooperation/a small enough scale focus. Huge problem- band-aid on a bullet-wound?

How to Evaluate: Field studies, data collection.

Sunil Garg

Text-free UI

- Problem: Much of the world’s population is illiterate and thus unable to independently access the vast majority of recorded human knowledge (ie. written media).
- Solution: Develop technology to bridge that gap by creating ways for illiterate persons to access and interact with information systems.

Microfinance

- Problem: Lack of capital and credit for economic growth
- Progress: Microfinance provides small loans
- Technology solution: Expand the geographic range of microfinance via electronic communication
- Client-side technologies: Android/SMS interface with authentication and encryption

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Text-free UI

- Technologies
  - general UI design
  - information systems
- Challenges
  - necessitates an ethnographic needs-assessment and evaluation
  - finding a balance between generally applicable and specialized techniques (eg. illustration)
- What to build
  - front-end UI for an information system that is relevant to a target population
- Evaluation
  - case study of a particular deployment

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Zac Fleischmann
Microfinance

• Server-side technologies: Database for loan and repayment records
• Challenges: Security, authentication, non-repudiation
• Evaluation: Usage statistics, conflict-avoidance, conflict-resolution

Heather Underwood

iPorter

• Problem: Porters in Nepal are poorly equipped to do their job, are uneducated about mountain safety, and face discrimination, malnourishment, preventable injury and disease, corruption, and death.
• Solution: Equip porters with “smart shoes” that are capable of taking basic health readings (temperature, weight, blood pressure etc.) and use a hand-held device to display health and GPS readings.

• Technology: GPS, health monitors (weight, temperature, blood pressure, etc.), basic mountain safety educational software, radio (walkie-talkie) functionality for communications between excursion groups.
• What would be built: The shoe chip (similar to the Nike device that syncs with iPods) and shoes, hand-held device that includes health alerts, health measurement display, tips/education on mountain safety, walkie-talkie/radio functionality.

iPorter

• Challenges: Making it cheap, making it durable enough for trekking, charging it on long treks (minimize functionality to preserve battery life, use hand crank or “shaker” recharging techniques?), making results easy to understand and accurate
• Evaluation: Collect data on number of porter deaths/accidents each year, interview porters on usability and provided functionality
• Other ideas: Calculator, photos, weather reports, music.

Beth Gusenius
Training Traditional Birth Attendants to Prevent Maternal Mortality
• Problem: About 99% of women who die in pregnancy or childbirth live in the developing world. Most of these women do not have access to adequate health care. Often, the only care these women receive is from traditional birth attendants.
• Solution: Provide community health workers and/or rural communities with a way of reporting infant’s vital statistics health care professional for evaluation.
• Technology: Tutored video instruction, possibly augmented with flip chart or PDA based diagnostic tool.

Training Traditional Birth Attendants to Prevent Maternal Mortality
• Challenges
  – Cost
  – Appropriate user interface
  – Cultural barriers to adoption
• What to Build
  – Editing of video series, UI for PDA-based diagnostic tool
• Evaluation
  – Feedback from community, traditional birth attendants, community health workers, and health care professionals
  – Maternal mortality statistics

Andy Turner

CSE 477
Project Ideas
January 13, 2009

PCG SR
Pull Cord Generator
Smart Recharger

• Problem: Low cost human power generation.
  – Makes excellent use of available muscle power.
  – Improper charging of batteries ruins them.

• Solution:
  – Integrate power conditioning and user feedback using additional electronics, micro-controller and a simple display.
• Technologies:
  – Batteries – Determine the proper recharge profiles for Lead Acid ‘wet cells’, NiCad, and Lithium Ion batteries.
  – Electronics – Measurement and Power – sense system activities, condition power flow appropriately.
  – Micro-Controller – Coordinate the activities of the electronics and provide user feedback.
• Product:
  – One of:
    – Integrated inside the generator.
    – Auxiliary box.
• Challenges:
  – Potenco has not yet released their product for purchase (est mid 2009).
  – Determining and verifying the recharge profiles.
• Evaluation:
  – Does the product 'correctly' recharge batteries?
  – Is the device robust and fool proof?

CSE 477 Project Idea

• Cuba is ravaged by tropical storms
• More people are buying cell phones
• SMS storm alerts to subscribers
• UW Dept of Atmospheric Sciences data
• Software application that reads forecast data
• Internet-based software application that sends SMS alerts

CSE 477 Project Idea

• Bureaucracy
• Finding Participants
• Could be evaluated using field testing

Text Viewer

• Problem: Even with limited internet in extremely rural areas, information is still very difficult to receive. There doesn’t seem to be many easy ways to quickly receive moderate amounts of information (for example, almanac info for farmers).
• Technology solution: Simple, cheap text viewer (similar to kindle, but less features). No direct internet connection, but would connect to computer via usb, drag text files (or something similar) to volume.
**Text Viewer**

- Technologies: Hardware of device, usb, website server
- Challenges: cost of device, intuitive and simple device interface, intuitive website (to be able to quickly find and download necessary information)
- Evaluation: Data on a single (or multiple) town’s usage of the device would be taken, including how they were able to contribute/download from the website.

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**Charlotte Robinson**

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**Distribution: Reducing Gov'n't Corruption**

**Problem:** Food, other goods, or services are transferred from government sources to sometimes corrupt district magistrates to be distributed. (IE, school incentives, etc)

**Solution:** Corruption might be lessened by automated and reliable delivery systems and computerized record keeping. Electronic record keeping would provide a way to track what is going where and make individuals more accountable.

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**Clint Tseng**

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**Distribution: Reducing Gov'n't Corruption**

**Technologies Involved:** Data storage/networking/potential low-cost devices for record entry/signatures.

**What Would Be Built:** UI for data entry/ record lookups.

**Major Challenges:** Getting govn’t workers to embrace system / having people track results.

**How to Evaluate:** Data collection in India / (surveying citizens, comparing against current numbers).

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goods and services

may be difficult to sell/trade goods and services between reasonably close rural villages and towns

therefore, build a 'craigslist for the developing world'
goods and services

organic enough to deal with connectivity
mesh/p2p networking

simple enough to deal with clarity
visual interface; audio/video options

evaluation is easy; collect usage data

Genealogical/Social Identification

• Problem: Maintaining records of individuals is difficult when there is no unique identifier. The problem is made worse by the fact that information is often incomplete or missing (unknown birthdates, inconsistent names, etc.)

• Solution: Create a system that combines a map of a person’s familial relationships with another of their social relationships, along with other information such as social positions, to uniquely identify that person. Collect information about a person’s family tree, as well as neighbors and friends, and their social roles, to create the maps.

Genealogical/Social Identification

• Technology: Map-Matching
Mobile (Android?) Interface

• Challenges: UI Design
Developing Questionnaire
Determining Matching Algorithms
Determining ways to accommodate missing data such as birthdates
Determining ways to accommodate inconsistent data
Maintaining Data Security

Genealogical/Social Identification

• What to Build: Database for Identity Data
Mobile Interface (Android?)
Interview Questionnaire for Identity Establishment
Interview Questionnaire for Identity Testing

• Evaluation: Health Workers and other organization representatives whom use the data to ID individuals
Individuals who use the system to track their genealogy

Beth Gusenius
Birth Records & Neonatal Risk Detection

Beth Gusenius

Birth Records & Neonatal Risk Detection

- Challenges
  - Designing practical UI for non-literate users
  - Connectivity
  - Cost
- What to Build
  - Create form/survey to collect vital information, possible Android implementation, & durable, low-cost scale
- Evaluation
  - Feedback from community health workers and health care professionals, Comcare project

Jennifer Hanson

Potable Water in the Developing World

Description
- Clean water is essential for life, yet large segments of the world lack this vital resource. It is quite costly and often privatized in the developing world.
- 99 percent of water on Earth is unavailable or unsafe for consumption.
- About 1.2 billion people lack safe water.
- 2.6 billion do not have access to adequate sanitation.

Importance
- Water is essential for poverty reduction, agriculture, food and energy production, and recreation.
- It is a women’s issue: Time spent gathering household water, traditionally a women’s task, robs women and girls of getting an education or engaging in meaningful work.
- It is a children’s issue: water is essential for healthy development.
- It is a national security issue: many conflicts arise from disputes over arable land and water.

Potable Water in the Developing World

Description of the application
- A simple communal water purification system could be devised.
- It could contain a water purification component, a cost counter (ie a gas pump only for water), and a tab system.

What does it do?
- The owner could purify the water, charge a nominal fee per volume purchased, and monitor payments.
- The purification component would remove harmful bacteria, parasites, calcium, heavy metals and other toxins.

What is it good for?
- The system could allow the economically disadvantaged an opportunity to purchase cheap and safe water.
- It could foster home businesses and increased entrepreneurship opportunities for those in impoverished communities.

Who will care?
- This system could benefit those in need of clean water and cannot afford to purchase current options.
- This system could benefit those who could form the home business.
Heather Underwood

Project Proposal: Deaf Education

Heather Underwood

Problem: India and Nepal have large deaf populations. Deaf children have little or no access to education and are often seen as outcasts.

Solution: Develop a sense of community among the deaf in these areas. Provide education to deaf children from deaf children. Foster a national form of sign language.

Technologies:
- Video phones, better video/picture SMS technologies
- DVDs focusing on promoting literacy and sign language (as well as basic health education), video manipulation, editing, replay
- Wireless connectivity, long distance networking

Challenges:
- Power, connectivity
- Cooperation among deaf population and reaching deaf populations in rural areas
- Communication, literacy, text to sign translation
- Deaf-targeted UI for education and communication

What to build:
- Cheap portable DVD player
- Robust video phones that can be used with local telephone connections
- Educational software for deaf children to promote literacy and a national form of sign language

Evaluation:
- Feedback from teachers of deaf students in India
- Determine if a national form of sign language is developing by comparing the signs used in various regions.

Danny Anderson
Mobile marketplace

Problem: Merchants, farmers, and service providers aren't reaching as wide of an audience as they could.

Solution: Build an SMS based mobile marketplace where sellers can upload ads and customers can search any desired good.

Technology: SMS I/O with SQL server. A free phone number should be provided to teach how to use the system, and also a web page and portal to the system. Hopefully this all could be provided as a free service.

Mobile MarketPlace

Challenges: Secure use and not exploitable by any party. Fair and equal somehow. Schema to index information.

What to build:
Web page, database, and SMS combined project. Use an existing SMS SQL interface.

Evaluation:
Have buyers remove sold items, track sales.

Sunil Garg

Rural Mapping

• Problem: NGOs are not able to maximize their effectiveness in working with their target populations due to inadequate record keeping, lack of access, and difficult terrain.

• Solution: Build a system that facilitates geotagged data collection which would then allow rich mapping of the population and issues surrounding them, as well as location-enabled services for rural workers.

• Technologies: existing NGO information systems, location-enabled mobile devices
• Challenges
  – effective mobile user interface
  – integration with existing systems
  – cost
• What to Build
  – mobile data collection toolkit that is location-enabled
  – collect information that is easily consumed by existing information systems
  – display and visualize the geotagged data in a useful manner
• Evaluation
  – feedback from the NGO
  – data collected from deployments

Additional Ideas
Charlotte Robinson

Translating Existing Medical Data/ Easy Entry

**Problem:** Currently, healthcare workers may waste time trying to identify someone/re-identify their problem, because of inconsistent methods of identifying someone.

**Solution:** Develop programs to translate current data into common formatting, and/or a program with easy UI/data entry for translating paper records to computer with low technical expertise.

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Richard Anderson

- From January 6

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Video Testimonials

- Problem: Village women end up in urban prostitutions after migrating to cities. Provide a mechanism for giving villages more information about urban migration. (Suggested by an Indian Social Worker)
- Technology solution – digital video of interviews, which are then replayed in village – Facilitator based or privately

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Video Testimonials

- Technologies: Digital Video, Editing, Video Transmission, Replay
- Challenges
  - Technology: low cost (especially reply)
  - UI: Editing videos, replay by illiterate users
  - Social: handling sensitive topics
- What to build
  - Emphasize editing or replay
- Evaluation
  - Feedback from social workers
Robust Record Keeping

• Problem: Keeping records when people don’t have unique identifiers, and information is poor (for example, people don’t know their birthdates, names are inconsistent, spelling is not available)
• Solution: Collect a range of information (e.g., relationships), develop algorithms for approximate matching of identities

Robust Record Keeping

• Technologies: Approximate matching in networks, possible Android implementation
• Challenges
  – Developing robust algorithms, designing interview, UI for mobile field use
• What to build
  – Interview system and database for maintaining identity, Android implementation
• Evaluation
  – Feedback from IHME, Comcare Project

Every flash drive in Africa is infected with viruses

• Problem: Wide spread computer viruses in an environment with limited internet connectivity, pirated software and no updates
• Solution: Transport mechanisms for virus updates via flash drives
• Technology: Anti virus technology, high latency networking

Anti virus software

• Challenges
  – Legacy software, understanding threats, many generations of systems, avoiding creating new threats
• What to build
  – Prototype system that allows virus updates to be propagated via flash drives
• Evaluation
  – Data collected from Africa