Visit to India
June, July, August 2004

What has been done so far...

- Potential partner identification
- Project Environment / technology survey
- Visits to 8 states in India
- Professional relationships with 40 groups in various IT & Development projects established

- Inducted into “National Alliance” for setting up kiosks in all Indian villages by 2007

- One successful wireless test link set up
The Band of Outsiders

India visit details

- Social scientists visited pre-identified projects to explore prevalent issues and approaches to IT and Development
- Organization level visits by team to build relationships with potential partners
- Conference attendance to present TIER research, visibility for UCB, and networking
- Technical team visits to research groups, corporations in related fields
- Focused field research project of education technology work with pre-identified organization
- Field project deployment of wireless technology
**Important lessons from first round**

- Trust building needed for collaborative work
- No obvious benefit of Berkeley partnership for groups in India
- Often work involves government, this increases need for trust building
- Groups often not doing well, concerned about negative publications
- Organizations very hierarchical, relationship with key persons vital in smooth working
- Logistical improvisation essential
- Complexity in licensing and policy issues
- Important to be within circles of influence (policy)

**Contacts established**

- Education
- Healthcare
- Government
- Lobbying bodies
- Research
- Regulatory bodies
- Corporate / Consumer computing
- International agencies
**Education**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**

- Pratham, Mumbai/Delhi
- Azim Premji Foundation, Bangalore
- UP Department of Education, Lucknow
- Tel Nek, Karnataka
- Agastya Foundation, Bangalore
- American India Foundation, All-India
- World Links, All-India

**Major work:** Simplified computing education for children, local language content, computing-based math training for children

**Berkeley opportunities:** Many opportunities on social sciences, interest in collapsible displays, multi-user environment computing

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**Rural Development**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**

- Deesha, Mumbai
- DHAN Foundation, Tamil Nadu
- Mapping the Neighborhood Project, Almora-Uttaranchal
- MSSRF, Pondicherry/Chennai
- Akshaya, Malappuram/Trivandrum
- IDS, Karnataka
- Food India
- N-Logue, Chennai/South India

**Major work:** Kiosks, content development, empowerment work

**Berkeley opportunities:** Water testing, power, wireless links, network infrastructure, census, speech applications uses still open
**Wireless Technologies**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**

- Tulip IT services, Delhi
- Sasken Technologies, Bangalore

- **Major work**: Cellular phone applications, wireless IP networks
- **Berkeley opportunities**: Technical testbeds for wireless research, opportunities to attach student researchers to field projects, publication opportunities

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**Healthcare**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**

- Aravind Eye Hospitals, Madurai / South India
- All India Institute of Medical Sciences, Delhi
- Narayana Hrudayalaya

- **Major work**: Telemedicine applications, limited efforts in medical informatics
- **Berkeley opportunities**: Testing devices, mobile telemedicine infrastructure, high bandwidth links, inexpensive retina cameras
**Government**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**
- Center for Spatial Database Management, Delhi
- Department of Science and Technology, Delhi
- Kerala Department of IT
- Bhoomi, Karnataka Department of IT
- STAR Project, Tamil Nadu Department of IT
- Telecom Regulatory Authority of India (TRAI)

- **Major work**: Land records, community kiosks, GIS mapping, infrastructure
- **Berkeley opportunities**: Involvement in infrastructure projects, policy level partnerships, conferences

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**Research**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**
- Ind. Inst. of Technology (IIT) - Madras, TeNeT group
- Ind. Inst. of Information Technology (IIIT), Bangalore
- Ind. Inst. of Science (IIS), Bangalore
- MSSRF
- Anna University, Chennai
- Center for Inter Disciplinary Studies, CISED
- MIT-India Program
- IT4D Magazine

- **Major work**: Ethnographic research, technical research
- **Berkeley opportunities**: Partnerships / outsourcing, technical collaboration, Government of India projects
**Corporate / Consumer Computing**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**
- Intel India
- Simputer Trust
- HP Labs

- **Major work:** Technical research into inexpensive computing, speech-based / stylus-based interfaces, PDAs
- **Berkeley opportunities:** Internships, research sharing

**International Agencies**

**GROUPS WITH RELATIONSHIPS ESTABLISHED**
- UNESCO India Office
- World Bank

- **Major work:** Funding of kiosk-type operations
- **Berkeley opportunities:** Social science research, joint funding applications
Industry bodies / lobbying

GROUPS WITH RELATIONSHIPS ESTABLISHED
- Confederation of Indian Industry
- Mahiti

- **Major work**: Lurking, OSS
- **Berkeley opportunities**: Great resources for information, joint publication lined up with OSS people, Networking source

Technical Results
MSSRF
Pondicherry
% MSSRF Network, Pondicherry

Technical Results

- Proxy cache deployment
  - collecting usage logs
- Speech Collection
  - ~20 samples
  - usability issues
  - lost in translation
    * need instructions in tamil
Long Distance Wireless Links

- Goal 1: establish Internet connectivity for one of the villages
- Goal 2: establish link between MSSRF and Aravind Eye Hospital
- Result: Aravind ⇔ Nallavadu ⇔ Villianur

The Installations

- Villianur, 80ft tower Station, 24 dB antenna
- Nallavadu, 60ft Master, 24 dB antenna
- Aravind Eye Hospital, 70ft Station, 18 dB antenna
Issues encountered

- Topology knowledge important
  - type of vegetation, 50-60 ft in Pondicherry
- Line of sight
  - towers expensive, need alternative
- Antenna Alignment
  - spectrum analyzer
  - GPS would help + binoculars, compass, map
- Antennas
  - 18 dB gain not directional enough for 7 kms
- Power problems
  - frequent power failure, solar power voltage variations

Technical Summary

- Line of sight
  - needed for 802.11
  - clearing vegetation, tower height of 50-100 ft
- Need for wireless kit
  - ease of physical installation
  - automatic network configuration
- High bandwidth possible
  - 10 km easy with 24 dB gain, no amplifiers
- Need for more detailed monitoring
In Conclusion… to the future

- Great relationships for future work
- Understanding of the competition
- Feedback on technology needs
- Experience with implementation
- Visibility among key players
- Several project ideas in the pipeline

...the ball is now rolling!

In short, all defined summer goals were achieved

Villianur
Thirukanchipet
Chennai Crocodile Bank