Impacting Global Health and Human Development via Mobile Technologies

Bill Thies
Microsoft Research India

Joint work with:

Microsoft Research India

Photo: Natalie Linnell (courtesy Kentaro Toyama)
Technology for Emerging Markets

**Understand** existing and potential technology users in developing communities

**Design** and **evaluate** technology that contributes to socio-economic development of poor communities

**Collaborate** with product groups, development-focused organizations, governments and industry for sustained, scaled impact
Part 1: Voice Portals for Citizen Reporting
Voice Remains Primary Interface for Mobile Subscribers in India

Interactive Voice Response: $1B Industry
Your Facebook, in your voice.

Now express emotions that words can't with Facebook Voice Updates on Aircel.

Aircel & Facebook partner to introduce Voice Status Updates. Now express your emotions and much more on Facebook in your own distinctive voice. Just dial 51555* from your Aircel mobile to record and update your status, without even having access to the internet. The recorded voice clip will appear on your Facebook wall as your status update. So go ahead, voice your mind!

Call: 38040 12345 for Kolkata & 98510 12345 for ROWB or 121*
Polly: A Viral Voice-Based Game
[ICTD’12, DEV’13, CHI 2013 Best Paper, DEV-4]

- That also advertises job opportunities!
- Over 2.5M calls in Pakistan

At Carnegie Mellon:
- Agha Ali Raza
- Roni Rosenfeld

At LUMS, Pakistan: F. Ul Haq, Z. Tariq, M. Pervaiz, S. Razaq, U. Saif
Chhattisgarh, India
CGNet Swara:

A Voice Portal for Citizen Reporting

with CGNet, United Nations Democracy Fund, Gates Foundation, Hivos Foundation, MIT and the International Center for Journalists

• Anyone can report news, issues, etc. in local language
• Submissions are reviewed by moderators over the Web
• Appropriate submissions are published:
  – For playback on audio channel
  – For browsing on Web
• Activists follow-up on reports
CGNet Swara:
A Voice Portal for Citizen Reporting
with CGNet, United Nations Democracy Fund, Gates Foundation, Hivos Foundation, MIT and the International Center for Journalists
Father wanders for due NREGA wages, son dies in hospital...

Manish Rai from Ambikapur says some days back I had heard an interview on CGnet Swara with a labourer called Pitbasu who had completed 100 days work in NREGA but had not been paid any wages. Today by chance I met him in the hospital and found that while Pitbasu was making rounds for his due NREGA wages his son died in the hospital. Is there any provision in NREGA to punish officials who has caused this grave incident? NREGA laws should be so strong that no one should wait for their wages as has happened with Pitbas. Fore more on the story please contact Manish at 09826538904

POSTED ON: JAN 14, 2011, BY MANISH RAI

Post a Comment

To record your comment, please call and leave a message at +91-80-4113 7280. Recording your comment in audio format will ensure that it is accessible to all CGNet Swara users, most of whom lack Internet access and access the reports via phone.
Father struggles to get NREGA wages, son dies in hospital

Supriya Sharma, TNN, Jan 21, 2011, 10.04pm IST

RAIPUR: A week after he lost his ailing son, and ten months after he worked on a village road project, Pitbasu Bhoi finally got the ten thousand rupees he had earned under the Mahatma Gandhi National Rural Employment Program (MNREGA).

"Of what use is the money now? I have just immersed my son’s ashes. When I needed the money to save his life, I did not have it," says Bhoi.

The disabled man, in his forties, along with his wife and three children, was engaged in a road project when he fell ill with a brain tumor and had to be rushed to the hospital. Within a week, he died. The government has proposed to do away with the labor-intensive road works under the MNREGA, which are seen less productive.
Borewell stopped working long back, We need to walk long for water, pls help...

My name is Kurasam Rambabu. I am calling from Ramaraopeta village in Dummugudem mandal, Khammam district of Andhra Pradesh. In our village bore well is not working from so many days. We complained to the mandal officers many times but they didn’t respond. We are struggling for safe drinking water. For water we need to walk very long. Please help us. For more Mr Rambabu can be reached at 07893421794

POSTED ON: SEP 10, 2012, BY KURASAM RAMBABU

Post a Comment

To record your comment, please call and leave a message at +91-80-4113 7280. Recording your comment in audio format will ensure that it is accessible to all CGNet Swara users, most of whom lack Internet access and access the reports via phone.
Petitioned Sri Siddarth Jain I.A.S

Collector, Khammam: Fix the Borewell in Ramaraopeta village

Petition by
Swar For Change
Ghaziabad, India

Victory

October 2012

1. More than 2800 signed the petition sending thousands of emails to the Collector asking him to take immediate action to fix the Borewell in Ramaraopeta village. 2. The District Collector of Khammam also received several phone calls from petition signers asking him to fix the Borewell. 3. On October 13th, a day after the petition was launched the collector sent the engineers to inspect the Borewell and take it for repairs. 4. Within two weeks, the Borewell was fixed and the entire village has access to drinking water.
Malaria Deaths in Chhattisgarh: Official Government Figures

CGNet Swara starts
Malaria Deaths in Chhattisgarh: Official Government Figures

CGNet Swara starts
Song from 3 days festival in Odisha where girls only enjoy and do no work...

“Shilpi from Odisha is telling us about Raja festival which is celebrated each year in the month of June. On these three days girls do not work and make merry after wearing good clothes and eating good food. She is singing a song in Odiya which girls sing on these days asking them to enjoy the festival.”

http://cgnetswara.org/index.php?id=22097
Qualitative Evaluation
with Preeti Mudliar and Jonathan Donner
[ICTD 2012, ITID 2013]

Most cited paper of ICTD 2012
Research Questions: How to Scale?

1. How to moderate content at scale?
2. How to distribute content at low cost?
3. How to search / index content at scale?
Sangeet Swara:
A Community-Moderated Voice Forum
for Songs, Poems, Jokes, & Cultural Content
[In Preparation]

Traffic in 1.5 months
• 20,000 calls
• 4,300 posts
  (by 450 people)
• 110,000 ratings
  (by 1,320 people)

Quality of Moderation
• Relative to “experts”:
  – 98% agreement on categorizing 50 posts
  – 98% agreement on gender of 50 posts
  – 90% agreement on quality of 10 posts
Emergent Ownership and Use by the Visually Impaired

“I am a blind person so I couldn't get educated. I want to thank you because you enabled all blind persons to get in touch and share. No matter how much I praise, it won't be enough.”

“You are like my father, my god, I want to thank you again and again, this small kid wants to respect you from the bottom of the heart. I want to welcome you again and again.”

“Swaras has influenced the country and the world.”
IVR Junction:
Enabling Replication of Voice Forums

Winner, USAID / Humanity United Tech Challenge for Atrocity Prevention (2013)
Runner-up, Manthan Award (2013)
Over 30,000 Voices Heard
Real-Time Monitoring by the Broadcasting Board of Governors
Fadhigii 3aad ee kalfadhiga 22aa ee Golaha Wakiilada Jamhuuriyada ayaa maanta ka furmay Xarunta Golaha Wakiilada fadhigan oo furmay 10:00 subaxnimay ayaa waxaa Guudoominayay Gudoomiyaha G...

Warsaxaafadeed

Golaha Wakiilada
 REPUBLIC OF SOMALILAND

GOLHA WAKIILADDA
House of Representatives

Golaha oo Maanta Dood Adag ka Yeeshay Xeerka Takaaliifta Haruumarinta Wadooyinka
Read More »

ILA DHAGEYSO
Uploada by IlaDhageyso

- Reaction to England's Decision: Video upload by Ila Dhageyso- Somaliland
- Reaction to England's Decision: Video upload by Ila Dhageyso- Somaliland
- Local Council Election: Video upload by Ila Dhageyso- Somaliland
- Local Council Election: Video upload by Ila Dhageyso- Somaliland
- Suggestion for SL Gov: Video upload by Ila Dhageyso- Somaliland
- England-SL Relationship: Video upload by Ila Dhageyso- Somaliland
- Secession from SL: Video upload by Ila Dhageyso- Somaliland
- England-SL Relationship: Video upload by Ila Dhageyso- Somaliland

LATEST NEWS

- Golaha Wakiilada oo wali sii wada dooda Xeerka Horumarinta Wadooyinka. 18.09.13
- Golaha oo Maanta Dood Adag ka Yeeshay Xeerka Takaaliifta Haruumarinta Wadooyinka
A Failed Deployment: Parent/Teacher Discussion Forum
Lesson:
Technology Amplifies Human Intent and Capacity; It Doesn’t Substitute for Them

Kentaro Toyama
Boston Review 2010, iConference 2011
Part 2: mHealth
“Mobile technology is changing the landscape of health care delivery across the developing world”

“A decade after the start of mHealth ... these expectations are far from being met.”
Mobile Data Collection to Combat Childhood Malnutrition
NordiCHI 2012

Using Biometrics for Tuberculosis Medication Adherence
Persuasive 2012

Automated Voice Calls for Healthy Behaviors During Pregnancy
ICTD 2013

Book by Donner and Mecheal

Mobile Data Collection to Combat Childhood Malnutrition
NordiCHI 2012

Assistive Technologies For Rural Health Workers
_in progress_
Totally drug-resistant TB emerges in India

Discovery of a deadly form of TB highlights crisis of 'mismanagement'.

Katherine Rowland

13 January 2012

Physicians in India have identified a form of incurable tuberculosis there, raising further concerns over increasing drug resistance to the disease. Although reports call this latest form a “new entity”, researchers suggest that it is instead another development in a long-standing problem.

The discovery makes India the third country in which a completely drug-resistant form of the disease has emerged, following cases documented in Italy in 2007 and Iran in 2009.

However, data on the disease, dubbed totally drug-resistant tuberculosis (TDR-TB), are sparse, and official accounts may not provide an adequate indication of its prevalence. Giovanni Migliori, director of the World Health Organization (WHO) Collaborating Centre for Tuberculosis and Lung Diseases in Tradate, Italy, suggests that TDR-TB is a deadlier iteration of the highly resistant forms of TB that have been increasingly reported over time.
Extensive Research to Improve Adherence, with Mixed Results

BMC Health Services Research

Research article

**Patient adherence to medical treatment: a review of reviews**

Sandra van Dulmen*¹, Emmy Sluijs¹, Liset van Dijk¹, Denise de Ridder², Rob Heerdink³ and Jozien Bensing¹

“The study is a review of 38 systematic reviews”

“Although successful adherence interventions do exist, half of interventions seem to fail”

“Non-adherence rates have remained nearly unchanged in the last decades”
TB Control Strategy in India: Directly Observed Therapy (DOTS)
Using Biometrics to Strengthen DOTS

Microsoft Research India and Operation ASHA

Biometrics Terminal

Cloud-Based Analytics

Missed Dose Alert & Follow-up

fingerprint reader
netbook computer
GSM modem

SMS
SMS

7500+ Patients
100+ Clinics
5 Indian States
3 Countries

Manthan Award (2011) – mBillionth Award (2011) – WSJ Innovation Award (2012)
@MSFTResearch has teamed up with @OperationASHA to fight #TB in India. Better data = better outcomes: b-gat.es/VoMO2m
Impact Assessment

• Two kinds of impact
  1. Showcase programs that work well
  2. Make programs work better

• In progress:
  Randomized Controlled Trial (MIT/JPAL)
Lesson: Participant Response Bias can Reverse the Outcome of a Study

[Nicola Dell, CHI 2012]
Lesson: DOTS is Rarely Possible to Implement Faithfully

Despite large expenditure on DOTS, many barriers to observing every dose:

- Difficult to come to center
- Patients travel / transfer out
- Private treatment unobserved!

Key unsolved problem: check whether patients take drugs *without supervision*
99DOTS: Monitoring Medication Adherence via Mobile Phone

99DOTS enables:

– Targeted reminders, incentives, and follow-ups
– Engagement of patients with 2-way communication
# Pilot Study: Patient Adherence

<table>
<thead>
<tr>
<th>Patients</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Month 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Correct response**
- **No response**
Deployment Trajectory

- Long-term pilots planned for 2014
- In conversations with pharmaceutical companies

Treatment Partners
- early stage - advanced stage
DataDev 2012
Bangalore, India
July 23-24, 2012

1st International Workshop on
Mobile Data Collection in
the Developing World

In conjunction with MDM 2012

About: Organizations in the developing world have long been burdened by managing large-scale data collection efforts using paper-based forms. Today, we are witnessing a technology revolution in which new tools for mobile data collection and automatic digitization have the potential to radically transform the management of data in resource-constrained settings.

This workshop will connect leading organizations, having field operations in India, with an international cadre of researchers who are developing the latest tools for collecting and managing data. Our goals are to identify new research directions, to disseminate the latest technologies from the lab to the field, and to forge new long-term collaborations that are beneficial to both researchers and practitioners.
Mobile Tools: Design Space

Input method

- Free-form speech
- Structured speech
- Typing

Output method

- Text
- Audio
- Graphics

flexible

[ICTD 2009]
[DEV 2013]
[TOCHI 2011]
[CHI 2013]
Lesson: Where There's a Will, There's a Way

[Thomas Smyth, CHI 2010]
Conclusions

• Innovative technologies can have a real impact on global health and development
  – But technology itself is not a silver bullet
  – Impact comes via capable, sustained deployments

• Lessons learned
  – Technology amplifies human intent and capacity
  – Participant response bias can reverse the outcome
  – Automated is not necessarily cheaper or better
  – Where there’s a will there’s a way