Challenges and Opportunities in Creating Scalable Voice Services

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Voice Remains Primary Interface for Mobile Subscribers in India

• Most subscribers lack smart phones
  - Smart Phone: < 5%
  - Feature Phone: 50-70% (e.g., music player)
  - Basic Phone: 30-50%

  Mobile Internet: < 3% of subscribers

• Text interfaces hindered by:
  - Low literacy (33% of adults in India are non-literate)
  - Language diversity (font support for tribal language?)

Source: McKinsey, IDC India
Interactive Voice Response in India

• In 2010: Rs. 4,000 Crore from value-added IVR
  – Expected to grow to Rs. 15,000 Crore by 2020

• Examples:
  – Ringtones, music, jokes, astrology
  – Booking movie tickets, travel, mobile commerce
  – Screening for Kaun Banega Crorepati
  – TATA’s Behtar Zindagi program: information for farmers with over 10,000 voice prompts
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!
Egypt protesters use voice tweets

Google and Twitter have launched a service which circumvents the ban on net services in Egypt.

The so-called speak-to-tweet system allows people caught up in the unrest to post messages without any need to use an internet connection.

The service, which is already live, allows people to dial an international telephone number and leave a voicemail message.

The message is then sent out as a tweet with the hashtag #egypt.
Journalism in Tribal Chhattisgarh

- No news medium for tribal languages in India
  - Very few tribal journalists who know these languages
- Is it not legal to broadcast news over community radio in India!
- Can a mobile platform enable citizens to share their own news?

<table>
<thead>
<tr>
<th>Language</th>
<th>Number of speakers (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kui</td>
<td>0.5</td>
</tr>
<tr>
<td>Kurukh</td>
<td>1.5</td>
</tr>
<tr>
<td>Gondi</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Number of news outlets (print or audiovisual)
CGNet Swara: A Voice Portal for Citizen Journalism

with CGNet, 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
  – Some submissions seed stories for posting on CGNet site + list
Deployment: Since Feb 2010

Calls per Day

Posts per Day
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 Pitbasu. For more on the story please contact Manish at 09826538904.
Father struggles to get NREGA wages, son dies in hospital

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

You are here: Home » India

Tags: National Rural Employment Program | MNREGA | Gram Adhikar Manch

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 four children, lives in Bhoi village in Raipur district. For the past 10 months, he had not been paid at all for the work he did under MNREGA.
Categorizing the Reports

- Grievance
- Performance
- News
- Opinion
- Information
- Appeal
- Interview

0% 5% 10% 15% 20% 25%
Who is Reporting?

- >400 contributors
  - Top 10% responsible for 49% of posts
- Often social activists, but with limited voice
  - Earning 5K-10K / month
Who is Listening?

• 9500 unique callers
  – Top 10% responsible for 62% of calls
• Geographies:
  - MP & Chhattisgarh
  - Bihar & Jharkhand
  - Rajasthan
  - Delhi Metro
  - Uttar Pradesh
  - Other
Research Challenge: Enabling Scale

• How to moderate content at scale?
• How to pay for the cost of calls at scale?
Moderating Content at Scale

• Run a call center?
  – ala JustDial
  – Challenge: maintaining consistent judgment, quality, accountability across moderators

• Community moderation
  – ala reddit, slashdot, Digg; Quora, Yahoo Answers
  – Opportunity: phone number is unique identity
  – Challenge: taxing to listen to long voice posts
    • Hybrid model: transcribe to Web, moderate on text?
  – Challenge: anonymity in moderation disputes
    • Role for a voice anonymizer?
**Distributing Content at Scale**

- Distributed server to enable local calls
- Deliver audio over data
  - Streaming download from Web
  - Or with mobile application
    - Can also offer meta-data, search, that reduces traffic
- Leverage peer-to-peer distribution
Peer-to-Peer Video Sharing

(Thomas Smyth)

- Ethnography of Bluetooth video sharing in urban Bangalore
  - Amongst non-computer owners (middle and middle-lower class)
  - Over 25 in-person interviews, 100 phone interviews, 10 weeks

- Despite steep barriers in usability, cost, legality, fear of viruses, privacy, etc., the drive for entertainment prevails
Current Directions
An Open Toolkit for Building Interactive Voice Communities

- **IVR Server for NGO in New Delhi, Delhi (India)**
  - Users in Delhi
  - GSM Network
  - Laptop
  - GSM Modem

- **IVR Server for NGO in Jaipur, Rajasthan (India)**
  - Users in Rajasthan
  - GSM Network
  - Laptop
  - GSM Modem

**Cloud Service**
- Moderation Platform
- Audio Hosting
- Upload Audio
- Synchronize Repository

- **Internet Enabled Users**
- IVR Service Moderator
- Synchronize Repository
- Upload Audio
Talent Hunt:
A Community-Moderated Voice Forum
Conclusions

• Huge untapped potential for interactive voice communities in India
• But current services have very limited scale
• Overcoming hurdles will require mix of technical, business, social solutions