Mapping Interactive Voice Response Call Data in Developing Regions

Aditya Vashistha
Joint Work with Ed Cutrell and Bill Thies

Image Credit: Busdoc77
Voice Remains Primary Interface for Mobile Subscribers in India

• Most subscribers lack smart phones

Smart Phone: < 5%  Feature Phone: 50-70%  Basic Phone: 30-50%
(e.g., music player)

Source: McKinsey, IDC India
Literacy and Language Barriers

Text interfaces are hindered by low literacy and language diversity!

How can we reach out to 33% people who are non-literate?
How can we reach out to literate tribal people (limited font support)?
Understanding Users

Image Credit: Jayanta Shaw/Reuters/Corbis
Voice Forums for “Development”

Citizen News Journalism
Mudliar et al. ICTD 2012

Community Radio
Koradia et al. ICTD 2012

Viral Entertainment Platform
Raza et al. ICTD 2012

Feedback on School Meals
Grover et al. DEV 2012

Content Creation and Dissemination by Rural users
Agarwal et al. ICTD 2009

Avaaj Otalo: Agriculture Discussion Forum
Patel et al. CHI 2010

Community driven Intelligent Maps
Kumar et al. ICTD 2009

Freedom Fone: Dial-up Information Service
Clark et al. ICTD 2009

(Healthline: Access to Health Information)
Sherwani et al. ICTD 2007

(Phone Broadcasting System for Sex Workers)
Sambasivan et al. CHI 2011
Visualize Data on a Mapping Platform
Hello, I am calling from Bengal and I want to report that work done is ... Read More

No electricity since last 8 days in Bakkhali

Hello, I am calling from Bengal and I want to report that work done is ... Read More
Location Aware Playback of IVR Content
Automatic Inference of Location

Cell Triangulation

Cell Broadcast Service (CBS) Message

Infer Calling Region from Caller ID

CBS Message Image Credit: http://humboldtherald.files.wordpress.com/2008/10/cell-tower1.jpg
Automatic Inference of Location

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None of these really works!!
Manual Entry of Location

• Use Postal Code or Zip Code
  • 6 digit pin code to cover 1M Sq. Miles
  • Accurate to the geographical boundaries of a post office

Image Credit: http://goindia.about.com/od/shopping/ss/paharganjshop_5.htm
Manual Entry of Location

- Use Postal Code or Zip Code
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- Use Fixed Line Area Code
  - Coarse granularity (city level)

<table>
<thead>
<tr>
<th>Fixed Line Area Code</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore</td>
<td>080</td>
</tr>
<tr>
<td>New Delhi</td>
<td>011</td>
</tr>
<tr>
<td>Mumbai</td>
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• Use SMS
  • Limited text literacy!

• Use Numeric Keyboard on an IVR System
Research Questions for Manual Entry

• Do people in rural, periurban and urban India know their postal code and fixed line phone area code?
• Are the findings same for other developing and underdeveloped countries?
• What is the granularity of a postal code?
  – For various regions in a country?
  – For other countries?
Research Questions

• Design recommendations for IVR mapping systems? Which approach offers:
  – The finest granularity of location data?
  – The minimum education/effort needed by callers?
  – Optimal processing so that data can be visualized quickly?
  – The lowest cost of processing the data?

User Study in Progress to Answer the Questions
Notable GeoHCl4D

Ushahidi

Local Ground

Folksomaps
by IBM India Research Lab
HCI4D SIG Meeting

Monday
11:20-12:20
Room 362/363

Thanks!
Aditya Vashistha

www.adityavashistha.com

Image Credit: Busdoc77