

Voice-based Social Computing Platforms in the Developing World

Aditya Vashistha

University of Washington

*Joint work with Gaetano Borriello, Shubhranshu Choudhary,
Ed Cutrell, Krittika D'Silva, Mohammed Gulaid, Meghana Marathe,
Pooja Sethi, and Bill Thies*

www.adityavashistha.com

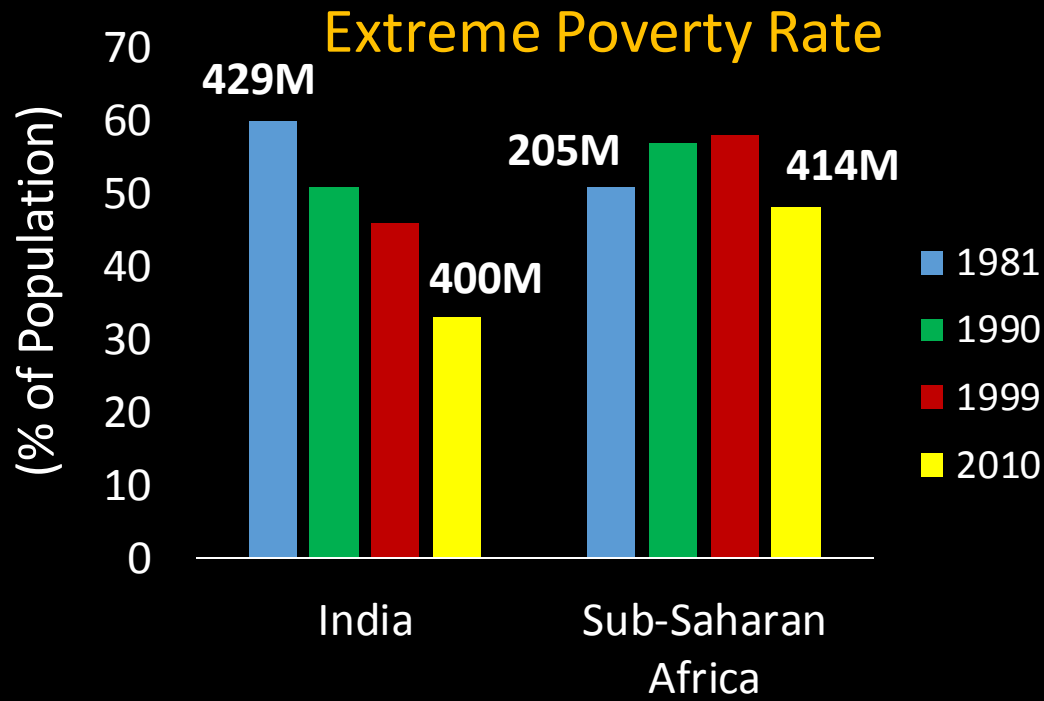
Today..

- Introduction to voice technologies
- CGNet Swara
 - Citizen journalism and civic engagement
- Sangeet Swara
 - Voice-based social media system
- IVR Junction
 - Toolkit for building voice interventions
- Respeak
 - Voice-based crowdsourcing system
- Voice-based health interventions



- 1600 languages
- 0.3 cent per SMS
- 1 cent per minute

- 3000 languages
- 1-2 cent per SMS
- 4-6 cents per min



Voice Remains Primary Interface for Mobile Subscribers

Most subscribers lack smart phones

Smart Phone: ~ 10%



Feature Phone: 50-70%
(e.g., music player)



Basic Phone: 30-50%



Only 1 in 5 people have Internet

Literacy and Language Barriers

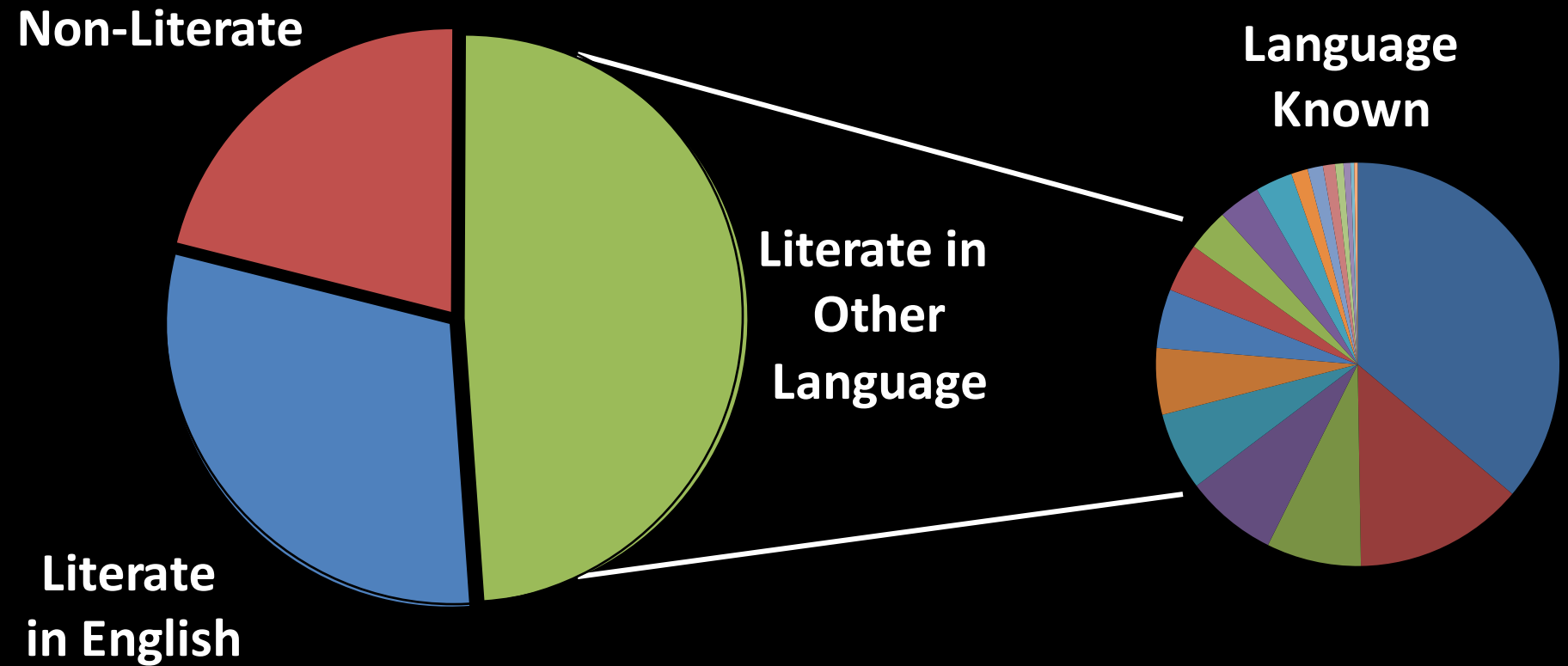




Image Credit: Jayanta Shaw/Reuters/Corbis

Interactive Voice Response



NEWS TECHNOLOGY

Home | US & Canada | Latin America | UK | Africa | Asia-Pac | Europe | Mid-East | South Asia | Business | F

1 February 2011 Last updated at 04:50 ET



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.



The service could give protesters a new way of communicating with the outside world

**Egypt's
Revolution**

Today..

- Introduction to voice technologies
- **CGNet Swara**
 - Citizen journalism and civic engagement
- Sangeet Swara
 - Voice-based social media system
- IVR Junction
 - Toolkit for building voice interventions
- Respeak
 - Voice-based crowdsourcing system
- Voice-based health interventions

Chhattisgarh, India

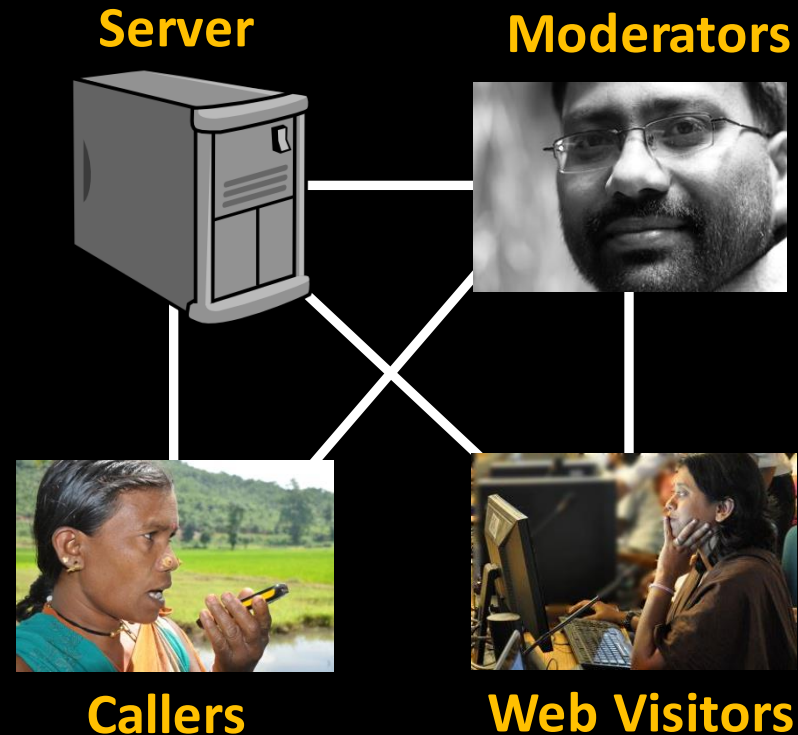
- Lowest HDI
- ~50% population is under poverty
- Teledensity < 10%
- Computers < 4.6%
 - Internet (1.2%)
 - Non-Internet (3.4%)
- Epicenter of Naxalite movement
- Poor governance



CGNet Swara

A Voice Portal for Citizen Reporting

- 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

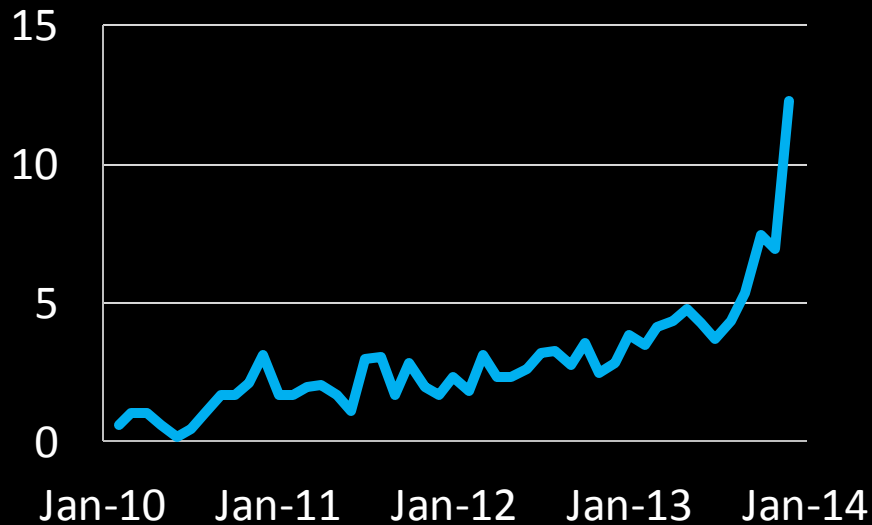


6000+ reports and 600,000+ calls in 5 years

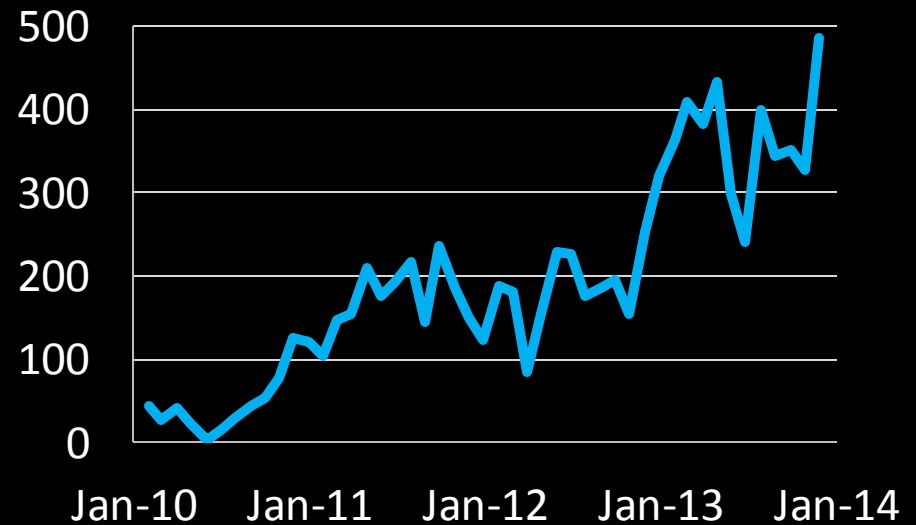
CGNet Swara

A Voice Portal for Citizen Reporting

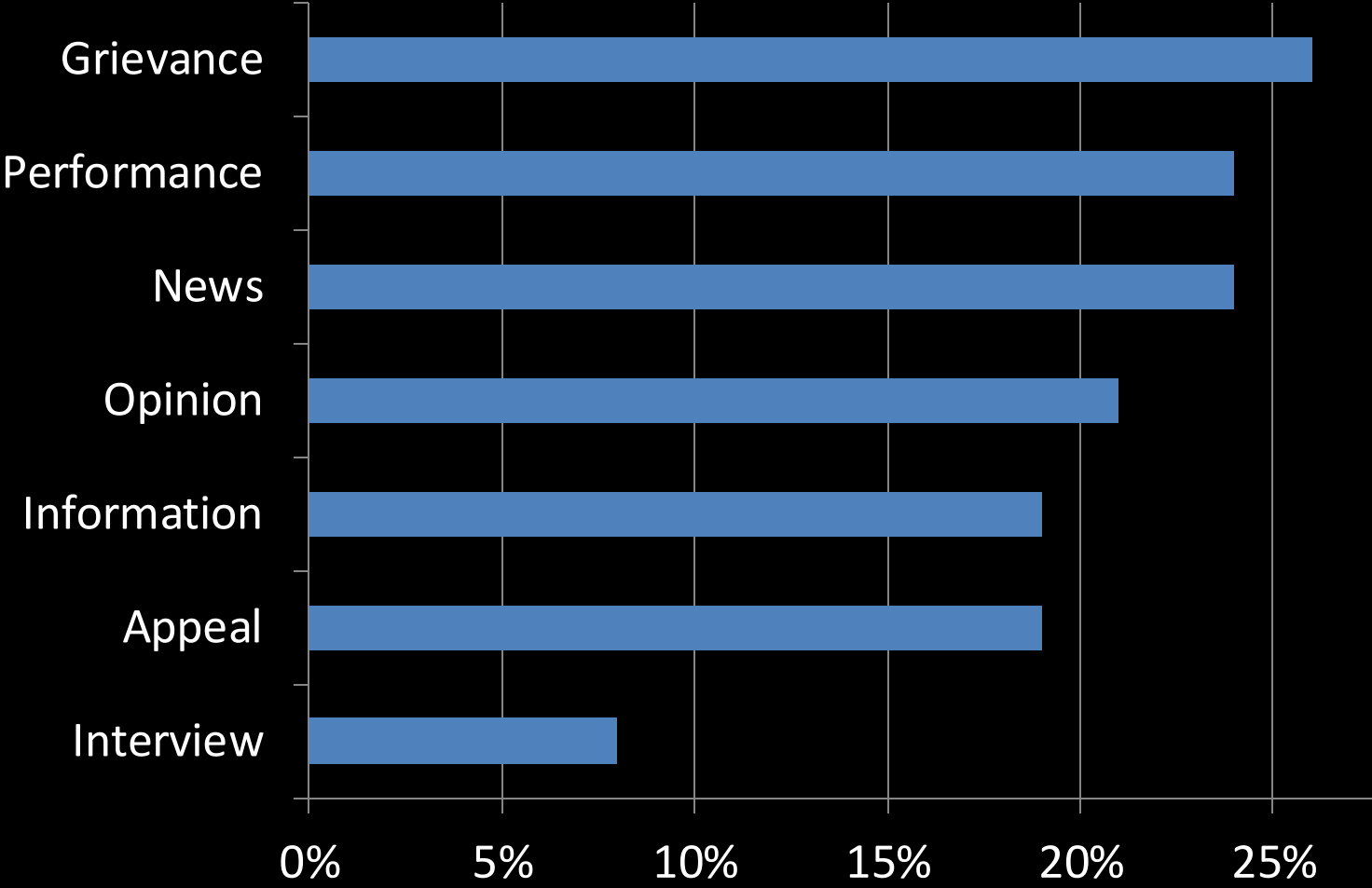
Posts per Day
(>4,200 total posts)



Calls per Day
(>280,000 total calls)



Categorizing the Reports



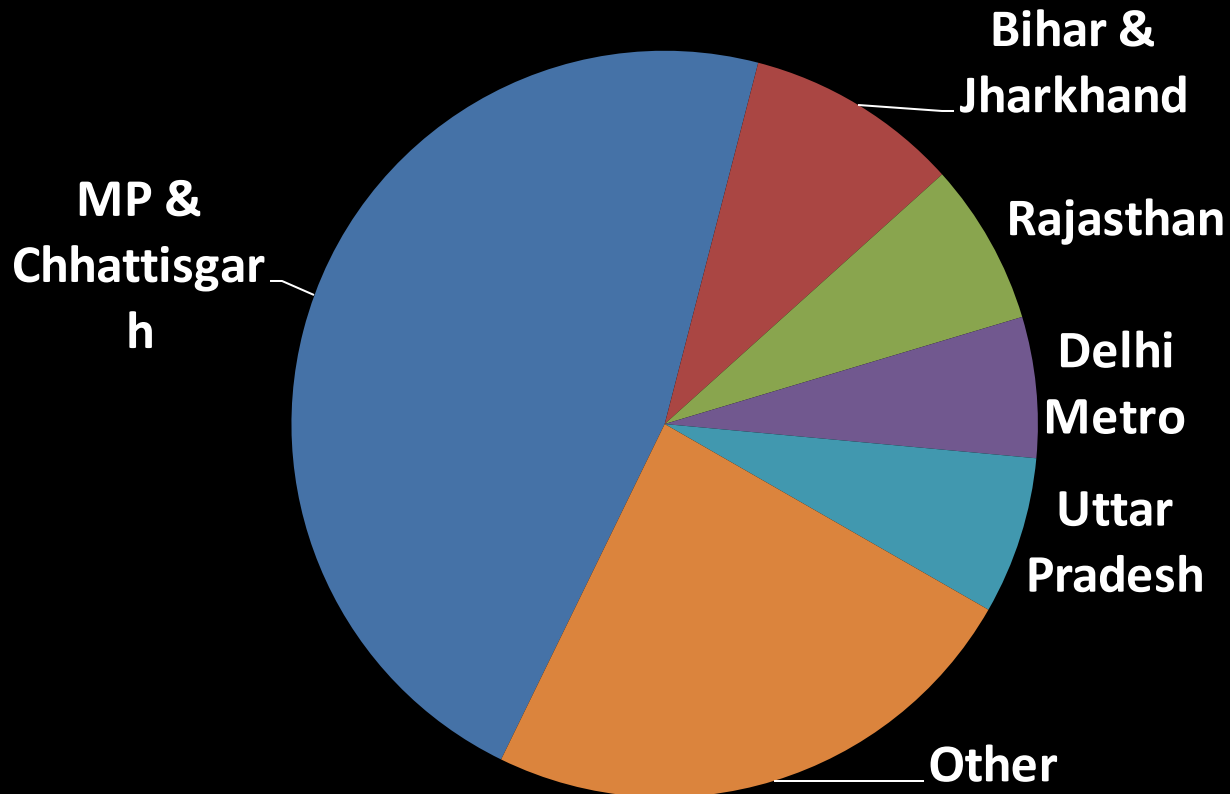
Who is Reporting?

- > 700 contributors
 - Top 10% responsible for 51% of posts
- Often social activists, but with limited voice
 - Earning \$ 100-200 / month
- Who is not reporting?
 - The poorest of the poor
 - Lack of awareness
 - Fear of repercussion



Who is Listening?

- 18000 unique callers
- Top 10% responsible for 61% of calls





CGNet
स्वरा

[About](#) | [News & Events](#) | [Impact](#) | [Recognition](#)

CGnet Swara is a platform to discuss issues related to Central Gondwana region in India. To record a message, call us on +91-80-4113 7280.

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. For 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.



Recording a report on CGNet Swara

SEARCH REPORTS »

Google™ Custom Search ×

BROWSE BY MONTH »

- ✱ [December 2011](#)
- ✱ [November 2011](#)
- ✱ [October 2011](#)
- ✱ [September 2011](#)
- ✱ [August 2011](#)
- ✱ [July 2011](#)
- ✱ [June 2011](#)
- ✱ [May 2011](#)

THE HINDU

[Home](#) [News](#)
[INTERNATIONAL](#)
[NEWS » NAT](#)

Son die paymen

[AMAN SET](#)
[RELATED](#)
[NEWS](#)

Centre's new
proposal on
MNREGS wage

[TOPICS](#)

labour
employment

[India](#)

THE TIMES OF INDIA | India

[Home](#) [City](#) [India](#) [World](#) [Business](#) [Tech](#) [Sports](#) [Entertainment](#) [Life & Style](#) [Women](#) [Hot on the Web](#) [NRI](#) [New!](#)

You are here: [Home](#) » [India](#)

Father struggles to get NREGA wages, son dies in hospital

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

[Article](#)
[Comments \(15\)](#)
[Share](#) [Print](#) [Save](#) [A A](#) [Fire](#) [Globe](#) [RSS](#) [Blogger](#) [StumbleUpon](#) [Dribbble](#) [MORE](#)

Tags: [National Rural Employment Program](#) | [MNREGA](#) | [Gram Adhikar Manch](#)

SHARE
AND
DISCUSS

33

[f Share](#)

18

[Tweet](#)

15

[Comments](#)

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



CGNet
स्वरा

[About](#) | [News & Events](#) | [Impact](#) | [Recognition](#)

CGnet Swara is a platform to discuss issues related to Central Gondwana region in India. To record a message, call us on +91-80-4113 7280.

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 Dummugedem 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



[f Recommend](#) 265 [Send](#)

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.



Recording a report on CGNet Swara

SEARCH REPORTS »

Google™ Custom Search ×

BROWSE BY MONTH »

- ✳ [March 2013](#)
- ✳ [February 2013](#)
- ✳ [January 2013](#)
- ✳ [December 2012](#)
- ✳ [November 2012](#)
- ✳ [October 2012](#)
- ✳ [September 2012](#)



Petitioned Sri Siddarth Jain I.A.S ▾

Collector, Khammam: Fix the Borewell in Ramaraopeta village

Petition by
Swara 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.

Victory

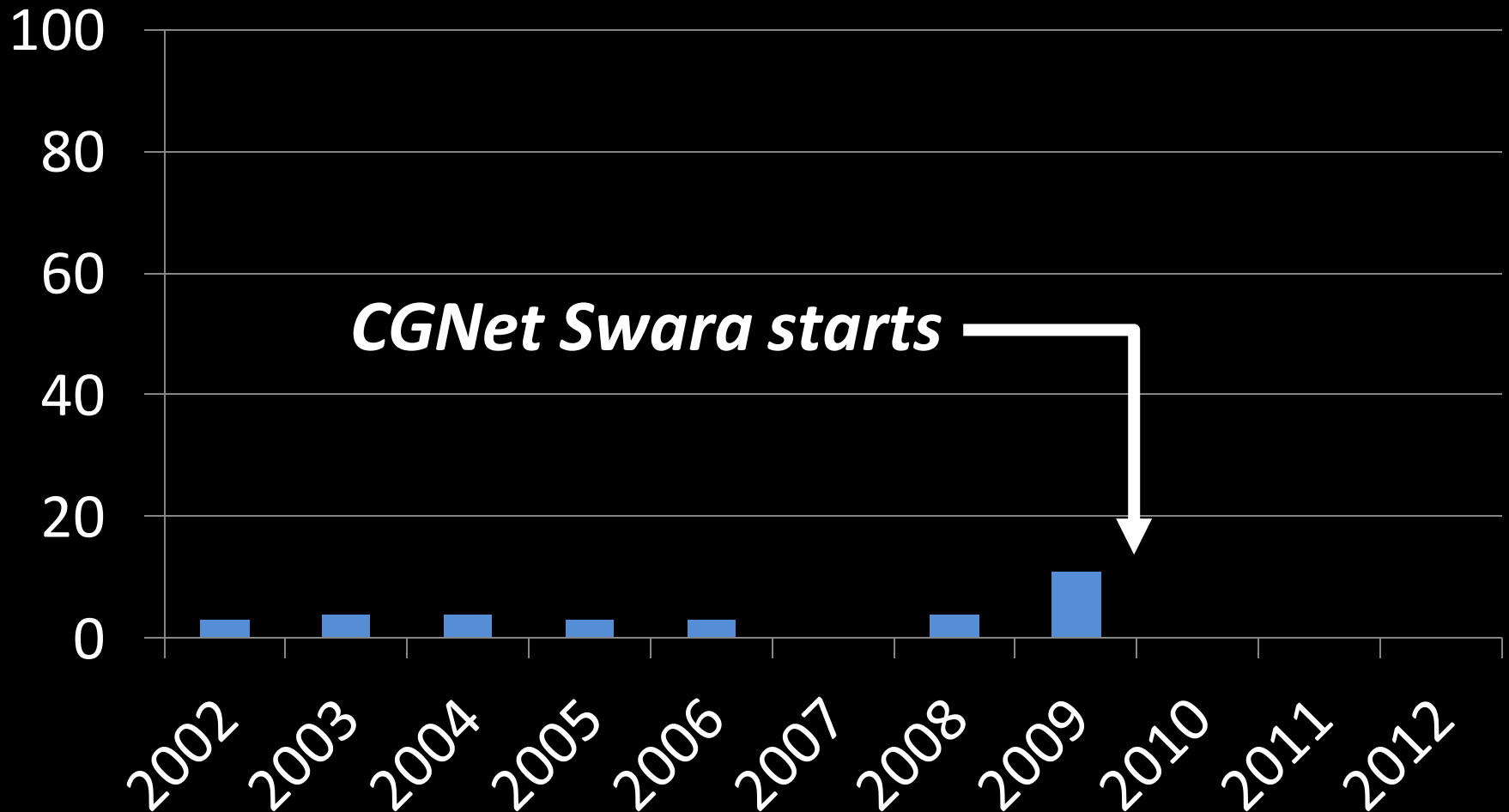
with 2,889 supporters

2,889 signatures

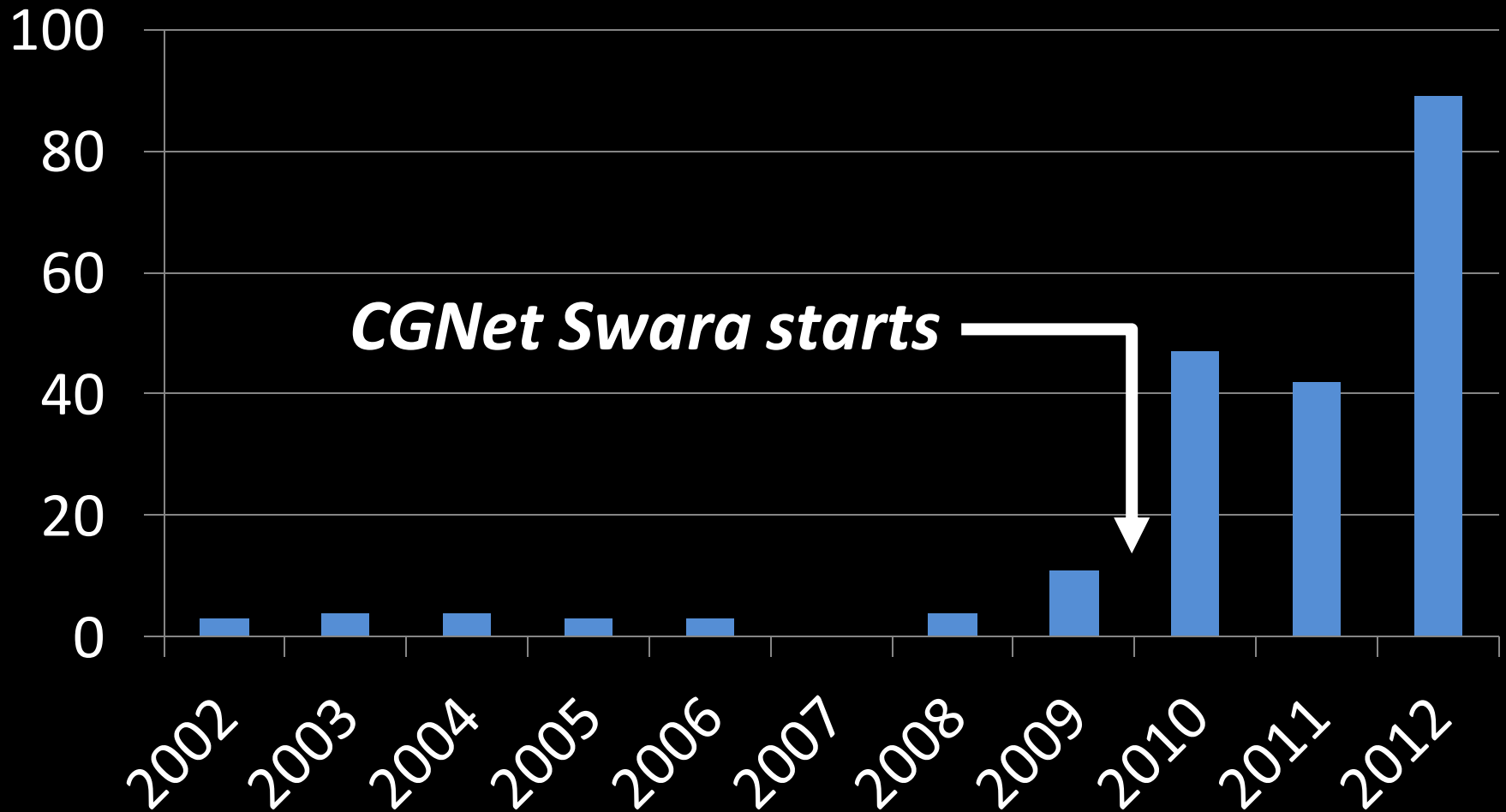
Recent signatures

HITESH PURANI	INDIA	180d
rama rajeshbabu	INDIA	181d
Ajay Adepu	INDIA	181d
ahsa sathyavan	INDIA	181d
chotababu soren	INDIA	182d
Sam Mathew	INDIA	182d
zaira khan	INDIA	182d
Aubrey Karew	TIRUVALLUR, IN	182d
Vishnu Vardhan	INDIA	182d
ayushi pandey	INDIA	183d

Malaria Deaths in Chhattisgarh: Official Government Figures



Malaria Deaths in Chhattisgarh: Official Government Figures





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.”

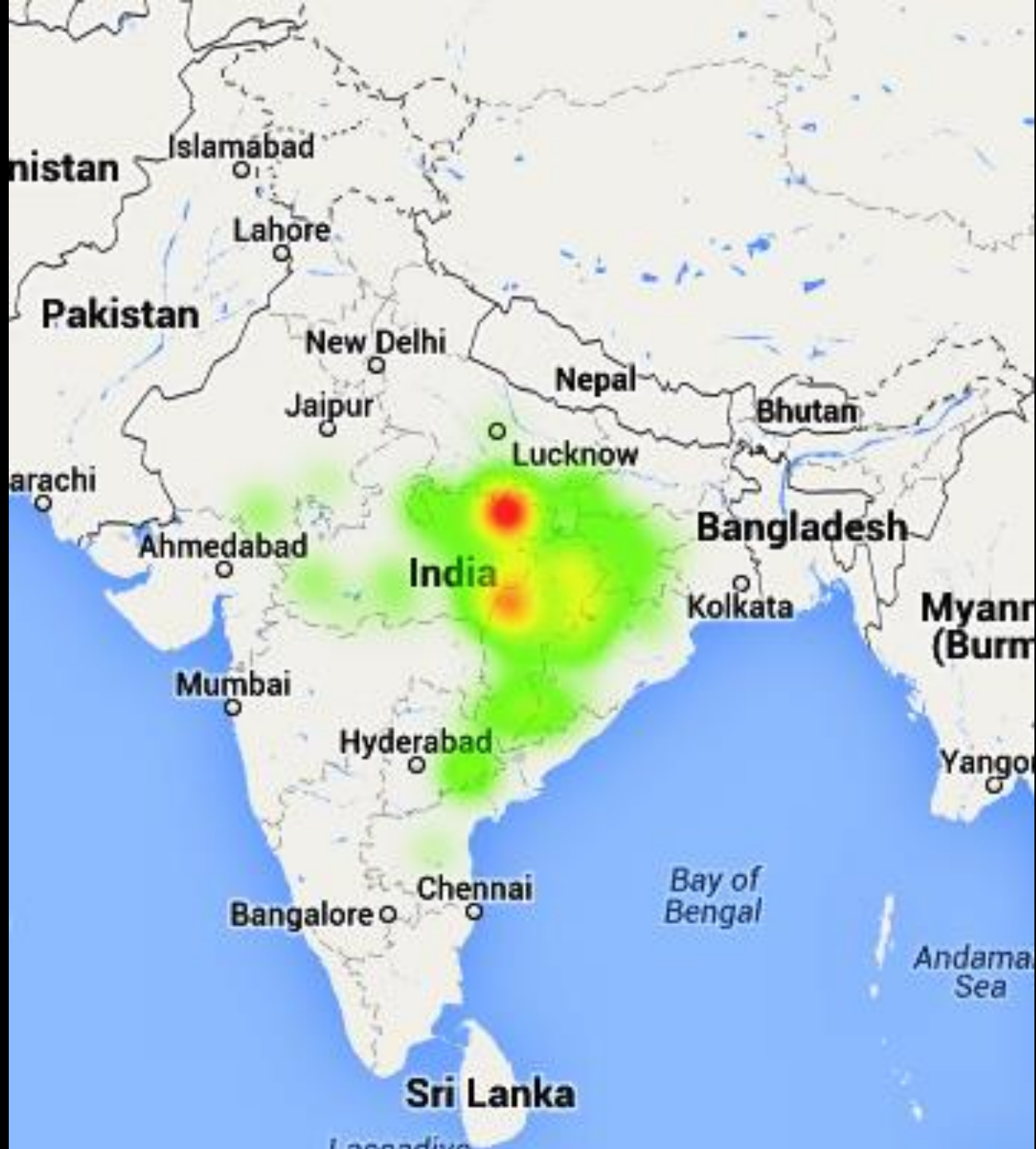
<http://cgnetswara.org/index.php?id=22097>



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>



Magarwada, Pandariya, CG
15 August 2014



कृष्ण
धर्म
बहा
धर्म

CGnet
जन्म पत्रकारिता आगरुकता
याज्ञा

Polmi (Haat), Pandariya, CG
16 August 2014



जन पत्रकारिता जागरूकता

यात्रा

15 अगस्त से 15

CGnet

हटीसग
एवं
महारा

जन पत्रकारिता

CGnet



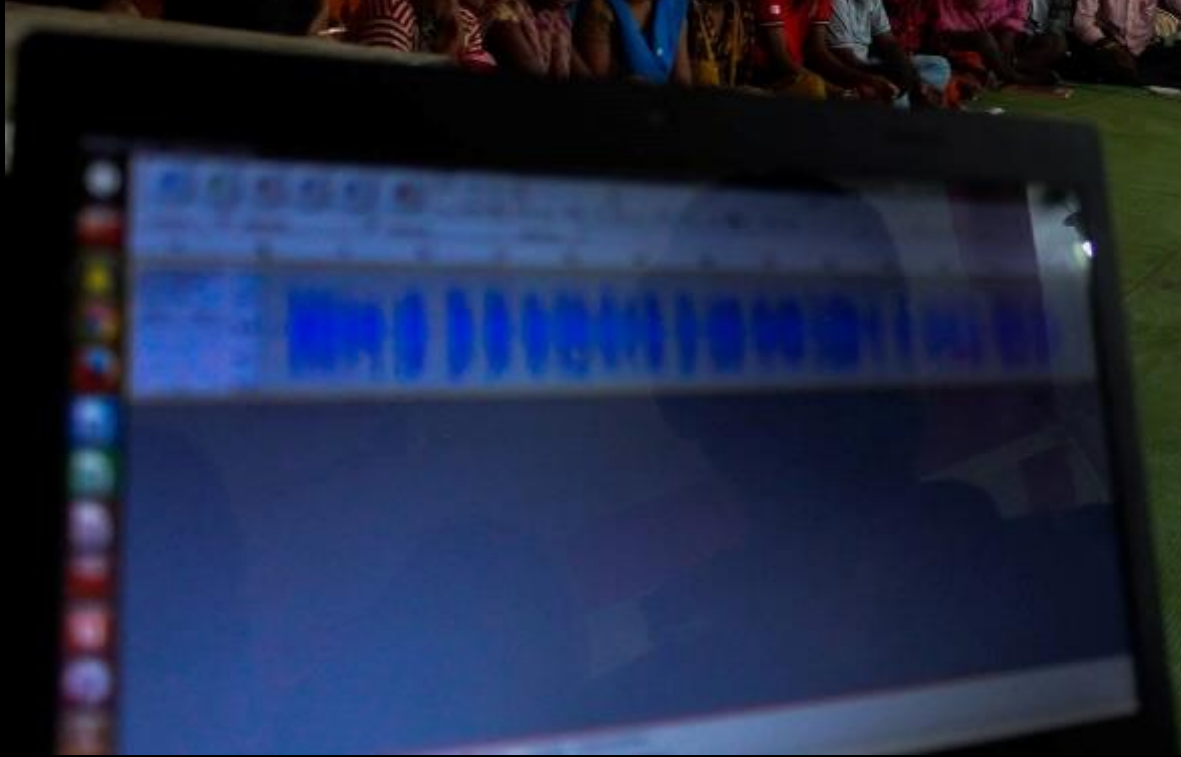
CGnet
जन पत्रकारिता जागरूकता

यात्रा



Dindori, Madhya Pradesh
12-14 August 2014

सीजीनेट स्वर कार्यशाला
UNDEF



दयारा
कार्यशाला

Tilda, Chattisgarh (Women Workshop)
8-20 August 2014



Sanghikar
कार्यशाला

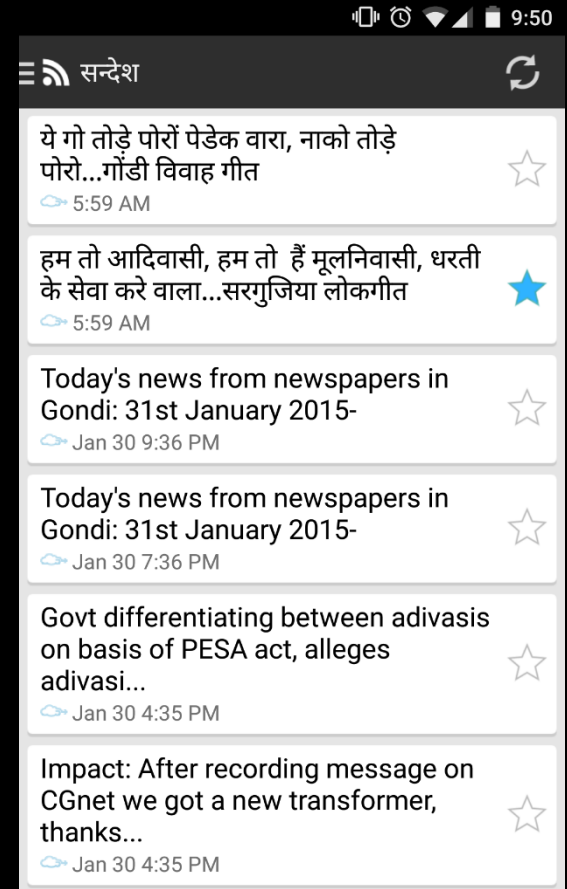


Image Credit: John Stanmeyer

A person is riding a motorcycle away from the camera on a dirt road that winds through a lush, green forest. The road is flanked by tall grass and dense trees. In the background, rolling hills are visible under a bright sky. The overall scene is peaceful and scenic.

As he travels, the app searches for a signal

Swara Smartphone App



156 posts (125 with photos) in 4.5 months

Research Questions

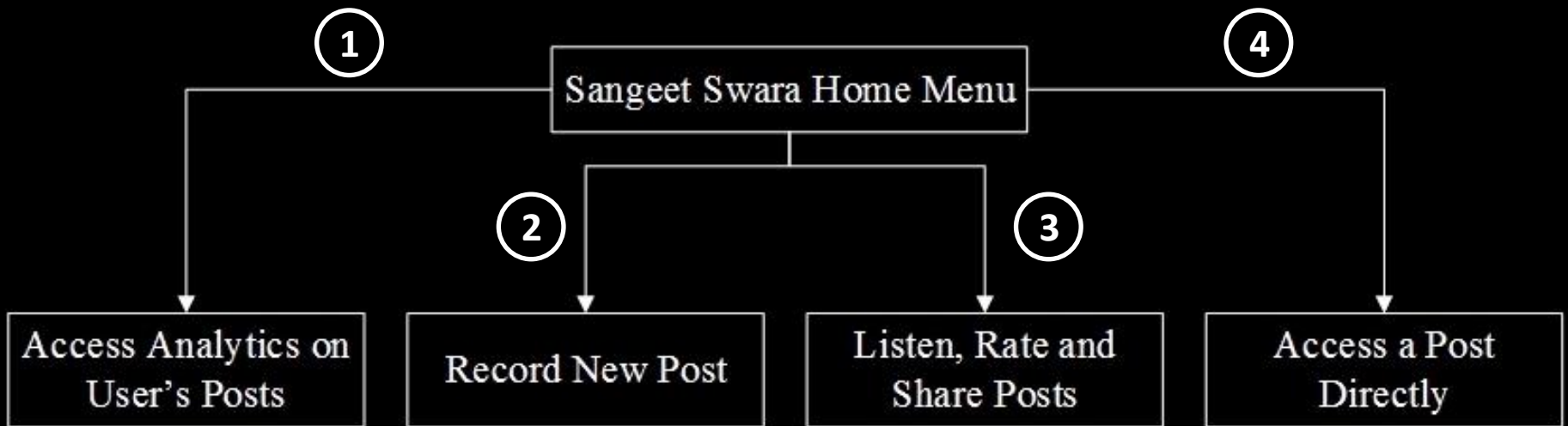
- Facebook/Twitter alternative for as-yet disconnected communities?
- How to design a scalable and sustainable IVR intervention?
 - Challenges in moderation
 - Challenges in cost of calls

Goals

1. Design, build and deploy a voice-based social media system
 - Measure engagement qualitatively and quantitatively
2. Solve the moderation challenge
 - Using the community moderation
3. Solve the cost challenge
 - Motivate users to pay for the calls

Sangeet Swara

A Community-Moderated Voice Forum
for Songs, Poems, Jokes, & Cultural Content



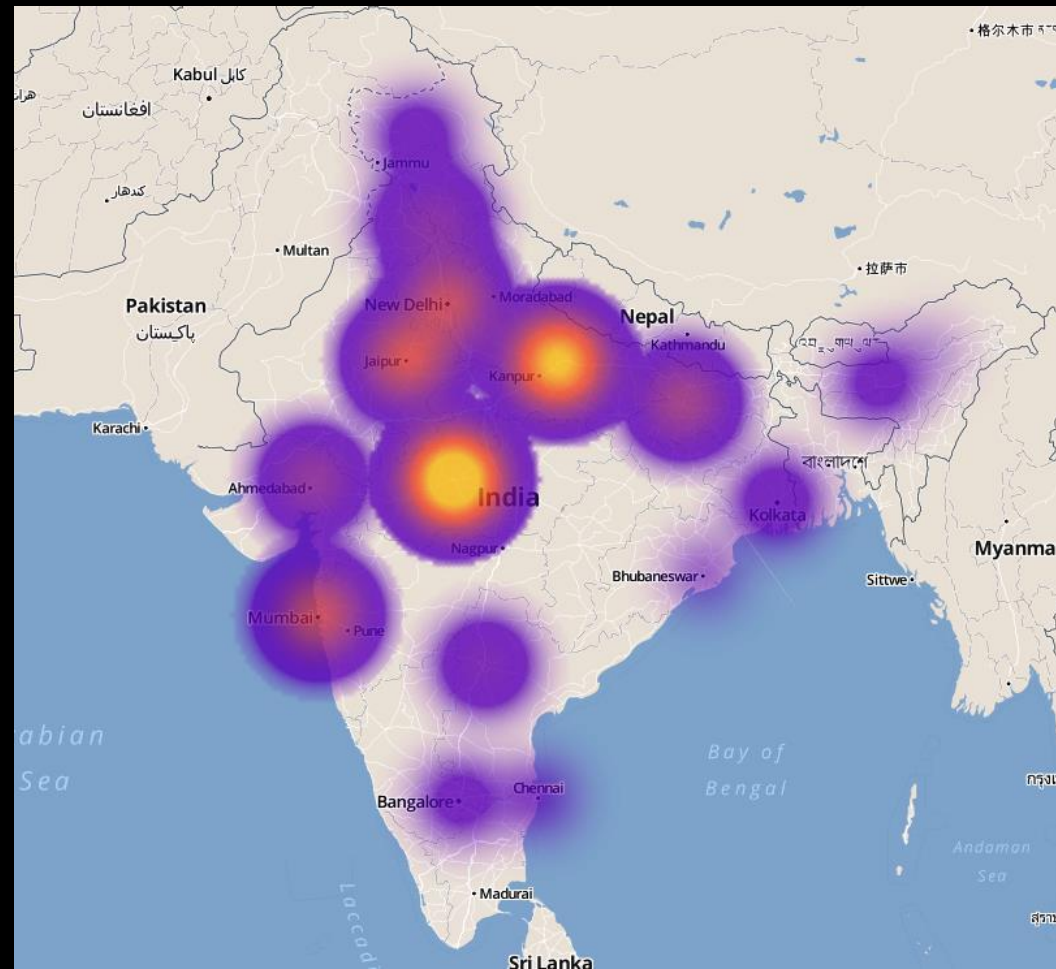
Sangeet Swara

A Community-Moderated Voice Forum
for Songs, Poems, Jokes, & Cultural Content

Traffic in 1.5 months

- 25,000 calls
- 5,400 posts
(by 500 people)
- 140,000 ratings
(by 1,500 people)

First introduction to social
media system for \$10
mobile phones owners



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.”

“Swara has influenced the country and the world.”

Instrumental Benefits

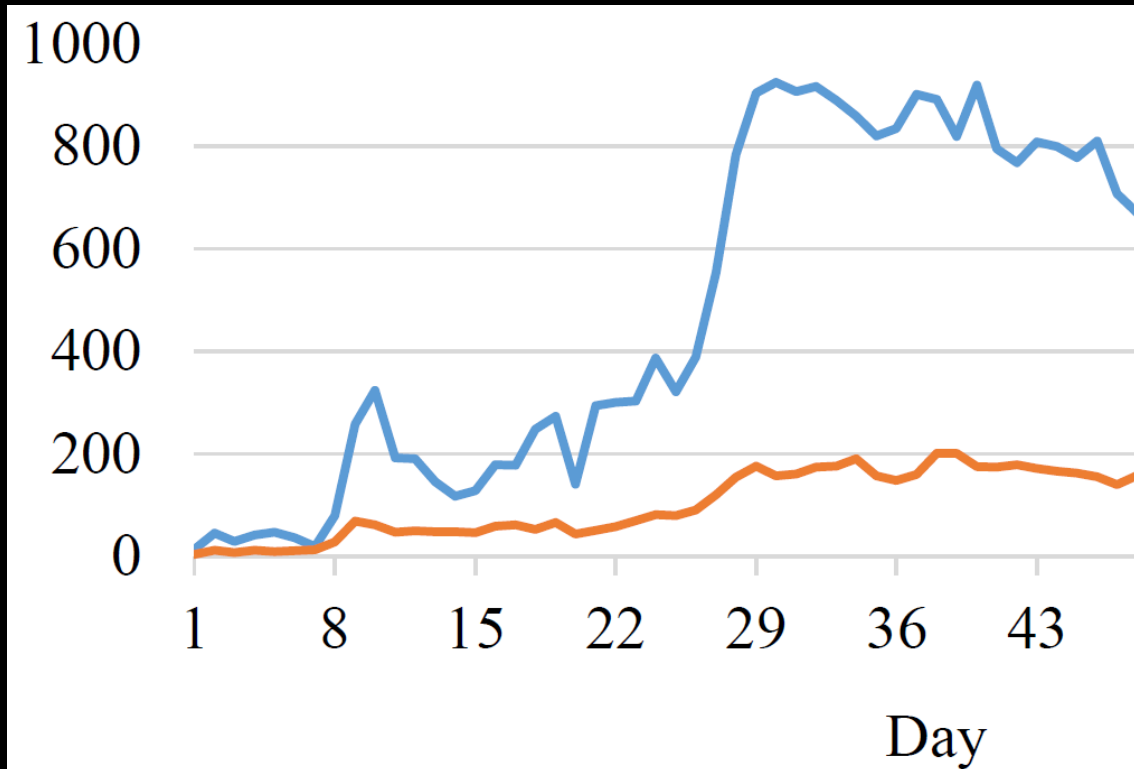
“I get a lot of knowledge by using Sangeet Swara. Some people record questions, which increases our knowledge. We get to listen to things we have never heard. We learn new vocabulary and sometimes new accent as well. I feel great when people give me feedback, be it good or bad. I consciously think of ways to improve my messages.”

Moderation

Task Type	Offered	Done	Response Rate	Accuracy
Content Categorization	1704	1551	91%	98%
Gender Categorization	2000	1895	94.7%	98%

- Relative to “experts”:
 - 98% agreement on categorizing 50 posts
 - 98% agreement on gender of 50 posts
 - 90% agreement on quality of 10 posts

Call Cost



Advertisements?

Revisiting Goals



1. Design, build and deploy a voice-based social media system

Isolated ☹️

- Measure engagement qualitatively and quantitatively



2. Solve the moderation challenge

- Using the community moderation

3. Solve the cost challenge

- Motivate users to pay for the calls

IVR Junction: Connecting Unheard Voices to Global Social Media



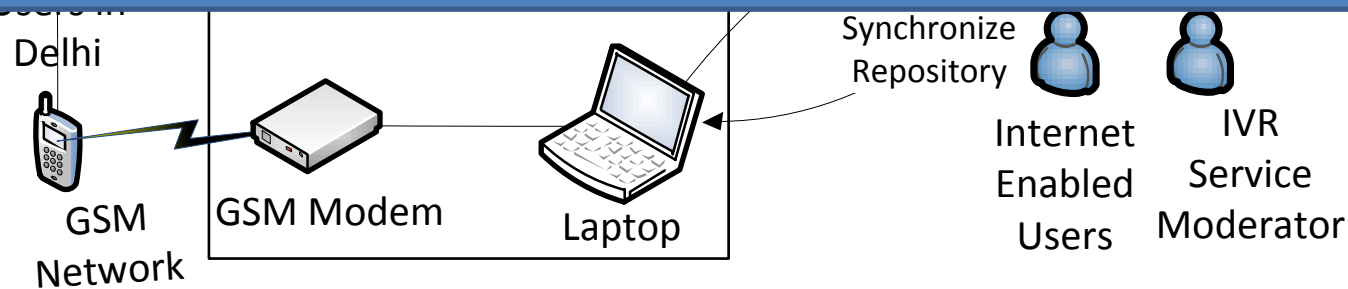
Internet



Distributed Architecture

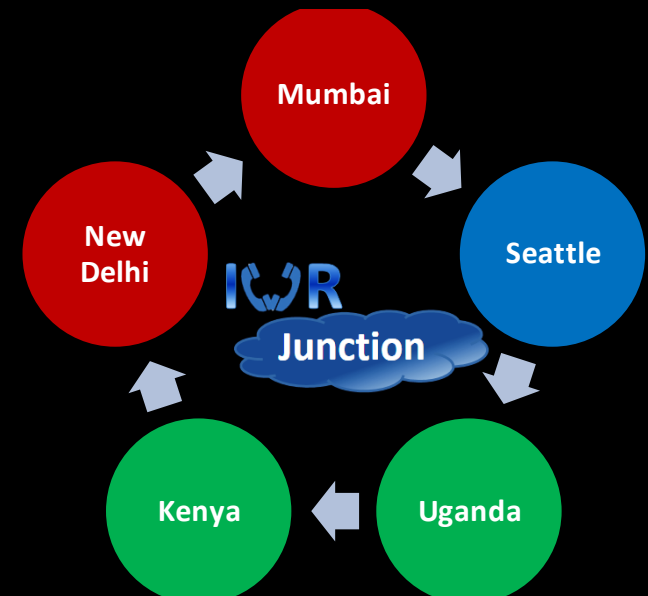


Operating Cost /Call Cost (India figures):
2x cheaper if you have users in multiple states
6x cheaper if you have users in multiple countries



Competitive Advantages

- **First** and **the only** system to seamlessly integrate IVR with Internet Services
- Easy for organizations to Set-up
- Distributed Architecture



Affordable

Scalable

Resilient



Protect Indian Women Voice Petition

Giving Voice to the Protestors in India

IVR Junction has enabled women rights activists from all economic backgrounds and varied literacy levels to raise their voice for advocating women safety and empowerment.



Vehicle for Civic Engagement and Political Stability in Somaliland



<http://www.youtube.com/iladhageyso>



GOLAHA WAKIILADDA

House of Representatives



- Home
- About the Parliament
- Parliamentary Business
- Committees
- Members of the HOR
- Documents & Reports
- Elections

- History
- Administration
- Parliamentary Services
- Functions
- Press Releases
- Gallery
- Contact us
- Public Feedback**
- Sitemap
- Check Mail
- Strategic Plan



Golaha Wakiilada oo maanta ansixiyay Xeerka Booliska.

[Read More »](#)

ILA DHAGEYSO

Uploads by Ila dhageyso

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

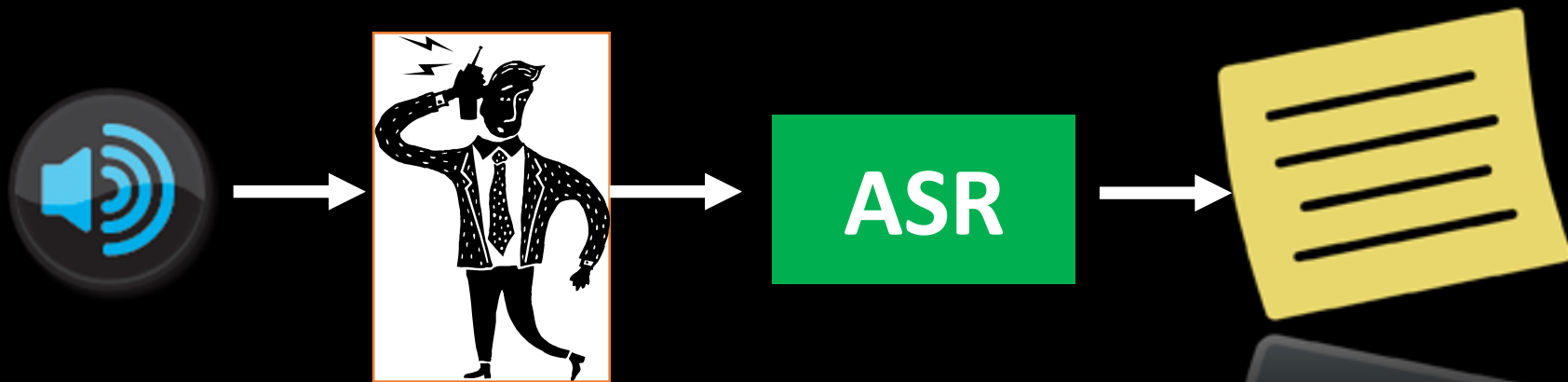
LATEST NEWS

- Qaar ka mid ah Guddiyada G/Wakiilada oo doortay Gudoomiyeyaal iyo ku xigeeno. 17.11.13
- KULAN WADA-TASHI OO AY ISKUGU YIMAADEEN GOLAHA WAKIILADA IYO HAYADDAHA LA SHAQEEYA 12.11.13
- Guddiyada Golaha Wakiilada oo isku shaandhayn lagu sameeyay. 09.11.13

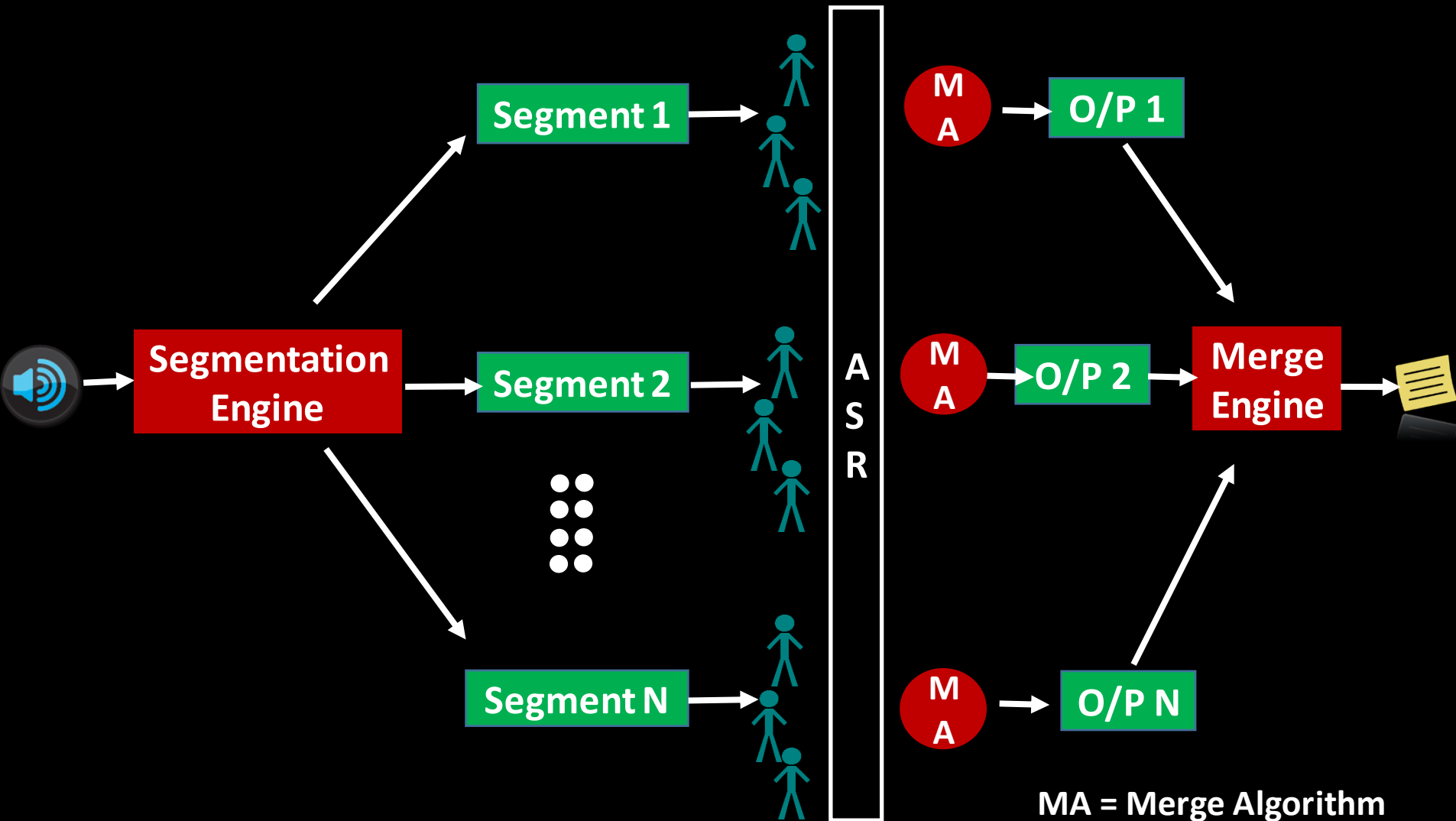
Transcription



How to make it Faster, Cheaper and Accurate



Respeak



Voice and Global Health

- Research projects
 - HealthLine: IVR system for providing information to health workers in Pakistan
 - Disseminating information to urban sex workers in India
 - Using automated voice calls to improve adherence to iron supplements during pregnancy
- Commercial initiatives
 - Patient Management System by Awaaz.De
 - MOTECH suite by Grameen Foundation

Future: Challenges and Opportunities

- Speech recognition for resource constrained languages
- Cost
 - Advertisements?
 - Crowd work?
 - Subsidy by MNOs or government



Thank you!

Aditya Vashistha

University of Washington

*Joint work with Gaetano Borriello, Shubhranshu Choudhary,
Ed Cutrell, Krittika D'Silva, Mohammed Gulaid, Meghana Marathe,
Pooja Sethi, and Bill Thies*

www.adityavashistha.com