



Building Scalable and Distributed Voice Forums in the Developing World

Aditya Vashistha and Bill Thies

Microsoft
Research

Voice Remains Primary Interface for Mobile Subscribers in India

- Most subscribers lack smart phones

Smart Phone: < 5%



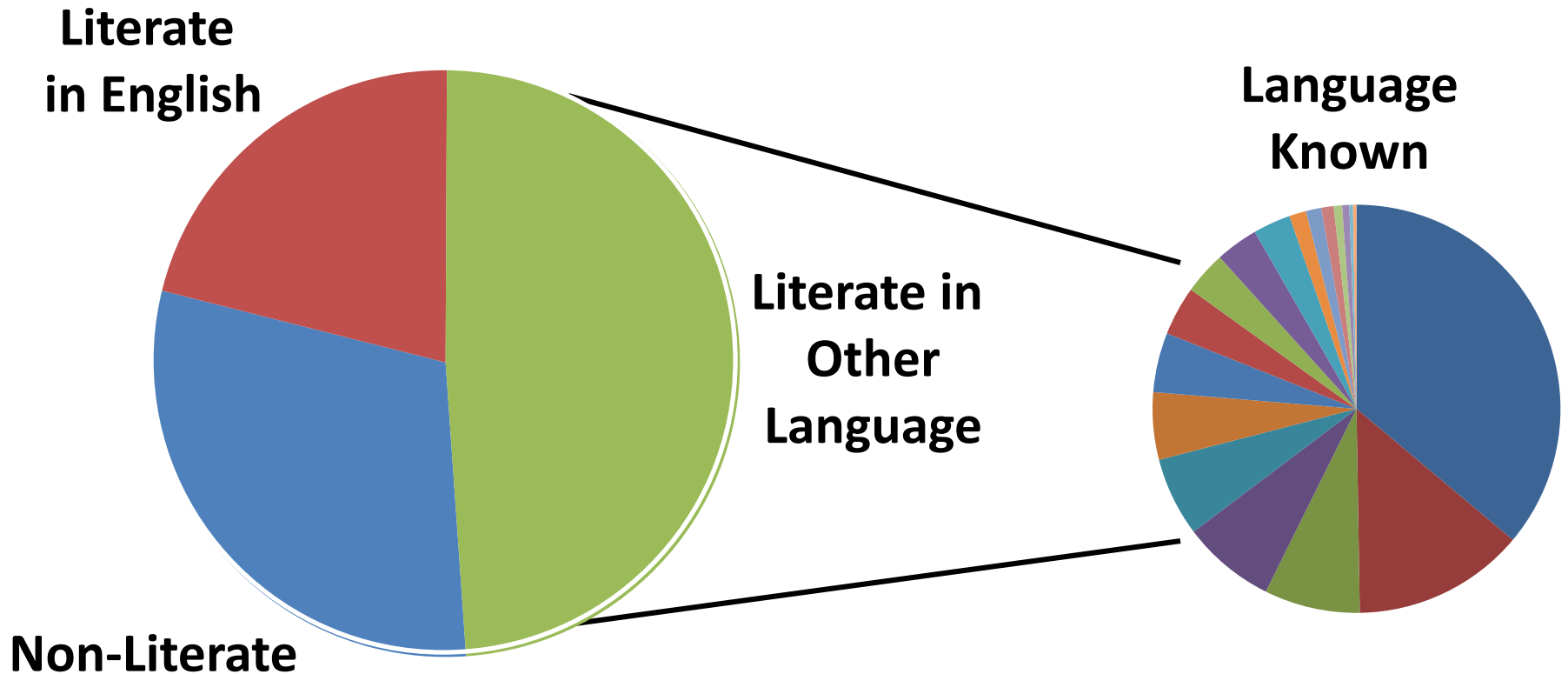
Feature Phone: 50-70%
(e.g., music player)



Basic Phone: 30-50%

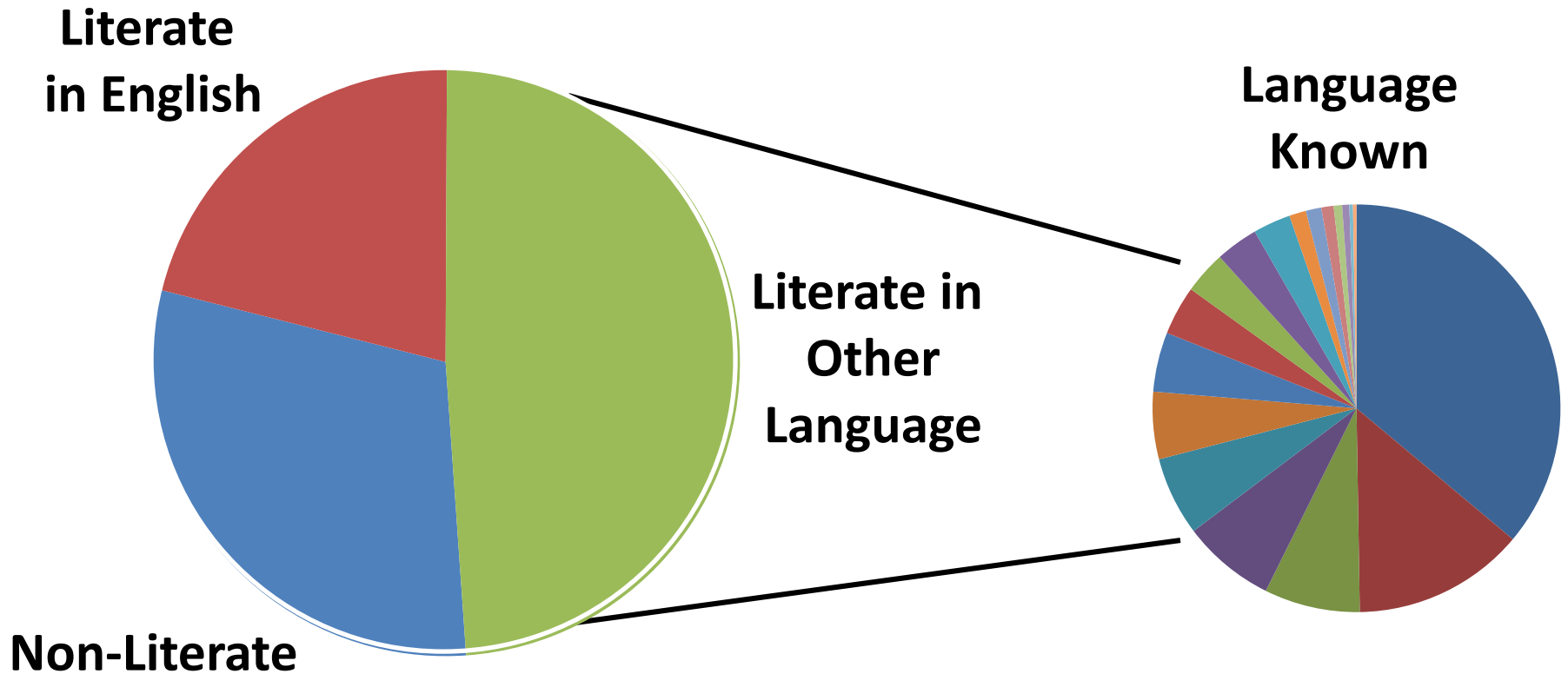


Literacy and Language Barriers



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)?

Literacy and Language Barriers



Everyone uses voice calls. Voice is an accessible and intuitive communication channel!

Interactive Voice Response in India

- Voice minutes are cheaper than most other developing and developed countries
- In 2010: \$750M from value-added IVR services
 - Expected to grow to \$3 billion by 2020
- Examples:
 - Ringtones, music, jokes, astrology
 - Booking movie tickets, travel, mobile commerce
 - TATA's *Behtar Zindagi* program: information for farmers with over 10,000 voice prompts
 - Screening for Indian version of Who Wants to be a Millionaire

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

Community driven Intelligent Maps

Kumar et al. **ICTD 2009**

Patel et al. **CHI 2010**

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**

NEWS TECHNOLOGY

[Home](#) | [US & Canada](#) | [Latin America](#) | [UK](#) | [Africa](#) | [Asia-Pac](#) | [Europe](#) | [Mid-East](#) | [South Asia](#) | [Business](#) | [H](#)

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**

**AIRCEL**

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!

Organizations Interested in Deploying Voice Forums in 2011

- InclusivePlanet
- LaborVoices
- Babajob
- Swasti
- Internews (Afghanistan)
- Environic Trust
- Barefoot College
- Mines Minerals and People
- Greenpeace
- Akshara Foundation
- Mobile Voices
- Dabba Radio
- Mobile Mitra
- Digital Green
- Sarvodaya Samiti
- Women against Sexual Violence and State Repression

It remains very difficult to set up and configure IVR system!

How to Build a Voice Forum?

- Option 1: Leverage a hosting provider



– Limited availability; are expensive

- Option 2: Build and host it yourself



How to Build a Voice Forum?

Limitations of Existing Tools (Freedom Fone, FreeSWITCH, Asterisk)

Host your own website for content moderation and distribution

Runs on Linux

Tied to single infrastructure
(not VoiceXML)

Centralized server
implies long-distance calls

IVR Junction

*A new open-source system that combines other free and commercial tools into an integrated platform to facilitate creation of **Distributed** and **Scalable** voice forums.*

How to Build a Voice Forum?

Limitations of Existing Tools (Freedom Fone, FreeSWITCH, Asterisk)

Host your own website for content moderation and distribution

Runs on Linux

Tied to single infrastructure
(not VoiceXML)

Centralized server
implies long-distance calls

IVR Junction

Utilize YouTube for hosting and content moderation

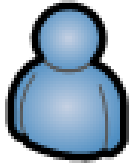
Runs on Windows

Portable VoiceXML code
(W3C standard)

Distributed servers
enable local calls

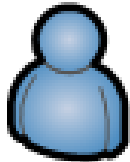
IVR Junction offers **easier setup, integration with Internet services and social media platforms**, and **cost-effective distributed access points**

IVR Junction User Interface



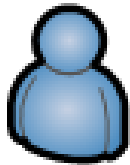
Phone Based Users

Call [+91 9632 746 257](tel:+919632746257) to access IVR Platform



Internet Audience

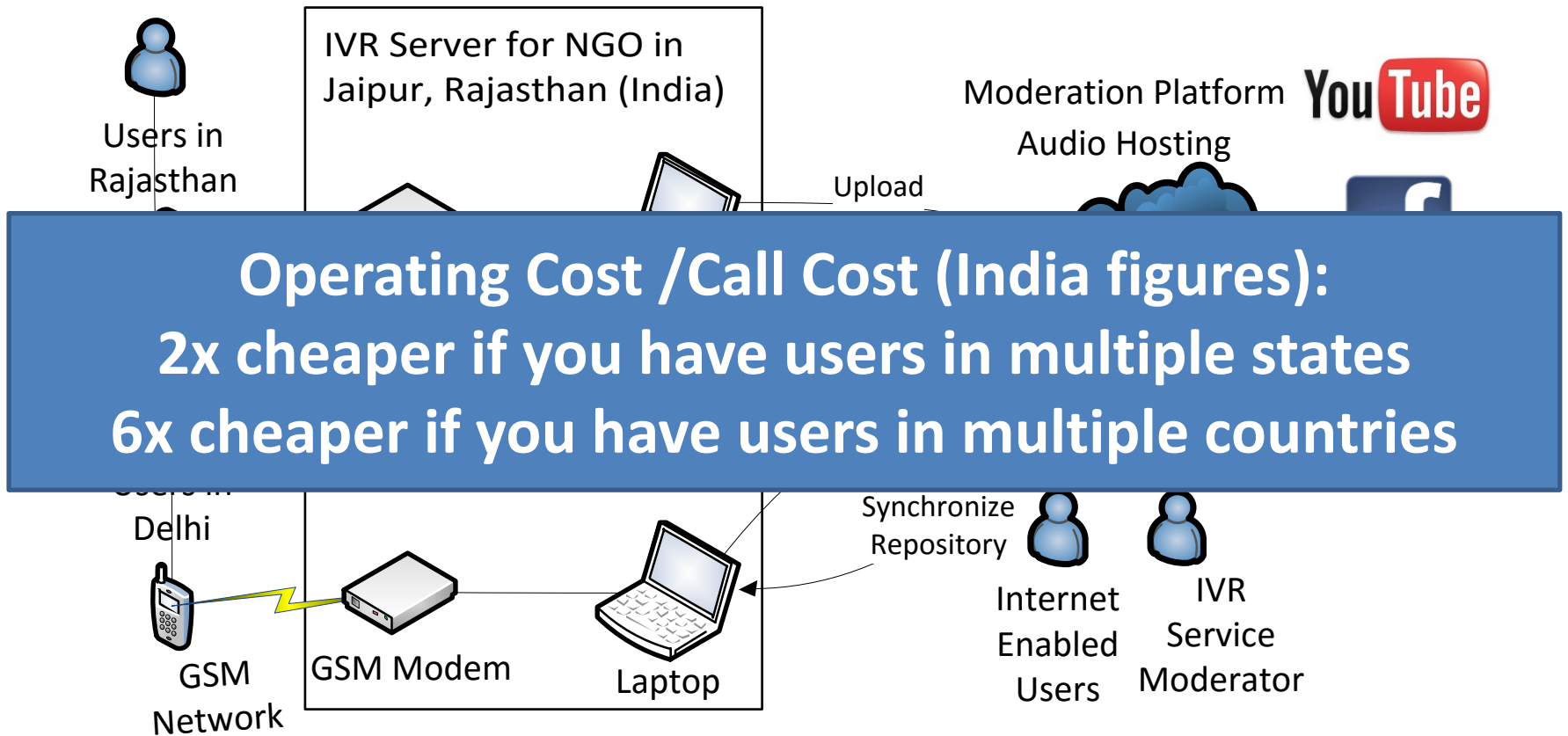
Go to www.youtube.com/channel-name
and www.facebook.com/page-name to listen to
what phone based users are saying



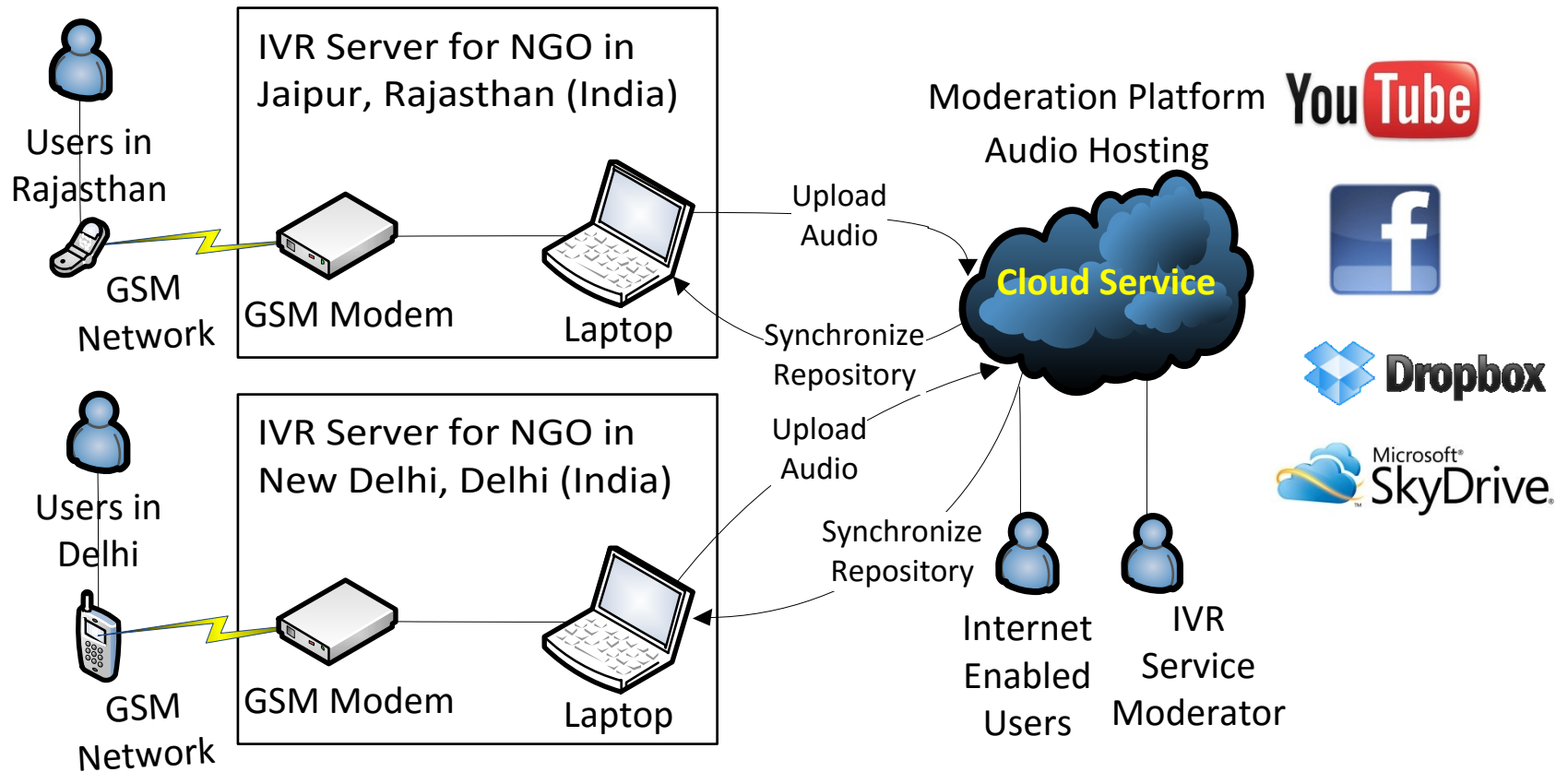
IVR Service Moderator

Go to www.youtube.com/channel-name to
moderate the submissions

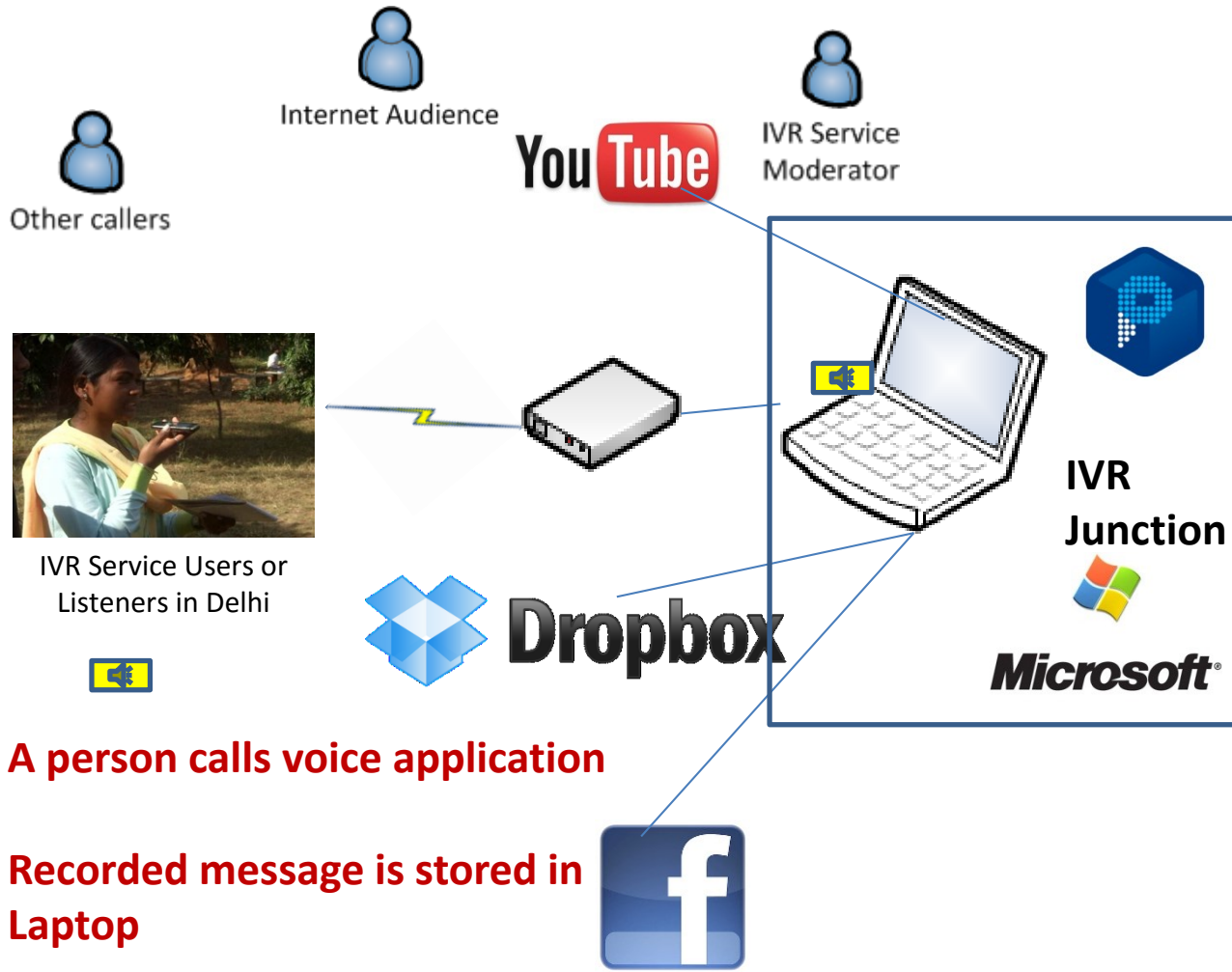
Distributed Architecture



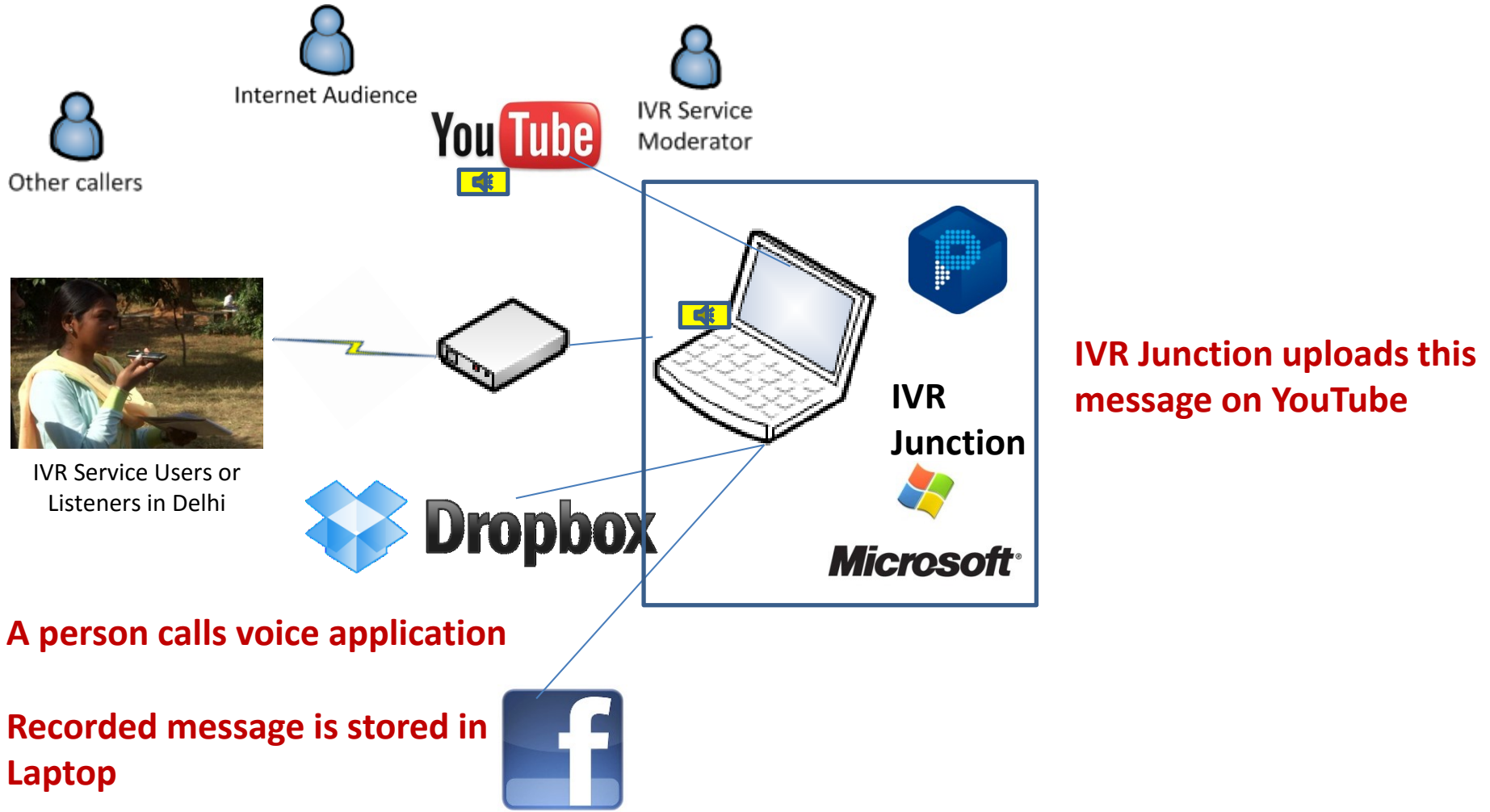
Distributed Architecture



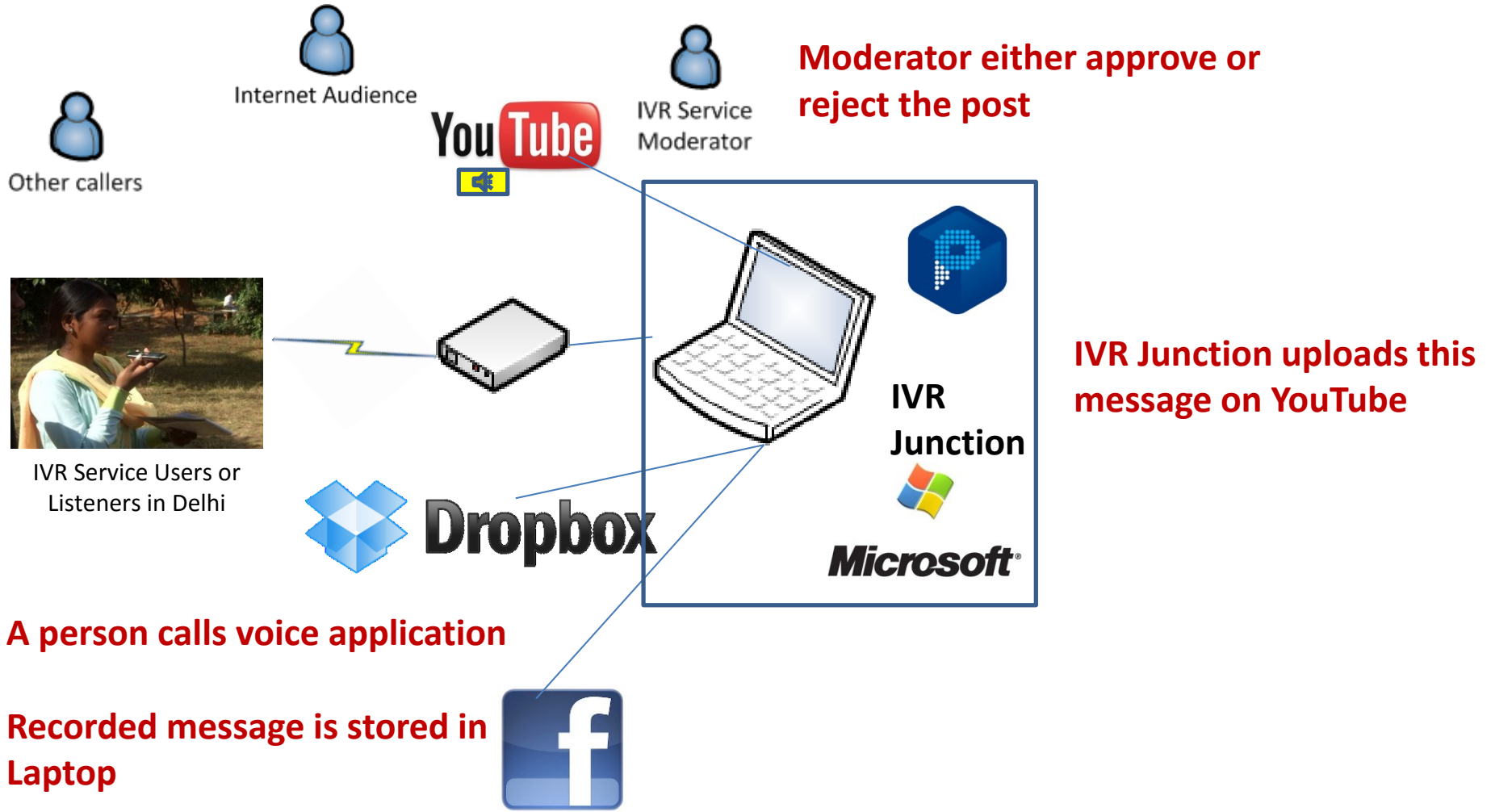
How it Works



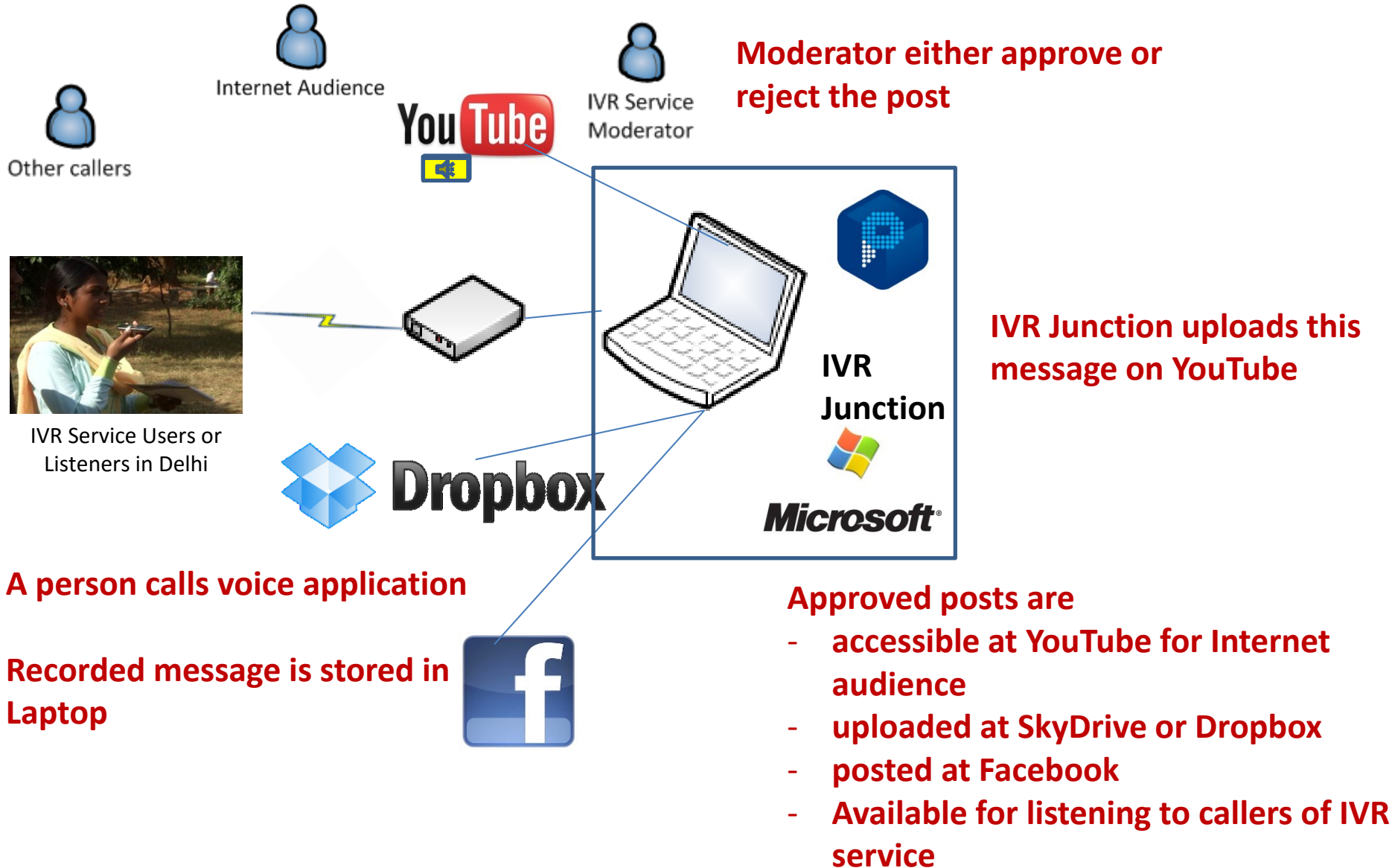
How it Works



How it Works



How it Works



Setting Up 'Your' Voice Forum

- Laptop
 - Windows OS
 - Internet
 - IVR Junction Software (free)
- Free Web services
 - YouTube account
 - SkyDrive or Dropbox account
 - Facebook page
- Paid Components
 - GSM or Fixed line modem (\$100 per port)
 - Voxeo Prophecy 11 (free for 2 ports)



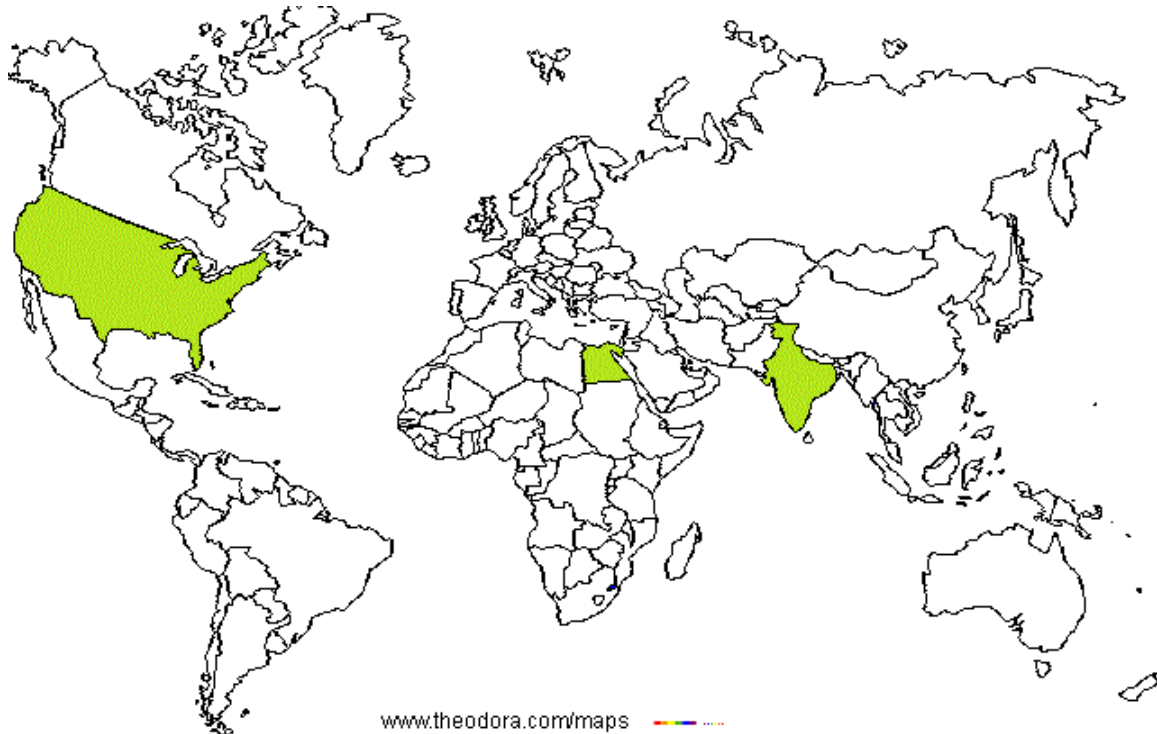
Power Applications

- Voice forums similar to CGNet Swara
- Phone Broadcasting System utilizing distributed architecture for lower outgoing call rates



Power Applications

- Voice forums similar to CGNet Swara
- Phone Broadcasting System utilizing distributed architecture for lower outgoing call rates
- Any voice forum connecting users in different countries



Some Existing IVR Junction Deployments

Bringing Transparency in Somaliland

In collaboration with University of Michigan

- Facts about Somaliland
 - Proclaimed independence from Somalia in May 1991 (unrecognized!)
 - Population: 3.5M
 - Language: Somalia, Arabic
- Functional democracy
- Largest population segment lives in rural areas
 - High mobile penetration
 - Low literacy
- Problems with existing media outlets



How to reduce political alienation and distrust between rural tribal communities and the government

Bringing Transparency in Somaliland

In collaboration with University of Michigan

- Facts about Somaliland
 - Proclaimed independence from Somalia in May 1991 (unrecognized!)
 - Population: 3.5M
 - Language: Somalia, Arabic
- Functional democracy
- Largest population segment lives in rural areas
 - High mobile penetration
 - Low literacy
- Problems with existing media outlets



Can audio feed from important figures decrease misinformation, which is a major problem in Somaliland?



- Audio discussion forum on IVR (also visualized on YouTube)
- ~ 3000 posts in less than 2 months
- Differences from CGNet Swara
 - Discussion forum vs. record-listen template
 - Buy in from the government and citizens
 - Top down approach
- Advantages
 - More transparent political process
 - Direct channel of communication (unbiased and unfiltered) between officials and citizens

REPUBLIC OF SOMALILAND



GOLAHA WAKIILADA

House of Representatives

[Home](#)[About the Parliament](#)[Parliamentary Business](#)[Committees](#)[Members of the HOR](#)[Documents & Reports](#)

Wasiirka Maaliyada oo Golaha horkeenay miisaaniyada 2012 ka

Wasiirka Wasaaradda Maaliyada Somaliland Eng. Maxamed X. Cilmi ayaa maanta xog-waran la xidhiidha miisaaniyada qaranka sannadka 2012-ka siiyay Golaha Wakiillada Somaliland. Fadhiigii maanta oo uu shirguddoominayay Guddoomiye Cabdiraxmaan Maxamed Cabdilaahi ayay Mudanayaashu war.

[READ MORE](#)

ILA DHAGEYSO

Uploads by iladhageyso

- Video uplodged by Ila Dhageyso service - Somaliland
- Video uplodged by Ila Dhageyso service - Somaliland
- Video uplodged by Ila Dhageyso- Somaliland
- Video uplodged by Ila Dhageyso service - Somaliland

LATEST

- Kulan deega IRI iyo aragti deega yeesh wakiil

Giving Voice to the Protestors in India

In collaboration with Women Rights Activists in Bangalore

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

NEWS INDIA

[Home](#) | [US & Canada](#) | [Latin America](#) | [UK](#) | [Africa](#) | [Asia](#) | [Europe](#) | [Mid-East](#) | [Business](#) | [Health](#) | [Sci/Environment](#) | [Tech](#) | [Entertainment](#) | [Video](#)
[Asia Business](#) | [China](#) | [India](#)

18 December 2012 Last updated at 05:56 ET



Delhi bus gang rape: Uproar in Indian parliament

There has been an uproar in India's parliament over the gang rape of a 23-year-old student on a city bus in the capital, Delhi.

MPs from all parties have expressed their horror at the incident which has caused outrage in the country.

Police said they have arrested four people, including the bus driver, and are looking for two more people.

The student and her male friend were beaten, stripped and thrown out of the bus on Sunday evening.

They have been admitted to hospital, where the woman remains in a critical condition.

"She continues to be serious. She has responded to us once in the last 12 hours and that is a good sign, but we cannot rule her out of danger. She remains on ventilator," Safdarjung Hospital medical superintendent BD Athani told the BBC Hindi service.

Delhi's rape figures are far higher than other Indian cities of comparable size, correspondents say.



Delhi has one of the highest rates of crime against women in India

Related Stories

[Women's tales from brutal Delhi](#)

[Outrage over India bus gang rape](#)

[Student 'gang-raped on Delhi bus'](#)

Top stories



[Karachi bomb blast kills dozens](#)

[Queen in hospital with stomach bug](#)

[US sinkhole home demolition begins](#)

[Cardinal sorry for sexual misconduct](#)

[Swiss back curbs on executive pay](#)

Features & Analysis



A tough gig

[Can funny men ever be taken seriously?](#)



In the frame

[The collectors who spend a fortune on art and gift it to us all](#)



Explorer's agony

[Sir Ranulph Fiennes on his ill-fated Antarctic trek](#)



Class divide

[Is Kenya's middle class too busy tweeting to vote?](#)





‘Protect Indian Women’ Petition

- 1** Call +91 990 253 1662 to record your voice message.
Share your opinion, suggest some corrective actions, and share your personal plan for bringing change to your community and the country.
- 2** Go to www.youtube.com/ProtectIndianWomen and www.facebook.com/ProtectIndianWomen
- 3** Find the last 4 digits of your phone number in the title of videos uploaded on YouTube and Facebook
- 4** Share your video message on your Facebook and Twitter account. Ask your friends to raise their voice peacefully for women safety and rights!

**All recorded voice messages will be shared
with legislators!**

Protect Indian Women

Example Recording



Protectindianwomen

Timeline ▾

Now ▾

Admin Panel

Create Page

Like · Comment · Share

Aditya Vashistha, Satya Prakash Natha and Shīvām Shārmā like this.



Write

Press E

40 people say



Prot

Janu

The messag



Like · Comme

35 people say



Prot

December 30, 2012

The messag

YY6257

The message is recorded
by: +91XXXXX YY0734+91XXXXX

Press Enter to post.

See Your Ad Her

protectindianw

the purpose of the
page is to provide
platform for people
india to identify the
steps needed to...

Like · likes this

How is it different from other online petitions:

- + Creative platform
- + Displays stronger association with the cause
- + Emotionally powerful
- + Well articulated support to a cause
- + Enable phone based callers to support online petitions
- + Easy translation
- Requires more efforts

Next steps?

Getting News to and from Mali

*In collaboration with Voice of America and Broadcasting Board of
Governors*

To provide an alternative means of getting news to and from
this technologically-challenged region



- People in Mali can now call a number to listen 3 minute news broadcast by Voice of America
- They can also record their feedback, comments, questions and news items
- All user generated recordings are accessible on a YouTube channel for global audience

Thanks!

Aditya Vashistha

Bill Thies