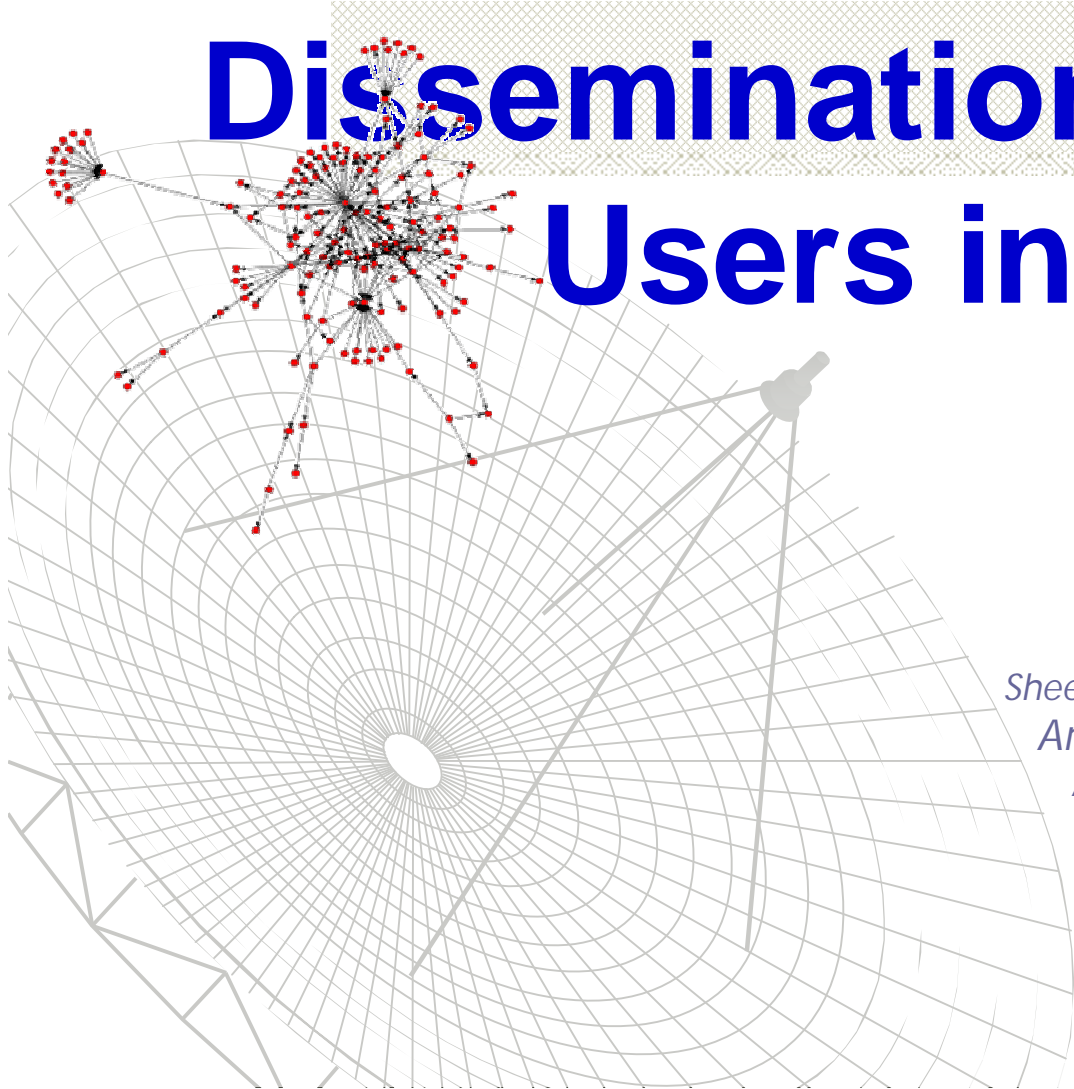


# Content Creation and Dissemination by-and-for Users in Rural Areas



*Sheetal Agarwal,  
Arun Kumar,  
Amit A. Nanavati,  
Nitendra Rajput*

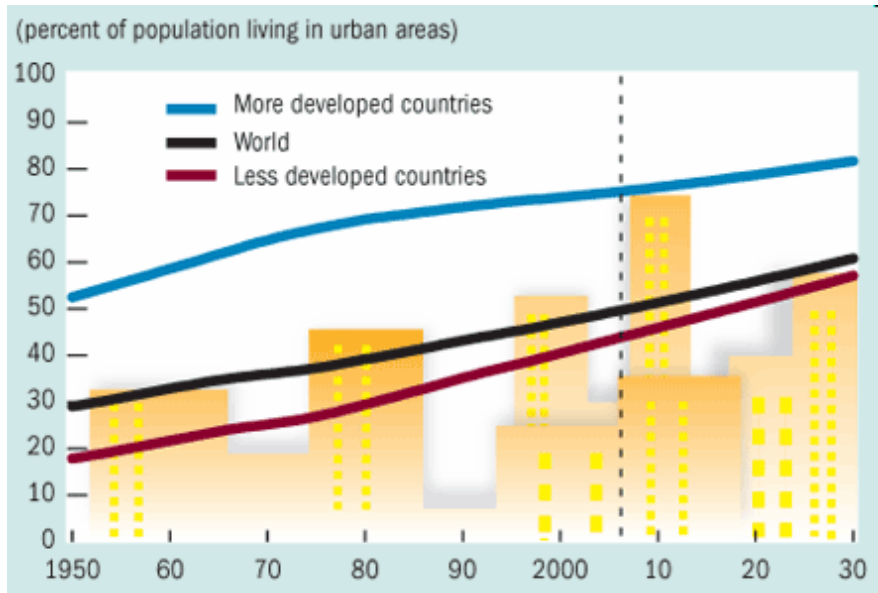
*IBM India Research Lab*

# Motivation

« Why has the Internet dramatically changed our way of life?

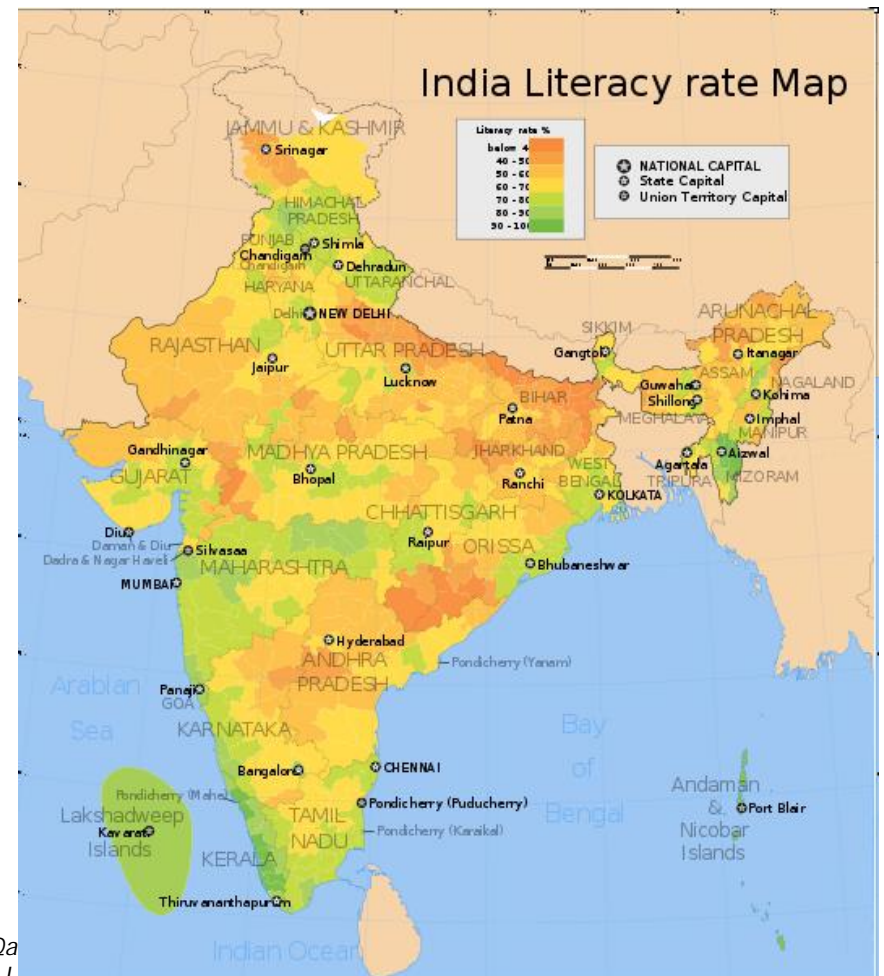
« *Because it has enabled ubiquitous access to information and services at the dick of a mouse*

# Motivation: World Demographics



Majority of the population in less-developed countries still lives in rural areas

Source: International Monetary Fund ([www.imf.org](http://www.imf.org))



Majority of the rural population in India is not literate

ICTD 2009, Doha, Qatar  
IBM India Research Lab

# Motivation: Limited information access

Table I Access to sources of information and communications for the rural poor in India (per cent)

Source	Personal ownership	Shared/communal	Not available
Radio	77.3	22.3	–
Television	9.3	84.0	6.6
Telephone	–	66.3	36.7
Fax machine	–	0.7	99.3
Newspapers/printed sources	11.3	80.0	8.7
Computer/Internet	–	12.0	88.0
Family/friends	100	–	–
Village head/community and political leaders	–	100	–

Note: Figures given are percentages

« Most information sources for rural areas are *global* in nature

<sup>a</sup> These sources (Radio/Television) lack *locally relevant content*

# Problem Statement

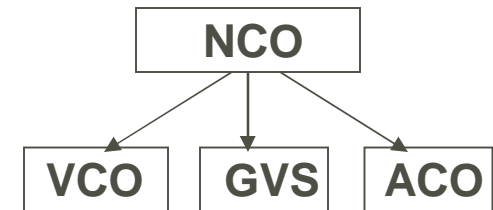
1. Current information sources for rural regions do not enable *locally relevant* content *dissemination*
2. Mechanisms for *locally relevant* content *creation* are missing

*How to enable these is the problem we address in this paper*

# Approach Followed

- « Perform a *needs-study* to identify the information needs of this population
- « Follow a *participatory-design* process to develop a low-cost solution for the less literate users
- « Assess usability by observing the *usage pattern* of the solution for the rural population

# Needs Study



## « Worked with the NGO – Byrraju Foundation

- a Adopted about 200 villages in Andhra Pradesh
- a One Nodal Coordination Officer (NCO) for every 3-8 villages
  - © Graduate, knows English well
- a One Village Coordination Officer (VCO) for each village
  - © Intermediate, trained in nursing, does not know English usually
- a A Grameen Vikas Samiti (GVS) consisting of 18 people of the village. Each person is responsible for one module (agri/aqua/water/sanitation/education/healthcare/...)
- a A GVS convener – head of the GVS
- a Villages that have an Ashwini centre will have a Ashwini centre Operator in addition
- a NCO, VCO, GVS convener, Ashwini centre Operator run the show in the field

# Needs Study: Field Visit



Information is usually provided through public address systems



Announcement about an upcoming health camp

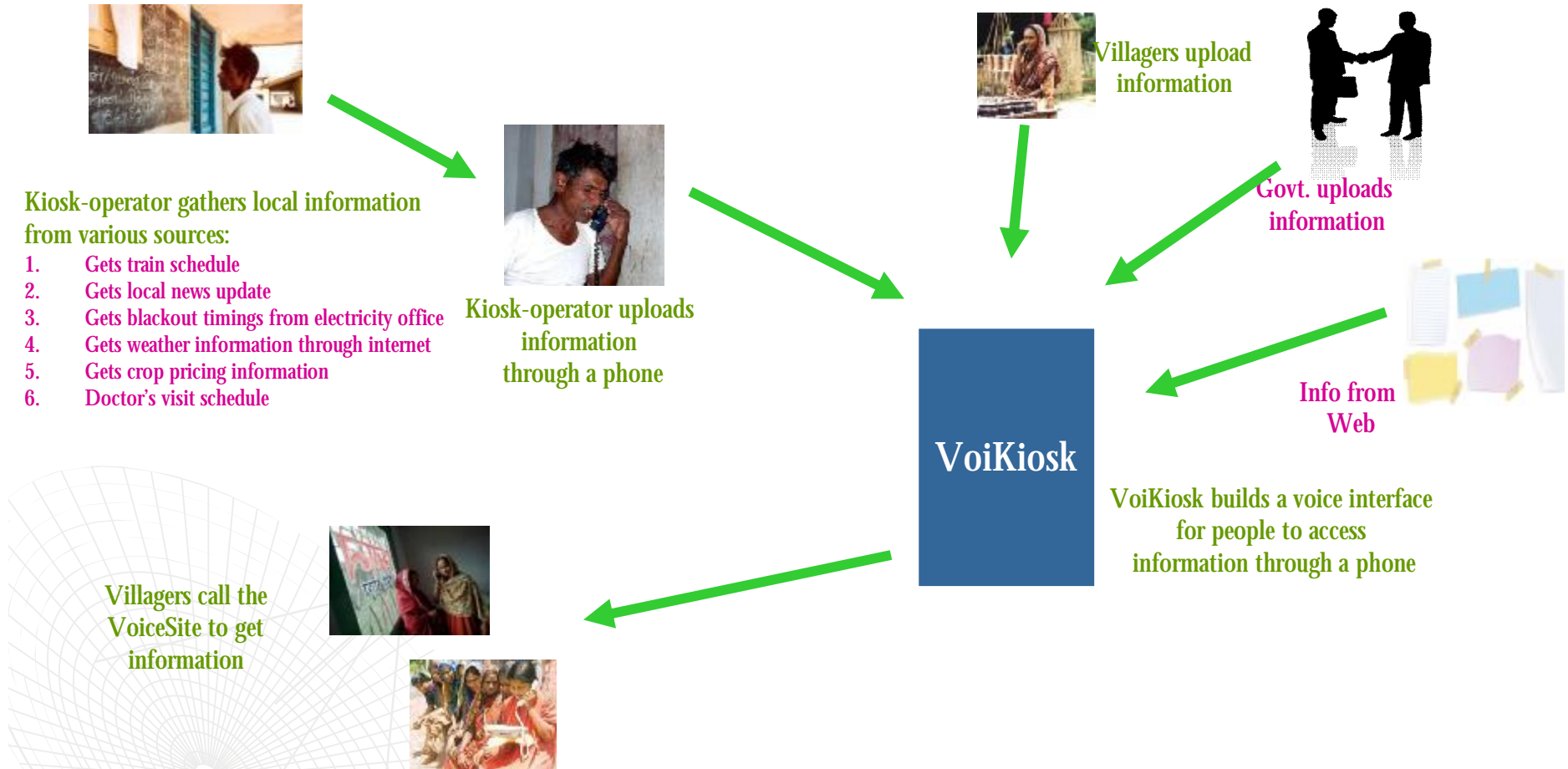


# Needs Study: Field Input

Village	Population	Households	Mobiles	Main operators	DTMF	Will pay?	Information	
<b>Vandaram</b> (Primarily Agriculture based)	2292	450	150	Airtel/BSNL/Idea/Vodafone	Will not prefer	depends on value of information. Not initially.	Program schedule of Ashwini, Information categorised on Modules, Pesticides, Medicines, Aqua information, sports updates, railway enquiry.	Yes for pilot
<b>Juvvala Palam</b> (A hub, renting of transport vehicles)	3800	850	70% households	Airtel/Tata/BSNL/Vodafone	Voice is better	same as above	Community news, agriculture info, NO to train, no to Electricity, doctor visit, Teleconferencing information announcement, panchayat meetings, ankur channel program schedule. Hub village for 4 lakh population in nearby villages.	Yes for Pilot
<b>Cherukumilli</b> (Aqua – farming)	4047	1000	500	Airtel/idea	Voice	After realising the value, they may. Not initially.	information about village, Panchayat meetings, GVS meetings	
<b>Ibhimvaram</b> (100% cell penetration)	4600		3000	Idea/Airtel	Voice	Yes	Tractor renting, electricians, etc. panchayat meeting, national fish rates, V-agri	GVS very interested for pilot.

# VoiKiosk: A VoiceSite for Rural Population

- A voice application deployed as a village portal
- Available over an ordinary phone call through a voice interface



*Service delivery to villagers through (mobile) phones by a voice interface*

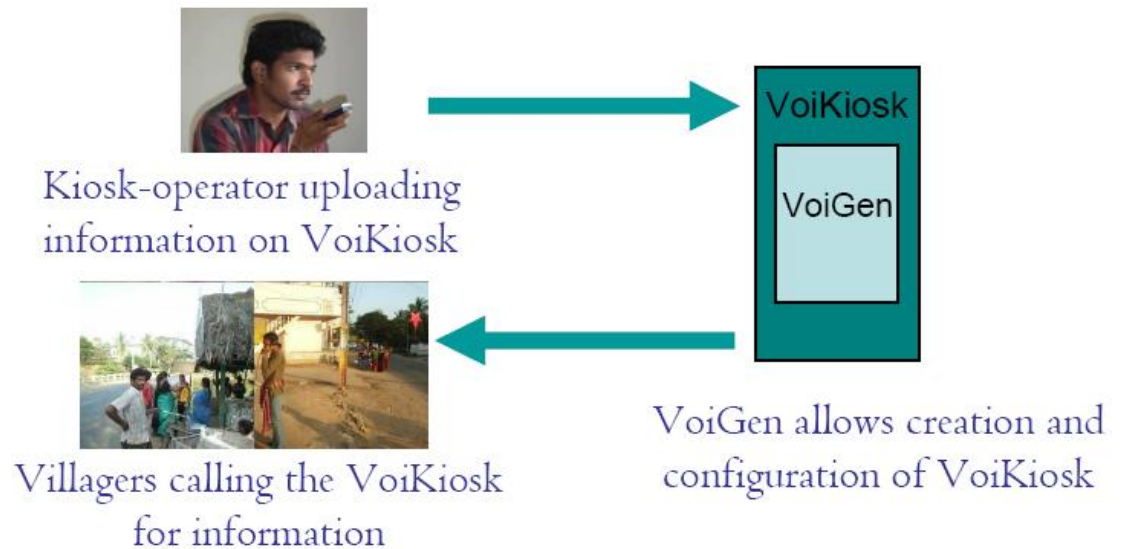
# Participatory Design

## « VoiKiosk

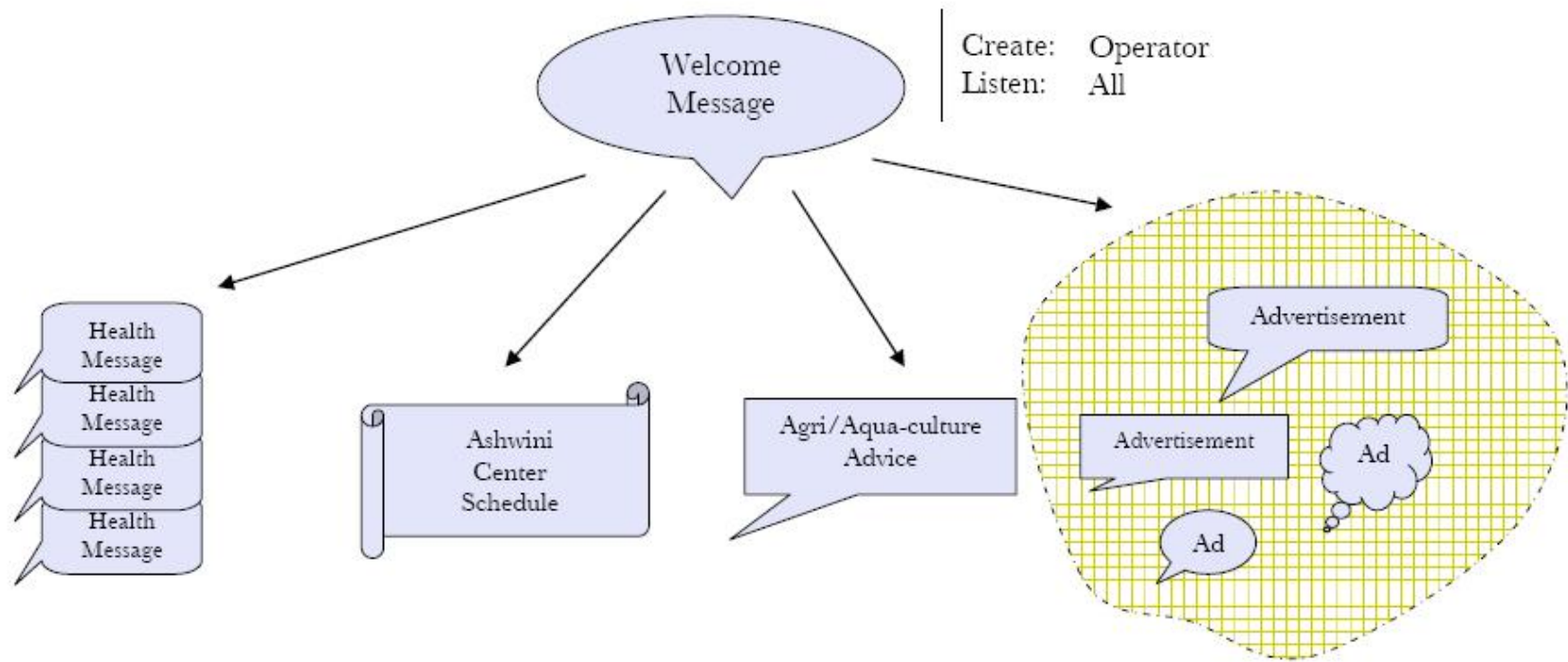
- a It can be a central point of access for a community
- a doesn't rely on Internet connectivity
- a In local language
- a it allows end-users to directly interact with the services

## « Identified Service Categories

- a Agricultural Advice
  - a Job Matchmaking
  - a Transport Rentals
  - a Health
  - a Aqua Prices
  - a People
  - a Entertainment
  - a Distance Education Program
  - a General info about the village
  - a Community news
- Pyr.me.IT**



# Four categories of information on VoiKiosk



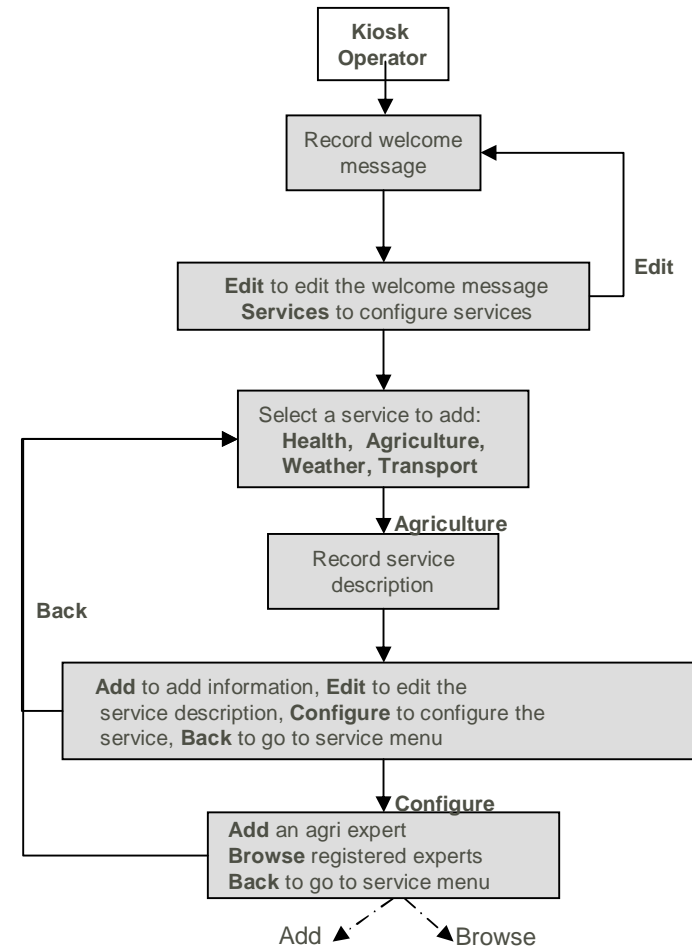
Create:	Operator	Operator	Expert	All
Listen:	All	All	Farmer	All

# The VoiKiosk call-flow

- « The Kiosk operator can choose to
  - a modify the welcome message for the VoiKiosk system, or
  - a modify information in any of the four different categories

- « Within a category, the operator is allowed to

- a create a new information message,
- a delete any existing message or
- a re-record an existing message

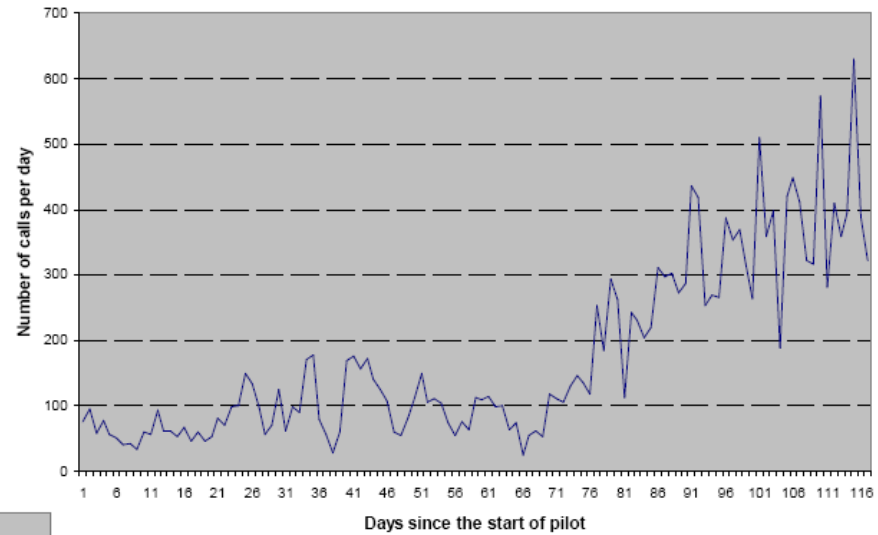


# Participatory Design Modifications

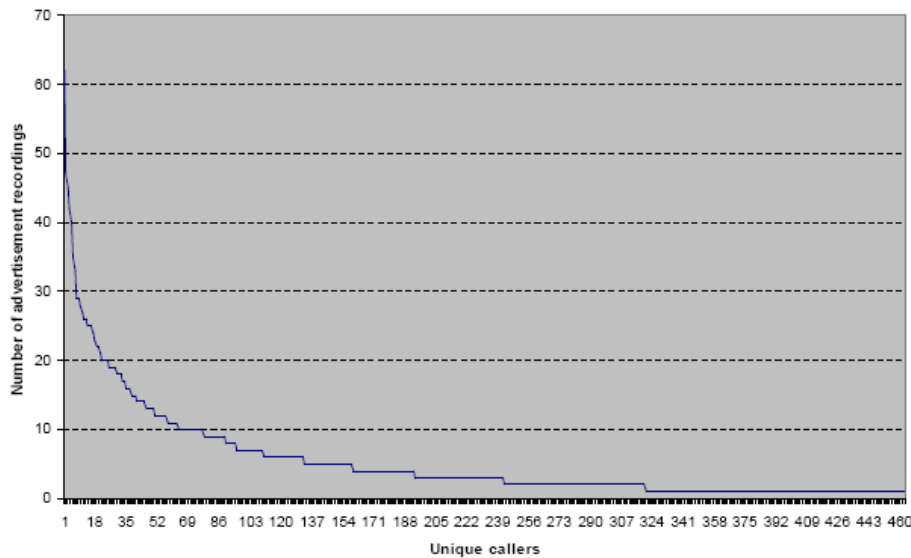
- « People did not know when to speak to the system
  - a Provided a beep sound after every system prompt*
  
- « Modification of prompts:
  - a Do you want information on Health or Agriculture or Ashwini Center Schedule or you want to know about the people in this village?*
  - a Please say Health to know about health related information, or say Agriculture to ...*
  
- « Increased duration of recording for agricultural experts from 10 sec to 30 sec.

# Usability

« Increasing number of calls



« High frequency of updating advertisements by few users



Villagers  
can access  
the  
VoiceKiosk  
from  
a public  
phone







Bike and Auto Mechanic uploading his advertisement on the VoiceSite



An Appey owner uploading his advertisement on the VoiceSite



The VoiceSite  
administrator uploading  
his advertisement

# Pilot Statistics

## Matrimonial Ads

- « Pilot Launch: May 23, 2008
- « Report Summary (as of Jan 28, 2009)

- a Total number of calls received = 114782
- a Number of unique callers = 6509

**Social Space**

- a Total time spent = 2135 hours
- a Average call time spent = 0 hours, 1 min, and 14 seconds.
- a Maximum call duration = 0 hours, 49 min, and 40 seconds.
- a Minimum call duration = 0 hours, 0 min, and 0 seconds.

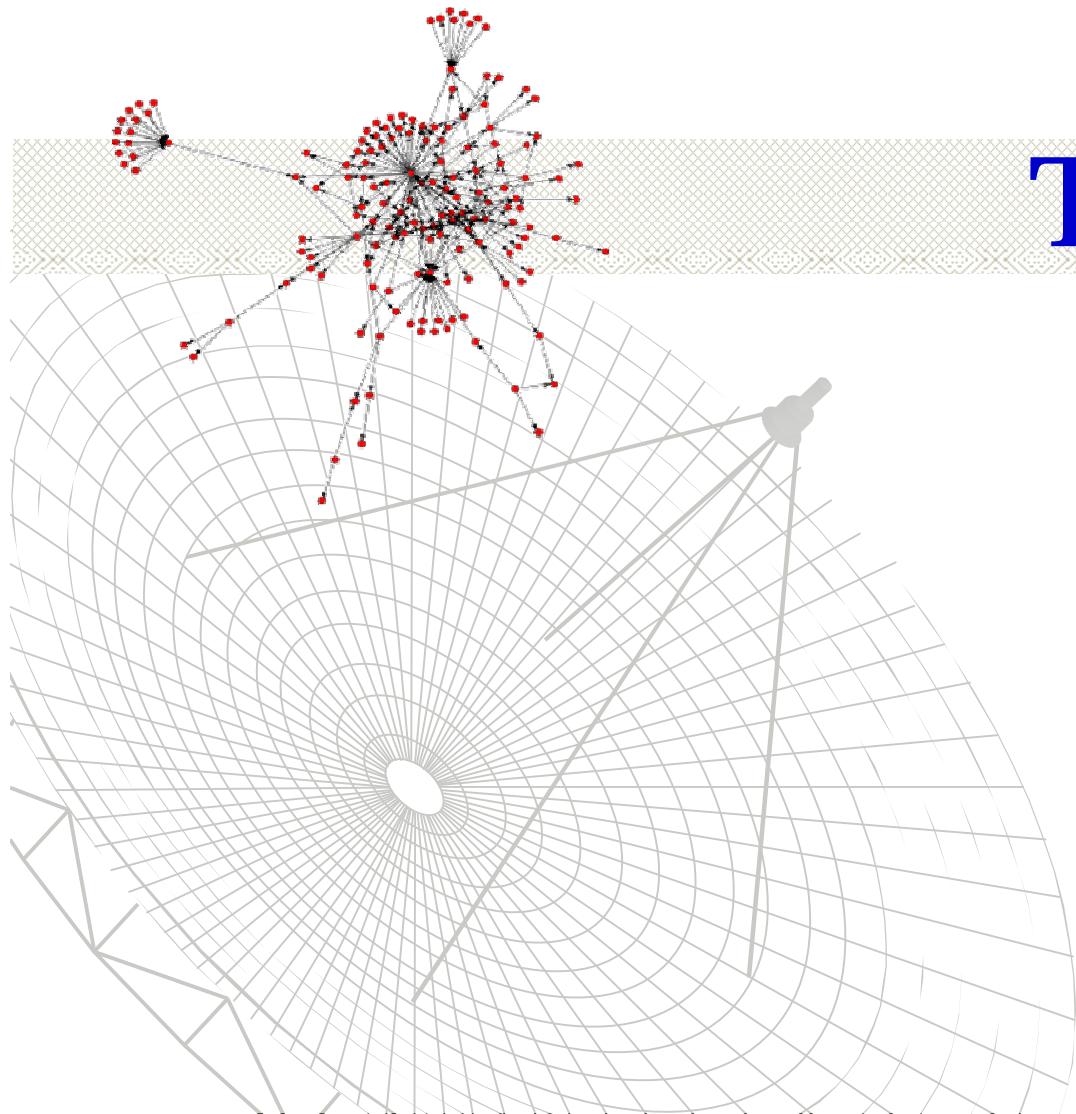
- a Number of calls to Ashwini Center = 8399
- a Number of calls to Health Center = 14216
- a Number of calls to V-Agri = 13881
- a Number of calls to Professional Services = 37112

**Election Speech**

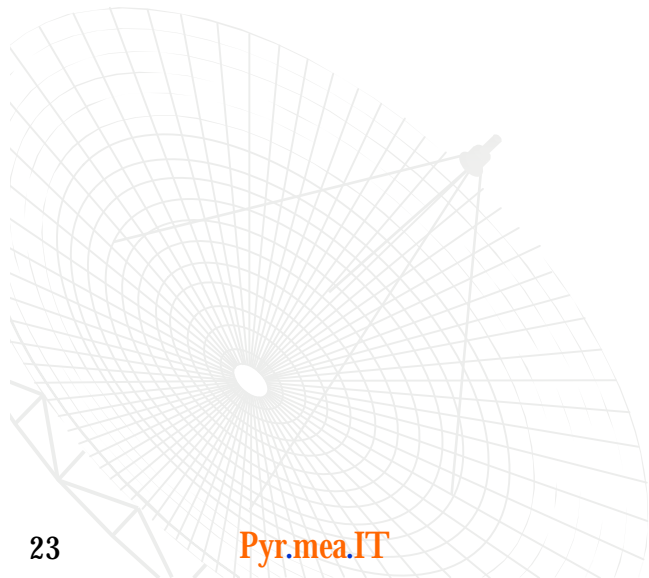
**No Advertising, No formal Launch, No Training**

# Summary

- « A village portal for locally relevant information creation and sharing.
- « People have a strong need for a channel to create and share locally relevant information.
- « A local partner who understands the community is a great enabler.
- « Voice over telephone provides easy access even to the illiterate.
- « Local language enables acceptability and usage without formal training or advertising.



**Thank you!**



# V-Agri service on VoiceSite

- « The field coordinator collects water sample from the pond
- « This sample is tested right at the pond-side while the water retains its characteristics
- « Previously, test results were uploaded through the Ashwini computer center. Now, this can be done by calling the VoiceSite.
- « Experts get the results and then upload advice to the VoiceSite
- « Farmers can access the VoiceSite at their farms through their mobile phones



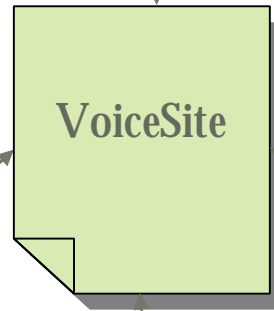


# VoiceSite Creation

## e.g. a Plumber Voice Site



Call VoiGen to create VoiceSite



VoiGen:

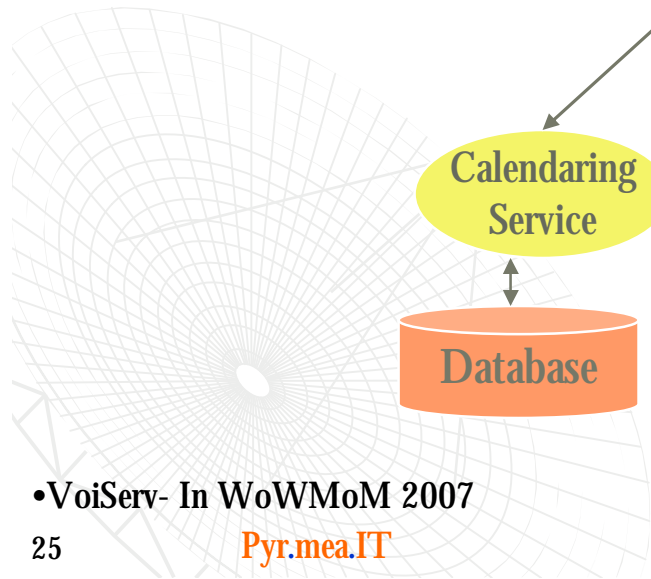
You have now created your voice site. We will be calling you to confirm the details of your site. Please provide your phone number through your phone. Thank you for using this system.

Caller:

Hi, I am a plumber. Please find information regarding my services on my VoiceSite.



WWW



# The World Wide Telecom Web

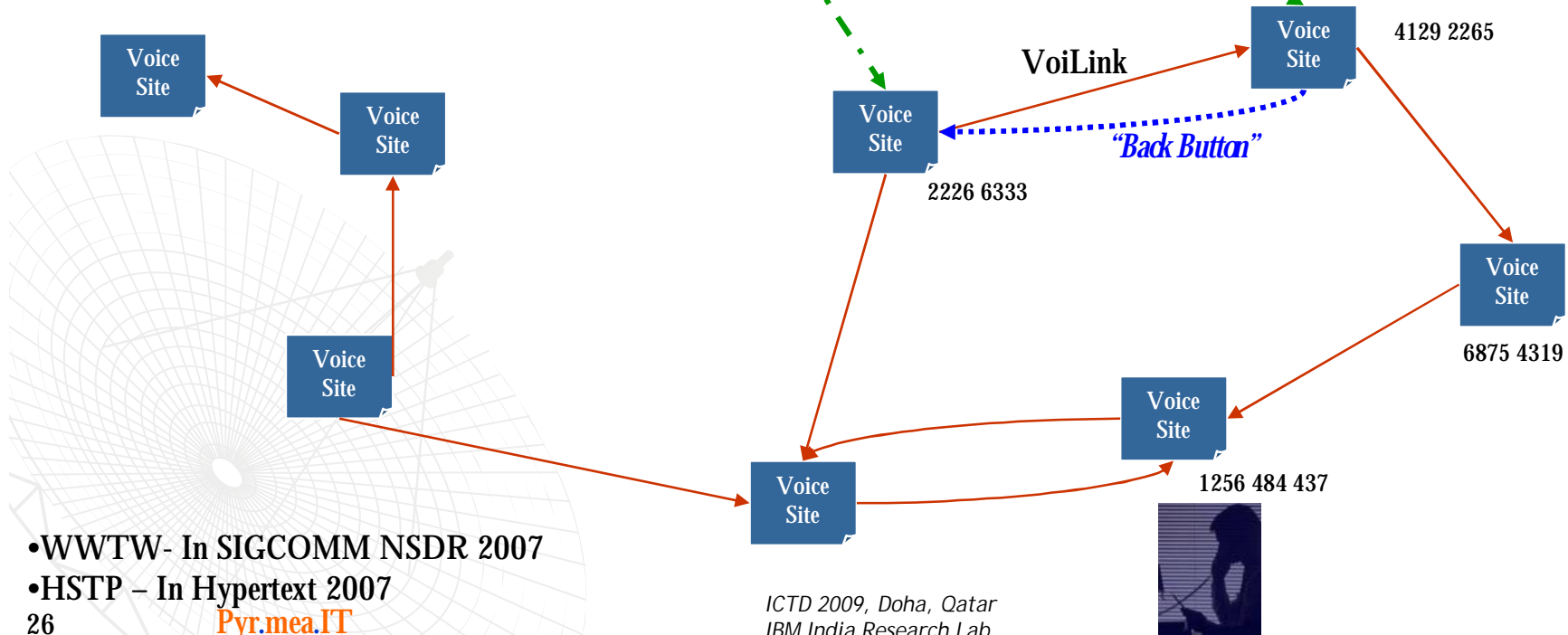


SurfLink  
(*phone call*)

SurfLink  
(*phone call*)

“Contextual Call Transfer”

- Key Concepts*
- *VoiceSites*
  - *VoiLinks*
  - *SurfLinks*
  - *Browsing*
  - *Search*
  - *Transactions*



•WWTW- In SIGCOMM NSDR 2007  
 •HSTP – In Hypertext 2007  
 26 **Pyr.me.IT**

ICTD 2009, Doha, Qatar  
 IBM India Research Lab



# What is the Telecom Web?

- « The Telecom Web is a world wide web in the *telecom network*
  - a Enables the individual subscribers to *create, host* and *offer* information and services *produced by themselves*
  - a people can *browse* VoiceSites, *traverse* hyper VoiLinks, even conduct *business transactions*, all just by talking over the existing telephone network
  - a provides simple and affordable means to *access IT services and applications* currently available to WWW users
  
- « The T-Web can coexist and interoperate with the existing WWW.
  - a Web site content as VoiceSites and vice-versa
- « The T-Web will interoperate with Next Generation Networks too.
  - a Presence information from IMS can deliver real-time location updates triggering dynamic adaptation of the VoiceSite