Avaaj Otalo - A Field Study of an Interactive Voice Forum for Small Farmers in Rural India

Neil Patel, Deepti Chittamuru, Anupam Jain, Paresh Dave, Tapan S. Parikh

STANFORD HCI GROUP

UC Berkeley School of Information

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dsc Development Support Centre
The need: relevant, on-demand agricultural knowledge
Our local partner: Development Support Center

Non-governmental organization for natural resource management and agricultural productivity enhancement
A Case for Voice
Why voice?

Works with all phones

Overcomes literacy constraint

Voice preferred to text

[Sherwani, PhD thesis 09]
[Medhi, et. al., CHI 09]

Voice for development

Advancement through Interactive Radio [ICTD 2007]

FreedomFone [ICTD 2009]

HealthLine [ICTD 2007]

IBM VoiceSites [ICTD 2009]

Source: International Telecommunications Union, www.itu.int
Voice forum: Avaaj Otalo

For information access and sharing
Users: low/no education, low literacy, computer novices

Interactive voice response (IVR) in Gujarati
Dial a number, navigate automated prompts

Record question; listen to posted questions; answer a question
Listening to questions on Avaaj Otalo

AO:  <tune> Welcome to Avaaj Otalo!
You can get to the information by saying a single word.
To ask a question, say 'question'.
To listen to announcements, say 'announcements'.
To listen to the radio program, say 'radio'.

User:  Question.

AO:  Okay, you want to ask a question.
To record a question, say 'record'.
To listen to other farmers’ questions and answers, say 'questions'.

User:  Questions.

AO:  Okay, you’ll now hear the most recently posted questions & answers.
Here is the first question...
Three features

ANNOUNCEMENTS

RADIO ARCHIVE

QUESTION AND ANSWER

Sketches courtesy of Bill Verplank
Launching Avaaj Otalo

Pilot launched January 2009

Goals
- Gather feedback about functionality
- Observe usage patterns
- Give DSC administration experience
Participants

63 males (all but 2 were farmers)

Across 4 geographic regions of Gujarat; all native Gujarati speakers

Age 18 - 60 (median: 29)

80% no more than high school education

No experience with computers or IVRs
Phone line implementation

30 simultaneous lines

Toll-free

VoiceSite on IBM’s Spoken Web platform

Speech recognition: IBM Websphere Voice Server
Cost

Fixed

Server (commodity PC): $300
PRI card: $2000
PRI modem: $1000

Total = $3,300

(Big) marginal cost: airtime

For pilot, ~$1000/month (at 6 cents/min)

Financial sustainability models

subscriptions, advertising, government
Measures

Navigation log analysis

Q&A transcription and coding

Participant interviews
Results

6,975 calls total
   4.7 calls per farmer per week average

5 min/call average

690 questions, 286 answers (122 from farmers)
Usage over time

Novelty effect

New users added

Calls

Announcements
Radio
Q&A Forum

Jan-15
Feb-12
Mar-12
Apr-9
May-7
Jun-4
Jul-2
91% of calls used touchtone
Usage: a power law

45 of 63 called

Top 3 callers

10th grade education or less
- Geographically remote
- Under age 30
- Progressive, experimental farmers

Top ten: 80% of calls
Q&A forum: lurking and posting

60% of total traffic; 73% lurking activity
82% lurking on discussion lists [Nonnecke et. al., CHI 2000]
Frequent questioners were also answer people
Contrasts Usenet [Welser et. al. JoSS 2007]
Salute to farmer friends, <name> from Kolava. For an earlier question about green and black sucking pests, which pesticide should be sprayed? We received answer from elsewhere that emidacloplete with carbon sulphide can kill green and black sucking pests. Also, when SAT with DDVP is applied the green and black sucking pests die.

<farmer’s name>, emidacloplete is for controlling large sucking pests, and will not be effective for [green and black] sucking pests. Instead of that you can use phosphamidon or metasystock. This would be more effective. DDVP that you sprayed will also do.
Hello, <name> speaking from Banasknatha district, Deodar Taluka, village Chalva. mobile number <number>. My question is that in our area, there is no rainfall. **For planting millet crop which we do in monsoon, what is the right time [this season]?** Please provide accurate information.

<famer’s name>, if there are is no rain after the third week of June, then plant **Millet GHB 558 or 577, or Sorghum JG39 and 41 can be sown.** In millet again I repeat GHB 558 and 577 varieties are there. But wait till the third week.
Other types of posts

Content requests

Hello, for improving DSC’s Avaaj Otalo, I have suggestions. The questions that are being asked by the farmer friends should be answered in 24 hours. Secondly, more announcements should be given. Thirdly, episodes 1 to 100 of the radio program should be added.
Other types of posts

Referrals

Salute to farmers, Farmer A speaking from Kolava. Mobile number <number>. Farmer friends, from a toll free number, market rates, weather news, crop advisor, regional and international news can be obtained. Note the number <number> and get information from it. Thanks.
Hello. <name> speaking from Beyok village, Vav taluka, Banaskantha district. Mobile number <number>. I want to inform all farmer friends that for summer vegetable crops, if you find insects, then you should create supports for birds to sit. They can control heliothis. **If you use a light at night, then other insects can also be controlled. This can be done in lucerne fodder. We have done this experiment in winter mustard crop.**
Other applications of Avaaj Otalo

Entertainment
  Songs, Jokes

Business consulting

Voice classifieds
  [Voicelist, Cervantes, et. al. Mobile HCI 2008]
Social dynamics
Norms

Norms, like announcing oneself, indicates the medium serves as a social space.

[ Ackerman et. al., TOCHI 1997 ]

Hello, I am <name> speaking from Rajkot district, taluka Jasdan, village Vangadhra; my mobile number is <number>...
Norms

Norms, like announcing oneself, indicates the medium serves as a social space.

[Ackerman et. al., TOCHI 1997]

Hello, I am <name> speaking from Rajkot district, taluka Jasdan, village Vangadhra; my mobile number is <number>...
Salute to farmers. I want to inform farmer friends that questions asked should be useful to all farmers. **Film songs or jokes in between should not be posted.** If the question asked is good, all farmer friends will also enjoy listening.
Hello. Earlier, <farmer name> had [made recordings] like this. **Are you making fun of DSC by asking such questions? Or are you asking for information useful to farming? You have not been given this number for such fun or for timepass.** You have been given the number to obtain quality and timely information from DSC. Why did you register your number if you wanted to do such mischief? In a short time, I will also complain to [DSC].
Hello. <name> speaking from Beyok village. **Three farmer friends here have asked this question.** They had [planted] psyllium. It was time of harvesting cumin. Due to unseasonal rains and cyclone, there is 60-80% loss in cumin. For this if it has to be presented to government, then on preliminary basis how can the presentation be done? Request to give answer.
Gaining social status

Interviewee:

I’m always the first one [in the village] to implement new methods and technology in agriculture. I have everything in terms of technology here. Everybody comes to see things at my place. Even Avaaj Otalo — I am the first one to get it in this place. So many experts and scientists are friends with me and I tell them about AO. When they are here they ask to see it and I show them how AO works. They are impressed by how much modern technology and knowledge I have. It is a matter of pride for my family.
Why would I use such a system [like AO]? Everybody’s answer has the same value no matter how correct or incorrect it is. **I am already respected in my community as someone knowledgeable in agriculture and my answers on [AO] will be treated just like anyone else’s off the street.** How does AO benefit people like me? In fact it does not even recognize the knowledge and wisdom I have gathered over the years.
Users preferred answers from authorities over peers

Who do you prefer receiving answers from?
- DSC only: 65%
- DSC and farmers: 35%
- Farmers only: 0%

Interviewee:

[Only] when these other farmer’s questions will be answered by an expert, then I will get to learn from [answers]. **Farmers don’t know everything, right? What most of the farmers talk about is common knowledge to us.** So I am interested in listening to what the experts say about the questions on AO.
Future work: a better system

Search and filtering
User alerts, personalized content
Curation tools for administrators
Themed forums
  e.g. entertainment, classifieds, experience sharing
Future work: research questions

Social behavior different from traditional CMC domains?
   How and why? Cross-cultural psychology can help

If different, what are the implications for design?
   Help back cross-cultural psychology
Thanks to...

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Farmers of Gujarat!

http://hci.stanford.edu/research/otalo