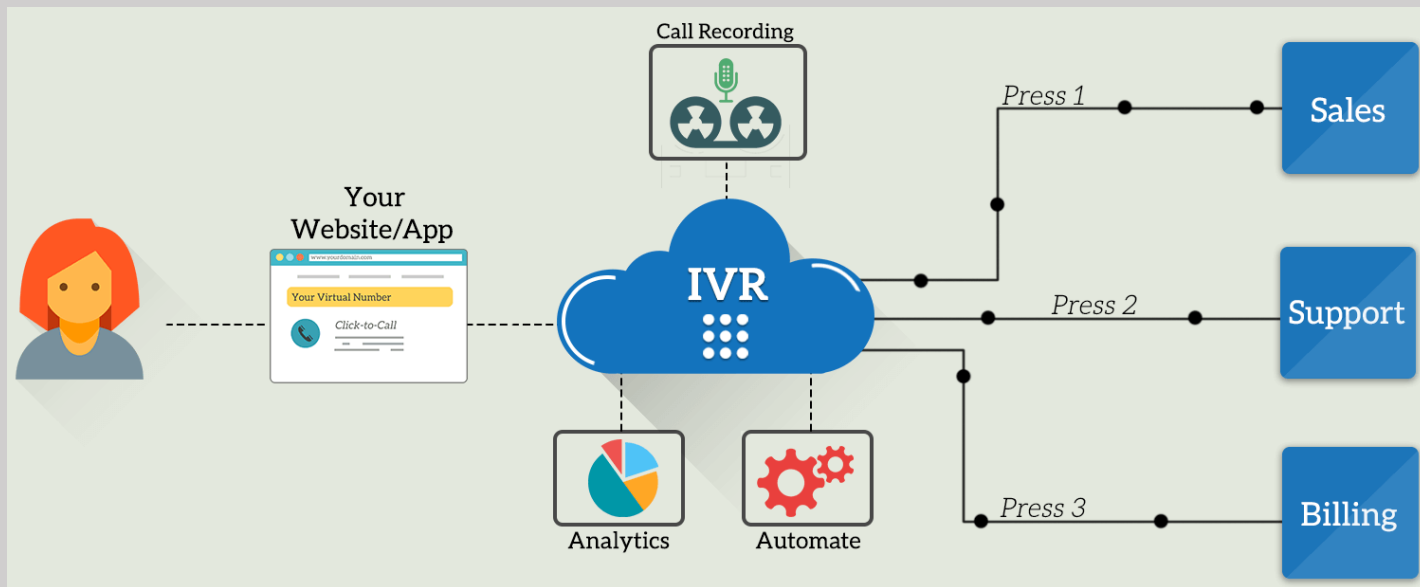


# IVR Applications

Lecture 7: CSE 490c





# Interactive Voice Response (IVR)

- Voice versus text
- Structure of Voice Applications
- Examples

# Voice and Text

- Advantages of Text
  
- Advantages of Voice

# Interactive Voice Response

- Applications we hate
- Robo calls
- Automatic surveys
- Customer service help lines

# Core Technology



- Convert Telephony to software
- Asterisk: Open Source Software Implementation of a Private Branch Exchange
- Operations
  - Make calls
  - Receive calls
  - Route calls
  - Record speech
  - Playback speech
  - Manipulate speech files
  - Detect key presses
  - Automatic Speech Recognition (ASR)

# IVR for Social Good

- Voice based messaging
- Help Lines
- Community Information Systems
- Redress and reporting
- Social Networks

# Voice based messaging

- Mobile Midwife application
  - Motech, Ghana, 2010
  - Strong formative work
  - SMS and Voice calls
    - Alerts and reminders
    - Actionable information
    - Educational information
  - Messages in English, Senya, Fante
    - Topic identification
    - Expensive to create local language messages
  - Strong preference for voice messages
  - Cost issues not resolved





# Help lines

- HealthLine Pakistan (2008)
- Health information by voice
- Touch tone
  - Press 1 for Malaria, Press 2 for Diarrhea, Press 3 for
- Speech
  - What disease do you want to hear about?
- “Poor man’s speech recognition”
  - Phonemes trained on English
  - Represent Sindhi words with phonemes

# Community Information Systems

- Awaaz De
- Voice Forum
  - Farmer information recorded by farmers
- Farmers call in to leave advice on farming
- Other farmers call in to listen to advice
- Farmers preferred getting information from other farmers as opposed to agricultural experts
- Neil Patel developed Awaaz De as PhD project from Stanford, moved to Gujarat and started a social enterprise



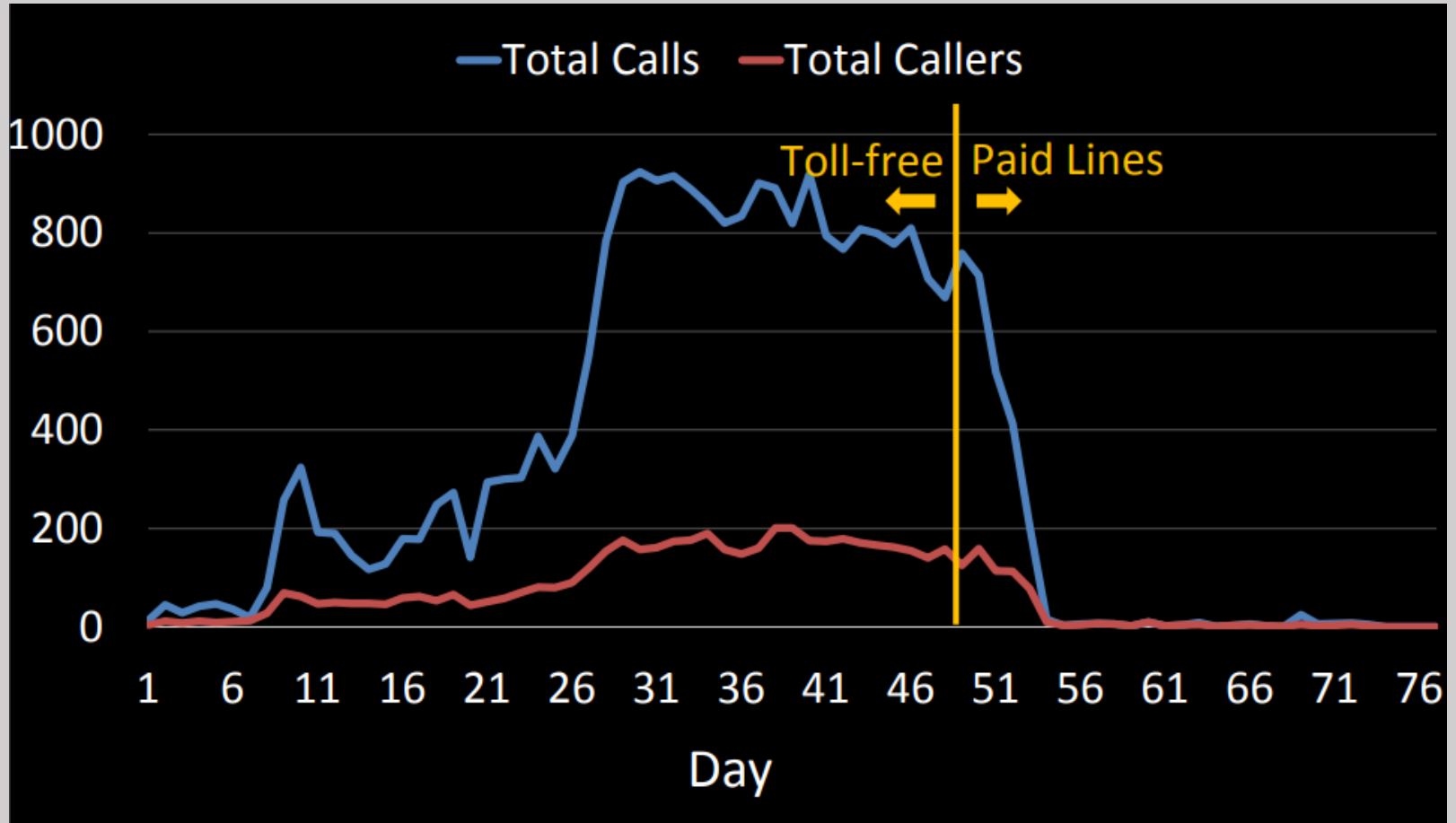
# Redress and Reporting

- CGNet Swara
  - Report local problems
- Ila Dhageyso
  - Reporting problems to Government of Somaliland
- Government reporting lines
  
- Challenge of processing voice input
- Need for taking actions
- Governments don't always want to hear this info

# Voice Based Social Networks

- Posting voice messages
  - Jokes, Songs, Poems
- Listening to posts of others
- Mechanisms for selecting posts, ranking posts
- Content moderation is a challenge
  - User moderation can work
- Example systems
  - Sangeet Swara
  - Baang
- Deployments have had viral growth
- Strong uptake by visually impaired

# IVR Challenge



# Sustainability: Who pays

- Cost per connection relatively high
- Service is a public good
  - Government covers the cost
  - Donors Pay
  - Subsidies
- Service generates income
  - Advertising models
  - Linked to income generation
- Service supports a business
  - Job Listings
- Service delivers value to operator
  - Agricultural cooperative
  - Information reporting