

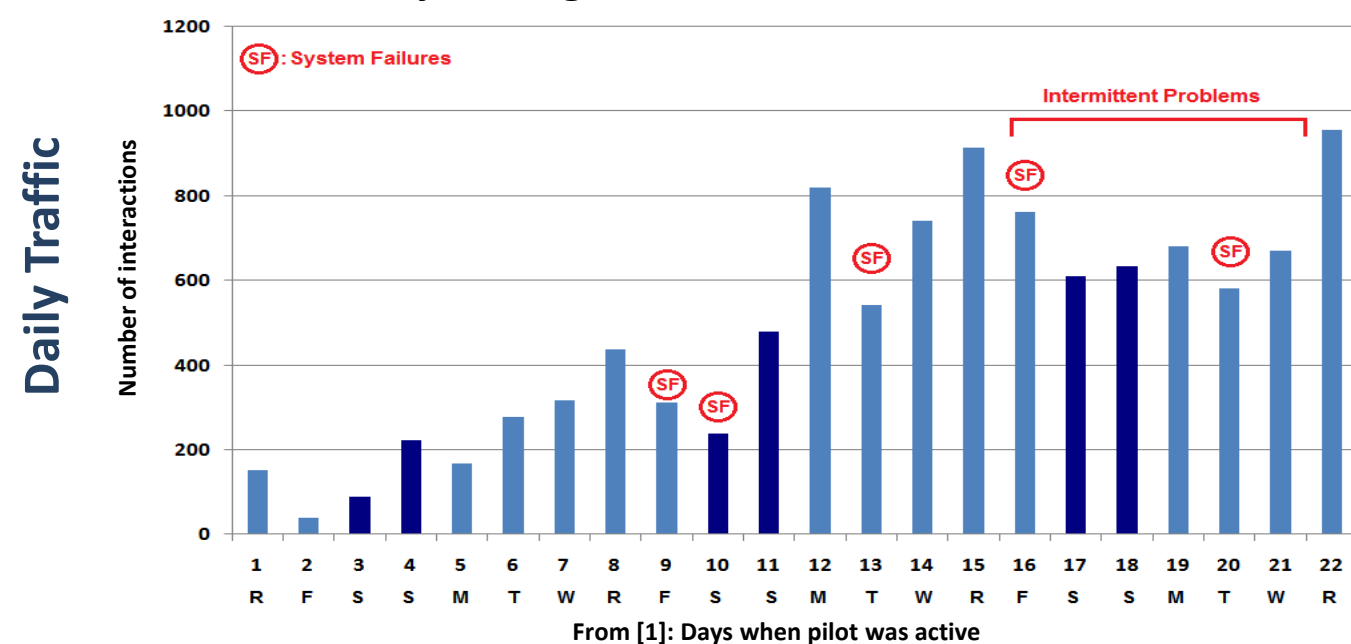
Past Work

1: Remote Pilot Deployment, Apr-May 2011 [Raza et al, 2012]

Simple entertainment:

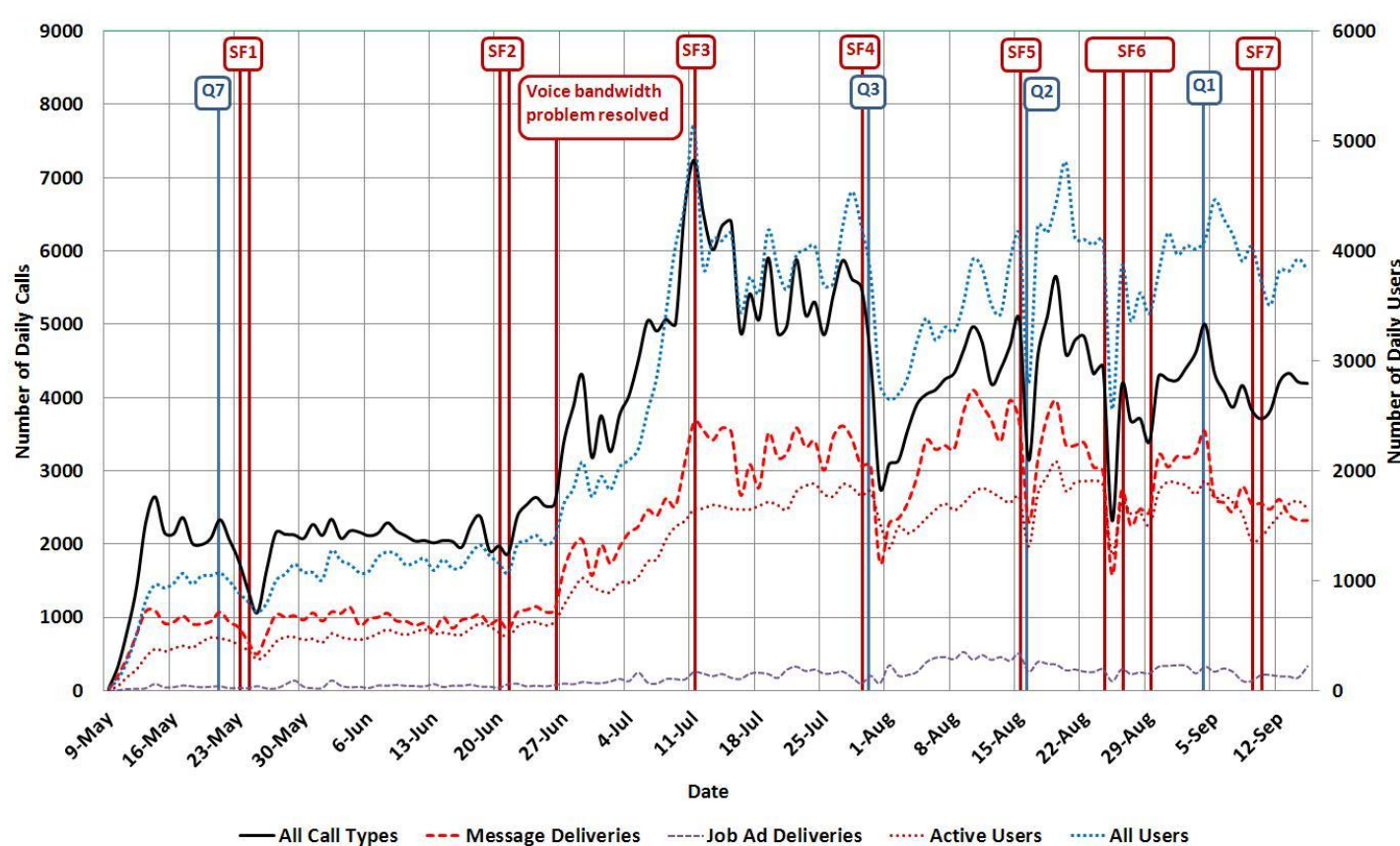
1. Give Polly a "missed call"
2. Polly calls you back
3. Record a short message
4. Choose and apply a funny voice modification to the recording
5. Optionally forward it to friends

- Seeded in Lahore with: **32 users**
- Total number of days online: **21**
- Total number of users: **2,032**
- Total number of interactions: **10,629**
- Shut down due to insufficient telephone capacity (1 line) and funds required to sustain the subsidized service (\$0.126/min, operated remotely from the US)
- Mainly used for voicemail and group messaging
- Spread across gender and age boundaries
- Remained mostly among low SES users



2: Onsite, Large Scale Deployment, May 2012-Present [Raza et al, 2013]

- Added our first Payload: Job Browsing
 - 30 telephone lines, operated via huntgroup
 - Toll-free and User-paid phone numbers
 - Seeded in Lahore and Okara with: **5 users**
- After five months (Sept 2012):
- Total number of users: **85,000**
 - Total number of interactions: **495,000**
 - Number of users of Job Browser: **27,000**
 - Number of times Jobs ads listened: **279,000**
 - Number of times Job ads forwarded: **22,000**
 - Still operational
 - Remains mostly among low SES users



From [2]: Polly's Activity Levels. "SF": system failures. "Q": onset of quota experiments. "Active users": users who called Polly or used it to schedule deliveries.

Spread and Sustainability: The Geography and Economics of Speech-Based Services

www.cs.cmu.edu/~Polly



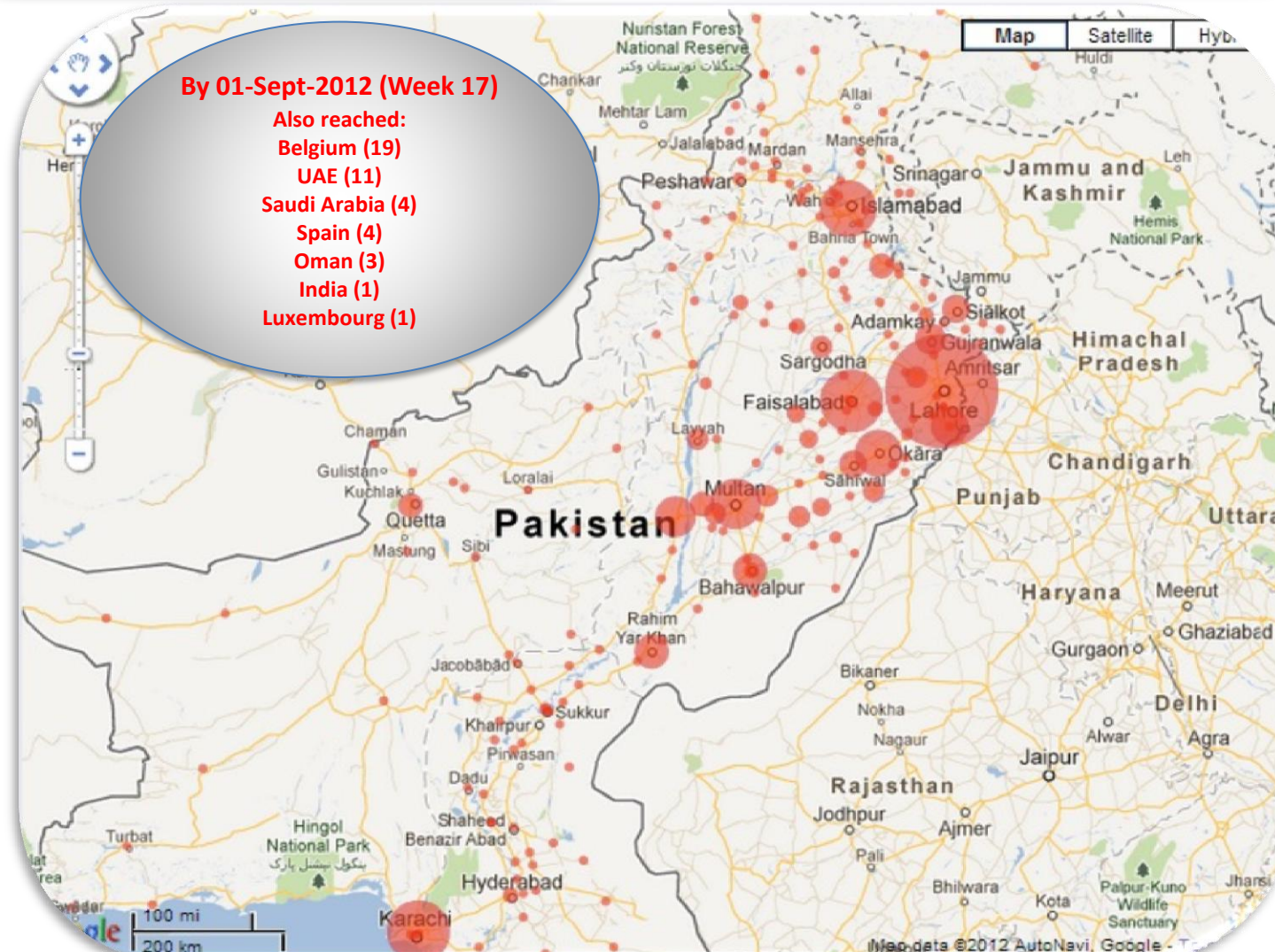
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Abstract

We have been developing techniques for spreading telephone-based services to low-literate people in the developing world, bypassing the need for explicit user training. We achieve this by using entertainment as a viral conduit to spread and popularize development related voice-based services. Polly, our telephone-based voice manipulation and forwarding system, has been in continuous operation in Pakistan since May 2012. In this poster, we show the geographical spread of Polly over the initial four months of its deployment. We then describe our attempts at reducing our operating costs by shifting some of them to users, and the impact this had on user behavior, demonstrated via randomized control trials and by the usage of landline vs. mobile phones.

Geographical Spread (call volume proportional to circle area)



Cost and Sustainability

- Local deployment of Polly reduced airtime cost from \$0.126/minute to \$0.023/minute
- Application of quota limits on number of toll-free calls per person per day, reduced expenses from \$400/day to \$300/day
- 40% of the remaining volume is due to *message deliveries*

Traditional Model

- User x schedules a message delivery for user y
- Polly calls y and delivers the message

New Approach

- User x schedules a message delivery for user y
- Polly sends SMS to user y, giving Polly's number to call in and listen to the message
 - This resulted in 6.5% caller-paid retrievals

Experiment 1:

- Randomly chosen half of those who did not retrieve within 24 hrs were sent voice reminders that a message is waiting. The calls were made from the caller-paid number.
 - This resulted in 4.2% additional caller-paid retrievals
- Remaining half were not sent reminders:
 - This resulted in 0.96% additional caller-paid retrievals

Experiment 2

- Randomly chosen half of those who did not retrieve within 1 hr were sent voice reminders that a message is waiting. The calls were made from the caller-paid number.
 - This resulted in 6.9% additional caller-paid retrievals.
- Remaining half were not sent reminders.
 - This resulted in 2.4% additional caller-paid retrievals.

Landline vs. Mobile phone usage

Landline phones were used in:

- 0.32% of toll-free calls
- 4% of caller-paid calls

References

[1] A. Raza, C. Milo, G. Alster, J. Sherwani, M. Pervaiz, S. Razaq, U. Saif, and R. Rosenfeld, "Viral entertainment as a vehicle for disseminating speech-based services to low-literate users," in International Conference on Information and Communication Technologies and Development (ICTD), vol. 2, 2012.

[2] A. Raza, F. Ul Haq, Z. Tariq, M. Pervaiz, S. Razaq, U. Saif, and R. Rosenfeld, "Come for the fun, stay for the jobs: Virally spreading speech-based services for low-literate users," accepted for publication in ACM SIG CHI'13.

Acknowledgements

We are grateful to USAID, the Fulbright program, the Higher Education Commission of Pakistan and the United States Educational Foundation in Pakistan for partially funding this work

Polly is Still Online!

Call Now: +92-42-38333112 (Int'l calling rates apply)

As of Jan 02, 2013:

- Total number of users: **152,784**
- Total number of interactions: **571,662**
- Number of users of Job Browser: **31,669**
- Number of times Jobs ads listened: **345,961**
- Number of times Job ads forwarded: **29,777**
- Current cost per day: **\$38**