IVR-Based Citizen Journalism in Pakistan

Hira Ejaz

Information Technology University, Punjab, Lahore, Pakistan

hira.ejaz@itu.edu.pk

Syed Ali Hussain

Michigan State University, East Lansing, Michigan, USA

alihussain.msu@gmail.com

Agha Ali Raza

Information Technology University, Punjab, Lahore, Pakistan

agha.ali.raza@itu.edu.pk

Abstract

Freedom of expression is a fundamental human right. Unfortunately, this right gets denied to the majority of people because they cannot read and write. This is because most modern means of communication rely on textual interfaces that are not inclusive to less educated and visually impaired people. However, simple and feature mobile phones are mostly available to such people. In this paper, we present *Mehfil*, an IVR based citizen journalism platform that was deployed in Pakistan for 41 days. It received 789 calls from 535 users (2.4% of them blind) from all provinces of Pakistan. *Mehfil* provides a platform to its users to report their local area problems by recording their grievances on a range of social issues including unemployment, personal safety, health, education, corruption and rights of disabled (especially visually impaired). We show that the ability to communicate and express social issues is essential for humans. For this purpose, IVRs like *Mehfil* play a vital role for low literate and blind people to voice their social concerns and gain support for their solution.

Introduction

Humans have an innate need to share their thoughts and ideas. Such expression of thoughts takes place via spoken and textual means of communication. Compared to text, greater part of the world's population relies on speech as a convenient medium of communication. Such populations include visually impaired and low-literates. However, most

contemporary means of communication rely on textual interfaces that exclude such populations. These people live without digital social linkages and public identity, and are incapable of raising their voice for their rights. As an opportunity, basic and feature phones are available and are inclusive to such populations as long as the service uses speech interfaces.

Most of the population in Pakistan (39%) lives in poverty and faces physical, financial and emotional losses. These people do not have access to modern technologies like computers and internet. As mobile phones penetration in Pakistan has increased to 71 subscribers per 100 inhabitants [9], the most suitable way to reach this population is via Interactive Voice Response Services (IVRs), essentially, speech interfaces over simple phones. IVRs prove helpful for people who cannot deal with textual medium (e.g. SMS and smart phone-based text interfaces).

In this paper we present, *Mehfil* (an Urdu word for 'social hangout or gathering'), an IVR based platform where people can record their grievances on various social issues including personal safety, unemployment, health, corruption, education and rights of visually impaired people. This service enables low-literates, non-tech-savvy and blind citizens of Pakistan to voice their social concerns. We test-launched *Mehfil* to explore the need for such services in Pakistani context and received enthusiastic response. Within 41 days of its deployment, *Mehfil* received 789 calls from 535 users from all provinces of Pakistan. It was found that 2.4% of the users of *Mehfil* are blind. The user acquisition process is detailed in section *Mehfil design and deployment.* Several reported problems are related to improper roads, personal safety, issues associated to

incidents of thefts and robberies, employment hurdles for visually impaired people, lack of educational institutes for blinds, inadequate medical equipment in hospitals, lack of proper health centers, bad governance and problems related to cellular network connectivity. *Mehfi*l is the first IVR service for citizen journalism in Pakistan. However, IVR services have been used for citizen journalism in developing communities. CGNet Swara is a voice based platform for citizen journalism that was launched in rural India (2010) [14,11]. The IVR helplines in Karnataka India were helpful in registration and tracking of public complaints [12].

Mehfil – A PLATFORM for the underserved
Mehfil is among the first projects in Pakistan that allows people to share their social issues over simple phones. It gives people a voice to talk about the denial of their social rights. It provides them a vehicle to express their fears, doubts and complaints. This paper presents the design, execution and evaluation of *Mehfil* in Pakistan. Specifically, in the sections below, we present the related work, followed by design and deployment, and then the results based on a thematic analysis of the received calls.

Mobile Phone Prevalence
The Modern Information and Communication Technologies (ICTs) like mobile phone enable social change [15]. Among other things, it is used for citizen journalism. Main interventions include improving transparency [2], effectiveness of governmental programs [3, 16], and increase citizen participation [13]. Mobile phones are instrumental in redistribution of political power, and giving voice to the oppressed [17, 19, 20].

As per International Telecommunication Union (ITU), mobile phone subscription in Pakistan has increased to 71 subscribers per 100 inhabitants, compared with 8 subscribers in 2005 [9]. It is expected that Pakistan would add 17 million new unique mobile phone subscribers by 2020, that point towards rapid adoption of mobile phones in the society.

Related Work

Interactive Voice Response services (IVRs) are viable in providing masses an opportunity to voice their grievances. Such IVRs have been tested in accessing, sharing and reporting information in both rural and urban settings. Prominent examples include IVRs for effective implementation of social welfare programs [24, 5], grievance redressal system in Madhya Pradesh India [7], government helpline for children in distress in India [6], and IVR service for farmers to seek feedback from agricultural experts through voice messaging [10]. CGNet Swara is another voice-based portal for citizen journalism launched in rural India (2010), and serves as a prominent example for IVR based grievance platform [14, 11]. In terms of their effectiveness, a project in Kerala (India) studied the role of intermediaries in tele-centers and proved successful [21].

However, the IVRs for citizen journalism encounter challenges of their own. For example, such ICT IVR-based systems may not be found effective in reducing exploitation of resources [23], because many low-level officials figure out a way to bypass the monitoring and accountability system [27].

Studies on effectiveness of IVRs suggests that the real benefits achieved from an IVR based grievance system depends on the level of corruption, political structure and dynamics that differ across states [4]. For example, an e-governance project in Tamil Nado India, for real estate, land, and property related administration, showed that the impact of ICT based solutions could be better determined in conjunction with policy decisions [26].

However, there is no stopping to the use of IVRs for pro-social outcomes. Instead, their use has been increased to other social issues including information services for agriculture [18], feedback on school meals [8], job search [28], and forums for immigrants in high-resource settings [1].

Mehfil design and deployment

Mehfil is an Urdu word that means, a social gathering or hangout. To gather news reports and grievances from citizens, we deployed *Mehfil* in collaboration with a popular IVR service in Pakistan, called *Polly*. Polly [22] is a speech-based, telephone service accessible over simple and feature phones that spreads useful social development-related information to low-literate and tech-shy people by engaging them through light entertainment. Using its entertainment appeal, Polly trains its tech-shy users to use IVRs and incentivizes them to spread the service to others. During 2012 and 2013, Polly organically spread from 5 initial users to 165,000 users who engaged in 636,000 phone calls without any external advertisement of the service. 34,000 of these users also started using a job search service that was made available through Polly [1]. In 2017, Polly was live in Pakistan. We collaboratively added *Mehfil*, citizen news reporting and grievances regarding local area issues, to *Polly* that resulted in a new interface described below.

A user wishing to interact with *Mehfil* places a *missed call* to *Mehfil's* number. A *missed call* is where the caller dials a number and immediately hangs up as soon as the phone starts ringing on the other side. This is to signal to the *missed call* recipient to call back. In developing countries, a *missed call* is a popular way to request a callback. *Mehfil* uses *missed calls* to subsidize airtime costs for its users. Soon after a *missed call*, *Mehfil* calls back. Users are greeted with traditional greetings, informed that the call is being recorded for research purposes, and warned that they should not record any personal information. The users are then provided multiple options; To interact with *Polly*, press 1; *<other advertised IVR services>*; to report a problem in your area, press 5; to report a news event, press 6.

Airing of Grievances
When users press 5 to report problems in their area,

they are asked to record their problems and report issues in their community. After a beep, they can record their message for up to 60 seconds. After the recording, users are thanked for their input.

Citizen Journalism
When users press 6 to report local news events, they are asked to record interesting news events that they would want us and the community to know about. After this they are allowed up to 60 seconds to create their recordings. Finally, they are thanked for their participation.

Data Analysis
The *Mehfil* IVR service received 789 calls from 48 cities across all provinces in Pakistan. *Mehfil* was one of

several services being simultaneously advertised on Polly, and *Mehfil's* call volume is comparable with other services. Two senior investigators, one of which is a linguist, and the other is a trained content moderator, read and coded the call-logs and documented their interpretations using inductive thematic analysis (Strauss & Corbin, 1990). The call logs were coded in terms of geographic location, type of news or grievance, gender and self-reporting of callers regarding disabilities (such as individuals who are blind). Calls which contained abusive remarks, cursing, silence and inaudible messages were discarded (N=472; 60%). After the initial phase of broad level categorization, the messages were translated word by word from Urdu to English. To ensure validity, the messages were back-translated in Urdu and verified for consistency. Next, the investigators corroborated on the coding, and themes and interrelationships emerging from the data [25, 29].

Any discrepancy in the categorization of messages was resolved through mutual discussion and consensus. Based on this iterative process, following key themes related to the conceptual constructs emerged to understand usage patterns of the IVR. All names have been **anonymized** to protect the privacy of the callers. The geographic locations of callers are not changed.

Results
Mehfil received calls about social issues on a range of topics. Main themes emerging from the thematic analysis include roads and infrastructure, personal safety, employment opportunities, education, health, governance, and corruption. Additionally, callers recorded messages to improve the IVR service and

provided feedback about call recording duration and moderation.

Usage Trends
Geographically, the highest number of calls originated from Lahore (11%), followed by Lodhran (8.1%), Multan (7.4%), Swat (6.6%), and Sanghar (6.6%) (Figure 1). In terms of calls received from people with visual impairment, 9 users (2.84% of all users) self-reported as blind. They called from Faisalabad, Sialkot, DI Khan and Layyah.

Roads and Infrastructure
Pakistan is affected by many natural disasters such as earthquakes and floods. These calamities have resulted in significant infrastructural damage to roads, bridges, schools and health centers. Additionally, lack of funds for infrastructural development in the rural-urban divide has caused many hurdles. One of the callers expressed this concern as: *"We do not have roads. We face problems in going to the city. Kindly convey our problem to the government to provide proper roads to us. The main road is 2 km from our home."* (District Kashmor).

Personal Safety
Users of *Mehfil* also reported issues related to personal safety including safety hazards due to poor electricity infrastructure, criminal activity, road accidents due to irresponsible driving, and lack of safety precautions. One caller reported: *"There are a lot of robberies in Multan these days. The police do nothing. The place from where they get money, they lean towards there. So, in Multan it happens once or twice a month in any area. The gang is not being caught"* (Multan).

Employment
Employment is a significant concern for citizens. The visually impaired people raised their voice against social discrimination in finding jobs. One blind user said: *"As per law, factories and government organizations are bound to hire 3% disabled people. In case of not hiring, they are charged 5000 rupees ($50) fine which is convenient for mill owners to pay"* (Faisalabad).

Education
The need for schools and education for kids emerged as a significant grievance from all geographic regions. A caller from rural Sindh, shared his grievance: *"We have no electricity, no hospital, no roads, and no school. Basically, we have no public service. Our children go 5 miles away to school. The Sanghar to Mirpurkhas road is also very bad"* (Sanghar).

Visually impaired users talked about educational facilities and jobs for their community: *"We do not have any school or institute for the blinds in our area. There should be a government institute for blinds in Dera Ismael Khan"* (Dera Ismael Khan).

Health
The facility to basic healthcare appeared as a significant concern for majority callers. Many rural and semi-urban regions of Pakistan suffer to ill-equipped health centers: *"We have one health center here, but no staff is available, and when the staff comes the medicines are not provided to the people. We also do not have proper electricity supply in our area"* (Layyiah).

Figure 1. Geographic span of calls received from across Pakistan.

Governance and Corruption

Callers also reported their grievance about political leaders: "*We are voting for a political party since past 40-45 years, and we have not got even a water tap. Take care of us as we are also Pakistani. The situation of Sanghar is really poor. Proper roads and schools are not constructed"* (Village Gota Asi Wari, Sanghar).

Some callers recorded problems associated with cellular networks in their region. For instance, one caller said, "*After 10 am the cellular service by phone towers stop working. So, we are unable to get connected" (*Dera Ghazi Khan*)*.

Discussion

This paper describes the design and deployment of an IVR based social platform, called *Mehfil*. This service enabled under-connected population from all provinces of Pakistan to convey their social issues. They desire to access to clean water, paved roads, schools and hospitals with proper equipment, playgrounds for kids, educational and employment opportunities for blinds. They also wish for a peaceful society without discrimination and corruption of leaders.

Relevance for HCI Across Borders

Mehfil is an IVR service that allows people to vent their grievances. It provides an inclusive platform for marginalized population segments such as women and visually impaired. *Mehfil* provides evidence to further explore the use of IVRs to make Citizen Journalism and reporting of grievances available to under-connected people.

Limitations and Future Work

Many callers recorded feedback messages with requests for an increase in the time to record the audio messages for *Mehfil*. As we subsidize airtime for our users, we need to restrict the overall length of calls. However, we do understand that some users may benefit from longer recording intervals for reporting their grievances and news updates. A limitation of the described service was that the grievances were not conveyed to relevant authorities. The purpose of the described deployment was need analysis and proof-of-concept. Since then we have deployed services where we have closed the information loop and the recorded material is actively responded to. We show that IVR based social platforms can impart under-connected populations with a voice to share their societal issues. Next, we plan to complete the annotation of the recorded speech for gender-based sentiment analysis. Moreover, we also plan to add a social component to *Mehfil* so that other users can comment on and rate the submitted concerns. This would enable automatic filtering of submitted content and may also make the platform more interactive.

References

1. Bar, F., Brough, M., Costanza-Chock, S., Gonzalez, C., Wallis, C., & Garces, A. (2009). Mobile voices: A mobile, open source, popular communication platform for first-generation immigrants in Los Angeles. In *Pre-conference workshop at the International Communication Association (ICA) Conference Chicago, Illinois.*
2. Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-

corruption tools for societies. *Government information quarterly*, *27*(3), 264-

3. Bhatnagar, S. (2003). Transparency and corruption: Does e-government help?. *DRAFT Paper prepared for the compilation of CHRI*, 1-9.

4. Jennifer Bussell. 2009. Political incentives and policy outcomes: who benefits from technology-enabled service centers?. In *Proceedings of the 3rd international conference on Information and communication technologies and development* (ICTD'09). IEEE Press, Piscataway, NJ, USA, 173-182.

5. Dipanjan Chakraborty and Aaditeshwar Seth. 2015. Building citizen engagement into the implementation of welfare schemes in rural India. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development* (ICTD '15). ACM, New York, NY, USA, , Article 22 , 10 pages.
DOI=http://dx.doi.org/10.1145/2737856.2738027

6. ChildLine. http://wcd.nic.in/childlineservice.htm.

7. CM Helpline. http://cmhelpline.mp.gov.in/index.html.

8. Aditi Sharma Grover, Karen Calteaux, Etienne Barnard, and Gerhard van Huyssteen. 2012. A voice service for user feedback on school meals. In *Proceedings of the 2nd ACM Symposium on Computing for Development* (ACM DEV '12). ACM, New York, NY, USA, Article 13 , 10 pages.
DOI=http://dx.doi.org/10.1145/2160601.2160619

9. ITU, 2017. http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2017/Mobile_cellular_2000-2016.xls

10. Lifelines. http://www.lifelines-india.net.

11. Meghana Marathe, Jacki O'Neill, Paromita Pain, and William Thies. 2015. Revisiting CGNet Swara and its impact in rural India. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development* (ICTD '15). ACM, New York, NY, USA, Article 21 , 10 pages.
DOI=http://dx.doi.org/10.1145/2737856.2738026

12. Anjali K. Mohan, Edward Cutrell, and Balaji Parthasarathy. 2013. Instituting credibility, accountability and transparency in local service delivery?: helpline and Aasthi in Karnataka, India. In *Proceedings of the Sixth International Conference on Information and Communication Technologies and Development: Full Papers - Volume 1* (ICTD '13), Vol. 1. ACM, New York, NY, USA, 238-247.
DOI=http://dx.doi.org/10.1145/2516604.2516622

13. Mudliar, P., & Donner, J. (2015). Experiencing interactive voice response (IVR) as a participatory medium: The case of CGNet Swara in India. *Mobile Media & Communication*, *3*(3), 366-382.

14. Preeti Mudliar, Jonathan Donner, and William Thies. 2012. Emergent practices around CGNet Swara, voice forum for citizen journalism in rural India. In *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development* (ICTD '12). ACM, New York, NY, USA, 159-168.
DOI=http://dx.doi.org/10.1145/2160673.2160695

15. Murdock, G. (2004). Past the posts: Rethinking change, retrieving critique. *European Journal of Communication*, *19*(1), 19-38.

16. Sriharini Narayanan. 2010. Accountability and the new media: use of ICTs in governance in India. In *Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development* (ICTD '10). ACM,

New York, NY, USA, Article 28, 10 pages. DOI: https://doi.org/10.1145/2369220.2369246

17. Obadare, E. (2004). The Great GSM (Cell Phone) Boycott: Civil Society, Big Business and the State in Nigeria. *Dark Roast Occasional Paper Series*, *18.*

18. Neil Patel, Deepti Chittamuru, Anupam Jain, Paresh Dave, and Tapan S. Parikh. 2010. Avaaj Otalo: a field study of an interactive voice forum for small farmers in rural India. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '10). ACM, New York, NY, USA, 733-742. DOI: https://doi.org/10.1145/1753326.1753434

19. Pertierra, R. (2002). *Txt-ing selves: Cellphones and Philippine modernity*. De La Salle University Press.

20. Rafael, V. L. (2003). The cell phone and the crowd: Messianic politics in the contemporary Philippines. *Philippine Political Science Journal*, *24*(47), 3-36.

21. Rajalekshmi, K. G. (2007). E-governance services through telecenters: The role of human intermediary and issues of trust. *Information Technologies & International Development*, *4*(1), pp-19.

22. Agha Ali Raza, Farhan Ul Haq, Zain Tariq, Mansoor Pervaiz, Samia Razaq, Umar Saif, and Roni Rosenfeld. 2013. Job opportunities through entertainment: virally spread speech-based services for low-literate users. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13). ACM, New York, NY, USA, 2803-2812. DOI: https://doi.org/10.1145/2470654.2481389

23. Schwittay, A. (2012). Incorporated citizens: Multinational high-tech companies and the BoP. *Information Technologies & International Development*, *8*(1), pp-43.

24. Vivek Srinivasan, Vibhore Vardhan, Snigdha Kar, Siddhartha Asthana, Rajendran Narayanan, Pushpendra Singh, Dipanjan Chakraborty, Amarjeet Singh, and Aaditeshwar Seth. 2013. Airavat: an automated system to increase transparency and accountability in social welfare schemes in India. In *Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes - Volume 2* (ICTD '13), Vol. 2. ACM, New York, NY, USA, 151-154. DOI=http://dx.doi.org/10.1145/2517899.2517937

25. Corbin, J., Strauss, A., & Strauss, A. L. (2014). *Basics of qualitative research*. Sage.

26. Vasudevan, R. (2006, May). Changed governance or computerized governance? Computerized property transfer processes in Tamil Nadu (India). In *Information and Communication Technologies and Development, 2006. ICTD'06. International Conference on* (pp. 101-109). IEEE

27. Rajesh Veeraraghavan. 2013. Dealing with the digital panopticon: the use and subversion of ICT in an Indian bureaucracy. In *Proceedings of the Sixth International Conference on Information and Communication Technologies and Development: Full Papers - Volume 1* (ICTD '13), Vol. 1. ACM, New York, NY, USA, 248-255. DOI=http://dx.doi.org/10.1145/2516604.2516631

28. Jerome White, Mayuri Duggirala, Krishna Kummamuru, and Saurabh Srivastava. 2012. Designing a voice-based employment exchange for rural India. In *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development* (ICTD '12). ACM, New York, NY, USA, 367-373. DOI=http://dx.doi.org/10.1145/2160673.2160717

29. Wolcott, H. F. (1990). Writing up qualitative research (Vol. 20). *Qualitative research methods series*.