The Case for IVR-Based Citizen Journalism in Pakistan

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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 becoming widely available to such populations. 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). This paper reveals a demand for mobile phone-based citizen journalism and grievance reporting platforms among low-literate people in Pakistan.

Author Keywords
Speech interfaces; IVR; low literate; visually impaired; citizen journalism; social concerns.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous: H.5.1.Multimedia Information Systems: Audio input/output.

Introduction

Humans possess 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 people 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 a public identity, and are incapable of raising their voice for their rights. As an opportunity, basic and feature phones are widely available and are inclusive to such populations as long as the provided services use 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 text (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 but not limited to 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.

It is important to mention that IVR-based citizen journalism is being successfully employed in other developing regions including India – where the cultural settings are very similar to Pakistan. 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]. However, past research [29] has shown that user response to speech-based, telephone services in India and Pakistan could be utterly different from each other. Therefore, before planning a large scale deployment, it is necessary to figure out how would a citizen journalism and grievance reporting service over mobile phones be received among low-literate, non-tech-savvy and under-connected people in Pakistan.

Mehfil is the first IVR service for citizen journalism in Pakistan. In addition, the current paper focusses on the qualitative analysis of the grievances and problems reported by the users. Within 41 days of its deployment, Mehfil received 789 calls from 535 users from all provinces of Pakistan. It was found through users' self-reporting 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.

Mehfil – A Citizen Journalism Platform for the Underserved

Mehfil allows people to share their social issues over simple phones. It gives people a chance 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 that follow, we present related work, followed

by design and deployment, and then the results based on a thematic analysis of the received calls. We conclude with an analysis of user feedback regarding Mehfil and its interface and usability.

Mobile Phone Prevalence

Modern Information and Communication Technologies (ICTs) like mobile phone could act as tools that enable social change [15]. Among other things, mobile phones could be used for citizen journalism. Main mobile phone-based interventions include improving transparency [2], effectiveness of governmental programs [3, 16], and increased 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 used to enable 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 systems 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]. The use of mobile phone-based speech services has also expanded to address social needs including information services for agriculture [18], feedback on school meals [8], and forums for immigrants in high-resource settings [1].

CGNet Swara is a voice-based portal for citizen journalism launched in rural India (2010), and serves as a prominent example of IVR based grievance reporting platform [14, 11]. In terms of their effectiveness, a project in Kerala (India) studied the role of intermediaries in tele-centers [21]. However, IVRs for citizen journalism encounter challenges of their own. For example, such ICT IVR-based systems may not be 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 suggest that the real benefits achieved from an IVR based grievance reporting 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].

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 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.

In 2017, Polly is still live in Pakistan. We collaboratively added Mehfil, citizen news and grievances reporting

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

regarding local area issues, to Polly that resulted in the 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, missed calls are a popular way to request 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 personally identifiable 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 local 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, 28].

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 and Discussion

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 the 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 themselves 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 force does 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 recorded: *"As per law, factories and government organizations are bound to hire 3% disabled people. In case of not hiring, they are charged a fine of rupees 5000* (approx. $50) *which is very 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 due to ill-equipped health centers: *"We have one health center here, but no staff is available, and when the staff comes, medicines are not provided to the people. We also do not have proper electricity supply in our area"* (Layyiah).

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 10am the cellular service by phone towers stops working. So, we are unable to get connected" (*Dera Ghazi Khan*).*

User Feedback about Mehfil
Mehfil also allowed its users to record unstructured audio feedback about its interface and usability. Most callers appreciated the opportunity to report social news and incidents. Out of all calls (N=786), 4.3% resulted in feedback messages of admiration and

appreciation by the users as well as suggestions regarding improvement of the service. Such requests included a capability of recording multiple messages per call; an increase in recording time and number of messages allowed per day per user; and longer retention of recorded messages in the system. One of the callers recorded: *"I am <anonymized name> from Islamabad. The messages get deleted from the system; we cannot listen to them again. Kindly make them available always."* (Islamabad). Another caller requested an increase in the number of messages allowed per user per day: *"Assalam o Alaikum, I want to say that you have limited us to record messages only two times a day. It is not enough. You should allow us to record messages as much as we can. Thank you very much. Kindly consider our request. It is recorded with all honesty."* (Sanghar). The issue discussed by this user refers to an overall subsidized usage quota of two calls per day that we have for all of our users.

Conclusion

This paper describes the design and deployment of an IVR based social platform, called Mehfil. This service enabled under-connected populations from all provinces of Pakistan to convey their social issues to us. Using thematic analysis, we found that they desire an 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. Mehfil establishes a demand for IVR-based citizen journalism and grievance reporting among under-connected populations in Pakistan.

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 and number of calls. However, we do understand that some users may benefit from longer recording intervals for reporting their grievances and 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 (publications in process).

This work shows 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. Finally, we also plan to follow up with a large-scale deployment of Mehfil in Pakistan.

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