Demo: A WhatsApp Bot for Citizen Journalism in Rural India

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Increasing penetration of Internet-enabled smartphones in low-resource areas makes them an attractive platform for engaging emerging users. In this paper, we demonstrate how a voice forum for citizen journalism in rural India– previously accessible via an Interactive Voice Response (IVR) system– can be naturally supported and enriched using a chatbot. Implemented using the WhatsApp Business API, the bot enables submission of both audio (with or without image) and video stories. Following review by moderators, stories are published on a website and social media sites, and can also be browsed interactively using the WhatsApp bot. This multi-way, intermediated model of communication expands the scope and functionality of typical WhatsApp groups while offering significant cost savings relative to IVR systems. In the first 9 weeks of a long-term deployment, the bot demonstrated high usability and acceptance and resulted in 218 published stories from 27 users.

CCS Concepts: • **Human-centered computing** → **User centered design**; *Ubiquitous and mobile computing systems and tools*; Smartphones; **Accessibility systems and tools**; **Accessibility technologies**; • **Computer systems organization** → *Special purpose systems*; • **Applied computing** → Service-oriented architectures.

Additional Key Words and Phrases: Citizen Journalism, WhatsApp, Chat bot, Low-literate users

1 INTRODUCTION

Online communication platforms and the mushrooming of citizen journalists have fundamentally changed our world, from Facebook groups that helped organize mass protests in Tunisia and Egypt to YouTube videos of citizens under fire from government forces in Syria. These changes have rendered an operational shift in the journalist's duty of keeping the public informed, from being a gatekeeper of information to a custodian of information who must curate, verify and lend credibility and context to content already in the public domain. Bruns [1] highlights the role of journalists as shifting from "gatekeeping" to "gatewatching", while Dailey and Starbird express the changing role of journalists by describing them as crowdsourcerers [3] who 'incorporate the crowd as co-collaborators' to 'collect, curate, synthesise, and re-broadcast information across technological divides.'

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At the same time, this democratization of the information space is occuring unevenly across the world, due to varying levels of technical proficiency, infrastructural barriers and high literacy requirements for producing content on most social media platforms. Nonetheless, the smartphone revolution and its increasing penetration among the next billion users of the internet are increasing the reach of citizen journalism platforms. The intuitive interfaces on apps like Tik Tok, YouTube and WhatsApp have allowed even semi-literate users to make extensive use of these platforms, thus opening up a new design space for letting these communities become citizen journalists who can tell their own stories.

In this paper, we showcase a demo built for CGNet Swara, a citizen journalism platform based out of Central India. For over a decade, CGNet has operated an interactive voice response (IVR) platform that allows users to report or listen to stories by simply calling a toll-free number. Upon seeing that many users now have WhatsApp, we integrated their IVR number with the WhatsApp Business API, thus allowing user generated content submitted via WhatsApp to be posted on YouTube, Facebook, Twitter and CGNet's website, similar to how it is done with their IVR channel. The WhatsApp channel has been designed to supplement and not substitute for IVR, which remains an important medium for engaging communities too poor to own a smartphone, too low literate to navigate a visual interface or too remote to access the internet [11]. We hope to contribute to the research community by both sharing our demo and the challenges we faced in designing with the WhatsApp API, and stimulating conversations around how low-resource communities can join the citizen journalism movement and share their stories with the world.

2 DESIGN

We created the chatbot for CGNet Swara, a citizen journalism platform where users give a missed call to a number, whereupon they are called back and can press '1' to report a story and '2' to hear the verified, fact-checked stories others have reported (this is cheaper than an inbound toll-free number). In the organizations 10 year history, over 100,000 unique users have called this number to report or listen, while more than 20,000 stories have been published from 6300 unique users. An internal survey found that roughly 30% of their users had associated WhatsApp accounts, prompting our team to explore how users could submit and listen to stories through WhatsApp.

The full interaction flow of the chatbot is shown in Figure 1. The choice for language was Hindi written in English characters. If the user sends a message other than from the WhatsApp attachments (audio, video, image, contact card and location), the bot replies with a randomly chosen story among the set of latest stories and a welcome message that includes the link to our chatbot, which can be forwarded to other users, as shown in Figure 2b.

One of our main design constrains arose from the fact that we were designing for users who may be too low literate to navigate text content. Medhi argues that textual non-literacy is correlated with reduced cognitive skills required to navigate information architectures [6], convincing us to sacrifice greater functionality for simplicity. If a user sends a WhatsApp attachment such as an audio or video file, it is assumed to be a story submission and there is no confirmation required as users may not know how to read or type. In case more technologically proficient users want a photo to go along with their story, they can send an image, which is then followed by a request for the corresponding audio story, as shown in Figure 2a. We tried to guide users at each step of their interaction journey through an instruction or acknowledgment based reply, although this can be tricky as users may be unable to understand these messages.

We also designed our chat interface so that it could be operated with minimal number of steps and without any textual input. If users want to listen to more stories, they can do that by typing in '3' at anytime, without having to return to the main menu. Users may also request for stories reported by another user by typing in '1' and then entering the phone number of the person whose stories they wish to listen to, or by directly sending a contact card attachment (Figure 2b). Similarly, users can listen to stories reported by users in their district by simply sending the
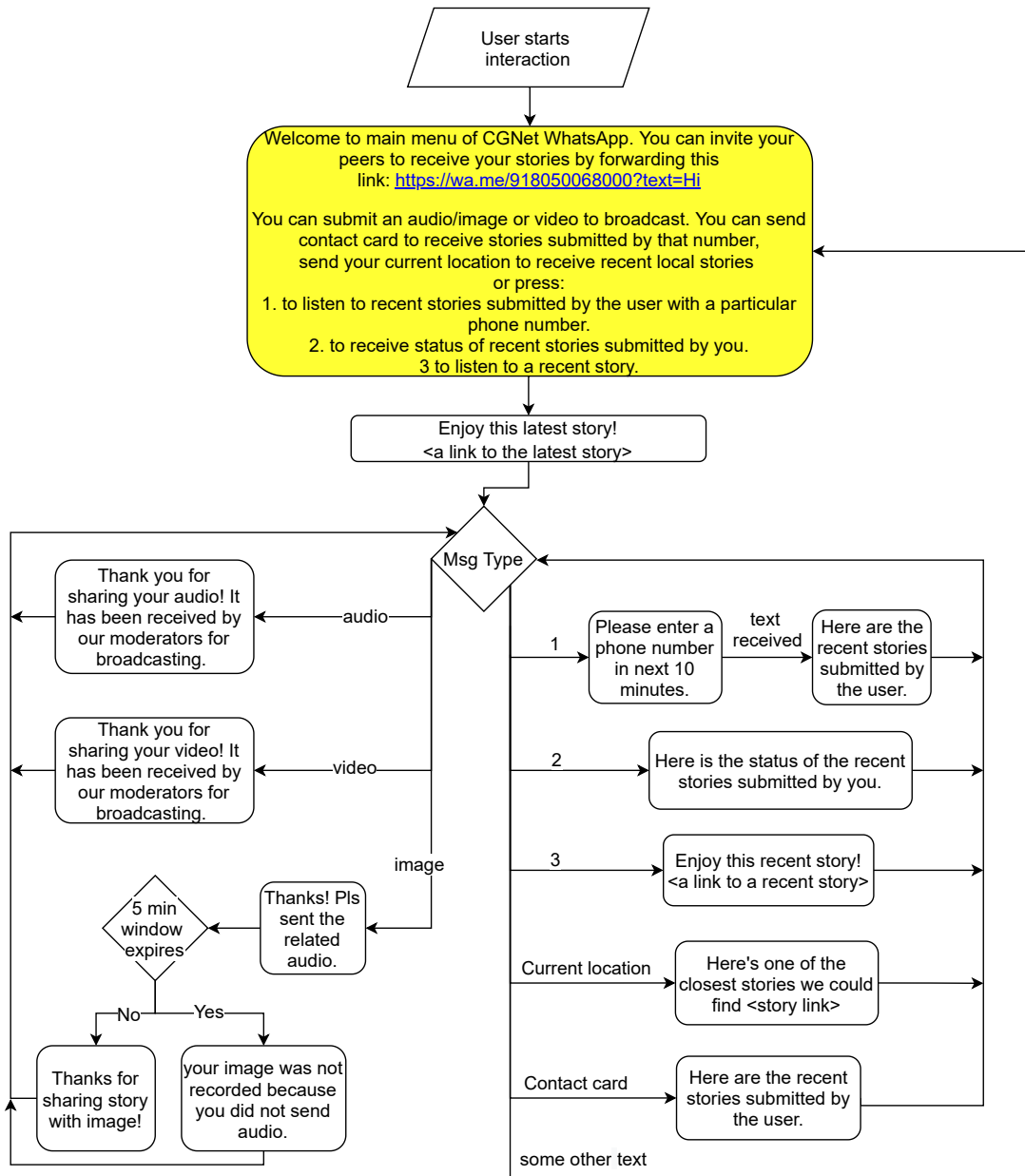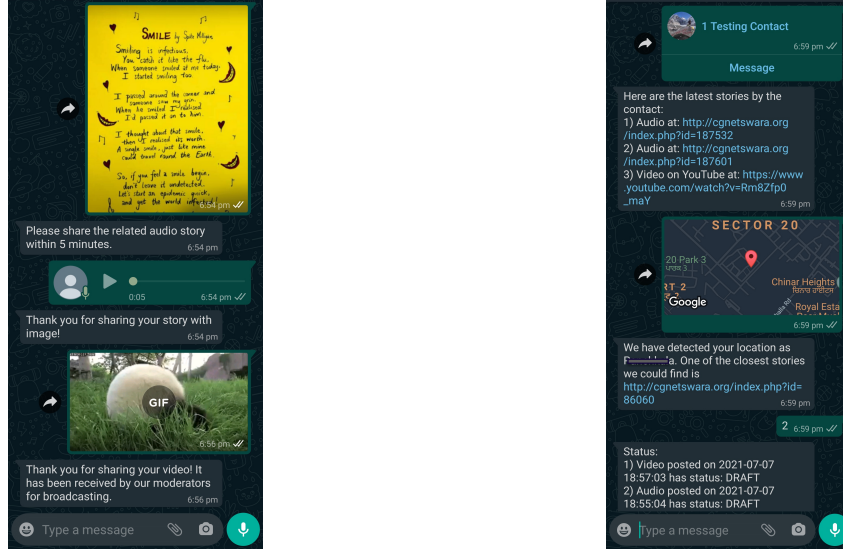
Fig. 1. Interaction flow for content acceptance and dissemination.

location attachment (through the 'Send current location' feature). Additionally, more literate users can request for the status of their unpublished stories by typing in '2'- a personalised feedback mechanism that could not only help

(a) Receiving video and image-based audio stories from user.   (b) Sending latest stories and status to user.

Fig. 2. Demo of the deployed chatbot.

increase their engagement but also build accountability in the organisation so that users can complain to the staff if their story has been left unattended.

A second set of design constraints came from our team having to integrate as far as possible with the existing workflow used by CGNet. For example, editing and reviewing stories submitted via IVR takes place on the open-source loudblog moderation platform, forcing us to modify its capabilities to accept video submissions made over WhatsApp. A regular account on WhatsApp would not have allowed us to take audio or video submissions directly onto the moderation platform, prompting us to explore the API which comes with a fixed cost of USD 500 per month and has its own set of design constraints. WhatsApp bots can reply for free within a 24 hour window from the user's last message, while initiating a conversation outside this window incurs marginal costs of USD 0.005 per message and also requires both permission from the user and that the message be pre-approved by Facebook. To minimize cost and complexity, we designed the bot such that it only replies to users.

The third and final set of factors influencing our design was the needs and capacities of CGNet Swara. To save space and reduce load on their IVR server, videos are hosted on YouTube and dissemination of stories on WhatsApp is done through sending links instead of the actual media file. Audio is automatically extracted from videos received via WhatsApp, so that they can be separately edited and played over the IVR channel. We also found that many of the staff reporters earlier faced issues with space on their phone for storing video or audio interviews they took while in the field, which was mitigated by having them simply send those media files to the WhatsApp chatbot we designed.

In the future, we have plans to introduce a special "moderator mode" on the WhatsApp bot that would reduce the workload of editors on the moderation platform. Experienced reporters in the field would be able to type in metadata about the story they are reporting, such as its title and description, which are currently filled in by moderators.

3 DEPLOYMENT

In 28 days of deployment, a total of 236 stories were reported by 25 unique users, of which 126 have been fact-checked, verified and published online (Table 1). Only 2 video stories have been published out of 37 submissions, due in part to the CGNet moderators lacking video editing skills. One of the videos was sent by an old man who sang a song,

"You would see that we will defeat Corona. We will not participate in mass gathering. You would see that we will defeat Corona. We will not hug or shake hands with each other..."

The majority of stories comprise accounts of violence inflicted by insurgent or government forces (CGNet operates in a region experiencing more than 30 years of civil war). This may be due to CGNet preferring to first test the chatbot with their own reporters, who are tasked with reporting stories of victims caught in the conflict, before publicizing it to other citizen journalists who currently use their IVR channel as a cultural repository and to report longstanding community issues. The chatbot nevertheless received 45 stories centered around basic governance problems that show how citizen journalists can speak truth to power. For example, despite government claims of electrifying all villages in India, we received the following report from a user in the Central Southern state of Telangana;

"Since past 15 years, the villagers are facing electricity problems due to which we do not have proper lighting facility here. We have to stay in dark during night times due to lack of electricity. Advanced facilities are also not available. I appeal to you all for help."

Only 2 impact stories were recorded where users updated us that the problem they reported earlier had been resolved. Future work will need to look more carefully at developing mechanisms to solve issues raised on the platform.

Table 1. Usage data for 9 weeks of deployment.

Parameter	Count
Total stories received via WhatsApp	539
Stories published on web	218
Distinct users	27
Total video stories received	93
Video stories published	4

Table 2. Analysis of stories submitted via WhatsApp which have been published online.

(a) Classification of stories.

Story Type	Count
Victim	117 (53.67%)
Problems	81 (37.16%)
Song	8 (3.67%)
Impact	6 (2.76%)
For Awareness	4 (1.84%)
Story	2 (<1%)

(b) Classification of problem stories.

Problem Type	Count
Water	35 (43.21%)
Ration card	8 (9.88%)
Road	13 (16.05%)
Electricity	4 (4.94%)
Pension	11 (13.58%)
Miscellaneous	10 (12.34%)

4 DISCUSSION

The use of WhatsApp in India has been transcending class boundaries [9], motivating us to explore whether its API can be used for distributing and crowdsourcing stories from communities that may not even be able to read or write. Our demo enabled users to contribute content in video, voice and vernacular- 3Vs that have been central to the growth of Internet users in India [2]. In particular, augmenting the phone numbers of existing IVR platforms with the WhatsApp API to allow users to submit videos (as opposed to only audio) has immense potential in scaling up the voices of marginalized communities and promoting linguistic diversity to create a more inclusive Internet. However, this model relies upon an ecosystem of cheap mobile data, since users use their own bandwidth for submissions via WhatsApp unlike an IVR platform that relies upon a simple missed call.

Another community media platform making extensive use of WhatsApp is Khabar Lahariya [10], whose reporters use WhatsApp to send videos to a central editorial team for processing and dissemination across multiple platforms and news organizations. We would argue that use of the WhatsApp API, which allows for providing acknowledgements, explanations, instructions and updates through automatic replies, is more accessible to people at the grassroots who want to be journalists and report their own stories. Compared to using a regular WhatsApp account for receiving stories, the API allows for a more robust two-way communication with grassroots communities that can be used to distribute stories back to them and conduct short polls, surveys and interviews. At the same time, expanding the base of reporters requires clear disclosure policies, as many may not be aware that stories they report are uploaded with their name against it and will remain on the internet for posterity.

Finally, an emerging body of research speaks to the benefit of 'meeting people where they are' or integrating with existing platforms already in use, rather than creating unfamiliar, custom-built platform [5, 8]. CGNet's earlier attempts to crowdsource and distribute stories through dedicated smartphone applications floundered due to the training and installation overheads for onboarding new users [4, 7]. By contrast, the CGNet field team now simply instructs new users to call the IVR number and report their stories if they do not have internet, or to WhatsApp them to the same number if they have a smartphone. If there is one takeaway we hope researchers and practitioners will absorb from this short paper, it is this: why build an app, when you can use WhatsApp?

5 ACKNOWLEDGEMENTS

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