

Jana Snehi: An IVRS based Feedback System

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Abstract— Many public funded social welfare schemes in India suffer from implementation problems. Most of these problems can be traced to missing or broken information flows and accountability loops. First, beneficiaries are often not aware about the schemes and the rules and regulations governing the schemes and the government officers do not have any direct medium to obtain feedback on the schemes from the beneficiaries. Second, beneficiaries are not able to access scheme related data due to Internet access and literacy challenges because the data is often posted on web-based MIS systems. Third, when the entitlements are denied there is no effective avenue to redress grievances as most grievances filed on the government run helplines go unresolved or the resolutions are ineffective. In this project we address the questions of how to augment the grievance redressal systems to improve their uptake and effectiveness; how can low-literacy users access information on web-MIS platforms and report discrepancy in the data; and how can government officers directly obtain feedback on the implementation of the schemes from the beneficiaries. We designed a model of grievance redressal which connects people to government officers through an IVR (Interactive Voice Response).

I. INTRODUCTION

The central and state governments in India, design public funded social welfare schemes to cater to the needs of the marginalized communities. Such schemes include employment guarantee schemes like Mahatma Gandhi

National Rural Employment Guarantee Act (MNREGA), food security schemes such as Public Distribution System (PDS), Financial Services Authority (FSA), housing schemes such as Indira Awaas Yojana (IAY), Pradhan Mantri Awaas Yojana (PMAY), financial inclusion schemes (Jan Dhan Yojna) and health insurance schemes Rashtriya Swasthya Bima Yojana (RSBY) among others. However, when it comes to the implementation of these schemes, several serious gaps come to be noticed such as lagging of data with respect to beneficiaries. Reasons for the gaps can be attributed to missing or broken information flows and accountability loops and irresponsibility in the system. There is an awareness gap around many of the schemes. The beneficiaries often do not know about their entitlements and if they do know about the entitlements, they do not know whom to approach in order to access the entitlements. When their benefits are denied to them by the local officials, because of corruption or other reasons, they do not know where to go and complain, so that an effective resolution can be obtained.

The governments on their part want to increase transparency and accountability in operations and have incorporated ways like publishing data on websites, social audits and grievance redressal helplines. However the websites have turned out to be more administration- facing than citizen-facing. The beneficiaries of these schemes have almost no access to the Internet and the websites often tend to be in English, thus cutting off a substantial portion of the beneficiaries many of whom are poorly educated. Social audits are very difficult to scale because they require extensive manual scrutiny by experts by visiting the sites of the programs.

Moreover, many states in India have no mechanism to conduct independent social audits and depend on the implementing agencies to also do the audit which is counter-productive. In addition, the policy makers do not have any direct means to collect feedback on the implementation of the schemes and services from the beneficiaries. The grievance redressal systems set up in many states also suffer from inadequate awareness and uptake and lack of effective and timely resolutions. Clearly, in order to improve the effective delivery of benefits to the beneficiaries there needs to be accessible channels through which beneficiaries can transparently access information regarding their entitlements and the government spending, channels through which the beneficiaries can communicate the correctness of the published information and other feedback regarding the implementation of the government programs and accessible channels through which the grievances of the beneficiaries will be addressed when their entitlements are violated. As the feedback generated by the beneficiaries will be verified with the data present in the government database and confirmed with the correct or false reason for the data collected. In this project, we explore the ways to fill these gaps by providing IVRS (Interactive Voice Response Systems) based application for delivering information related to various government schemes and seeking feedback/grievances from the beneficiary about government schemes like MNREGA and Public Distribution System (PDS).

II. GAP IDENTIFICATION AND PROBLEM DEFINITION

There is no direct feedback system existing between end users and government official. There are some web portals and Android based feedback systems.

1. In Web-based systems, we need computer with trained person to operate and enter the information on behalf of computer illiterate persons.
2. To use Android based feedback application, we require the smart phones with Internet connectivity and most of the rural people cannot afford it. They don't have enough knowledge to use smartphone.

With the existing approach, to give feedback about any scheme, we need to have computer system and smart phone with Internet connection. A person without having knowledge of how to use smart phones/computer system will not give the feedback. Without feedback we will not get information about irregularities/problems taking place in implementation of various schemes. To overcome this, we are implementing our project in a normal mobile handset using the IVRS system. Earlier there was no feedback system provided to people and here the opportunity for them to reach their views to a higher level officer of the government and have transparent implementation of various scheme.

Here end users can use normal mobile phone (**non-smart phone without Internet**), through the voice based services,

1. Simplified way to get the information about various government schemes to the end users.
2. Feedback about the work carried under MNREGA scheme/ grievances about irregular/incorrect/delayed

payment to avoid the corruption taking place under implementation of such schemes.

III. OBJECTIVES

The aim of the project is to provide following services using Interactive Voice Response System (IVRS)

1. Providing information related to various government schemes to the end users.
2. Allow the end beneficiaries to give the feedback/ grievances about the implementation of the government scheme like MNREGA and get it cross verified.
3. Allow the end beneficiaries to give details of commodities received through the Public Distribution System (PDS) and get it cross verified.

Working of Proposed System :

In the proposed system we have a database consisting of following information:

Pre-recorded information about each government scheme. As part of this service, we have recorded information about various government schemes. whenever user opts for listening about the particular scheme, that scheme details will be played back to the user.

Under scheme like MNREGA, we have each registered worker profile is stored in database. Registration of the worker is done at taluk/tahsil level. Whenever a worker completes job(work) at any place, for that work taluka level officer will add following details {worker_id, place_of_work, from_date, to_date, payment_made} into the database. There is possibility that taluka level officer may enter wrong details like showing higher payment_made rather than actual payment made against work. That is what we want cross verify through our application.

As part of PDS each Ration cardholder profile is stored in the database. For every month various commodities will be distributed to each PDS card holder. For each distribution PDS vendor will compulsory enter commodity distribution details like {card_holder_id, vendor_id, commodity_name, commodity_quantity} by the into the database. There is possibility that vendor make purposely wrong entry like for example for 5kg rice distribution, they make enter at as 10kg rice distribution. That is what we want cross verify through our application.

The user dials the system, the system responds with the following 3 options:

1. Getting government scheme details.
- 2.1 Cross verification of work details of the worker.
- 2.2 Grievance about delayed payment.

3. Cross verification of commodity distribution done to ration card holder under PDS.

When the user selects option 1, the system responds with the menu of government scheme names for the user to select. Once the user responds with scheme number, the system plays the recorded details of the scheme.

When the user selects option 2 and the opts for sub-option 1, the system asks him/her to give his work details{place, period <from_date, to_date>, amount received}. The received voice (unstructured form) will be converted to text. The resulting unstructured text, is then converted into structured data. Unstructured text will be converted into structured text using Machine Learning techniques. This structured text(work details) are then matched with work details entered by taluk level officer for cross verification of work done and payment made against the mentioned work.

If there is no mismatch of details, system thanks to the user for information.

If there is mismatch, then report of wrong work detail entered by taluk level officer is sent to the higher authority(district level officer) to take action against the officer for checking alleged possibility of corruption.

This will help to detect the frauds that are happening in the implementation of scheme. This avoids officer making wrong(undone) work details into scheme database and claiming the payment done.

When the user selects option 2 and the opts for sub-option 2,as mentioned in 2.1 service system asks give his work details(place, period <from_date, to_date>, amount received).The system asks whether he/she has received payment against the work done. If worker responds with “Yes” system will thank the worker. If worker responds with “No”, then information about nonpayment will sent to both taluk officer and district level officer for speedy payment of work done

When option 3 is selected, the system responds with details of the current month commodity distributed to cardholder. After this, system prompts the cardholder to give his response about commodities distributed for cross verification. If the response is “Yes”, then the system thanks the cardholder. If the response is “No”, system then prompts the cardholder to give the actual details of distribution. After receiving the details, system will generate a report about wrong distribution and send it to a higher authority and inform the same to the cardholder. With this possible black marketing of PDS commodities done by vendor can be detected and fair distribution will be done the cardholder. For this option also, voice to text conversion and unstructured to structured text conversion as that of option 2.1 will be done.

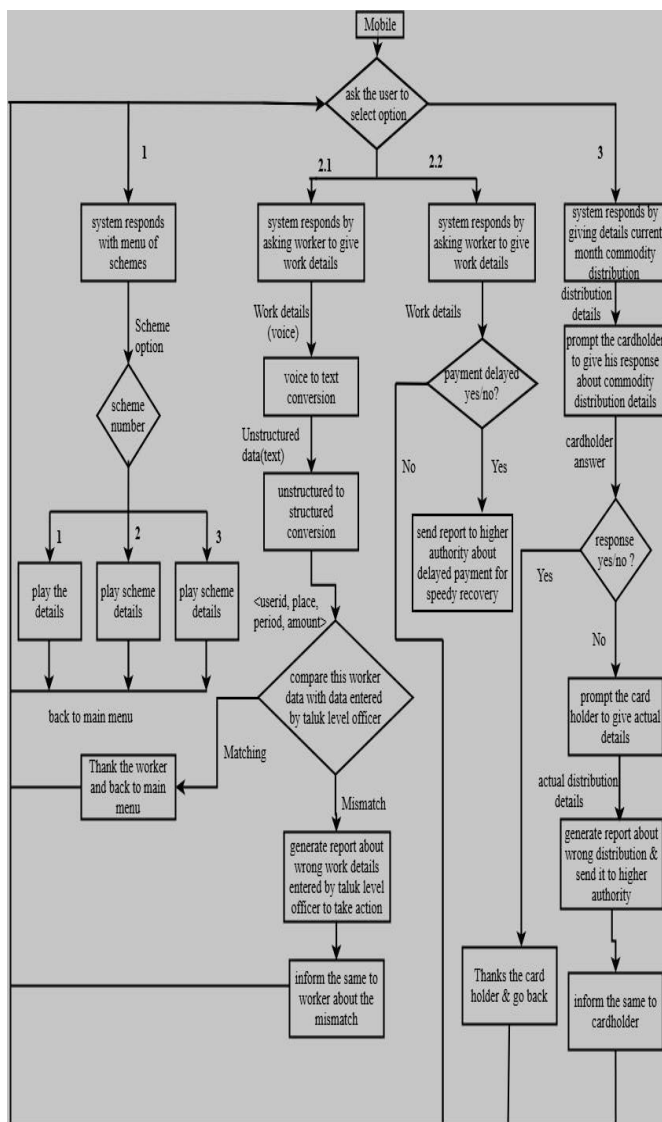


Figure: Flow Chart of Proposed System

IV. METHODOLOGY

In our proposed system, User with a mobile phone (GSM Network) calls to the IVR number which connects to the computer provided with voice responses via a GSM Modem. User will record his feedback through the mobile which is stored into the Laptop System. After collecting the feedback, a report/query is raised to the government officers of respective schemes.

There are 4 modules. They are as following,

1. In Ring detector circuitry & DTMF decoder module will receive the incoming calls and identifies calling mobile number. Then it prompts the user to give his/her option to continue further. Once user selects the option then this module will initiate the processing of option and ask user to speak. The received voice is the translated into to text using

Google speech to text translation API. Then this module passes this unstructured text to structured text conversion module.

2. The unstructured text to structured text conversion module converts text to structured text and passes it to cross verification module.
3. Cross verification module check the match/mismatch of information and gives the concluding remarks.
4. Based on the concluding remarks action will initiated by the reporting/query module.

Interactive voice response (IVR) is an interaction between the caller and the computer provided with voice responses by the computer according to the caller response. IVRS uses ring detector circuitry for detecting and connecting the caller to the computer. The DTMF signal from the caller is provided from the caller's mobile phone keypad. Caller can access the information from anywhere at any time simply by dialing a specified IVRS number and following voice response according to user input. The input will be given by in form of dual tone multi- frequency signal, which is generated when a caller presses a key from keypad of a mobile phone set. The voice responses to the caller are provided when the caller gets connected to the computer. Voice response is generated dynamically according to the caller's DTMF signal from caller's mobile phone.

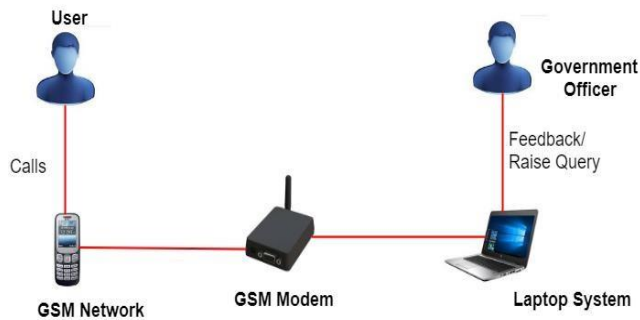


Figure: Overview of proposed system

V. EXPECTED OUTCOMES

As we are providing a user friendly IVR system, which helps the people to get government scheme details and a redressal grievance system where they give feedback and share their views about the existing schemes which are running now.

- **Beneficiaries will be aware of each schemes undergoing**
Beneficiaries will be aware of each scheme as we provide the information of all schemes with updates, where they will be able to know how and for what the schemes is for without any extra resources (web portals) very easily.
- **Overcome the problems of the beneficiaries under government schemes**
In our project we verify the work details of the worker and the delayed payment, also verify the

commodity distribution done to ration card holder under PDS. After verifying we send the report to higher authorities and intimate them to take certain actions over the report. This will help the beneficiaries to overcome the problems which are under government schemes. Certain action would be taken by the government officers for whom the report has been generated.

➤ **Gap between the people and the government authorities will be eradicated**

As the report generated under the MNREGA schemes will directly intimated to the higher authorities which are under this scheme will solve the problem where it is an direct contact between the people and government officers of same scheme. Similarly, for the PDS scheme there will be a cross-verify of the commodity distribution given to card-holders. And if any mismatch occurs as the report is generated to government officers under PDS schemes, certain actions are taken by government officers to have a proper distribution of commodities to card-holder.

CONCLUSION

Among the different aspects of governance, affirmative action like social welfare schemes affects a big part of the population. This population is marginalized economically, in terms of access and in terms of education. Gaps in the implementation of these schemes and other government services have been widely reported. The government takes transparency and accountability measures like publication of data on the web, social audits and setting up grievance redressal helplines. However, these measures often fall short owing to accessibility and literacy challenges and because of lack of accountability in the government system. The grievance redressal systems have very low utilization and are unable to provide timely and effective resolutions for the grievances. The information on government schemes is primarily published on web-MIS platforms which are inaccessible to beneficiaries, a majority of whom are poorly literate and have no access to the Internet. In addition, the government does not have any direct medium to collect feedback from the beneficiaries on the implementation of the government schemes and programs. In this project, we take an information flow approach to answer three research questions: how can the grievance redressal systems be augmented to improve their effectiveness and uptake; how can beneficiaries access information on web-MIS platforms and verify the information; and how can the government directly collect feedback on the implementation of the schemes directly from the beneficiaries.

Broken information flows between the beneficiaries and the governments around the design and implementation of government schemes and systems lead to bad design of these systems and programs, which in turn lead to low uptake. In this project, we described IVR tool which can be easily used

by even poorly literate people to convey feedback on the schemes directly to the government. Using this tool, the government can solicit feedback on any scheme. The government officials that we shared this data with agreed that the information was new and they did not have any means to capture them at scale. They will resolve the problems which are reported through our project. There have been demands to scrape public funded welfare schemes as they are riddled with leakages. We counter this argument because public funded schemes are required to bridge the widening class divide in society and to provide every citizen a fair chance to progress in life. Instead of scraping these schemes, focus should be shifted to developing techniques to plug the leakages and widen the reach and effectiveness of the schemes. In this project, demonstrated a few ways in which technology can serve this purpose.

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