

TN Government Infrastructure Survey Application



mSpace Technologies Private Limited
H.No. 2-2-118/A, Flat-302, Sreemanrajals Residency,
Tilak Nagar, New Nallakunta,
HYDERABAD – 500 044
Andhra Pradesh, INDIA
Tel.: +91-9246084979
+91-40-40192803
www.mspacetech.com
E-Mail: info@mspacetech.in

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1. Introduction

The GovInfraSurvey application is an IT based mobility solution to reliably capture and digitize the information related to infrastructure in the government offices at villages and towns. The mobility solution is designed to capture transactions in near real-time. All the infrastructure is photographed and saved on the mobile device using easily available technologies like Android mobile phones.

The application facilitates capture of key data elements using a mobile phone. Information like broadband availability, condition of the building, a picture of the infrastructure and other things are entered through the application running on the mobile device. The data captured by the mobile application is automatically uploaded if data connectivity is available, if not they are saved locally in the device's external microSD card. Whenever the device is connected to the internet through Wi-Fi, GPRS or 2G, data is uploaded to a centralized server and stored in a database.

2. Key Benefits of using GovInfraSurvey App

- Developed for the needs of government infrastructure which is spread across remote areas.
- Easy to install and access even in remote areas.
- Captures accurate information at each village site using state of the art technology
- Easy to use and intuitive
- Data entry through selection, text entry and photographs
- Transactions saved on Server
- Mobile application

3. Solution Architecture

The solution comprises of a client and server application. The client is an Android application that runs on a mobile device and is used to capture the data on site. Multiple mobile devices can be used to capture data from each location as well. The server application runs on cloud, captures the uploaded data and stores it in a database. Reports are then generated from this centralized data repository. The overall data process flow is as depicted in Figure 1.

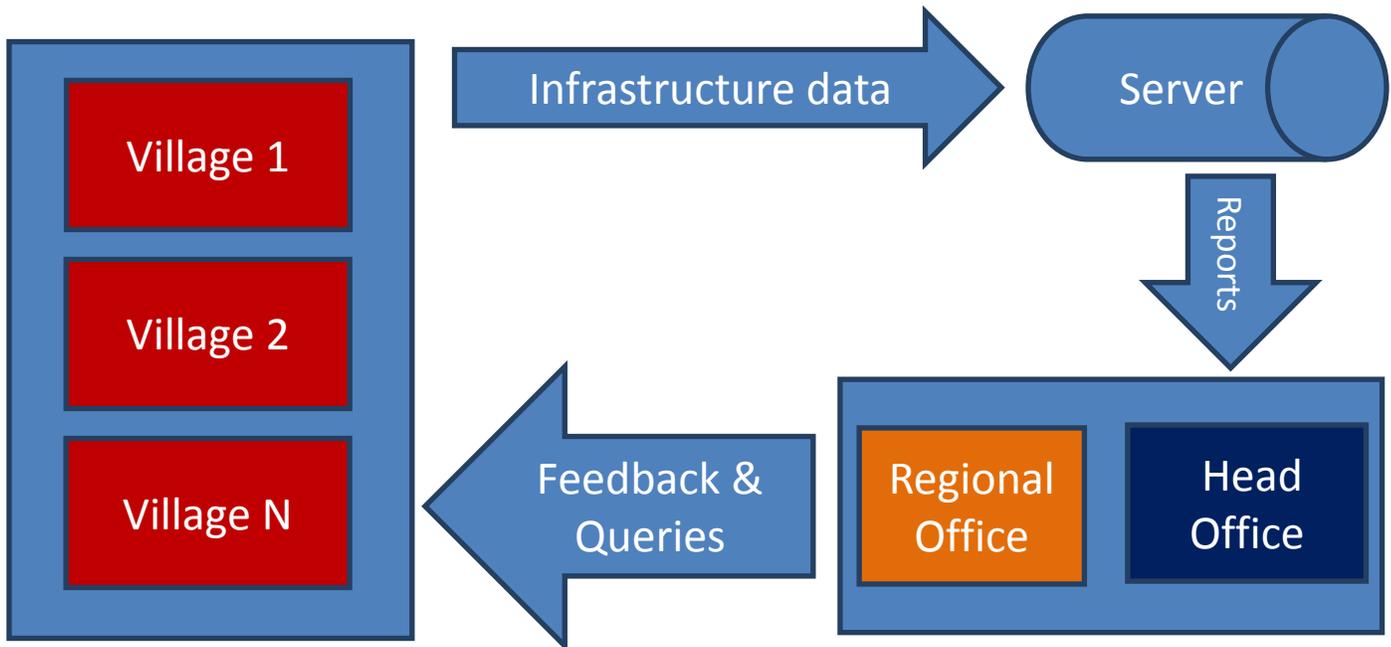


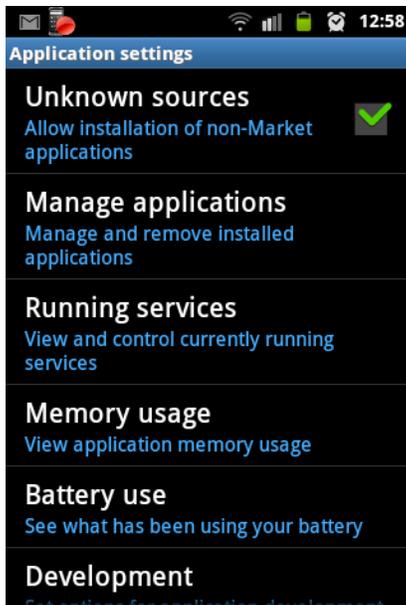
Figure 1: Data Flow Diagram

The client mobile application is designed for ease of use and data entry is done through drop-down selections and easy navigation with data validations. The infrastructure data is uploaded to the server through a web-service and is then inserted into the database in structured tables. The pictures are stored on the server hard disk. The stored data can be used to generate reports. These reports can be exported into Excel and PDF files for analysis purposes.

4. Installation

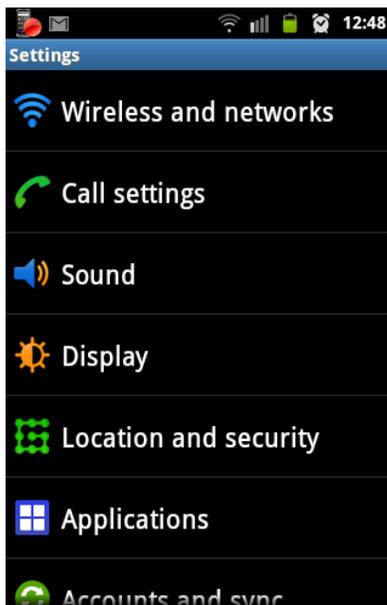
Supported Android OS: Version 2.3 and above.

Preparing the mobile device: Enable Unknown Sources in the Security Settings.



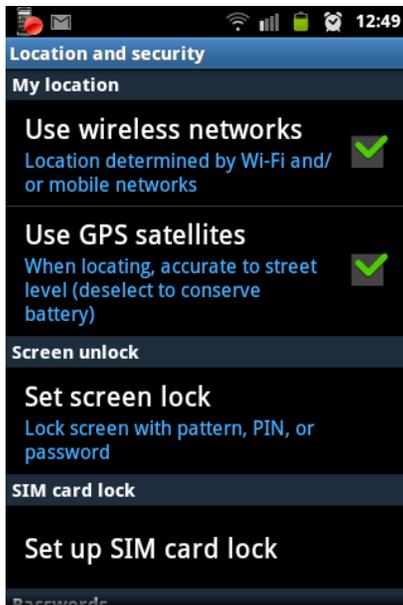
Enable GPS in the Security Settings

Go to Settings and select Location and Security



Under Locations and Security Enable

- Use Wireless Networks
- Use GPS Satellites



Note : The GPS have to connect to at least 7 satellites to get location information.

Download the GovInfraSurvey Android Client (TNGovtInfraSurvey_V_00_08_Mar18_2015.apk) on the Android mobile device.

Installation: Now navigate to the directory where you have copied or downloaded your APK file. Mostly, it's stored in the "Downloads" folder on your Android device. Once in the directory, tap the APK icon and an installation dialogue box will pop-up. Hit the install button to install the APK on your Android.

5. Android Client Application

The android client application is used to capture data at the field level using a Mobile phone. The mobile application is secured access using login/password for each user. It is mandatory that each user uses their access ID/password combination.

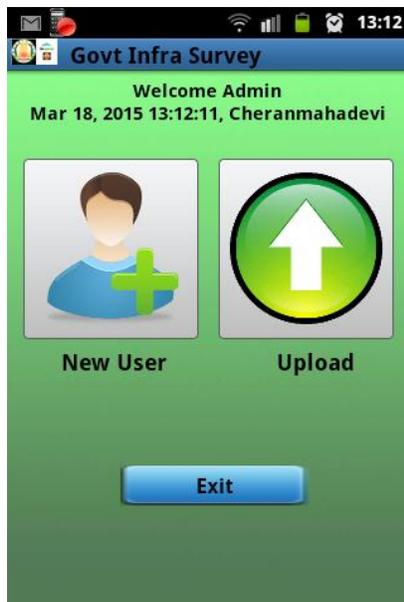
5.1. Admin Login

The Administrator access can create/delete individual user access. The following steps allow the Administrator access and creation of users.

Click on the "Govt Infra Survey Application" icon on the mobile to start the Application.



Select "Admin" and the assigned Password to create additional users for the mobile device.



Select New User and create a few mobile users. The role of the user is "Mobile User" and Location is to be selected from the pre-defined locations list.

11:28

User Registration

First Name

Middle Name

Last Name

User Name

Password

Confirm Password

Location: Cheranmahadevi

User Role: Mobile User

Mobile No

Fill in all the details of the user.

11:19

User Registration

Last Name: Reddy

User Name: Raj

Password: 1234

1234

Location: Cheranmahadevi

User Role: Mobile User

Mobile No: 9911111111

Email: raj@mspacetech.com

Register Cancel

Click on "Register" to create a new User on the Mobile.

Admin must create a normal user. Admin cannot capture data for upload to server.

Normal user login can capture data and upload it to the server.

5.2. Normal Mobile User Login

The following steps are used for Normal user login.

Click on the "Govt Infra Survey Application" icon on the mobile to start the Application.

Select a non-admin user to Login and enter the password.



The Remember me Option allows the user to login without re-entering the password



The Normal Mobile user has to collect field data in related to the infrastructure present in each village. The data collection is classified into two flows for each and every Taluk.

The flows are

- Revenue
- Development

The first step is to select a Taluk from the pre-defined drop-down list.

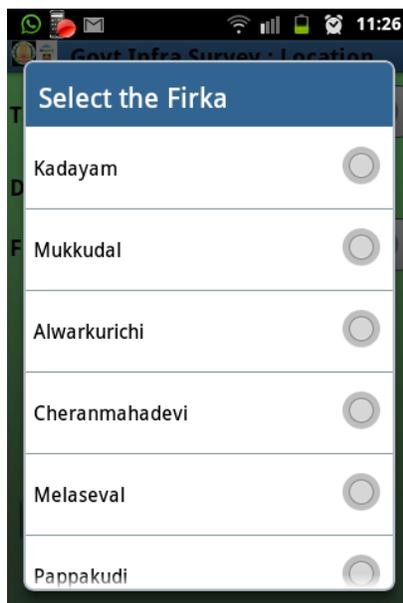


After Taluk is selected, the next step is to select the Dept. either Revenue or Development



5.2.1 Data Capture - Revenue

Select Firka from a pre-defined drop-down list



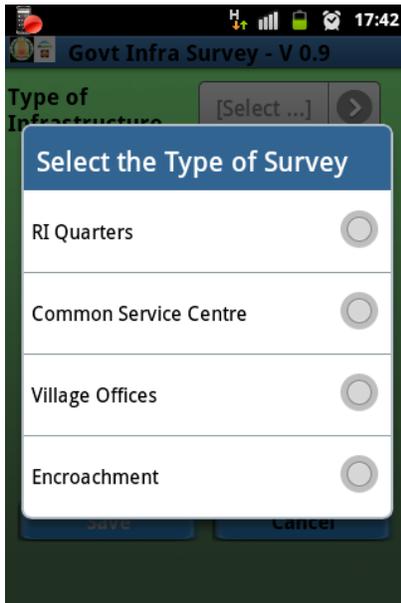
Select Revenue Village from a pre-defined drop-down list

Continue

Next Screen

Select Type of Infrastructure from a pre-defined drop-down list

Data capture elements change depending on the Type of Survey selected. This shows the data elements for RI Quarters



Name of Firka (Type in the name)

Broadband Working (Select either "Yes" or "No")

Condition of RI Quarters (Select either "Good" or "Average" or "Bad")

Remarks – type some text that describes the resource being surveyed.

This screenshot shows a mobile application form with a green background. The fields are as follows:

- Type of Infrastructure:** A dropdown menu with "RI Quarters" selected and a right-pointing arrow.
- Name of Firka:** A text input field containing "FIRKA NAME".
- Broadband Working:** Radio buttons for "Yes" (selected) and "No".
- Condition of RI Quarters:** A dropdown menu with "Good" selected and a right-pointing arrow.
- Photo:** A camera icon.
- Remarks:** A text input field with the placeholder text "Remarks".

After entering the above information, scroll down and the following screen will be shown

This screenshot shows the same mobile application form as above, but with the "GPS Location" section visible. The fields are as follows:

- Broadband Working:** Radio buttons for "Yes" (selected) and "No".
- Condition of RI Quarters:** A dropdown menu with "Good" selected and a right-pointing arrow.
- Photo:** A camera icon.
- Remarks:** A text input field with the placeholder text "Remarks".
- GPS Location:** A section with the text "GPS is Disabled. Enable GPS for Location." and a blue button labeled "Mark Location".
- Buttons:** Three blue buttons at the bottom: "Upload (0)", "Save", and "Cancel".

Click on the Mark Location button. Wait for a few seconds. If the GPS and Satellite communication is working, you should see the location on the screen. Depending upon the connectivity, this operation could take up to 5 minutes.



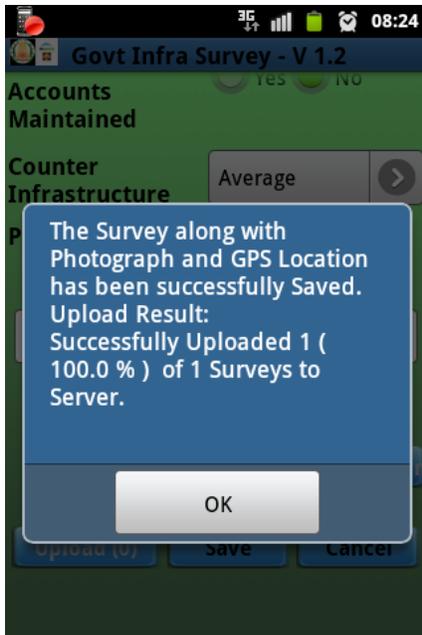
Click a photograph and Save it with some name.

Note : The photograph button is enabled only if the Location has been updated.



The Save button is enabled only if the Location has been updated and photograph has been clicked.

On clicking on the Save button, the data is uploaded to the server and the application exits.



5.2.2 Data Capture - Development

The first step is to select a Taluk from the pre-defined drop-down list.



After Taluk is selected, the next step is to select the Dept. either Revenue or Development



Dept. Development has a different set of data elements to be captured. The Block should be selected from a pre-defined drop down list



After selecting the Block, select the Town or Village. Then select the name from a pre-defined drop down list.



This is how the data entry done so far would look like

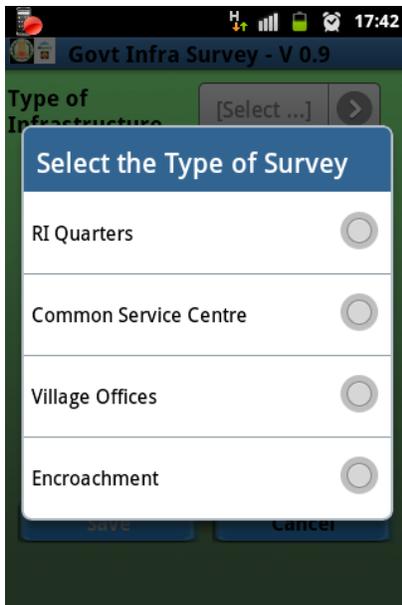


Continue

Normal User: Next Screen

Select Type of Infrastructure from a pre-defined drop-down list

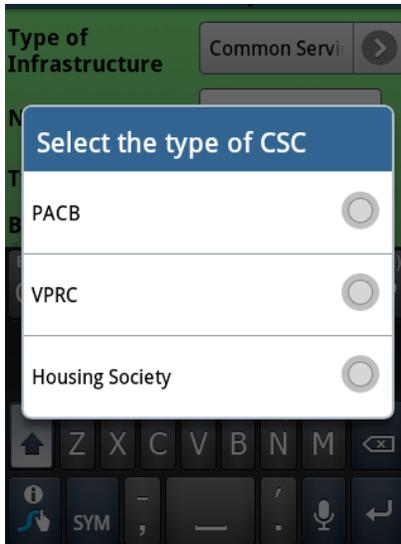
Data capture elements change depending on the Type of Survey selected.



This shows the data elements for Common Service Centre



This name of the CSC has to be typed in the given space.



Select the type of CSC from the pre-defined drop-down list.

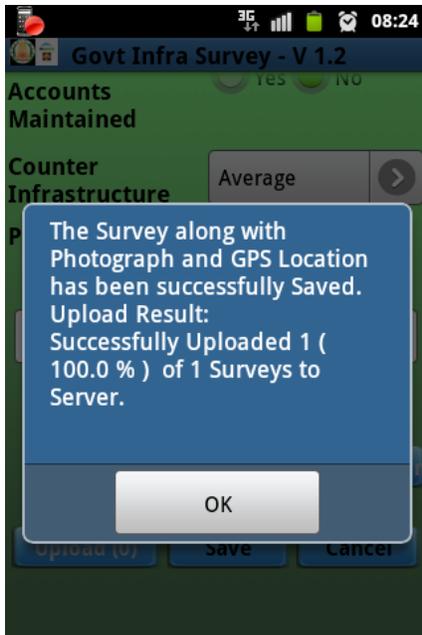
A screenshot of a mobile application form. The form has a green background. It contains several fields: 'Type of Infrastructure' with a 'Common Servi' button; 'Name of CSC' with a text input field containing 'Name'; 'Type of CSC' with a '[Select ...]' dropdown button; 'Bill Books and Accounts Maintained' with 'Yes' and 'No' radio buttons; 'Counter Infrastructure' with a '[Select ...]' dropdown button; and 'Photo' with a camera icon.

Select the Counter Infrastructure as "Good" "Average" or "Bad".

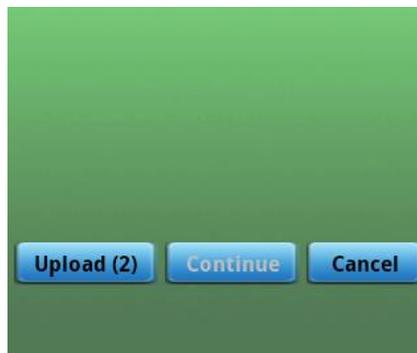
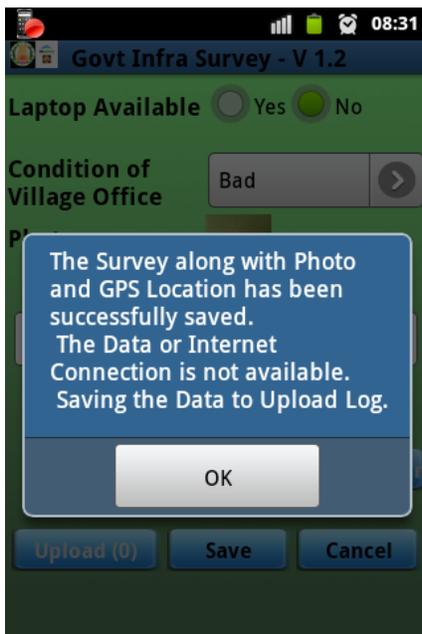
The photo feature is enabled only if location has been updated.

The Save button is enabled only if the Location has been updated and photograph has been clicked.

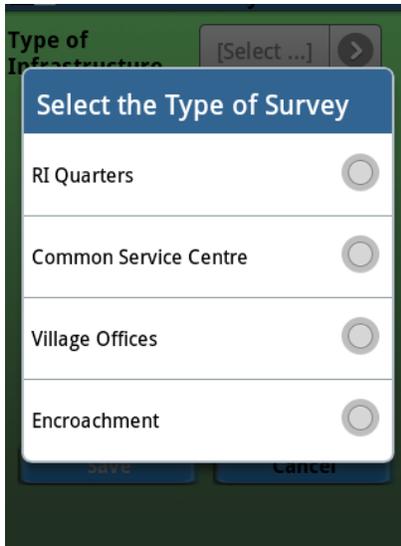
On clicking on the Save button, the data is uploaded to the server and the application exits.



If data connectivity is not available the survey is stored on the mobile device. This is indicated by the count on the Upload button



Type of Survey – Encroachment

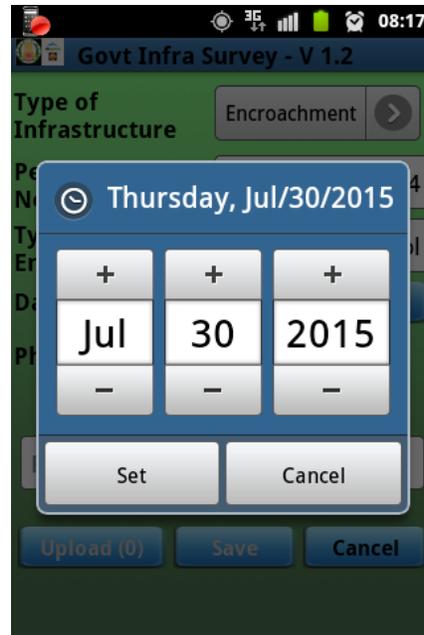


This is common to both Revenue and Development



The User has to enter data about

- Petition or File No
- Type of Encroachment
- Date of Removal
- Remarks



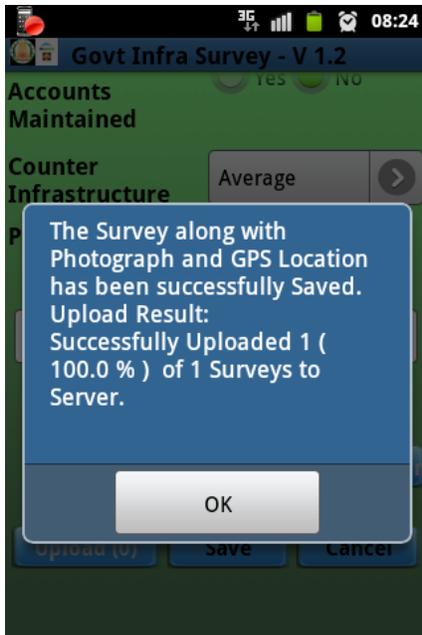
To take a photograph, the GPS has to be enabled.

The photograph taken is stamped with the latitude and longitude of the place

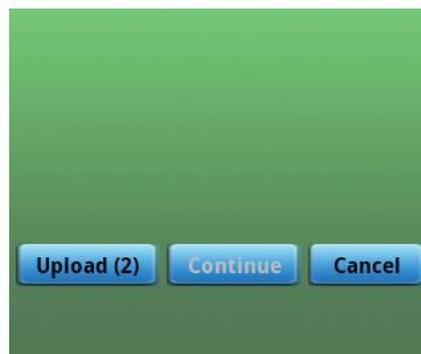


The Save Option is enabled once the photograph is taken

If data connectivity is available, the Survey is uploaded to the server immediately



If data connectivity is not available the survey is stored on the mobile device. This is indicated by the count on the Upload button



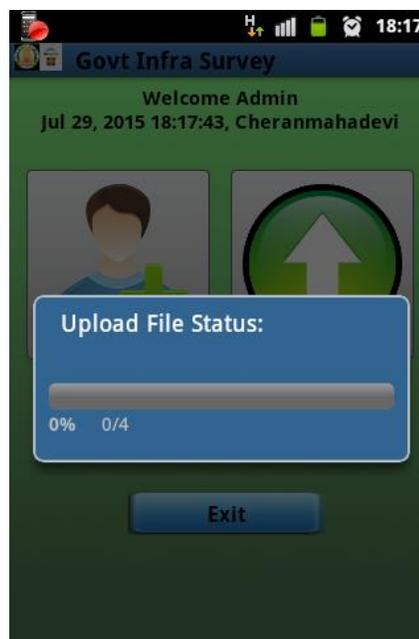
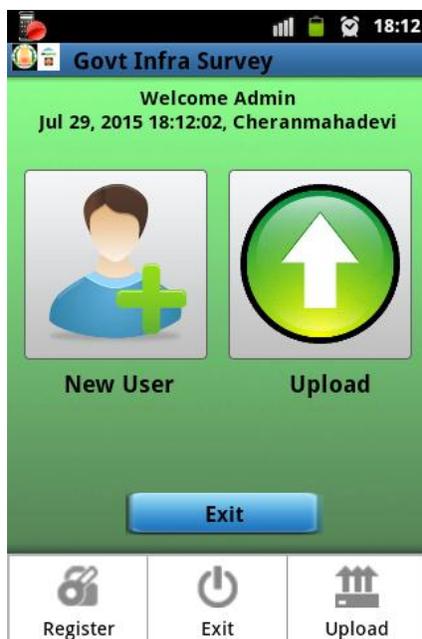
5.2.3 Save the captured data onto the mobile device

If there is no connectivity to the server, the Save button will result in data being saved locally in the mobile device in a folder called MGovOutbox.

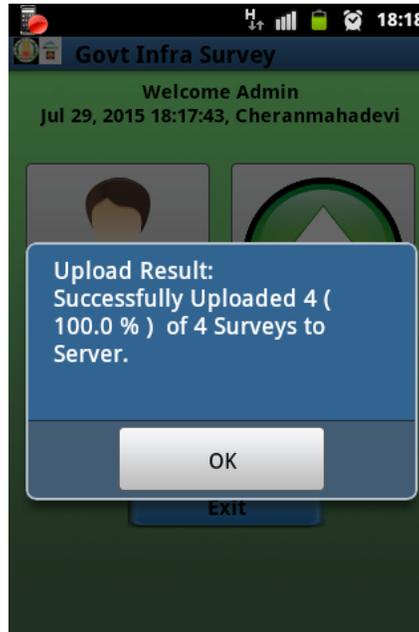
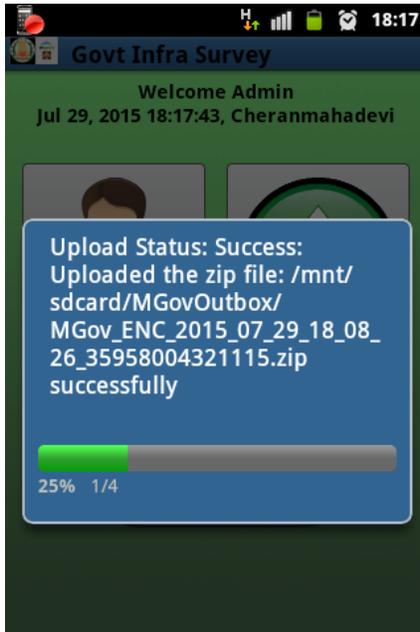


5.2.4 Upload the captured data to the server

In case, there is no connectivity with the server, during data capture, it is possible to later upload the data using the Upload feature provided under Options.



All the surveys that could not be uploaded while the survey was being done are saved in a folder on the mobile device and uploaded once the connectivity is established.

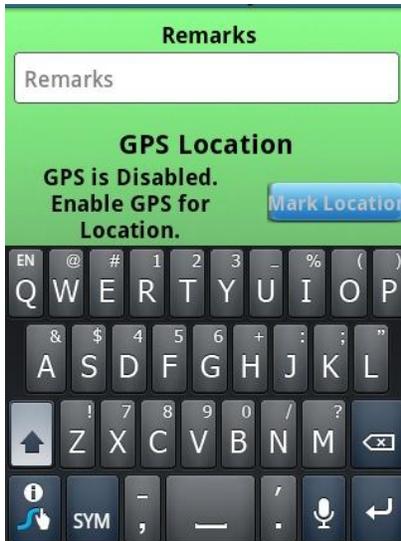


A log file "MGovUploadLog.txt" is saved on the mobile device during the surveys that could not be uploaded due to unavailability of internet.



5.3. Trouble-shooting

If the Save button is not getting enabled, it means the GPS is not enabled.



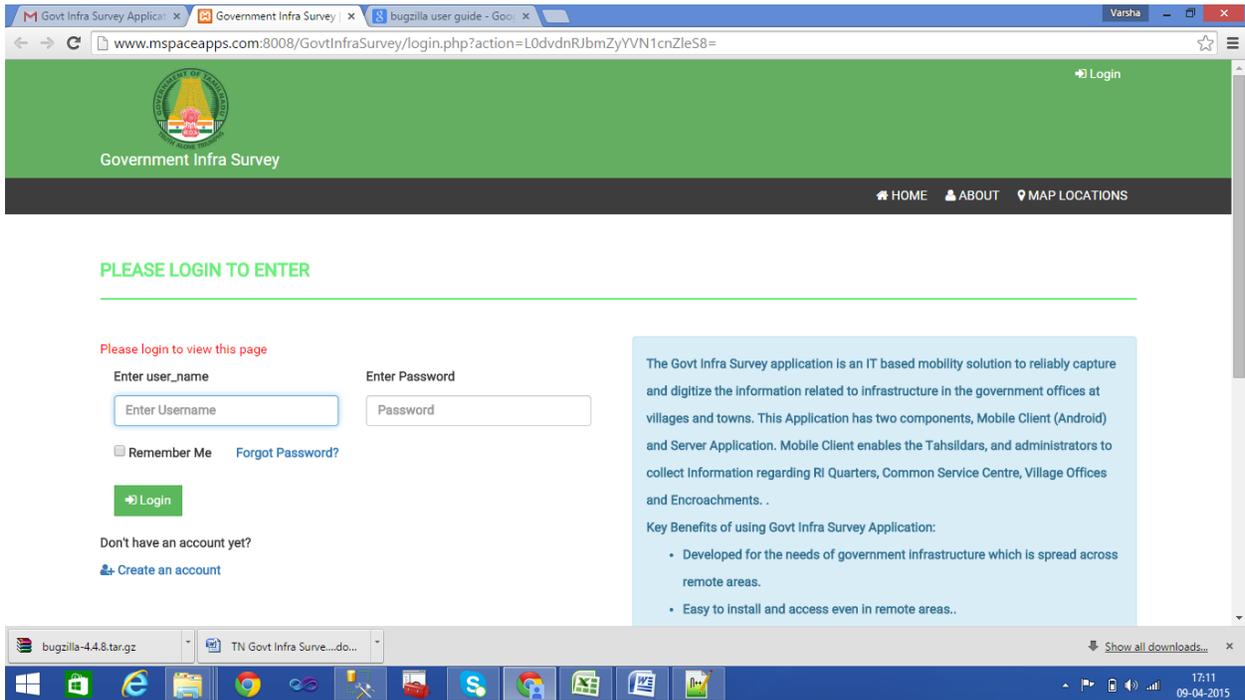
Follow the instructions given in Section 4 on enabling GPS in the mobile device.

If the Save button is not getting, even though the location has been calculated, ensure that photograph has been taken and saved.

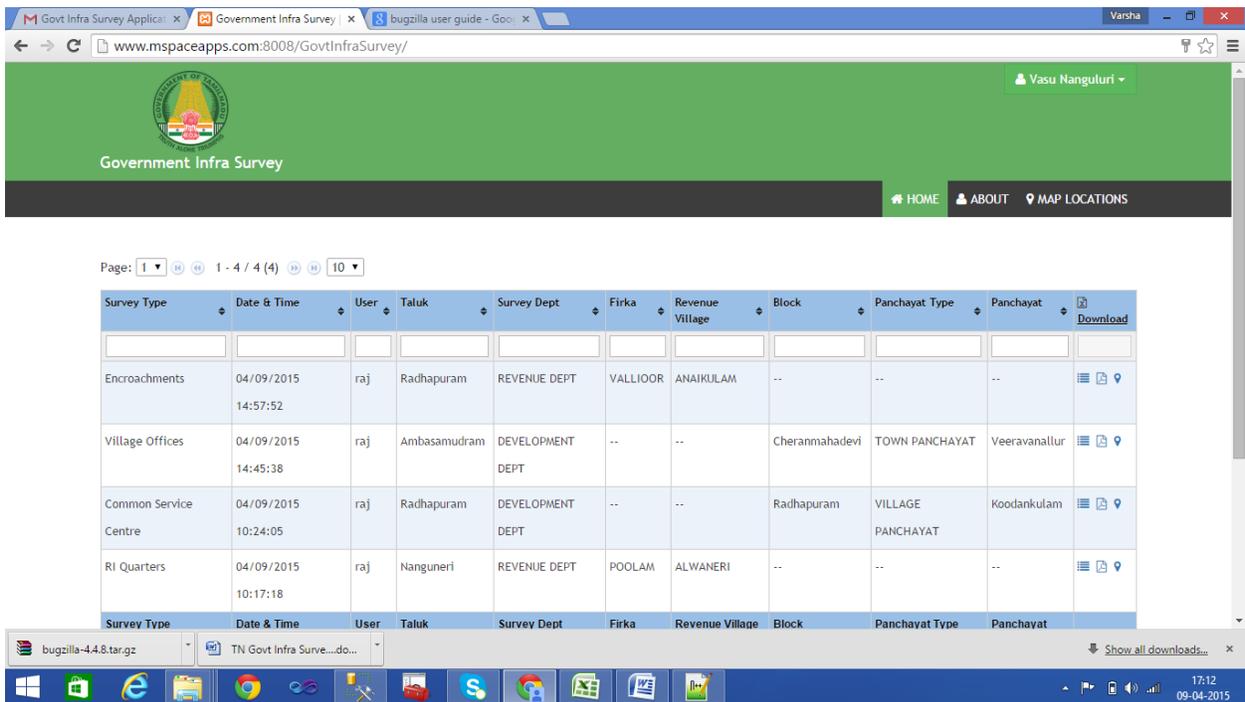
5.4. User Tips

1. Always login with your user ID.
2. Make sure you have GPS and wireless communication enabled.
3. Wait for the application to respond fully before moving to the next item.
4. Enter all the data before clicking "Save Form Data"
5. Do not move the phone during a photo capture.
6. Report any errors or connectivity problems ASAP

6.0 Server Application



If the login credentials are correct, the user is given access to the server application.



Reports can be

- sorted on each column
- each survey details can be downloaded as pdf file
- downloaded as excel
- viewed in batches of 5,10,20,30,40,50
- link to details
- link to map

The screenshot displays the Government Infra Survey web application. The header includes the Government of Tamil Nadu logo and the text "Government Infra Survey". A user profile for "Vasu Nanguturi" is visible in the top right. Navigation links for "HOME", "ABOUT", and "MAP LOCATIONS" are present. Below the header, a pagination control shows "Page: 1" and "1 - 4 / 4 (4)". A dropdown menu is open, showing options for 5, 10, 20, 30, 40, and 50 records per page. The main content is a table with the following columns: Survey Type, Date & Time, User, Taluk, Survey Dept, Firka, Revenue Village, Block, Panchayat Type, Panchayat, and Download. The table contains four rows of data:

Survey Type	Date & Time	User	Taluk	Survey Dept	Firka	Revenue Village	Block	Panchayat Type	Panchayat	Download
Encroachments	04/09/2015 14:57:52	raj	Radhapuram	REVENUE DEPT	VALLIOOR	ANAIKULAM	--	--	--	PDF Excel Map
Village Offices	04/09/2015 14:45:38	raj	Ambasamudram	DEVELOPMENT DEPT	--	--	Cheranmahadevi	TOWN PANCHAYAT	Veeravanallur	PDF Excel Map
Common Service Centre	04/09/2015 10:24:05	raj	Radhapuram	DEVELOPMENT DEPT	--	--	Radhapuram	VILLAGE PANCHAYAT	Koodankulam	PDF Excel Map
RI Quarters	04/09/2015 10:17:18	raj	Nanguneri	REVENUE DEPT	POOLAM	ALWANERI	--	--	--	PDF Excel Map

The Windows taskbar at the bottom shows the system tray with the date and time: 17:20, 09-04-2015. The taskbar also displays several open applications, including a PDF viewer, a file explorer, and a terminal window.

View Details

Revenue Village: ANAIKULAM

Petition or File No: 2015/STP/43
Type of Encroachment: Ship
Date of Removal: 07/07/2015
Remarks: BAD DESIGN
Latitude: 17.477592
Longitude: 78.392227

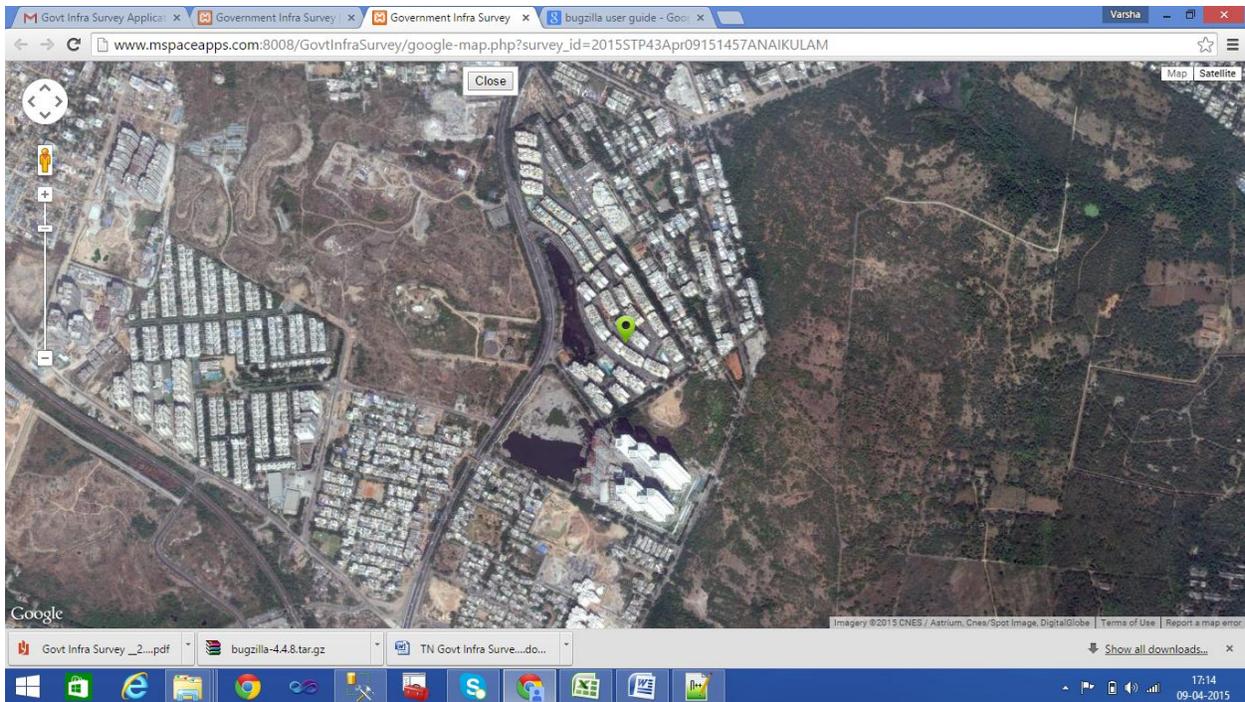
Location Details

Survey Type	Encroachments
Date & Time	04/09/2015 14:57:52
User	raj
Taluk	Radhapuram
Survey Dept	REVENUE DEPT
Firka	VALLIOOR
Revenue Village	ANAIKULAM
Block	--
Panchayat Type	--
Panchayat	--

Details include

- Photograph of the infrastructure with time stamped and latitude-longitude of the place
- Type of Infrastructure
- Condition of the Infrastructure
- Location (Village/Block/Panchyat) of the Infrastructure
- User who captured the survey data

View Map



Shows a geographical map of the area.

Map Location Menu Option on the top right can also be used for viewing the map.

About mSpace Technologies

mSpace Technologies Private Limited is founded by former IIT and IIM graduates with over 80 man years of experience in conceptualizing and implementing Information technology solutions. We provide Mobile Business Advantage to businesses across verticals (Infrastructure, Logistics, Utilities etc) by providing the following quality services:

- Business Consultancy
- Mobile Strategy - Solution conceptualization
- Design and Build Mobile Applications and end to end solutions
- Managed Solution Design Expertise - Hosting and Maintenance

These solutions are aimed at tracking and optimizing any business process or activity spread across various geographies thereby allowing near real-time monitoring of operations. This results in not only major savings in time, material and management but can also be used to significantly optimize operations through analysis of the data collected.

Telephone: +91-40-40192803 / 09246084979

E-Mail: info@mspacetech.in

URL: www.mspacetech.com