ABC Infra Gate Application
System for Material Real-time Tracking (SMART)

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1. Introduction

The System for Material Real-time Tracking (SMART) is an IT based mobility solution to reliably digitize the information to track, monitor and analyze material movement in and out of construction camps. The SMART mobility solution is designed to capture transactions in near real-time. An incoming or outgoing material movement is tracked using easily available technologies like Android mobile phones.

The SMART uses key data elements that can be captured through the mobile phone based application. Material related details such as type of material, grade of material, photographs such as vehicle registration number, the material and a picture of related document are gathered 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 SMART

- Enhancing the security and material movement tracking through simple Mobile Technology for a Large Infrastructure Firm
- Developed for the needs of large Construction and Infrastructure firm
- Capture accurate and timely information at gate entry at camps using state of the art technology
- Easy to use and intuitive
- Data entry through selection, text entry and photographs
- Transactions saved on Server
- Log all gate entry at camps
- Mobile application
- Easy to use and intuitive
- Data entry through selection, text entry and photographs

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.

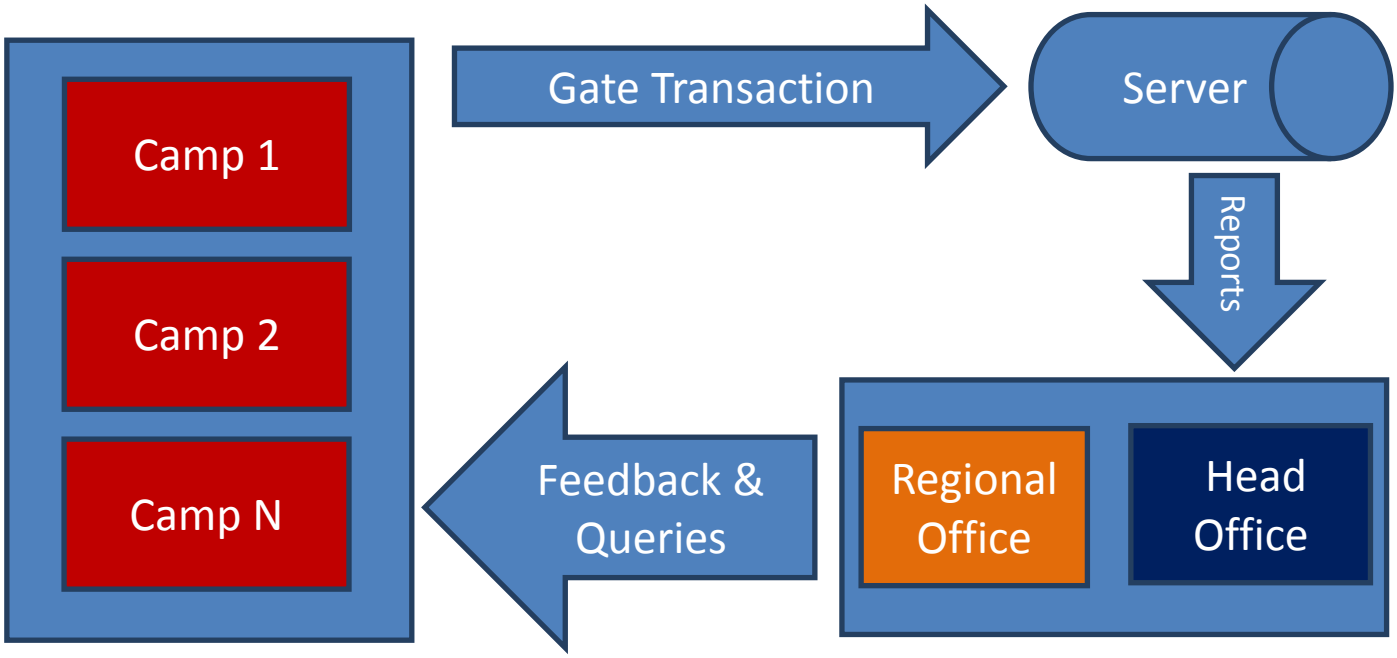


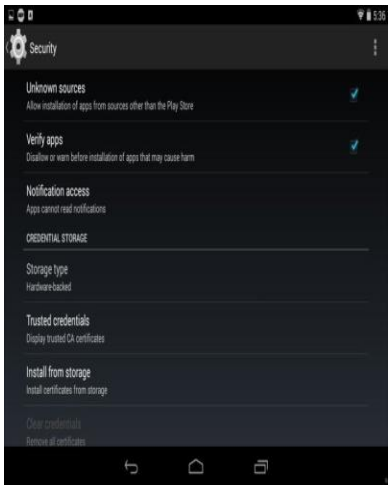
Figure 1:Data Flow Diagram

The client mobile application is designed for ease of use and data entry is donethrough drop-down selections and easy navigation with data validations. The material 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 harddisk. The stored data can be used to generate reports. These reportscan be exported into Excel and PDF files for analysis purposes.

4. Installation

Supported Android OS: Version 2.3 and above.

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



Download the ABCinfra Android Client (ABCInfra_V01_00.apk) on the Android mobile device.

Install: 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.

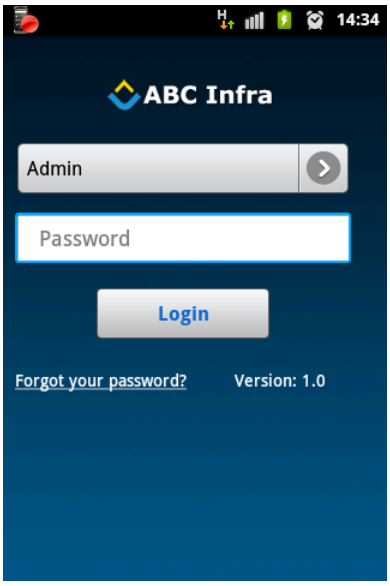
5. Android Client Application

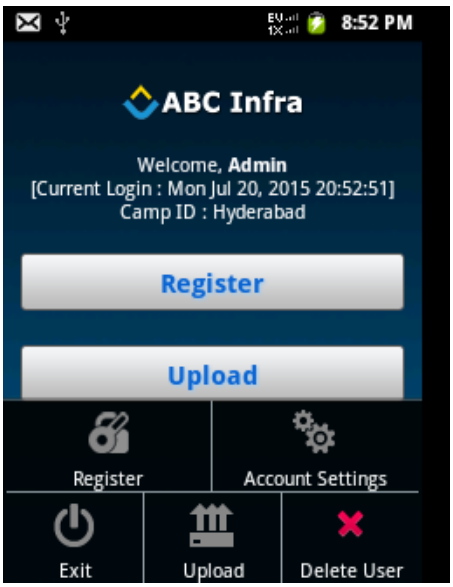
The android client application is used to capture data at the field level using a Mobile phone.The mobile application is secured access using login/password for each user. It is mandatory that each user uses theiraccess ID/password combination.

5.1. Admin Login

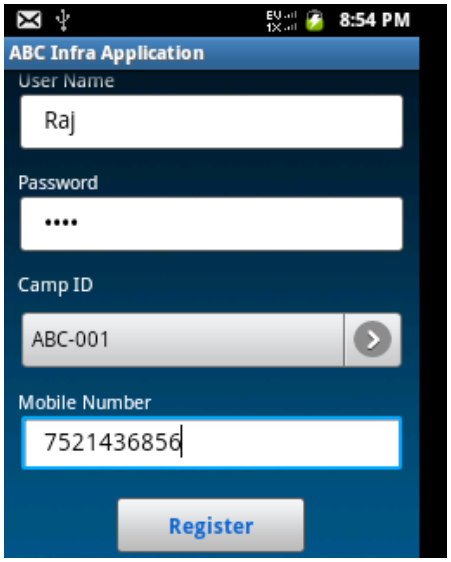
The Administrator access can create/delete individual user access. The following steps allow the Administrator access and creation of users.

- Click on the "ABC Infra Gate Application" icon on the mobile to start the Application.
- Select "Admin" user to create additional users on the mobile device. Password: ""





- Click on "Register" to create a new User on the Mobile.
- After the admin creates a normal user the user needs to be registered on the server-side using the mobile user's mobile phone's IMEI number.
- The IMEI number should be shared with the Admin user.
- Admin must create a normal user. Admin cannot create transactions for upload to server.
- Normal user login can create transactions and upload them to server.
- Register a new user with the following details:

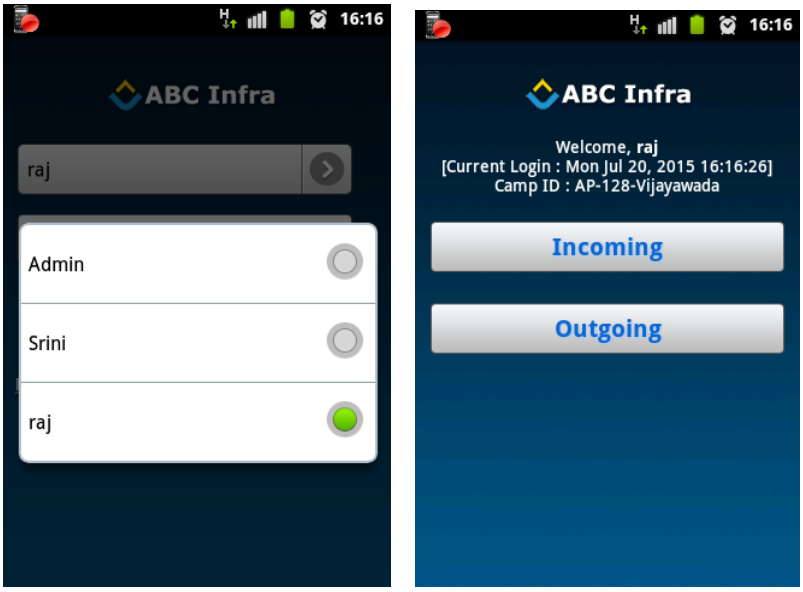


- User Name
- Password
- Camp ID
- Mobile Number

5.2. Normal User Login

The following steps are used for Normal user login.

- Click on the "ABC Infra Application" icon on the mobile to start the Application.
- Select a user to Login and enter the password.
    - Note: Only normal users can create and upload transactions.



Normal User: Main Screen

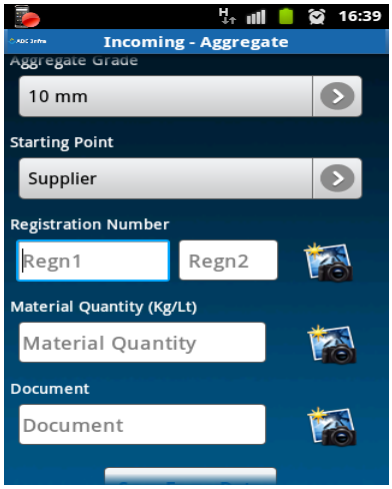
- User, Date and Camp Information
- Incoming
- Outgoing
- Click on "Incoming" or "Outgoing" button to start a Gate Transaction

5.3. Material Selection – Incoming

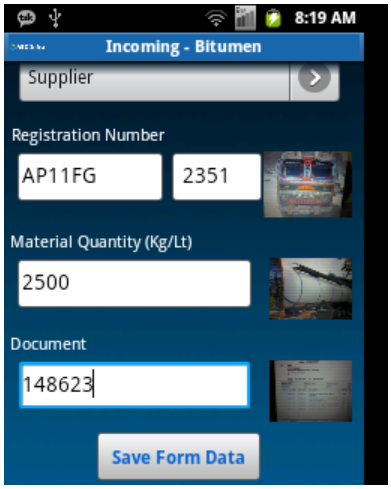
Click on image to select

- Aggregate
- Bitumen
- Cement
- Steel
- Fuel
- Sand
- Empty
- Other

5.4. Data Entry – Incoming Material

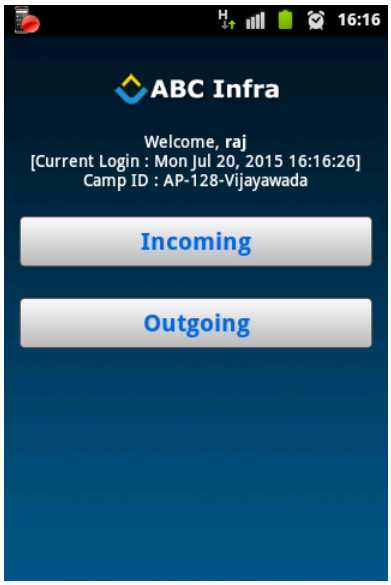


- Select Grade (No grade for Empty and Other)
- Select Starting Point.
- Enter the Vehicle Registration Number.
    - Box1: First 7 Characters
    - Box2: Last 4 digits

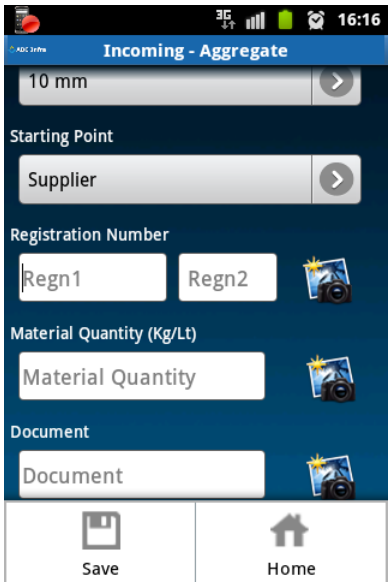


- Enter Material Quantity
- Enter Document Number
- Click on the Camera icon next to each category to take a photo
    - Vehicle registration
    - Material
    - Document
- Once all the photos are captured/taken, then the thumbnails will appear next to each category

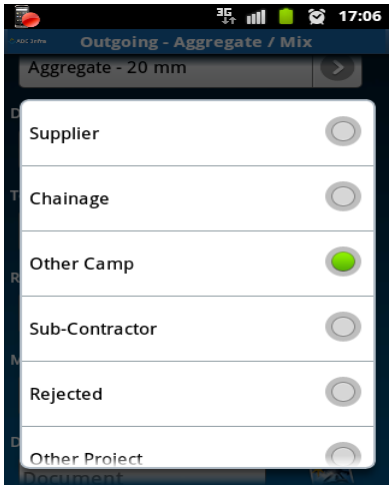
- After all the data is entered, click on "Save Form Data" button to save the Entry.
- After the save, the application will upload the transaction to the server and return to the main menu



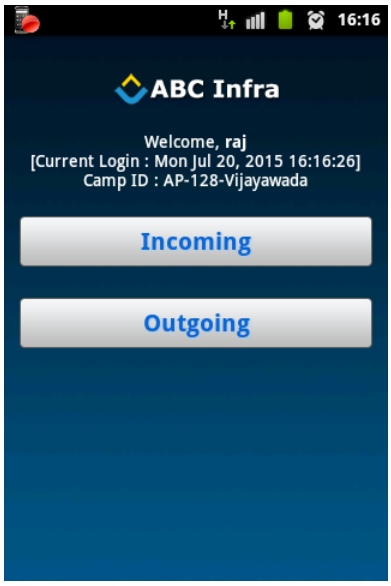
In case there is no connectivity to the server, the data captured can be saved on the mobile device and uploaded later.



5.5. Data Entry – Outgoing Material



- Select Grade (No grade for Empty and Other)
- Select Destination.
- Enter the Vehicle Registration Number.
    - Box1: First 7 Characters
    - Box2: Last 4 digits
- Enter Material Quantity
- Enter Document Number
- Click on the Camera icon next to each category to take a photo
    - Vehicle registration
    - Material
    - Document
- Once all the photos are captured/taken, then the thumbnails will appear next to each category
- After all the data is entered, click on "Save Form Data" button to save the Entry.
- After the save, the application will upload the transaction to the server and return to the main menu



In case there is no connectivity to the server, the data captured can be saved on the mobile device and uploaded later.

- After completing the Gate Entry transactions you can exit the application using the Option Menu or Click the "Back" button.
- After confirmation, the application will exit and will upload all the transactions to the server.

5.6. User Tips

1. Always login with your user ID.
2. Make sure you have internet/data connection and that it is 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

About mSpace Technologies

mSpace Technologies Private Limited is founded by former IIT and IIM graduateswith over 80 man years of experience in conceptualizing and implementing Information technology solutions. We provide MobileBusiness 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 oractivity spread across various geographies thereby allowing near real-timemonitoring of operations. This results in not only major savings in time,material and management but can also be used to significantly optimizeoperations through analysis of the data collected.

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