Development, Hosting and Maintenance of Mobile App for Road Data Collection

1 Introduction

KSCSTE-National Transportation Planning and Research Centre (NATPAC) is undertaking a project on development of mobile application for Road data collection and integrating it with Cloud server. Project also requires a web-based admin portal to manage the data and set levels of authorized users, for assuring data security and allocating different levels of roles to be assigned to each user.

A mobile application was developed inhouse with functions to record track, add road inventory details to the track, record road cross-sectional data, add points along with photographs from field and to generate output in Excel file and KML format. NATPAC has procured the Firebase cloud server along with professional email and domain name. The mobile application was developed on the following technologies.

1) Android-based application was developed using the software **Android Studio**.
2) **OpenStreetMap** service are used as base map for the application developed.
3) The development of the app was done using **Java programming language** and **Osmdroid** library on the Android studio platform.
4) Free Firebase Cloud server was integrated as the backend database of the app, programming need to be done to shift it to paid service.

Firebase cloud server was procured by NATPAC and the billing of the service is done by Trayam software. The details of the cloud server are given below:

FEATURES	DETAILS	PER MONTH
Firebase Realtime Database	GB stored	5 GB
	GB transferred	25 GB
Cloud Firestore	GiB stored	50 GiB
	Document writes	5,000,000 writes
	Document reads	5,000,000 reads
	Document deletes	10,000,000 deletes
Firebase Cloud Storage	GB stored	500 GB
	GB transferred	100 GB
	Operations (uploads & downloads)	5,000,000 Operations
Firebase Phone Authentication	Phone verifications in US, Canada or India	15,000 verifications
Firebase Hosting	GB stored	100 GB
	GB transferred	50 GB
Domain Name (.com) - **http://webmail.natpacgetmap.com** Professional Email (1 User) - **office.natpac@gmail.com** Standard SSL		

2 Scope of Work

2.1 Expected Technical Features of the Mobile App

The developed app needs to be enhanced with the following functionalities
- Global track file needs to be generated which shows the total road track data that was collected by all users.
- A single point validation of data collected through the app to be facilitated before storing in cloud server.
- There needs to be a provision for the users to request for the already collected data from the server via the administrator.

2.2 Admin User- Content Management Functional Requirement Specification

To manage all mobile application contents, separate user-friendly Content Management System (CMS) tool needs to be developed and integrated with the domain name purchased by NATPAC.

2.2.1 General Design Guidelines for CMS Application

Following list will provide the general guidelines followed for CMS application design.
 a) User should be able to create, update, publish/unpublished and delete the data.
 b) User should be able to search the data.
 c) User should be able to sort the data.
 d) CMS should support two levels of user.

   i. Admin User - Can perform all the CMS functions.

   ii. Normal User - Can perform all the CMS features except Publish, Delete and editing any record in the system. Normal user cannot create any new user.

 e) CMS should be protected using HTTPS for secure access of information and access for CMS users

2.3 Reporting Requirements

As per the requirement of NATPAC, following reports will be needed for the Admin:

1. Audit Log Screen will be provided to admin user to check the activities performed by all users. The data will be available only in read-only mode.

2. Admin User will be able to see the list of login/logout information for the user through Authentication report screen.

3. Admin User will be able to see the list of notifications sent to the devices through notification screens. Data will be only in read only mode.

 4. Google and iPhone provides the required details on their console along with app publishing.

5. Google Analytics

3. Mobile Platform Requirement

Sl. No	Platform Support (OS)	OS Version	Display Orientation	Display Support
1	iOS	7.0 and Above(latest Version available)	Portrait or landscape both	All
2	Android	5.0 and Above(latest Version available)	Portrait or landscape both	All

4. Technology and Server Requirements

- App should be developed on Firebase Cloud server platform procured by NATPAC.
- Mobile App development should be in English language.
- Admin CMS application should be developed in PHP/.net and uses MySql/MS SQL open source Database
- CMS system should be hosted on vendor provided Firebase Cloud server.
- Vendor will setup and deploy Admin CMS application, Web Application on the cloud-based server.
- Vendor has to ensure the development of mobile application as per guidelines issued by Application stores. For ex: Google play, iTunes etc. Vendor has to summit mobile app binary to iTunes app store and Google play store

5. Testing

- Vendor is expected to perform comprehensive NATPAC mobile application testing as part of the project scope.

- The test plans, test cases and results for each of the phases will be shared by vendor with NATPAC.

- Vendor has to facilitate User acceptance testing environment for NATPAC.

- A security Audit of Complete Application be done by Vendor

6. Timeline and Deliverables

- The selected Vendor shall be required to execute and complete the work including design, development, customization, configuration, testing, hosting commissioning of mobile application within 2 months of the execution of the contract agreement.
- Vendor is expected to deliver the mobile application on application store (Google Play & Apple) at the earliest.
- Vendor has to share the Design Documents based on the NATPAC Requirement document for NATPAC Review & Sign-off.
- User Manual, Admin Manual, Test Cases, Test Plan and QA Results for User Acceptance testing.
- Application Code, Web API's.
- Deployment document
- Source Code of Mobile App along with CMS as well as Web Application be the property of NATPAC.

7. Training

For the effective uses of the supplied software/application licenses & their functionalities, the selected vendor must compulsorily provide classroom training for NATPAC officials. Following training needs are to be provided by Vendor as part of the scope:

- Content Management Training
- Deployment & Hosting Training
- Application Submission Training
- Support Handover

8. Support

The NATPAC requires application, billing and account support be available from the vendor. Minimum support period is 1 Year after NATPAC acceptance of deliverables.

9. Intellectual Property Rights

The Intellectual Property Rights of the application will rest with NATPAC. The vendor will provide the source code of the application to NATPAC at the time of sign-off

10. Implementation of Mobile Application Software

The Mobile applications software should be tested at NATPAC in the cloud Servers using network infrastructure (Internet & Intranet). Once the testing of Mobile applications software is successful, the apps should be on live.

CONDITIONS
(Information Communication and Technology (ICT) Standard)

a. Selection of the technologies for the above procurement should be robust, scalable, should fully support technological upgradation.

b. Application development may be done using open source as well as proprietary software. Technical support for the applications is necessary requirement at least for one years.

c. Once the application has been delivered and hosted at cloud server, concerned officials of NATPAC should be properly trained and at least for one year hand holding should be ensured for smooth functioning of the new application into the NATPAC system.

d. The application should be fully compatible with the existing proprietary / open source software in use at NATPAC and should support all data formats.

e. The bidder should clearly describe his methodology, the tools/ software he is proposing to achieve the same.

f. The final product in the form of customization/ Application as any software development in the process of execution of the work order under this tender will be the intellectual property of NATPAC.

g. Any software procured for developing the application under this tender should be handed over to NATPAC along with the license/ key.

h. All such source code developed for the above application or customization should be duly delivered to NATPAC.