Android-Based Resource Tracking and Management

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Abstract

Today's mail couriers have rushed onto real time tracking in postal services. The Post Office is rolling stone for tracking of mail couriers. Even in an growing environment, the postal service remains part of the social economy, serving its people and businesses. Before replacing in more robust form, "This program is an interim step for replacement of current scanners with a single device based on Smartphone technology using GPS & GPRS". This system aims to provide low cost means of monitoring resources of courier company like manpower, time and money. Customer gets the facility to request material just in one click without wasting time in going to courier office and request for material. This application helps administrator to assign tasks to the employees according to the destination to manage resources. Our application reduces the errors caused due to manual entries. Customer gets full assurance of material delivery within stipulated time. Our application is beneficial for courier boy in terms of saving his time to prepare his daily services reports and send it to the admin through application[3].

1. Introduction

As per current formal courier services (Speed Post, Postal Services), it is found that there is no guarantee of service. In this section we include the brief introduction about the "Android based resource tracking and management". The rationale seems to give customers a real time tracking of package carriers and the mailing companies see this as great opportunity for customers who want to know package delivery status as it occurs. This system is useful for small and large scale courier services for improving their service and increasing sales and service by using web application. The objective of this study is to reduce the cost of the courier tracking system using the latest technologies and making it available to the common people. The existing system work on manual methods which is a time consuming process [1]

1.1 What is Resource Tracking ?

The proposed system provides web based application to keep track of any courier. Sender gives the courier to his city courier once. Details of courier are register so that sender can see current updates of his courier. Courier delivery boy is given the mobile with GPS activated so that tracking can be done

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asily. Courier gets filtered according to destination areas. Cell phone will allow the data to broadcast wireless on predetermined schedule (10 sec) interval. Administrator gather data and then analyze the work process and intensify it.

1.2 Technologies Used

Following technologies are used in proposed Android-Based Resource tracking and Mnagement:

1.2.1 GPS

GPS stands for global positioning system which helps to track the movement of the person, place or any object .This help in visualising the exact location along with geo-fence area. A good number of courier tracking systems had so far been developed with a wide range of tracking facilities but the operation cost of most of these systems is higher which prevents us from their use.

1.2.2 GPRS

GPRS stands for General Packet Radio Service. It helps to locate the position of the phone on the map. We get coordinate of the position Of the phone and we place it on the map say Google map to get its exact position. The whole system allows the user's mobility to be tracked using a mobile phone which is equipped with an internal GPS receiver and a GPRS

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transmitter details. The combination of both the technologies: GPS and GPRS provide a constant, continuous and real time tracking system. The cost of the overall system has been reduced by two facts one is using the existing mobile phone and another is using GPRS instead SMS [5].

1.2.3   JSON parsing

JSON stands for JavaScript Object Notation which is the best alternative to XML. Its core lies in storing data in less space. It is easy to parse and access data stored in JSON format. JSON or JavaScript Object Notation is a text-based format use for human-readable data interchange. It is derived from the JavaScript scripting language. It is used for representing simple data forms. It uses an assembled object that includes associative arrays. Despite its relationship to JavaScript, it is language-independent, with parsers available for many languages. It is used primarily to transmit data between a server and web application [4].

1.2.4   QR code

A QR code is a type of barcode used for ensuring validity of person. It also holds wide information than the formal general wide. The QR basically stands for Quick response code, which entails the speed at which the large amounts of information can be send with short period of time. Later the code can be decoded by scanners in order to analyze the data.

2.   Literature Review

Following are the system exists for courier services:

Postal service: It forms the basic foundation where the actual mail couriers started. It included basic operations like collection, transportation, delivery of goods. It included limited exchange of goods, information and money. The main disadvantage of postal service was that all the operations were carried out manually. In addition, they support interim communications and social communication.

Speed Post: It is service provider in the domestic courier or mailing industry and providing time-bound and fast delivery of Letters Parcels, Documents, Gifts, article, merchandise services etc. A drawback of this system is Speed post courier does not provide status of courier. Speed post delivers courier fast, but its cost is more [2].

E-Courier services: The "E-Courier Services" delivery status and notication system was devloped for the need of company running simultaneously e-courier services this is specially meant for their frontline user service information. This is one of the best efforts to prove that how Internet can be helpful

in tire service industry. As the above systems provides various services it widely used everywhere but it has some limitations.

3.   System Design

This Architecture consists of four modules. Customer, server, admin and the courier boy, Block diagram of proposed system architecture is shown below.
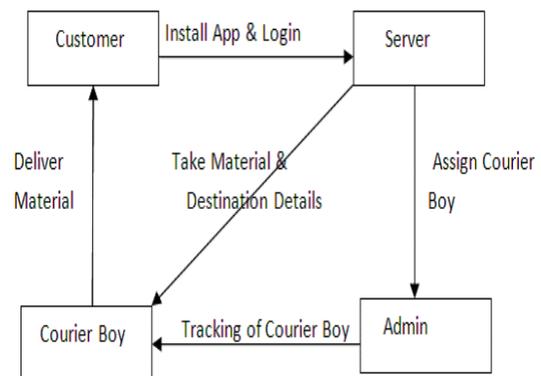

Fig: 1. Block diagram for Resource Tracking and Management

- **Input: -** User fills install and login to the application through an android mobile. After that all the information is updated by the server and maintained by the administrator.
- **Processing: -** Registration of user information updates server database and manages delivery assignments by the administrator. Server will update the status time-to-time and will display location on the Google map.
- **Output: -** Daily service reports will be sent by courier boy through application. It will keep 30 days back up of all activities.

3.1 Module 1: Customer

To request the material, customer must get connected to the system. He must log in to the system. After login customer will have to fill the form that is MRS login form and provide a password for the security. The request will be sent only if the GPS of the courier boy's phone is on. Thus, while sending the request the address of the customer is sent and the one part of socket containing address is created. So connection is set up between the customer and the application is downloaded.

3.2 Module 2: Server

Server will receive the request from the customer and the pairing is done. Admin will update the information on the server and the details of the

material and the destination are provided to the courier boy.

3.3 Module 3: Administrator

Admin plays an important role in the system . He updates the data on the server. He assigns the courier to the courier to the courier boy according to filtered destinations. Admin notify whether GPS of the courier boy's phone is on or o and keeps track of the courier boy. He verifies whether courier is delivered to the right customer and accepts the DSR sent by the courier boy.

3.4 Module 4-Courier Boy

Courier boy is the main concern of our project. We are developing this application so that the resources like time speed and security gets managed and the customer gets his request full-filled within given period of time with security. Courier boy gets details of the material and the destination from admin and the server. He authenticates the user and then delivers the material to the right customer. He must keep the GPS of his phone on to send the request and conformation of the delivery of the material. Courier boy can send his Daily Service report through the application. He does not have to go on desk and prepare his Daily Service Report separately. Thus, time gets saved.

4. Methodology

In this section, complete details of the project system development are given. In our application android client will send a request to the server. As server cannot directly communicate with android client, a PHP-based web service will be used to serialize and de-serialize the data. It will contain facilities of request and response. Client and Server communication is done using technique called JSON Parsing. Creating JSON objects through arrays and encoded data is much faster than XML data. First part details the JSON algorithm.

Step 1: Build JSON object.

Step 2: Add key-value pair, where key contains web URL & value contains the website name.

Step 3: Send the JSON object to the server. i.e. over Network.

Step 4: Declare the HTTP client & HTTP post request object & gathering a response from server.

Step 5: Use the convertStreamToString() function convert the input stream to string.

QR code is used here to scan and store the data provided by the customer. The code on the receipt will contain the information filled by the customer while requesting the material. The same information will be matched while handover the material to the

destination. Thus, QR code plays an important role in our application to provide authentication [6].

QR code detection algorithm:

1. QR code detection is done by finding 3 square patterns at the corners of the symbol called FIP: Finders Patterns.

2. FIP is represented as (T, x,y) Where T-> size of square region X,y->co-ordinates of the center of that Square.

3. Find the minimum and maximum distance between two FIP's.

Min=1.6T

Max=19T

4. F1=(T1,x1,y1) and F2=(T2,x2,y2) be the FIP candidates , and |F1F2| denotes length of line segment connecting (x1y1) and (x2y2)

5. Satisfy Size, Distance and Orientation criteria.

For size criteria: F1 and F2 should have T=T1=T2.

For distance criteria1.6T<=dist((x1y1),(x2y2))<=19T.

For orientation criteria angle between { F1F2 , F2F3} should be1)90^0 2)45^0

6. Aggregation algorithm is used to aggregating FIP candidates.

- Input: a list of FIP candidates, each represented by a triple Fi = (Ti; xi; yi), and tolerance parameters.

- Output: a list of subsets of the form {Fi,Fj , Fk} satisfying the size, distance, and orientation criteria, with respective allowed tolerances.

5. Simulation Results
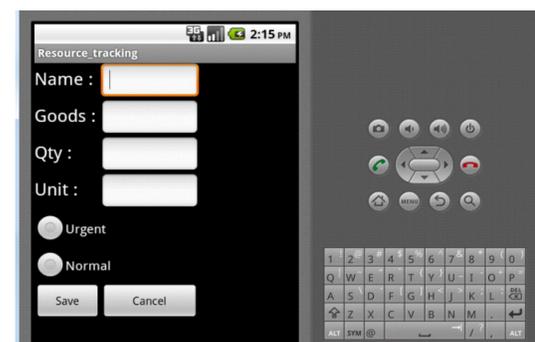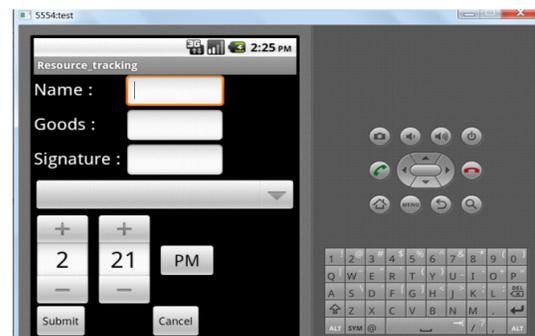
6. Conclusion

Client will be able to see live position of mobile on Google map. Client will be able to request for material with full assurance of material delivery. We conclude that Resource Tracking and Management system provides more efficient and reliable service than other existing system and also helps company to manage its resources.

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