

Integration Of Complaining Proficiency In The Android Application Of Garbage Bin And Vehicle Tracker.

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Abstract— For clean India, our country first needs to solve its waste disposal problem. From solid urban waste to sewage to chemical or industrial waste – every type of waste is mismanaged and has become a mammoth problem in the face of rapid urbanization. Less than 25 percent of that waste is recycled and the rest ends up in landfills, incinerated or in ditches and roadsides. Improper garbage disposal isn't just an eyesore; it poses a serious threat to nature. The easier solution is to collect and dump the garbage properly. There are many garbage bins available and also there are many garbage collection vehicles, but usually people don't have ideas about them or their locations. Apparently there is no economical system to track the locations of garbage bins and garbage collection vehicles.

On the other hand, people find it very difficult to make complains against the different garbage related problems that they experience and observe in their day to day life. They write and send complain letters to different Government offices present in their town or city, but most of the time they get late or no replies because most of the complaint letters never reaches to the head or Supervisor of that particular sector. This happens due to the corrupted and slow middle system which lies between normal public and the main supervisor. There is no straightforward way to express our problems directly to the main head or supervisor of garbage disposal sector. This project presents the development of an Android Application which tracks garbage bins and garbage collection vehicles' location with an integration of making complains against different garbage related problems. The location of garbage bins and garbage vehicles are showed on a map which is already present in the application.

Keywords—garbage; tracking; android; GPS; bin; vehicle; complain; mobile.

I. Introduction

Everybody uses dustbin and the service of door to door garbage collection vehicles in their day to day life. The problem is that there is no such system to track the garbage bin or garbage collection vehicles. Then there comes a secondary problem that the people have no idea about the location of the nearby garbage bins especially when they are standing in an unknown or new area. So they usually end up by throwing the garbage here and there. This leads to the creation of unhygienic city. This project is very useful to detect the garbage bins and garbage collection vehicles that are near and far from you.

We know that we have a serious garbage problem. But the problem is not about finding the right technology for waste disposal. The problem is how to integrate the technology with a system of household-level segregation so that waste does not end up in landfills, but is processed and reused. It is clear that there will be no value from waste, as energy or material, if it is not segregated. But this is where our waste management system stops short.

It is the responsibility of the urban local body to ensure segregation of waste at source as per the Municipal Solid Waste (MSW) Rules, 2015. This means the body must get citizens to segregate waste at the household level and then ensure that this segregated waste—wet and dry, compostable and recyclable—is collected separately and transported separately for processing. In the last two decades, Indian cities have seen a rising tide of waste that's disposed of in open dumps. Such landfills, often on fire, are only aggravating the pollution problem, contaminating both air and groundwater.

II. Literature Survey

A. Previous work related to project

•Solid waste monitoring and management using RFID, GIS and GSM. Authors – Maher Arebey, M A Hannan, Hassan Basri and Huda Abdullah. (Dept. of Electrical, Electronic and Systems Engineering, National University of Malaysia, 43600 Bangi, Selangor, Malaysia)

- Tracking and localization system using Android mobile phones. Finds persons in case of accident and give a set of necessary information for rescue. The system sends the GPS coordinates of the person, display the coordinates on a map. Authors – Adela Puscasiu, Alexandra Fanca and Honoriu Valean. Automation Department, Technical University of Cluj-Napoca, Cluj-Napoca, Romania
- Smart City Carpooling Mobile Application Based on Intelligent Route Keywords: Carpooling Service, intelligent rout merging, Global Positioning System, urban traffic management, Google map. Prof. S. U. Kadam, Mahesh W. Nimje, Sheetal Kode, Vaibhav Talegaonkar, Anand Sangle. (India) International Journal of Science and Research (IJSR).
- Mobile Tracking System Using OpenMTC Platform.
Maman Abdurohman, Anton Herutomo, Vera Suryani Unified Communication Laboratory Universitas Telkom Bandung – Indonesia.
- Arduino Based Vehicle Tracking system (using external GPS and GSM modules).
- Raspberry pi Based Vehicle Tracking system (using external GPS and GSM modules).
- OLA CAB, JUGNOO, BLA BLA, Ibibo, Uber Lifto, GreenCar, Pune Carpool Android Applications.

III. Requirements

B. Software Requirements

- Windows 10 OS (for development)

Windows 10 is a personal computer operating system developed and released by Microsoft, as part of the Windows NT family of operating systems. It was released on July 29, 2015. This is the platform on which we run the coding of this project. It is the first version of Windows that receives ongoing feature updates. Devices in enterprise environments can receive these updates at a slower pace, or use long-term support milestones that only receive critical updates, such as security patches, over their ten-year lifespan of extended support.

- Android OS (for working)

Android is a mobile operating system developed by Google, based on a modified version of the kernel and other open source software and designed primarily for touchscreen mobile devices such as smartphones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars, and Wear OS for wrist watches, each with a specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics.

- Android Studio

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA. On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps.

- Android API level: 10 and above

API level is basically the Android version. Instead of using the Android version name (e.g. 2.0, 2.3, 3.0, etc.) an integer number is used. This number is increased with each version. Android 1.6 is API Level 4, Android 2.0 is API Level 5, and Android 2.0.1 is API Level 6, and so on. As you develop your application on Android, it's useful to understand the platform's general approach to API change management. It's also important to understand the API Level identifier and the role it plays in ensuring your application's compatibility with devices on which it may be installed. Updates to the framework API are designed so that the new API remains compatible with earlier versions of the API.

Platform Version	API Level
Android 2.3.3	10
Android 2.3	9
Android 2.2	8
Android 2.1	7
Android 2.0.1	6
Android 2.0	5
Android 1.6	4
Android 1.5	3
Android 1.1	2
Android 1.0	1

- Developing Language: JAVA

Java is a popular general-purpose programming language and computing platform. It is fast, reliable, and secure. According to Oracle, the company that owns Java, Java runs on 3 billion devices worldwide.

Considering the number of Java developers, devices running Java, and companies adapting it, it's safe to say that Java will be around for many years to come. Java is platform independent, object-oriented, fast and secure programming language. It has large Standard Library.

- **User Interface Language: XML**

Extensible Markup Language (XML) is a universal format maintained by the W3C used for representation and transfer of structured data on the web or between different applications. The language uses a structured representation by allowing user to create custom defined tags according to XML Document Type Definition (DTD) standards. The structure of XML document can be represented in the form of a tree known as Document Object Model (DOM). XML stands for extensible Markup Language. XML is a markup language much like HTML. It was designed to store and transport data .XML was designed to be self-descriptive. It is a W3C Recommendation. XML is a software- and hardware-independent tool for storing and transporting data.

- **Database: SQLite**

SQLite is a self-contained, high-reliability, embedded, full-featured, public-domain, SQL database engine. SQLite is the most used database engine in the world. SQLite is a software library that provides a relational database management system. The lite in SQLite means light weight in terms of setup, database administration, and required resource.

C. Hardware Requirements.

- **ANDROID DEVICES (Android Based Smartphones or Tablets)**

An Android device is a device that runs on the Android operating system. Android is an array of software intended for mobile devices that features an operating system, core applications and middleware. An Android device may be a smartphone, tablet PC, e-book reader or any type of mobile device that requires an OS.

A smartphone is a class of mobile phone and mobile computing device. They are distinguished from feature phones by their stronger hardware capabilities and extensive mobile operating systems, which facilitate wider software, internet (including web browsing over mobile broadband), and multimedia functionality (including music, video, cameras, and gaming), alongside core phone functions such as voice calls and text messaging. Smartphones typically include various sensors that can be leveraged by their software, such as a magnetometer, proximity sensors, barometer, gyroscope and accelerometer, and support wireless communications protocols such as Bluetooth, Wi-Fi, and satellite navigation.

- Not all Android Devices have GPS module implemented inside it.
- Some Android Based smart TVs and smart watches don't come with GPS technology.
- Smartphones and Tablets must have pre-inbuilt GPS facility for this project.

IV. Working Of Project

The Android application will be installed on user's Android smartphone as well as on the Android devices of different garbage collection vehicles' drivers. When user will open that application on his/her android smartphone, he/she will get different facilities and options in that application's main window.

One of them will be 'Track Garbage Vehicles and Garbage bins'. When user will click on that option, the application will use Google Maps Services and will open Google Maps in a new window within the application. The map will track and will show the locations of different garbage collection vehicles that are near or far from user. As well as the Android application will plot the locations of different garbage bins and dustbins that are near or far from him or her and this will be done by using SQLite database. The locations (i.e. geographical coordinates) of different stationary garbage bins around the city will be saved in the SQLite database. On the other side, the application will also have a window for making complains against different garbage related problems. He or she will be able to send complain messages to the Nagar Adhyaksh or Nagar Adhyaksh's assistant.



D. Flow Chart and Conceptual view



Fig. 1. Flow Chart of project working.



Fig. 2. In App-View of the Android Mobile application. Figure Labels:

	Dustbin or Garbage Bin
	Garbage Van

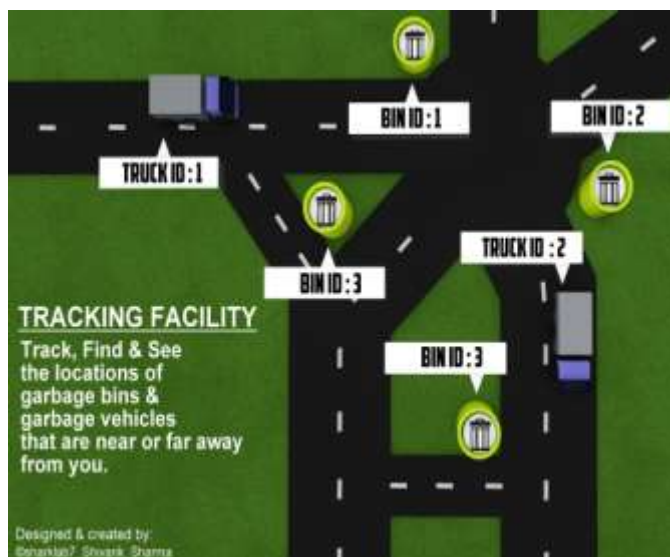


Fig. 3. Abstract View of Project (Tracking Mode).



Fig. 4. Abstract View of Project (Complain Mode)

V. Advantages

1. It helps to track the location of garbage bins and dust bins.
2. It helps to track the live location of garbage collection vehicles.
3. It is a total wireless system.
4. It helps to decrease land pollution as well as water pollution (avoidance of throwing garbage in various water bodies).
5. It makes our cities more clean and hygienic.
6. Allows user to complain against various garbage related problems that are happening in the surrounding to the Nagar Adhyaksh or the head of Garbage Disposal Department.
7. It is very cheaper.
8. It helps to avoid the blockages in ditches, drains and avoids waterlogging.
9. It is very compact and portable.
10. It helps a lot in finding nearby garbage disposal portals when user is standing in an unknown area.
11. Even though you are far away from your home, you can simply track the current location of garbage vehicle that is nearby your home and then you can tell anyone to throw your home's garbage.
12. The supervisor/ head of Garbage Management Department or Nagar Adhyaksh can easily monitor the overall working of garbage vehicles.
13. The supervisor/ head of Garbage Management Department or Nagar Adhyaksh will come to know the exact problems that people are facing in that area.

14. It helps in proper garbage management and hence, helps to avoid creation of harmful environment which may cause typhoid fever, food poisoning, enteric fever, gastroenteritis, and other major illnesses.

VI. Limitations

1. It requires GPS.
2. It requires internet.
3. Every city has to make a separate application for its region. (Wardha's Application will not work in Nagpur region).
4. The icon of garbage vehicle on map will disappear, if driver switches off his or her mobile.

VII. Applications

- To track the live positions of garbage vehicles.
- To track the location of garbage bins.
- To make complains about the different garbage related problems.
- To monitor the overall working of garbage collection vehicles.
- To get ideas about the different garbage related problems.

VIII. Scope Of Project

- Size of the .apk file can be reduced in future.
- Accuracy and efficiency can be increased in future.
- The programming can be done more precisely to enhance the functionality of the system.
- Locations of stationary garbage bins and dust bins can be tracked offline.
- It can be used in the Government projects such as the "Swacch Bharat Abhiyaan".

X. Conclusion

This mega project will achieve its objectives and will be able to provide a system that could track and monitor the garbage bins and vehicles and it will report the current position of garbage bins and vehicles via Android application using GPS technology. And also it will provide the facility to complain about the garbage related problems to the current Nagar Adhyashksh of city.

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