# Location Based Garbage Management System with IOT for Smart City

## Progress Presentation 2

**Project ID : 17-100**


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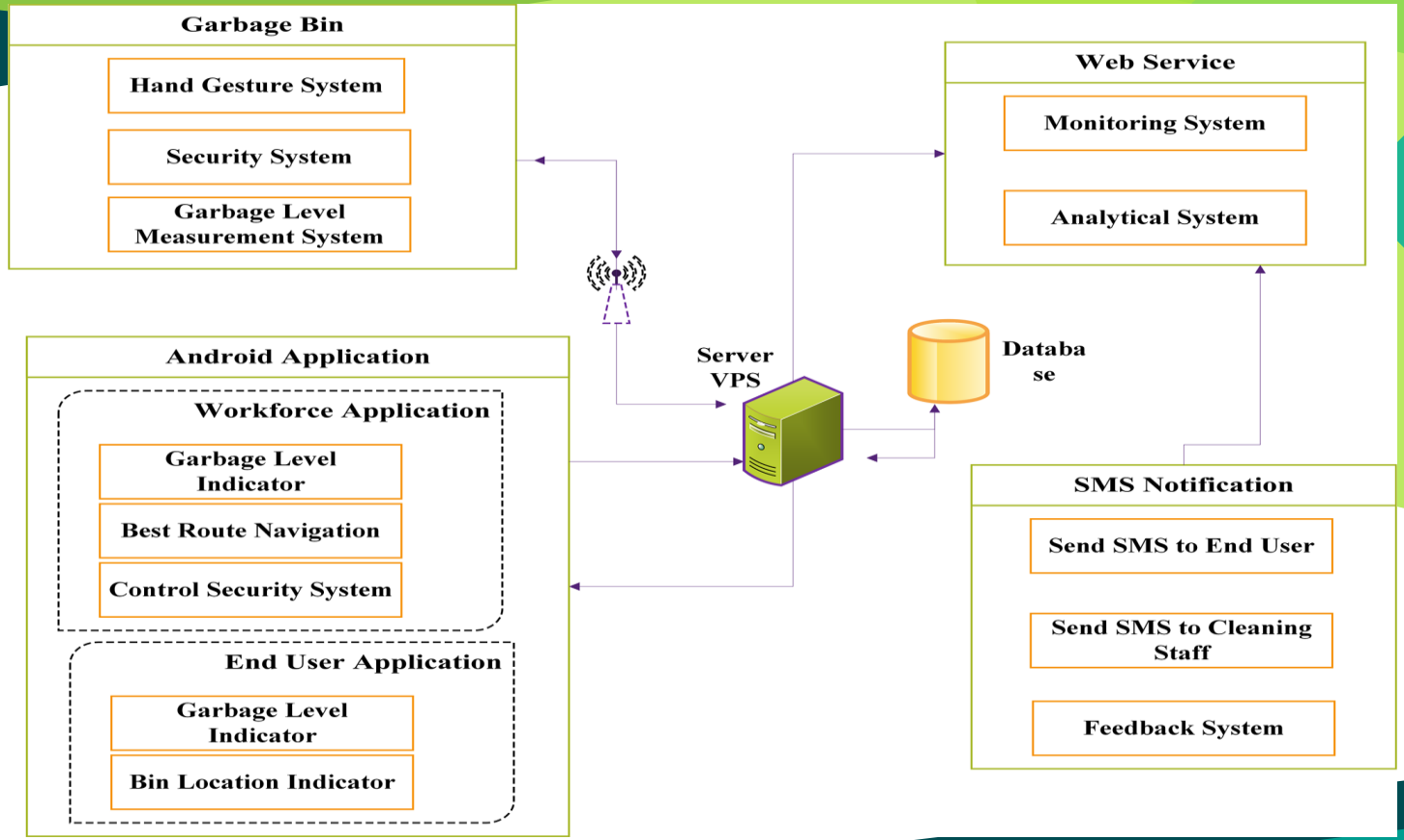
# Methodology

# High-level Architecture



# Setting up the Garbage Bin

All the Processes of the garbage bin are implementing on a Raspberry pi zero Development Board.

Setting the garbage bin will divide into three main sub-functions

- **Hand Gesture System**
- **Measure the Real time Garbage level**
  - Data Transfer
  - Bin lock mechanism
- **Security System**

# The Website

Client:

- View real-time bin details
- Request bins on specific locations
- Receives system news and updates
- Give Feedback

Admin:

- View real-time bin details
- Add, remove and update bin details.
- Get monthly, annual reports.
- Manage normal users

# Android application development

While in the development stage two separate applications will be developed for the workforce and the user. After the two applications have been developed, the 2 apps will be merged together to form one final application

**End user application Application**

- Real-time levels
- Route calculation
- Bin visualizer

# End user application con....

- In Bin location detail visualizer : This application also has the functionality to view all the bin locations and their fill levels through the given map.
- In bin navigator : This provide a route to the nearest available bin. This route is calculated by considering the GPS location of the user. The best route from the current location to the nearest available bin is provided in the map provided in the application.

# SMS Notification System

- Develop web interface to get  feedback from users.
- Inform management
- A system for users to request bins on specific locations or report malfunctions.
- Ultimately provide better communication system

# WorkForce application

- This application also has the following functionality

- Real-time levels
- Route calculation
- Bin Visualizer
- disabling/re-enabling security system

# Real time levels

The map shows all the bins that are placed throughout the city. The cleaner can access each bin to get all the specific information about the bin like real time level, history of fill levels, etc.

# Route calculation

When a certain bin reaches 80% fill level the cleaner receives the best route calculated to the 80% filled bin from the base station. This route is calculated taking into consideration some other bins that will be filled in a certain period of time in the future. These extra bins will be added as waypoints into the route.

# How to build best route?

Use recent data that are exceed 80% filed level.
Use past data that are filed level each hours.
Develop an equation to each bins.
Develop best route based on identified waypoint.

# Disabling and enabling security system

As mentioned earlier the bin has a security system that is enabled when its placed in the city. When a cleaner has to clean a bin, the security system has to be disabled in order to do so. This function enables the cleaner to disable the security system at the start and re- enable it when the cleaning is finished.

# Testing and Evaluvation

Building

Testing

Implementing

- The proposed system has to follow a set of testing phases to check the quality of the system.
- This will help to evaluate the system of various aspects:
  - Accuracy
  - Efficiency
  - User friendliness
- During the initial stages in the testing phase each and every group member carries out an individual testing on each single task completed.
- After each successful completion on the unit testing on each task, each and every component is integrated.
- Then an integration testing is performed, which will ultimately eliminate the integrated errors.

# Testing and evaluvation con….

There is a testing phase when a system is initially setup in a city

In the 1st week

- bins are placed on specific locations, data is collected and analyzed
- the collected data is taken as past data to calculate routes

In the 2nd week

- garbage are trucks implemented with routes
- Feedback system for citizens is implemented


Then the system is evaluated by the managers for the implemented city.


Thanks!
Any questions?