

GREENER NEIGHBORHOODS, WITH SMART WASTE MANAGEMENT.

An Android Case Study



THE CLIENT

Spain's leading telecommunications and new technologies company, which caters to the needs of organizations, companies and the public sector.

THE BACKGROUND

The client's customer was into waste management, and was facing time and manpower issues due to inconsistent processes. They needed to streamline their workflow and improve their practices.

THE TASK

Develop an efficient waste collection and disposal system through a network of sensors in order to improve the quality of life of people living in cities where waste disposal has become a looming issue.

WHY SUYATI?

1. Extensive expertise in mobile app development and FOSS technologies
2. Our strengths include:
 - **Linux • Java • PHP • Android • ROR • Python-Django • iOS**
3. Short turnaround times
4. Nimble staying abreast of the latest technologies
5. The client wanted a flexible and open relationship since the project was part of their R&D department



THE CHALLENGES

The daily route of truck drivers was plotted manually, and there was no competent system to keep track of the amount of garbage being collected by the trucks. The major challenges that needed to be addressed were:

1. **Absence of a mapping and navigation solution.** Because of this, garbage truck routes were not optimized, with some trucks running light, and others overloaded.
2. **Lack of centralized monitoring of fleet and drivers.** This meant that reallocating resources on the fly, were not possible. For example, trucks on routes with less garbage on a particular day could not be diverted to other routes or even brought back to base.
3. **Unavailability of accurate and reliable statistics** for waste collection and disposal. This meant that the client was always playing catch up, instead of staying on top of the growing heap of garbage.

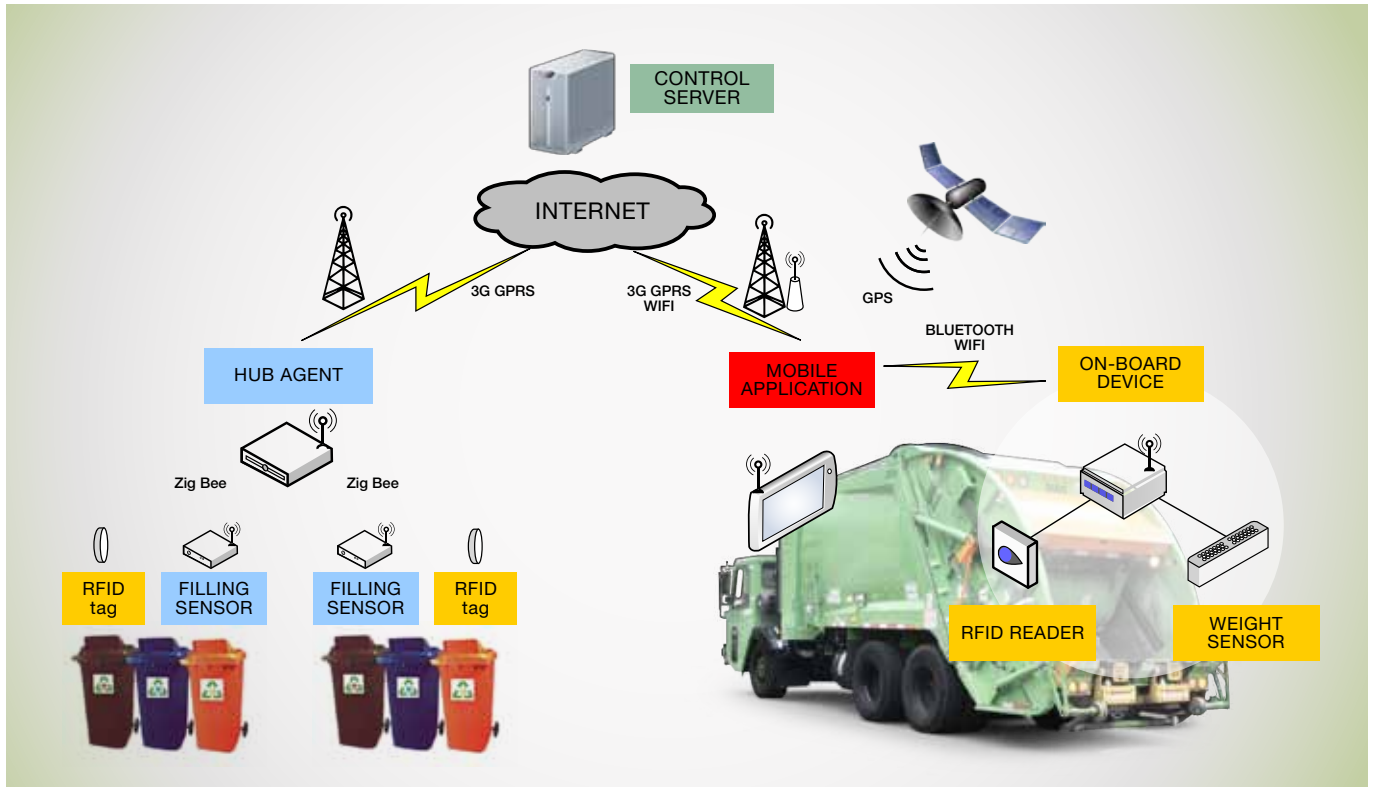
The end client, who had a strong environmental commitment, depended on traditional methods of waste collection, which proved to be insufficient to meet the growing needs.



THE SOLUTION IN A LINE

Using WSN (Wireless Sensor Network), RFID, Bluetooth, open source maps and GPS to streamline navigation, plot optimal truck routes, and keep track of the entire field activity as well as individual drivers.

THE PROJECT FLOW



SOLUTION HIGHLIGHTS

Optimized routes

Depending on the filling of containers and the cost involved in the collection process, the best possible route was plotted with respect to the coordinates provided for each collection point.

Keep track of route deviations

The system kept a check on whether the route followed daily by drivers deviated from the pre-determined ones and in such cases an alert was generated.

Keep track of container status

The quantity of waste collected at each point was monitored using WSN (Wireless Sensor Network) and RFID technology. Incidents related to containers such as damages, cleanliness etc., were also monitored systematically via Bluetooth.

Invoicing

Delivery notes were generated at the waste disposal centers which were dispatched to the central server.



RESULTS

Comprehensive Visibility

With the new operational capabilities enabled, the client now has comprehensive visibility across the entire waste management chain.

Increased efficiency in the waste collection and disposal process

The system resulted in streamlining the costs involved in the process, and helped in improving operational excellence.

Proper resource allocation

Automatic redirects of valuable resources like drivers and trucks to mapped routes daily without direct supervision were enabled. This resulted in a drastic reduction in the costs related to planning activities.

Instant, optimized route planning

The frequency of travel along a particular route is now planned according to the volume of waste collected from a collection point. This ensures that a driver goes to a collection point at timely intervals, depending on the quantity of waste collected previously, helping avoid unnecessary travel and time loss. In case a garbage truck is running light, and another is full, the former can be redirected to the latter's route.

Suyati focuses on delivering niche IT solutions and services, including CMS (Ektron), CRM (Salesforce) and eCommerce. It is an Ektron Featured Implementation Partner, Microsoft Gold Partner, and Salesforce Appexchange Partner, with extensive experience in .NET, FOSS and Mobile App technologies.

Suyati's expertise in FOSS technologies and mobile app development focuses on application development, web applications, and app development. The 5+ years of experience in design, development, and deployment of complex open source/ mobile software and hardware projects on various platforms have seen a gamut of successful projects. They include a conference app, job placement portal, amusement park management system, digital archive management of an online theses collection, and a book management system for a library cum bookshop chain.