

Mobile Resource Management – Case Study

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The Need

Our client, a large national entity, is responsible for the management of waste collection at various bio-waste generation points (hospitals, clinical laboratories, blood banks, medical research centers, etc.) The entity has contracts with 1700+ hospitals/clinics in various cities. The waste needs to be collected from the site every day and regulatory authorities expect them to report any establishment that has not reported biomedical-waste for more than 48 hours.

Complicating Factors

Not every location generates waste in a predictable manner. Based on numerous conditions (traffic, time to turn in and out of location, etc.) trucks can take variable length of time. The fleet of trucks needs to respond to these ever changing conditions to complete the operations in a given timeframe. Further, new hospitals are always signing up and the routes need to be adjusted routinely. And yes, both trucks and truck operators occasionally call in sick.

Solution Overview

BizMerlin Biomedical Waste Management (BBWM) solution is based on the core BizMerlin [Mobile Resource Management solution](#). BBWM provides the fleet operations team with a complete end-to-end solution to improve efficiency as well as to keep track of the process and the real time status tracking of each pickup point.

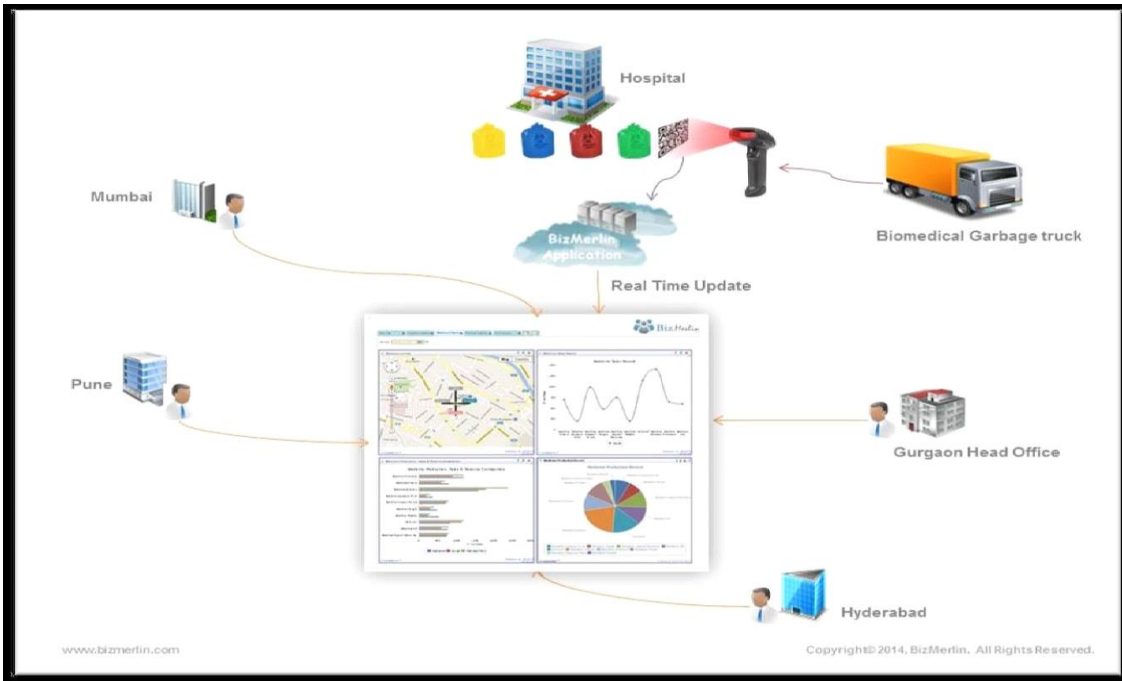


Figure 1: Complete end-to-end solution is available to users of different types and based in different locations.

Solution Components

Route Planning

The system suggests users their monthly visit plan based on historical data, geographical location and ratings. User can override the monthly plans based on suggested monthly plans. Systems will track the route and save the input or data received.

Route Execution and Dynamic Rerouting

The vehicles/apparatus is GPS enabled and the location of vehicles at any time can be tracked and trucks are rerouted as necessary to ensure minimum time and overall cost of execution.

Minimal Data Entry

BBWM is a minimal data entry system that ensures the accuracy of records. The personnel on field submit the data of the collected biomedical waste from different collection points in real time to the server through the hand held terminal.

Centralized Data Storage

The information about the waste collected from various points, the vehicles used for transportation of bio-waste, the routes and locations details as well as the records of data collection from past, are all stored centrally which are always available and accessible over internet.

Hardware Integration

The fleet team is provided with the mobile weighing machines and mobile scanners. These are used to weigh the waste bags and the scanner sends the details like client information, color code of bag, along with the weight it contains in real time to the server. Geo location is also sent along with this information to serve as another confirmation of the visit to the actual location. The three hardware units – Handheld terminal, printer and weighing scale are connected via Bluetooth. Establishing and maintaining device connectivity with pre-chosen and older models of devices was one of the significant challenges faced and overcome by the [BizMerlin](http://www.bizmerlin.com) engineering team.



Figure 2: Multiple hardware units (weighing scale, barcode scanner and the mobile handheld) communicate via Bluetooth.

Configurable, Real-time Alerts and Notifications

System generates alerts and notifications in real time based on many different criteria.

Offline Access

In case of emergency when there is unavailability of the network area, then the data collected from the collection center is stored locally on the hand held devices itself and later as soon as the network is available, the data is transferred to server. In case the hand held devices fails to scan the information from the bar code the fleet team member have the facility to manually enter the data.

Predictive Analytics

Using the large amount of data collected in the BizMerlin big data platform and predictive analytic algorithms, the system anticipates the pickup demands at various locations to create a preliminary plan. This preliminary plan is calculated on a daily basis. During the execution phase, the exact route of the trips taken by trucks can vary from the prepared plan. The changes serve as feedback to the predictive analytics models.

Summary

Using the state of the art BizMerlin supply chain management platform, our client generates significant savings. Using real time trip optimization, real time integration and big data analytics, and real-time notifications and alerts, the supply chain management and execution are both simplified.