Monitoring Dumper State

Tracking Idle Time

Monitoring Fuel Level

Monitoring Engine Health

Tracking Location

Case Study

gslab

**Improving bottom -lines & increasing utilization of IoTized heavy vehicle fleets**

A heavy equipment manufacturer reduces service downtimes and improves fleet efficiency using data from smart sensors

## Executive Summary

Our customer manufactures a variety of heavy machines used for construction. These machines generate data about activity & components using embedded sensors. We connected these smart machines to the fleet owners using IoT and telematics. Now, the owners have fingertip-access to crucial business insights in real-time. This has not only optimized business operations, but it has also improved profitability for fleet owners significantly.

**Vehicle 1 Moving**

**24/7 Service Center**

**Repairman 2 Moving**

**Vehicle 5 Moving**

**Vehicle 4 Break Down!**

**Vehicle 6 Low Fuel Warning**

**Vehicle 3 Parked**

**Vehicle 2 Emptying**

**Vehicle 7 Parked**

## Overview

Our customer is a global heavy equipment and construction machinery manufacturer. Large dealers and fleet owners buy these high-priced machines availing loans. The more the utilization of these machines, the higher is the profitability for the fleet owner. Hence, our customer decided to create an engineering solution to get accurate, timely and useful information about the location, utilization & condition of their equipment. The banks too hypothecate fleets purchased with loans and want to know the exact location of the machines to reduce risk.

**To maximize utilization of the machines, the fleet owners needed to:**

- Improve the uptime

- Track machine availability & utilization

- Minimize the travel time between work sites

- Receive alerts about machine health issues, maintenance & theft

## Challenge

Our customer manufactures smart machines with embedded systems present on them. It was crucial to connect them to fleet owners and provide real-time updates.

- The machines were remotely located. Owners needed the exact location of the machines. This had to work in a low bandwidth areas and at low operational cost.

- The machines had lots of sensors which were generating large amounts of data. This data needed to be converted into actionable insights for the owner.

- The information had to be made available to the owners on their mobile device. The experience had to be holistic yet simple.

- The product had to support multiple languages.

## Solution

The complete solution consists of backend as well as mobile applications. Our telematics server fetches all the information periodically from a third-party server which maintains records of all users and their machines. Android and iOS applications were developed for the fleet owners. Fleet owners needed real-time information and alerts on various parameters. User experience was very crucial.

### User experience

With the classical outside-in approach, our UX team interviewed our customers and their fleet owners. The qualitative interviews enabled us to come up with the following specifications along with the need to develop a mobile application.

| Measure utilization & operational costs | Enable preventive maintenance | Prevent theft & misuse | Reduce service downtime |
|---|---|---|---|
| Extract hourly usage | Display health parameters | Track precise location | Extract location for quick service visits |
| Extract planned vs unplanned usage | Identify severe usage | Enable geo-fencing | Specify right spare parts |
| Generate idle time alerts | Generate alerts for potential issues | Enable time fencing | Identify issues during first service |
| Identify fuel consumption | Schedule maintenance alerts | | Schedule maintenance correlation based on usage |

## Development and implementation

A massive amount of sensor data was available in the cloud. Great Software Laboratory designed the backend to cleanse, standardize, transform, integrate and analyze the data in real-time. Analytics algorithms were then written to bring out actionable insights.
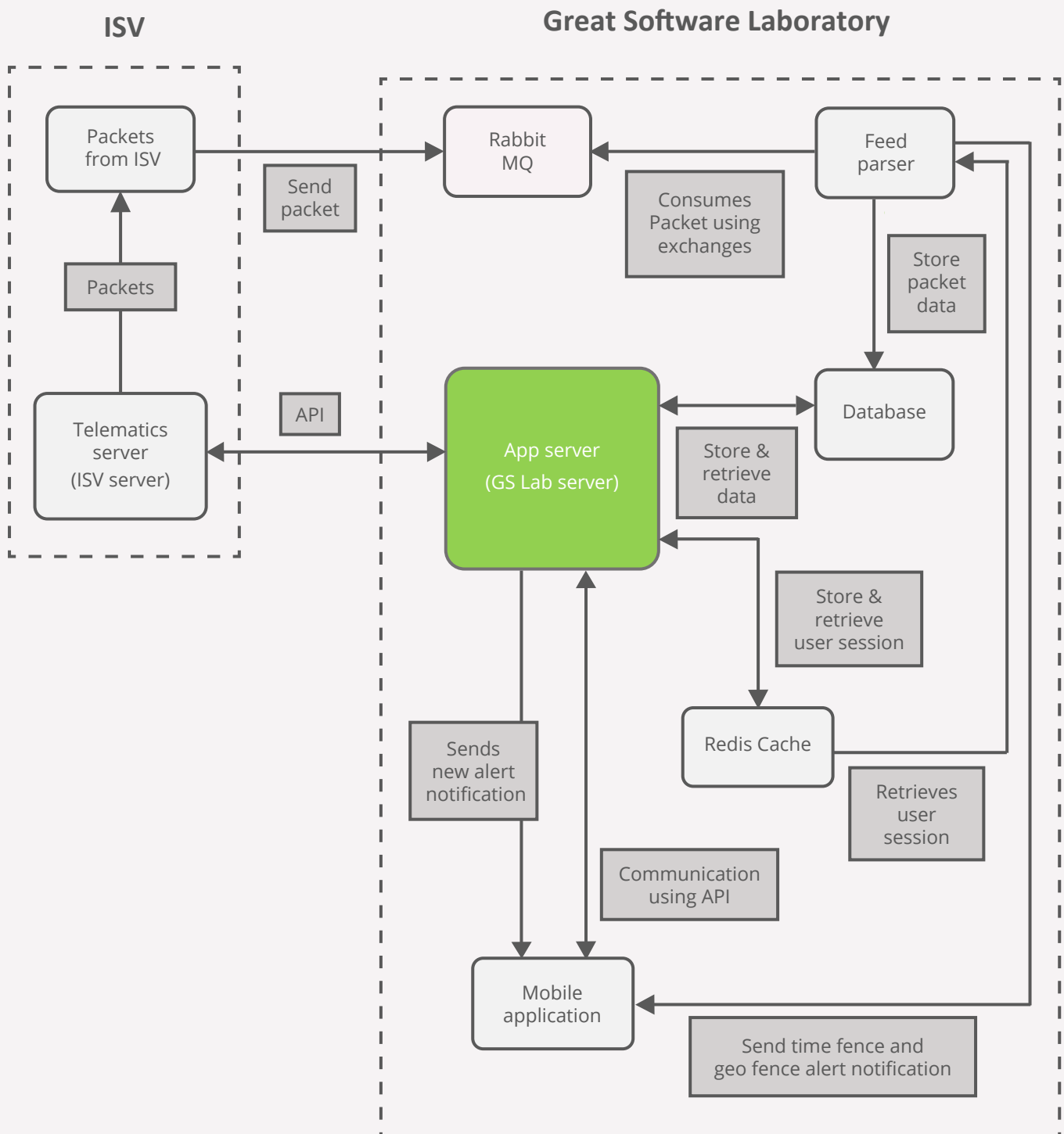


*Solution architecture*
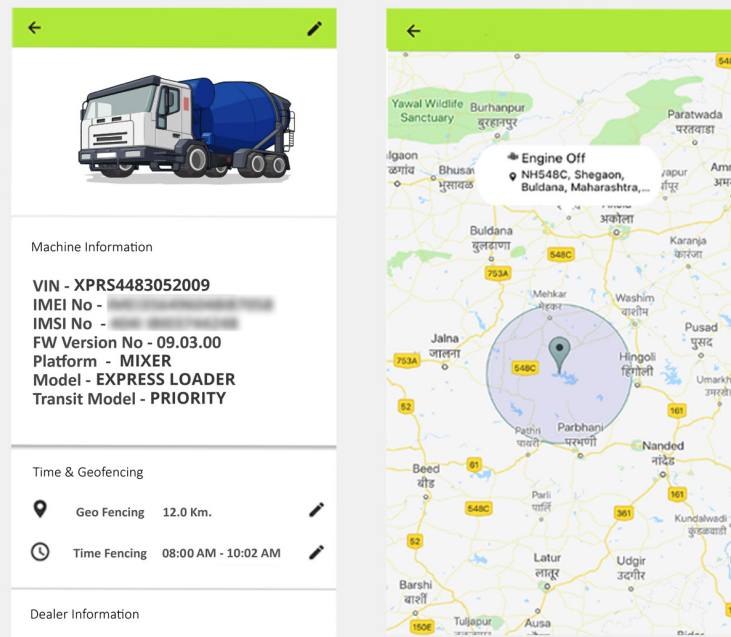
Using powerful APIs, Google Maps, analytics and networking tools, we built the telematics application sever. This server collected all information from the machine sensors regularly and managed the database. This data included information like geo-fencing details, time-fencing details, operating history, comprehensive fleet history and break down frequency.
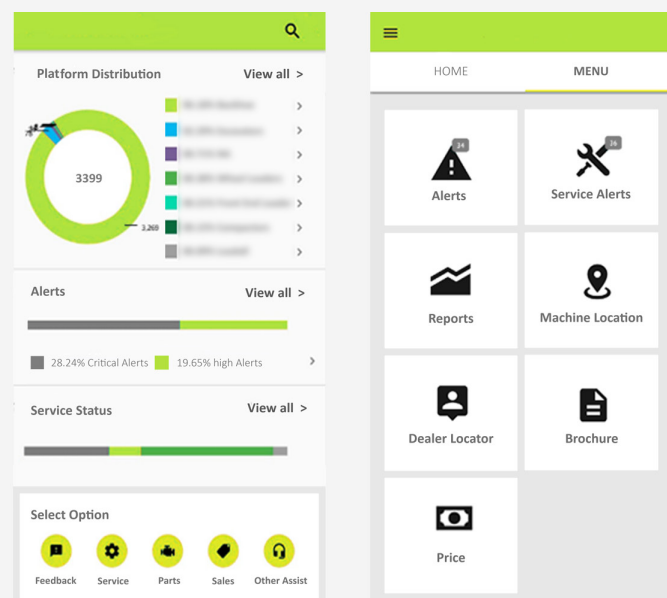


Using simple dashboards, dealers could gain real-time visibility into key performance indicators such as mean time between failures, actual fuel consumption and idle time. This enabled the end consumers to analyze the machine's optimum utilization.
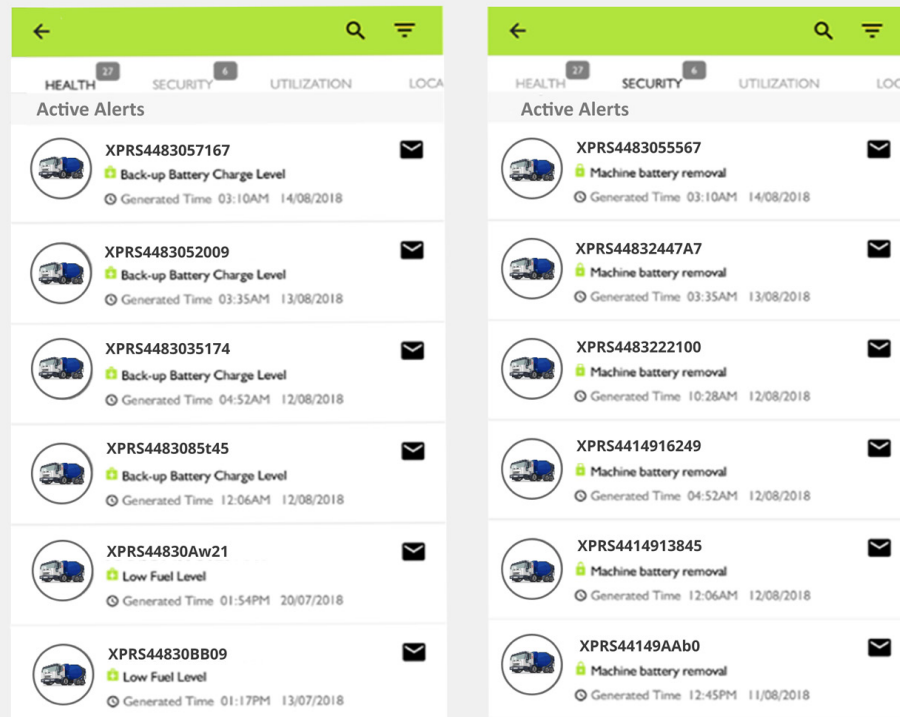
In addition to frontend and backend convergence, push notification service was integrated for categorized alerts such as health, security, utilization, location, and service. Geo-fencing and time-fencing alerts were set to keep track and prevent machine theft.

**Special feature**
We built a *Breakfast Update* feature in the app. Every morning, key business parameters from the earlier day were made available to enable fleet owners to plan their day.

**Going the extra mile**
Apart from developing the application, we provided a few additional services like:

- Conducting a third-party security audit for the developed application

- Defining the API contract with a third party for receiving data from the telematics servers

- Developing a PoC for our customer's foreign entities.

- Consulting to reduce potential development costs. This included the Reverse Geocoding method instead of Google services for identifying the location of the machine.

## Impact

**Improved Uptime**

**Improved utilization**

**More than 150K users**

This telematics application transformed the way fleets were being managed.

- **Happy fleet owners:** Our customer armed fleet owners with a powerful tool to bring transparency and save costs. More than 20 thousand fleet owners owning more than 150,000 machines use the application daily.

- **Improved utilization with transparent operations:** Fleet owners have complete visibility of planned vs actual usage, fuel consumption and usage patterns. This provides the desired control on the entire fleet spread across remote locations.

- **Improved uptime:** The machine uptime went up due to preventive maintenance and more first-time fixes. This increased earnings for fleet owners.

- **Potential use in newer business models and digital twins:** Our customer plans to use rich information for their newer business models such as direct leasing. Our customer has better visibility of the aggregate machine usage data and powerful input for creation of digital twin models. This has allowed them to take better business decisions backed by data.

Great Software Laboratory (GS Lab) has been the technology partner of choice to 100+ organizations across North America, Europe and Asia-Pacific for over 16 years. Leveraging our expertise in 130+ tools & technologies, we have created 300+ 'first-of-its-kind' solutions to real-world problems. Our 'Beyond code' philosophy ensures that we not only push boundaries of existing technologies but also try out newer problem solving approaches to keep our customers one step ahead of their competitors. Our global team of 1200+ employees is adept at creating 'real value' at each stage of the customer growth journey, right from proof-of-concepts to completely scaled up products. For more information about our solutions & offerings, please visit www.gslab.com

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