



WORKSITE SAFETY SOLUTION

Advanced worksite safety solution to detect and prevent accidents caused by intrusions into mobile work zones



PROJECT OVERVIEW

Mobile workforce, specifically in road construction, face a huge risk of injury from motorists, construction vehicles, and worksite equipment. Accidents can be prevented by continuously monitoring location and movement of assets/personnel at worksite. We developed a solution to monitor hardware, track events, and provide reporting capabilities, utilizing a network of sensors to detect and prevent accidents caused by such intrusions. The web and mobile applications complement the existing system with a user-friendly interface.

CLIENT PROFILE

The client is a leading multinational building materials group in North America serving all segments of the construction industry. The company employs over 90,000 people in 4,000 worksites across 37 countries.

BUSINESS REQUIREMENT

A system of sensors to detect and prevent accidents caused by intrusions into mobile work zones nationwide. The system would include a suite of connected devices that track location, upload/download data, and upgrade software applications.

- ❖ Create a cloud instance to store and access system data
- ❖ Secure all data on the system by creating a user database with appropriate permissions
- ❖ Create base station mobile applications in iOS and Android
- ❖ Web interface to display system performance and generate reports

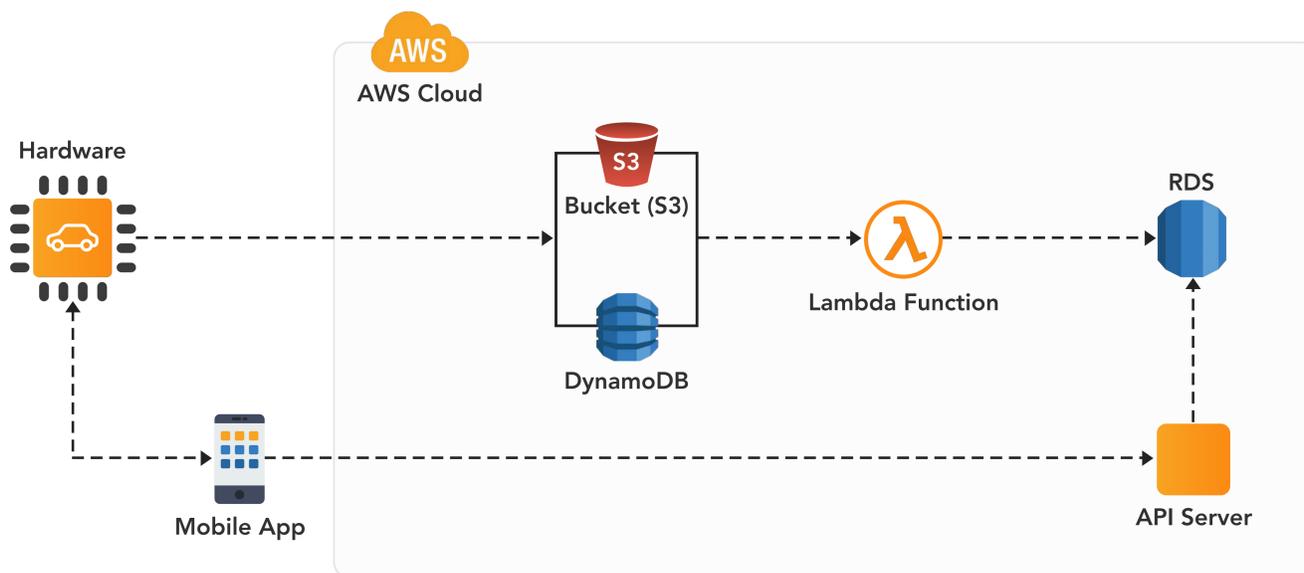
QBURST SOLUTION

The client uses a suite of devices that capture real-time data and broadcast alerts to employees and supervisors. We hosted microservices in AWS which enabled a robust and scalable cloud database structure. This ensured fast, secure, and easy access to data from anywhere, anytime.

Data Modeling was enabled to review, analyze, and remap existing data to implement hierarchical access control mechanism. This is a step-by-step process that starts with a thorough understanding of system components, their interactions, and the data they generate on a regular basis.

The web and mobile platforms are designed to set up and control devices at the worksite and can be used as a visualization tool to assess the performance of sensor-based systems. The web and mobile interface place each asset on a map. When an asset is selected, users can view status of equipment as well as track speed, proximity, and trajectory of oncoming vehicles. The solution helps in continuous monitoring of traffic and

tracks movement of construction equipment and workers in real time. Geofencing and an audio-visual and haptic alert system ensure enhanced worksite safety. Since the data captured by system sensors has value beyond work zone safety, it is stored locally until it can be uploaded to a backup server.



KEY FEATURES

❖ Administration Portal

- Intuitive dashboard
- User provisioning
- Advanced analytics
- Create, update and search projects, companies, and users
- Inventory management for sensors and assets
- Visualizer with maps and video for alert rating and classification
- Detailed reports with smart graphics and filters
- Role-based security and access controls
- Infinite data storage in AWS — archivable for future use

❖ Base station mobile apps

- Create and archive projects
- List and map view of projects
- Communicate with radar and sensors
- Activate and deactivate sensors
- View and rate alerts from sensors
- Visualizer with maps and video for alert rating and classification
- Neutral UI color theme to support lighting conditions (day/night)
- Large tappable areas in UI for smooth interaction with the application

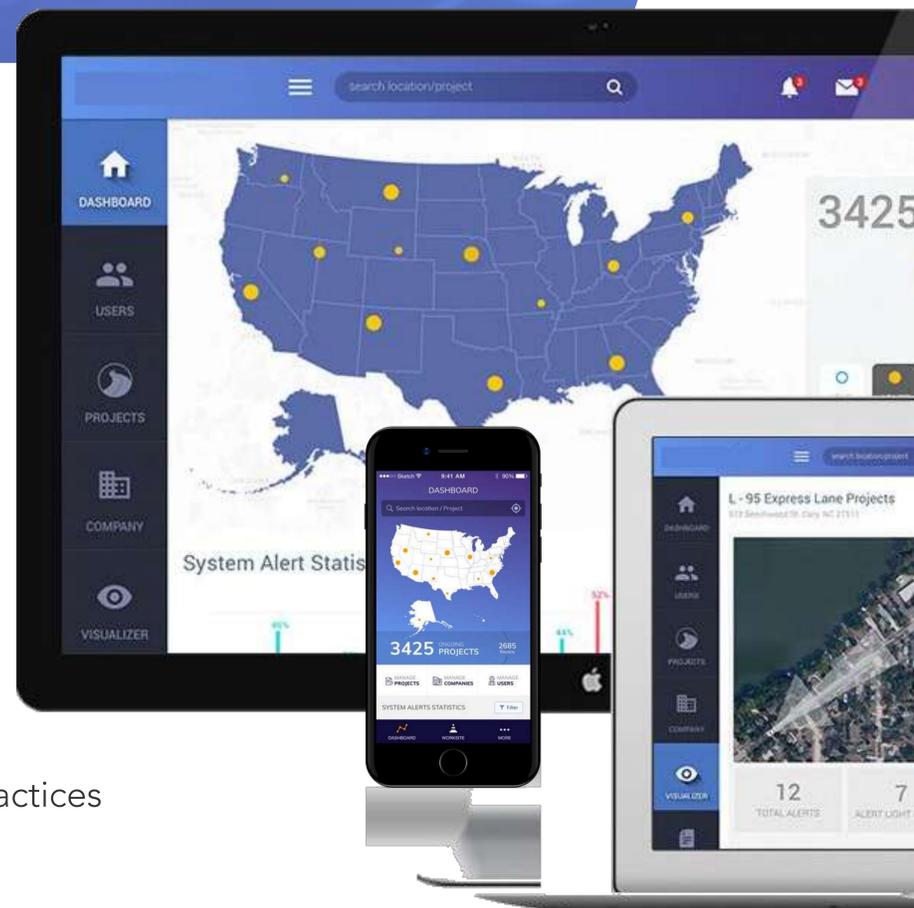
TECHNOLOGIES

- Swift
- Android SDK
- Python
- Django
- PostgreSQL
- Angular
- TypeScript
- SystemJS
- HTML5
- Gulp
- Bootstrap
- Redis
- AWS
 - DynamoDB
 - S3
 - RDS
 - Lambda
- BLE
- IoT
- Highcharts

BUSINESS BENEFITS

Within a year from implementation, our client achieved the following results:

- ❖ Zero incidents relating to life or equipment
- ❖ Zero incidents of worksite stoppages
- ❖ 15% increase in operational efficiency at worksite
- ❖ 12% cost savings on insurance through enhanced safety practices
- ❖ Significant improvement in employee satisfaction



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